Autodesk® Architectural Desktop

autodesk®

New Features Guide

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Understanding Autodesk Architectural Desktop 2004

I

Topics in Part 1

- Introduction
- Autodesk Architectural Desktop 2004 Overview

Introduction

1

With Autodesk® Architectural Desktop, you can move smoothly from 2D drafting to building information modeling in an AutoCAD-based environment. Autodesk Architectural Desktop respects your current practices and helps you to take advantage of your knowledge of AutoCAD software. You can reap productivity benefits because the many features offered by Autodesk Architectural Desktop, such as intelligent architectural objects, minimize tedious drafting and rework and provide powerful software for design and documentation.

Autodesk provides many resources to ensure that you quickly become productive with Autodesk Architectural Desktop and the many new features available in this release of the software. Online and print documentation, real-world tutorials, and technical support channels help answer your questions as you begin working with the software.

In this Chapter

- Where to Begin
- Finding Help
- Contacting Autodesk

Where to Begin

After you have installed Autodesk Architectural Desktop 2004, you can begin drawing according to your level of experience, whether you are a skilled user who is upgrading from a previous version or a user who is new to Autodesk products.

Additional Topics

- Beginning Users
- Experienced Users

Beginning Users

If you are a new user of Autodesk Architectural Desktop, you can begin by completing some of the procedures in the tutorials. Tutorials are exercises designed to take you through practical applications. For more information on running the tutorials, see "Online Documentation" in "Finding Help" on page 2.

If you are new to AutoCAD 2004, it is important to begin with AutoCAD tutorials or AutoCAD Learning Assistance™ and to refer often to the online *AutoCAD 2004 User's Guide*.

Experienced Users

If you are upgrading from a previous version of Architectural Desktop, see "Autodesk Architectural Desktop 2004 Overview" on page 7 to read about the new features and improvements. Additionally, refer to the online *AutoCAD 2004 User's Guide* to find out about important innovations in AutoCAD drawing tools.

Finding Help

There are various available resources to help you learn about Autodesk Architectural Desktop 2004 and AutoCAD 2004.

Additional Topics

- Online Documentation

Online Documentation

The following online manuals help you learn more about both Autodesk Architectural Desktop 2004 and AutoCAD 2004.

Autodesk Architectural Desktop 2004 Installation Guide	Explains how to install and configure Autodesk Architectural Desktop 2004.
Autodesk Architectural Desktop 2004 Help	Explains Autodesk Architectural Desktop concepts and provides step-by-step procedures. Includes a glossary with definitions of Autodesk Architectural Desktop terms.
AutoCAD 2004 User's Guide	Provides conceptual and overview material with step-by-step procedures for AutoCAD 2004.

The advantage of online manuals is that they present information quickly while you are in a drawing session. Although online Help topics provide some conceptual and overview material, their main purpose is to help you get a task done efficiently. Therefore, the Architectural Desktop online Help emphasizes step-by-step procedures relevant to command selection. It also incorporates visual examples and links to more information.

Additionally, online tutorials are an excellent way to become familiar with Autodesk Architectural Desktop. You can use the tutorials to learn program concepts, and you can keep the tutorial window open in the drawing area while you perform the steps.

To access online Help

- From the Help menu, choose Architectural Desktop Help or AutoCAD 2004 Help.

  When the Help window is displayed, browse Contents to locate the information you need or look up index entries to pinpoint specific topics.

To access online tutorials

- From the Help menu, choose Architectural Desktop Tutorial.

  When the Help window is displayed, browse Contents to locate the Autodesk Architectural Desktop tutorials. The tutorials are available in

either metric or imperial units and include datasets that correspond to each exercise.

Contacting Autodesk

Autodesk, Inc.
11 McInnis Parkway
San Rafael, CA 94903 USA
Phone: 415-507-5000
Web site: *http://www.autodesk.com*

Additional Topics

- Sales Information
- Customer Satisfaction
- Technical Support
- Feedback

Sales Information

To purchase additional Autodesk software, contact your local reseller. For the name of the authorized reseller nearest you, call 1-800-964-6432 or access the Resellers and Training Centers web site, *http://www.autodesk.com/resellers/index.htm*.

Customer Satisfaction

Phone: 1-800-538-6401
FAX: 603-621-3387
Web Site: *http://www.autodesk.com/feedback/*

Technical Support

If you have technical questions about the products, you should contact your local reseller or check the frequently asked questions (Technical Solutions & FAQS) section and Discussion Groups on the web site for Architectural Desktop at *http://www.autodesk.com/archdesktop*. News groups are another good source of information. You can look through the questions that have already been posted, or you can post your own questions.

Feedback

Let us know what you think! If you have a suggestion for product enhancement or a compliment, or a complaint, or if you think you have found a bug, then we'd like to know about it.

To make comments and find additional information, visit our Web site at *http://www.autodesk.com/archdesktop*.

Autodesk Architectural Desktop 2004 Overview

2

Autodesk® Architectural Desktop 2004 improves your design and documentation efficiency while protecting your technology investment. It gives you the best of both worlds by providing traditional drafting methods in an AutoCAD® environment, as well as efficiency gains through intelligent building model objects. And now Architectural Desktop offers new productivity tools such as a streamlined user interface and direct manipulation of architectural objects; coordination features like file and level management; design visualization features such as Autodesk® VIZ Render; and collaboration and data exchange tools like Export to AutoCAD and integration with the Autodesk® Buzzsaw™ online collaboration service.

Autodesk Architectural Desktop—building information modeling on the AutoCAD platform.

In this Chapter

- Productivity: Reduce Tedious Drafting Tasks
- Coordination: Do the Work Once
- Design Visualization: Bring Your Designs to Life
- Collaboration: Work Effectively with Your Extended Design Team

Productivity: Reduce Tedious Drafting Tasks

With intelligent architectural objects—such as walls, doors, and windows that relate to each other logically—Autodesk Architectural Desktop provides many tools that automate tedious drafting tasks. Enhancements to the Autodesk Architectural Desktop user interface, and new features such as direct manipulation, let you easily make changes in a workspace that is both visual and intuitive, providing a smoother, nondisruptive means of design.

Streamlined User Interface

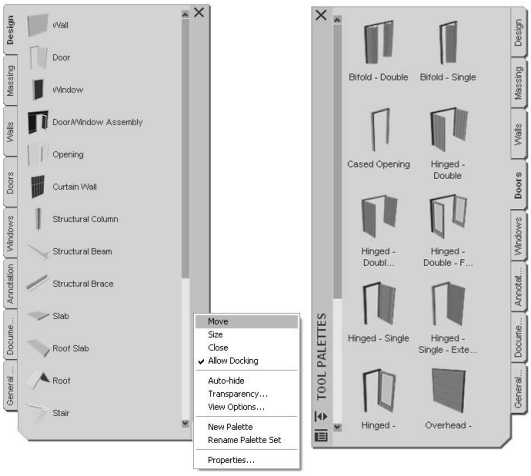
The streamlined user interface in Autodesk Architectural Desktop marks a dramatic improvement from traditional CAD design software in terms of "look and feel" and overall functionality. Highly visual and more intuitive, the new interface makes the software even easier to use. With less focus on dialog boxes and more emphasis on designing directly in the workspace, the software's design tools speak your language—the language of design. Enhanced tool palettes and the Properties palette as well as the new Content Browser complement the redesigned workspace to help you work more efficiently.

Tool Palettes

Tool palettes provide instant access to a complete inventory of stock Autodesk Architectural Desktop tools, such as walls, doors, and windows. Highly visual, tool palettes include a preview of each style.

You can create custom tool palettes that address your specific design needs. For example, you might create a single palette to store a custom list of commonly used curtain wall, stair, and window styles. You could then group these tool palettes into project-based catalogs. Because tool palettes and catalogs both use i-drop®technology, they can be posted externally—on an intranet, the Web, or the new Content Browser—and accessed via drag-and-drop functionality.

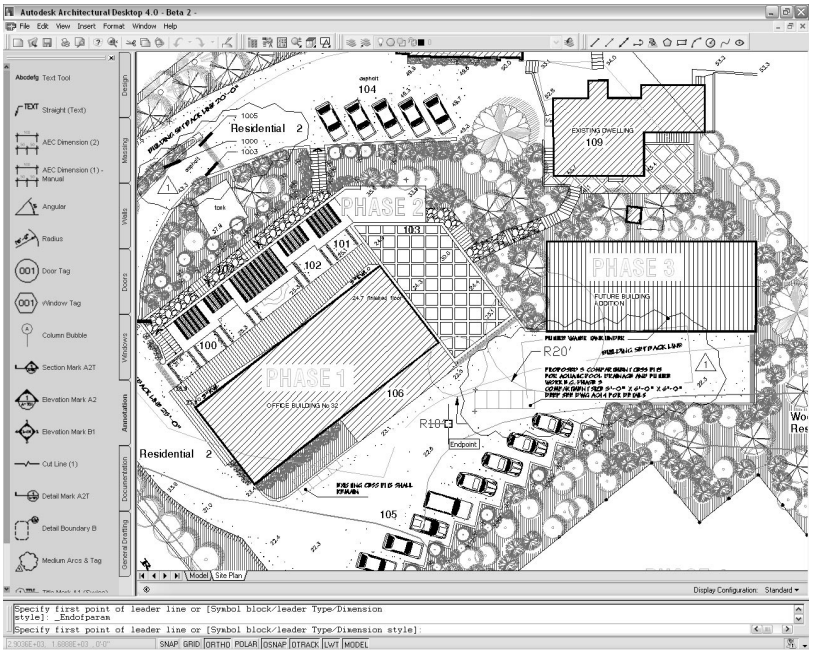
Tool Palettes are highly visual and customizable



Tool palettes also provide the following functionality:

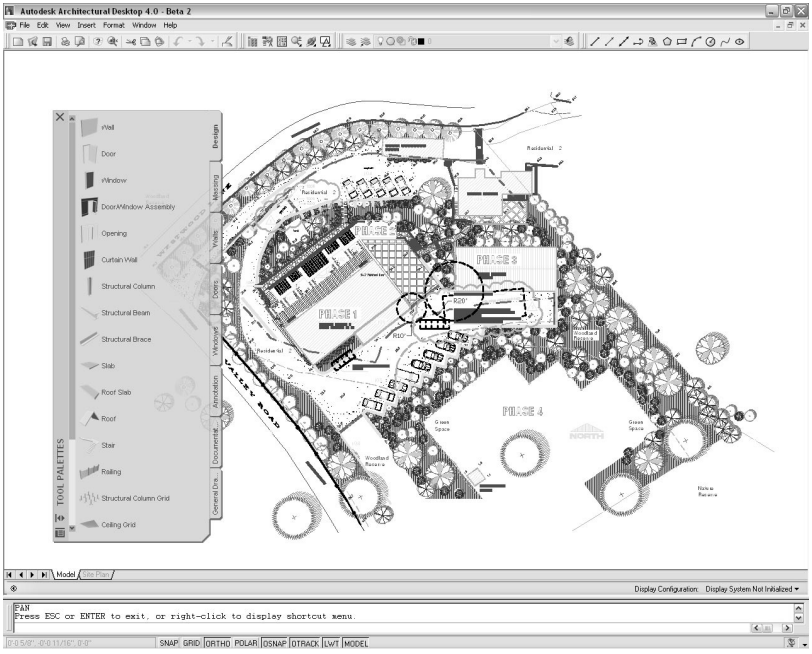
- Docking—You can dock tool palettes so they are always visible and easily accessible.

Tool palettes can be docked for more design space



- Auto-hide—When this feature is on, inactive tool palettes are minimized, increasing screen space.
- Transparency—Save screen space by displaying the drawing geometry beneath the tool palette. You can even apply transparency to the command line.
- View customization—View options let you modify the appearance of tools to suit your environment. Detailed tool descriptions make it easier to learn about new tools. Once you are familiar with the tools, you can switch to icon-only tool display to save screen space. You can apply view options to individual tool palettes or to all tool palettes at once.
- Icon creation—Auto-generate the icon from a preview image of the object or select a JPG, PNG, or BMP file.
- Tool grouping—You can group multiple tool palettes into project-based catalogs.
- Palette refresh—Refresh the tools on a palette, including an individual tool's properties retrieved from a tool catalog, over your intranet or the Internet.

Tool palettes support transparency



Properties Palette

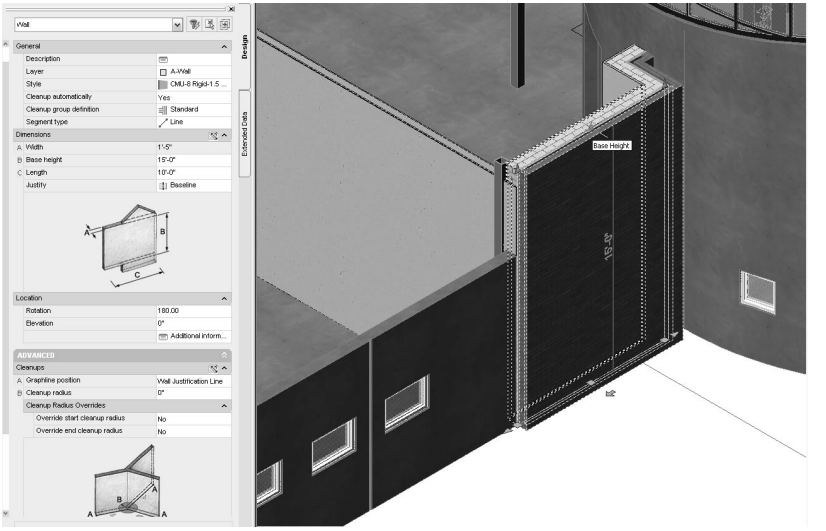
The enhanced Properties palette consolidates tools for adding and modifying building model objects into a single, consistent user interface, eliminating the add and modify dialog boxes. The Properties palette also provides a hierarchical display of design options, ranging from basic to advanced.

In addition, the Properties palette gives you access to two other key features: extended property set data, for scheduling purposes; and worksheets, for more design options.

The Properties palette provides the following enhancements:

- A centralized location for adding and modifying objects
- Hierarchical display of basic and advanced modification options
- Easy access to extended object data and worksheets

The Properties Palette supports design changes in one consistent user interface



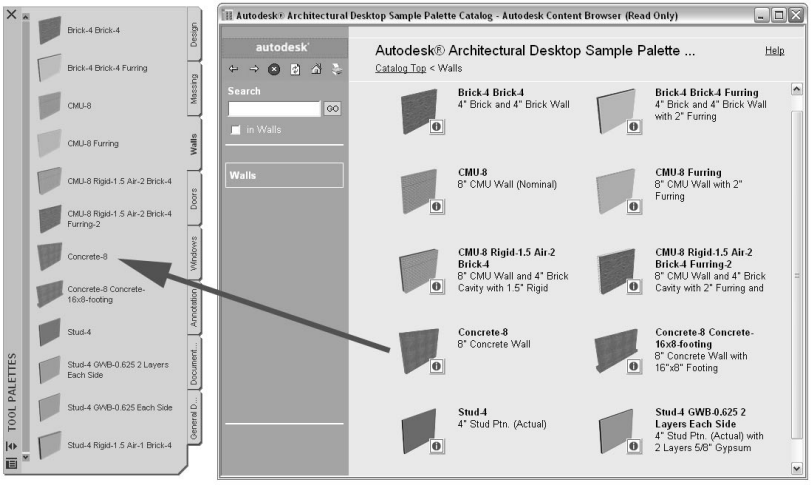
Content Browser

The new Content Browser provides quick access to Autodesk Architectural Desktop tools—such as catalogs, tool palettes, and design content—in the form of blocks and multi-view blocks. The Content Browser is the central location for project-based tools and content, ensuring that every member of your design team has access to the most up-to-date tools.

Create catalogs for specific projects

The Content Browser enhances data exchange with its use of i-drop technology. You and your team members can drag standard, project-based, and manufacturer content via your own company intranet or over the Web.

Browse project-based catalogs for specific tools; drag and drop them onto tool palettes



Menus

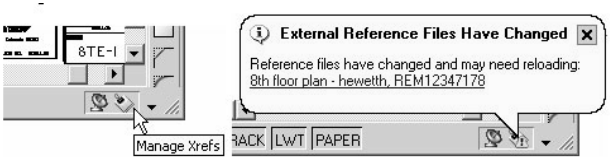
Menus have been streamlined to contain all-purpose application commands and access to formatting and manager dialog boxes, such as the Style Manager and Display Manager.

Drawing Window Status Bar

The new Drawing Window status bar provides access to pertinent information and tools for each drawing. Now you have a central location to access the following:

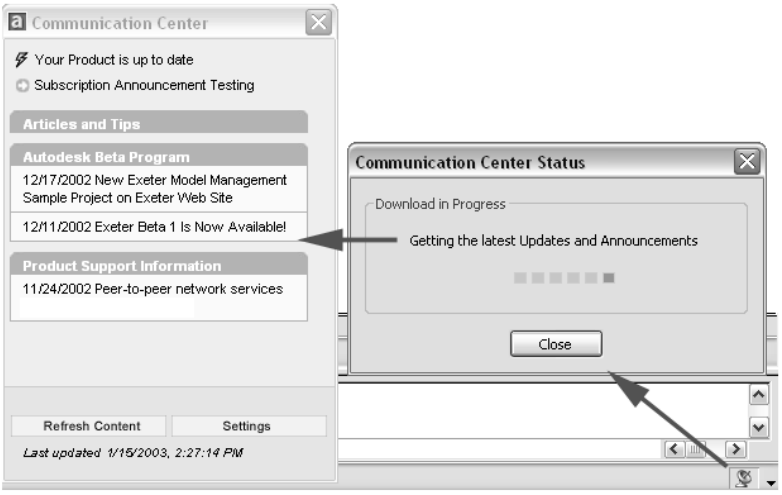
- Project information—Displays the project name associated with your current drawing to let you know that you're in the correct project or that you need to associate the drawing to a project. For more information, see "Drawing Management" on page 209.
- Display configuration information—Shows the drawing's current display configuration. This tool provides a central location to toggle to different levels of plan view detail. It also lets you switch to other views of your design, such as Reflected and Presentation, providing even more control over display of your designs.
- Drawing Management information—Indicates whether the current drawing is a sheet, view, construct, or element, and gives the drawing name. (Sheets, views, constructs, and elements are part of the new Drawing Management feature.)
- Xref Manager—If a colleague revises a file associated with your current drawing, the Xref Manager icon alerts you if external references require reloading. This ensures that you are working with the most current view of your overall design.

Xref Manager notifies you of drawing updates



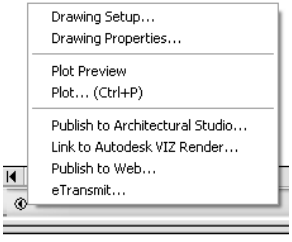
- Communication Center—This in-product notification system keeps you up-to-date on service pack availability. It also provides information for Autodesk Subscription Program members, such as extension availability, product tips and tricks, and product support information.

Communication Center provides access to software updates



- Drawing menu—This tool provides a central location to launch common setup and export operations, such as the following:
  - Drawing Setup—Set up units, annotation scale, and layer schemes
  - Plot—Plot DWGs to paper sheets or publish to DWF™ (Design Web Format™) files
  - Publish to Autodesk® Architectural Studio—Import drawings into a running version of Autodesk Architectural Studio for review
  - Link to Autodesk VIZ Render—Transfer designs to VIZ Render for design visualization
  - Publish to web—Make designs available for review via a web browser
  - eTransmit—Send files to colleagues

Drawing Menu provides a central location to do common tasks such as plotting



Style Manager

In earlier releases, the Style Manager provided access to every style-based object in Autodesk Architectural Desktop, and the advanced grouping and filtering options enhanced productivity and ease of use.

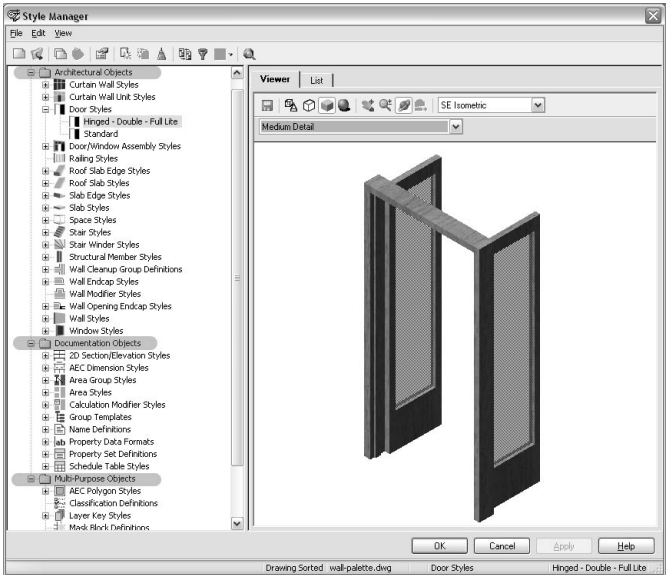
In this release, the enhanced Style Manager takes productivity a step further by introducing grouping by functionality.

The Style Manager is now grouped into the following categories:

- Architectural (such as doors, walls, and windows)
- Documentation (such as sections, elevations, and schedules)
- Multi-purpose (such as profiles and material definitions)

Grouping by functionality helps you to focus at a glance on a specific object style. Filtering functionality is still available, giving even more control over display of the Style Manager.

New grouping enhancement sorts objects by use for faster access



Display Manager

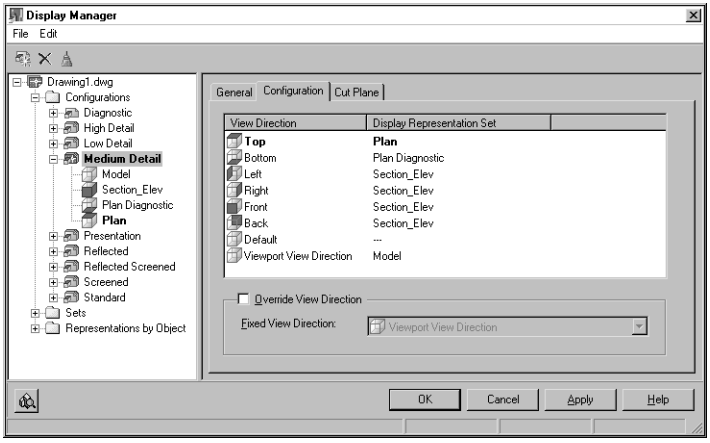
The Display Manager lets you quickly change the way your designs are displayed. By clicking a button, you can change the level of detail that your floor plans display, without layer manipulation. You can even change the way your design data is displayed through various phases of design. For

example, you can change the view from a plotted floor plan to a reflected ceiling plan to a custom plan, such as demolition, without creating separate drawings for each view. And because each view is based on your design, any change you make is reflected properly throughout all views of your design data.

Autodesk Architectural Desktop 2004 improves the Display Manager with the introduction of classifications. Classifications give you even more display control over your designs because you control the view of all AEC objects and multi-view blocks independently, without layer manipulation.

With classifications, for example, you can create clean structural base sheets that display only walls (bearing), grids, slabs, openings, structural members, and multi-view blocks (such as column labels and structural member call-outs) without needing to freeze the layers of other objects and multi-view blocks (such as stairs and door tags).

Use the Display Manager to switch to multiple views of your building model



Layer Manager

Autodesk Architectural Desktop enhances the Layer Manager with tools for layer standardization. Because the Layer Manager also supports project-based standards through layer key styles, you can keep a library of layer standards to use as needed.

Although you can create your own layer standards, Autodesk Architectural Desktop provides the following standards for local, regional, and even international projects:

- AIA
- BS1192

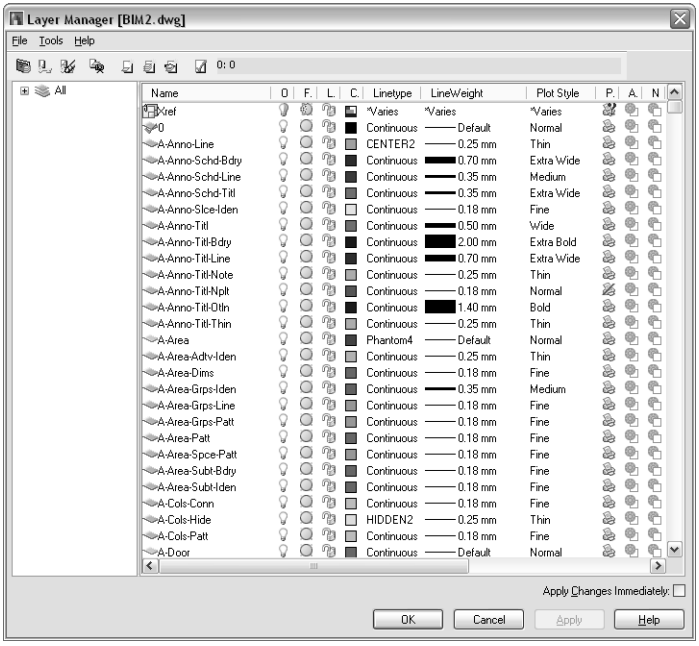
- DIN 276
- ISYBAU
- STLB

Using the Layer Manager, you can be confident that everything you draw is placed on the correct layer, reducing manual layer management and ensuring accuracy.

The Autodesk Architectural Desktop Layer Manager enables you to:

- Define project-based layer standards through layer keys
- Override layer standards to account for status changes such as New, Existing, or Demolition
- Remap a drawing from one layer standard to another during file exchange

Layer Manager assigns layers as you design



Direct Manipulation

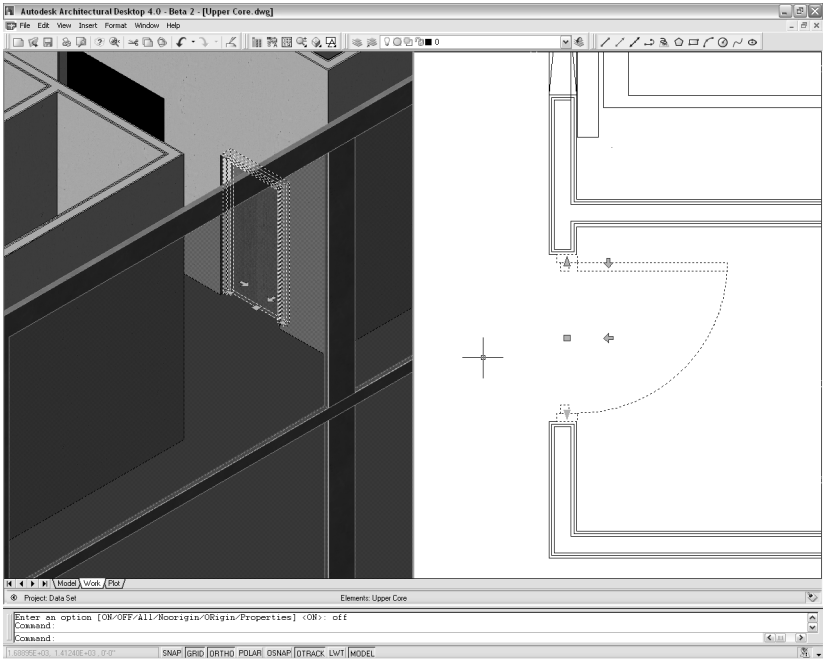
Direct manipulation is the ability to make common design modifications or to explore alternate design possibilities directly on an object, without dialog boxes. This streamlined approach to design enhances productivity by keeping you focused on the task at hand.

Direct manipulation functionality has been implemented for all Autodesk® Architectural Desktop building model objects. It enables you to make design changes with either grip manipulation or in-place object editing.

Grips

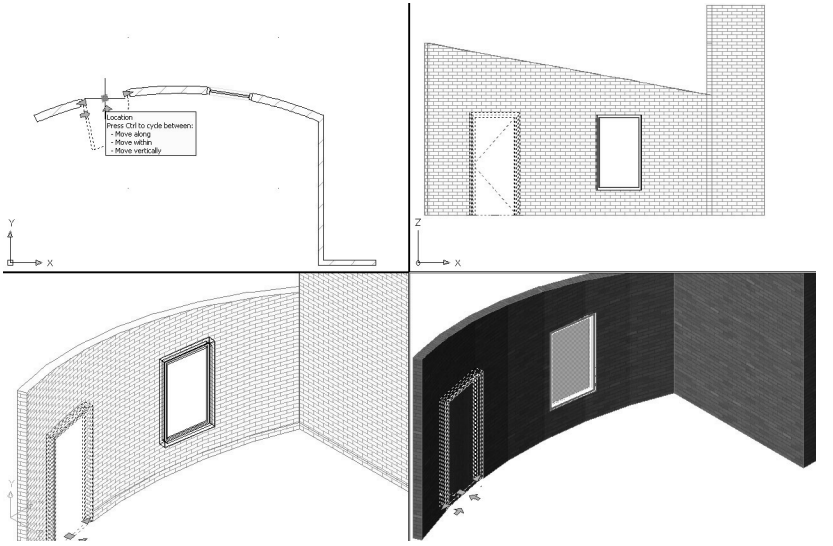
With enhanced grip functionality, you can make quick design changes directly in the workspace, without using dialog boxes. With a single click, you can perform design changes such as adjusting door widths and window heights, modifying wall rooflines, or reversing wall direction.

Use grips to adjust position, height, and width of AEC objects without dialog boxes



Tooltips indicate the function that each grip performs. An added enhancement is dynamic dimensions. As you make design changes, dynamic dimensions ensure that your changes are precise and accurate. You enter values directly in the workspace, eliminating the need to enter numeric input at the command line.

Grips provide tooltips, enhancing ease of use



Edit-in-Place

The new Edit-in-Place functionality reduces the number of steps required to edit or create object styles, significantly enhancing design productivity. And because you can make design changes directly in the workspace, you stay focused on the task at hand, working fluidly with your designs.

Edit-in-Place functionality enables you to:

- Create custom profiles as you work
- Customize existing object styles or create new ones as you work
- Explore different design alternatives quickly and easily

Building Model Enhancements

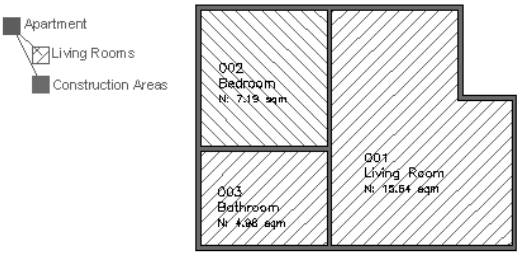
Autodesk® Architectural Desktop 3.3 enhanced user productivity by adding objects such as curtain walls, window assemblies, and structural members. Autodesk Architectural Desktop 2004 takes productivity a step further by extending the usability of objects, so that you can design faster and more accurately in an AutoCAD-based environment.

Areas and Area Groups

After the floor plan design is complete, you can calculate areas and group them to export pertinent information from your model in various formats,

such as Microsoft® Excel. You use areas and area groups to create an area evaluation of a floor plan. You can even add modifiers, such as price per unit area, to each area or group and extract cost estimations based on your designs, which saves time compared to calculating these estimates manually.

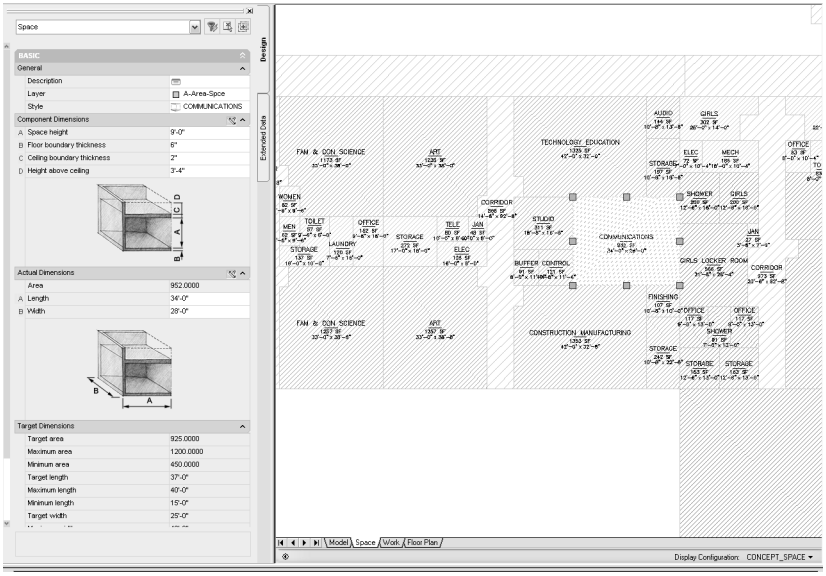
Group and color-code areas



Spaces

You can create spaces from closed boundaries, such as walls and linework. Use the Auto Generate feature to quickly create color-coded space studies for the purpose of generating reports, such as room finish schedules.

Space information can be used to generate reports that you can export to an external database



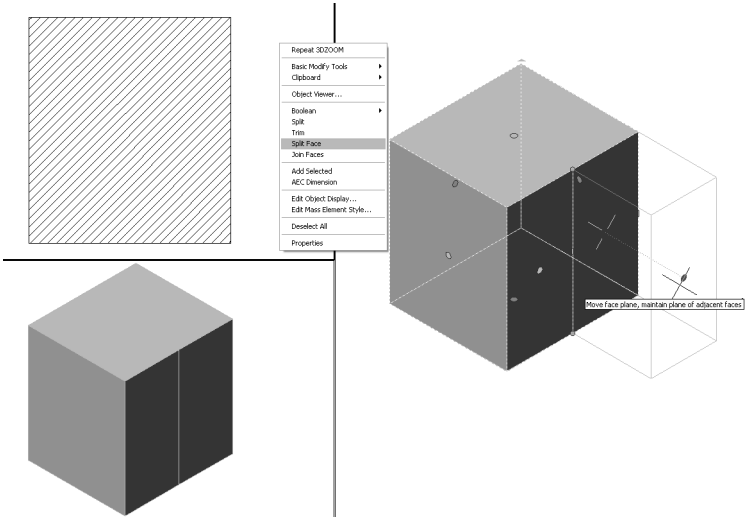
Mass Elements

Not only are mass elements instrumental throughout the conceptual phases of the design process, but they can also be used effectively in design development. These multi-purpose elements can aid you in creating complex massing models or in adding detail to other architectural elements, such as a recess in a wall, to indicate design intent.

Enhancements for Autodesk Architectural Desktop 2004 include the following:

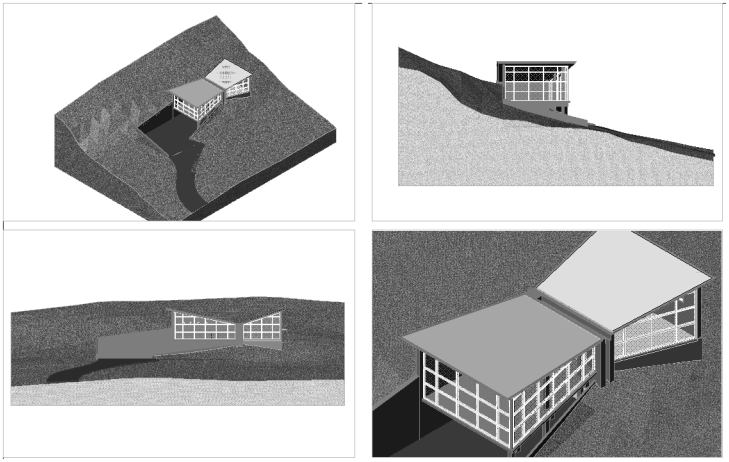
- Mass element styles—Save mass element styles with display, material, and classification settings for reuse
- Free-form editing—Use new grip functionality for face, vertex, and edge modification
- Trim/split behavior—Create planes for trimming or splitting mass elements

New direct manipulation options allow you to easily modify mass elements



- Above and below cut plane display—Define cut plane and plan view display of mass elements
- Drape—Convert polylines with different elevations into a free-form mass element that can represent terrain. Because it is a mass element, you can then use the Boolean operations (addition, subtraction, intersection) for cut and fill

Convert contour lines to terrain models



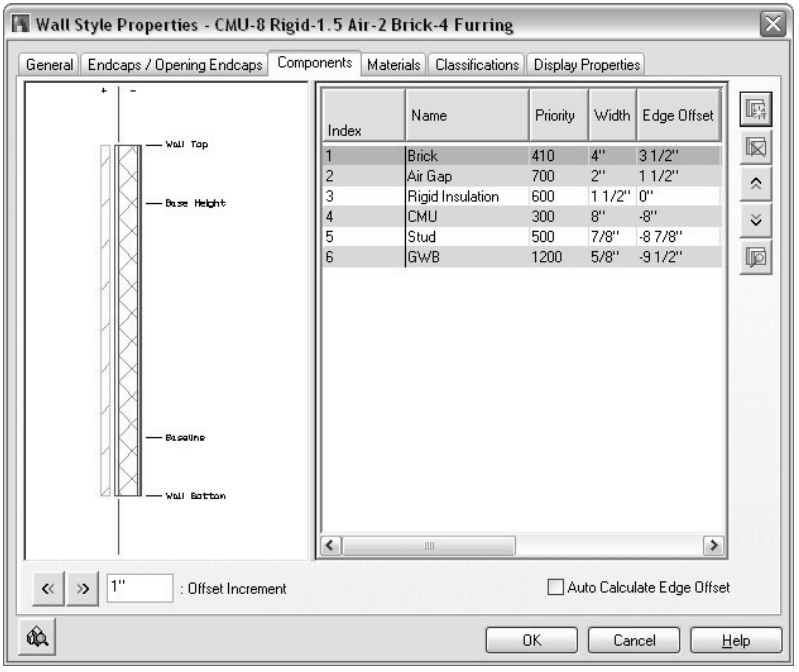
Walls

With enhancements to wall creation, display, and cleanup, walls provide even greater productivity boosts through their increased ease of use.

Wall creation: Creating wall styles is easier because of the enhanced Wall Style properties interface. This tool includes features such as the following:

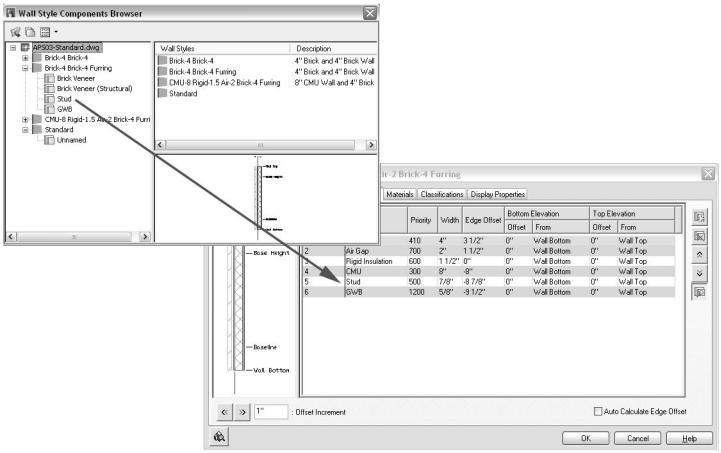
- Real-time Preview Pane—Updates your wall preview as you add and adjust components, ensuring that you get exactly what you want.

Preview Pane updates in real time as you adjust components



- Auto-Calculate Edge Offset toggle—Adjusts the distance between wall components.
- Wall Style browser—Explore a library of wall styles on a component level, and save time by dragging them into your new wall style.

Browse existing wall components; drag and drop them into new wall styles

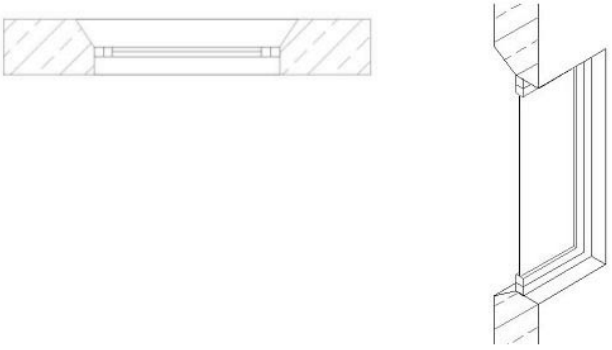


- Curved wall display—Faceting has been removed from wireframe views of any curved AEC object, such as walls.

Wall Display: Autodesk Architectural Desktop has improved wall display in 2D and 3D with the following enhancements:

- Global cut plane—Set the cut plane globally at specified heights for all walls in your current drawing.
- Endcap—Create endcaps directly on walls through the Edit-in-Place feature.
- Opening endcaps—For even greater detail, openings for endcaps now appear in 3D.

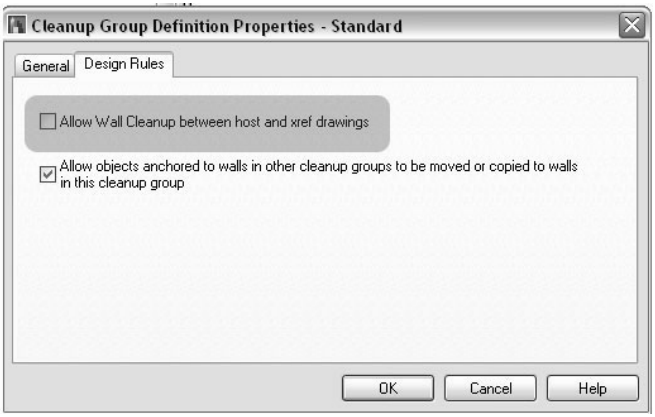
Create more detailed sections with 3D endcaps



Wall Cleanup: The following enhancements to wall cleanup help to make you more productive:

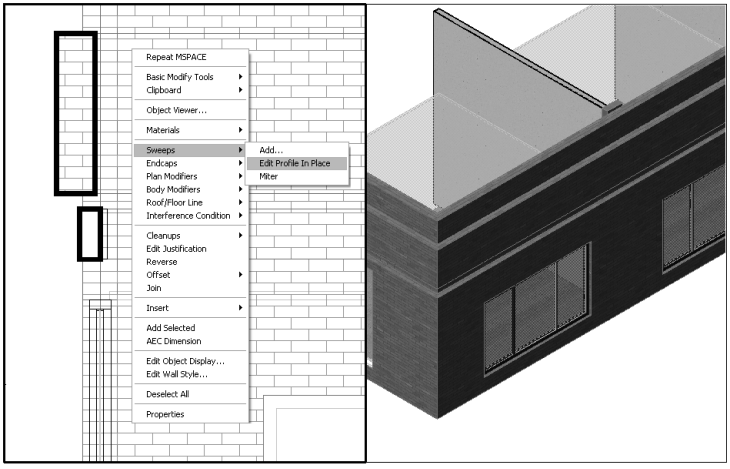
- Xref cleanup—Walls clean up across external reference files so that you can organize and manage designs more efficiently. For more information, see "Drawing Management" on page 209.

New cleanup options allow walls to clean up across xrefs



- Graphline toggle—Enhanced grips let you directly manipulate cleanup radii with graphic information displayed.
- Additional clean-up routines—The added "T" and "L" routines automate common cleanup tasks. You can even extend or trim a wall to an xref wall.

Create sweeps by adjusting wall profiles



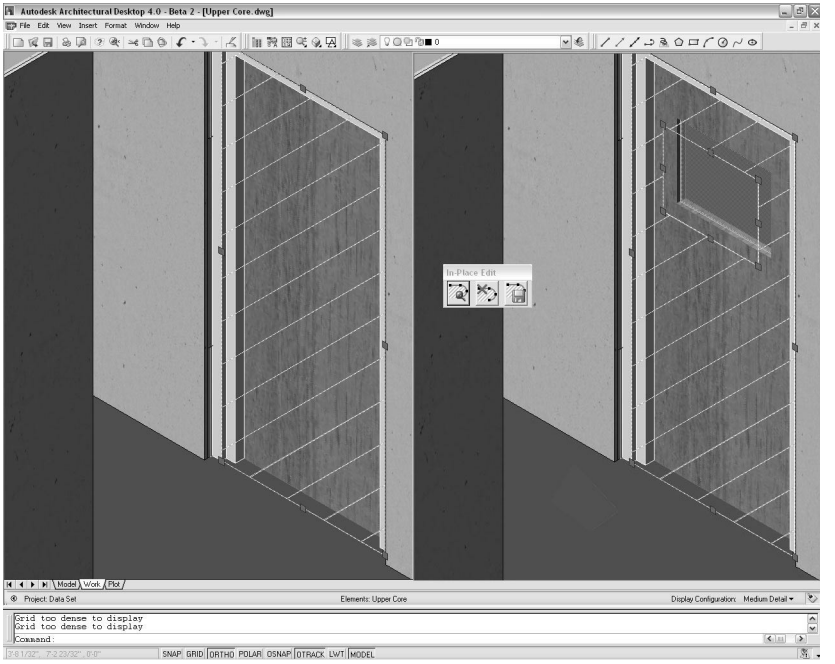
Doors

Doors have been enhanced because of the system-wide implementation of the direct manipulation functionality and enhanced display controls in Autodesk Architectural Desktop.

Direct manipulation enhancements include the following:

- Edit-in-Place—Edit existing or create custom door styles.
- Grips—Easily adjust door standard sizes (width and length) and position.

In-Place editing allows you to make design changes quickly and easily



Enhanced display control includes the following:

- Dynamic dimensions—Appear upon door insertion and provide visual feedback.
- Above/below cut plane display—Controls appearance of panel, swing, stop, and frame.
- Muntins—Add further graphic detail to the glass component of door panels for more accurate sections and elevations.

In addition to a useful collection of stock door styles, Autodesk Architectural Desktop provides the following door types for custom door style creation:

Door Types		
Accordion	Overhead	Single-Double Hung
Bifold	Double-Double Hung	Sliding
Bifold Double	Panel	Sliding Double

Door Types		
Communicating	Passthrough	Sliding Triple
Double	Pocket	Uneven
Double Opposing	Revolving	Uneven Double Hung
Double Pocket	Single	

Windows

Windows also benefit from the system-wide implementation of direct manipulation functionality and enhanced display controls in Autodesk Architectural Desktop.

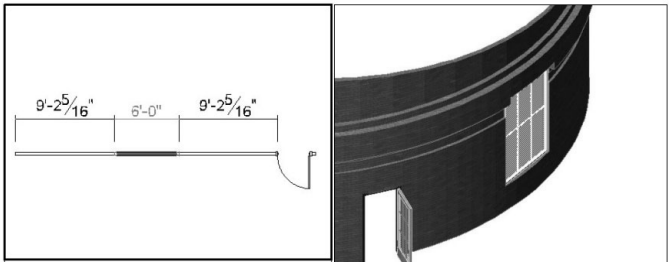
Direct manipulation enhancements include the following:

- Edit-in-Place—Edit existing or create custom window styles.
- Grips—Easily adjust window standard sizes (width and length) and position.

Enhanced display control includes the following:

- Dynamic dimensions—Appear upon window insertion and provide visual feedback.
- Above/below cut plane display—Controls appearance of frame, sash, and glass.
- Muntins—Add further graphic detail to the glass component of windows for more accurate sections and elevations.

Temporary dimensions aid in accurate placement of windows, doors, and other openings.



Parametric muntins come in seven basic types that you can modify for more complex window designs:

Parametric Muntin Types		
Diamond	Prairie-9 Lights*	Sunburst
Gothic	Rectangular	
Prairie-12 Lights*	Starburst	

* Indicates new types available only in this release.

In addition to a useful collection of stock window styles, Autodesk Architectural Desktop provides the following window types for custom window style creation:

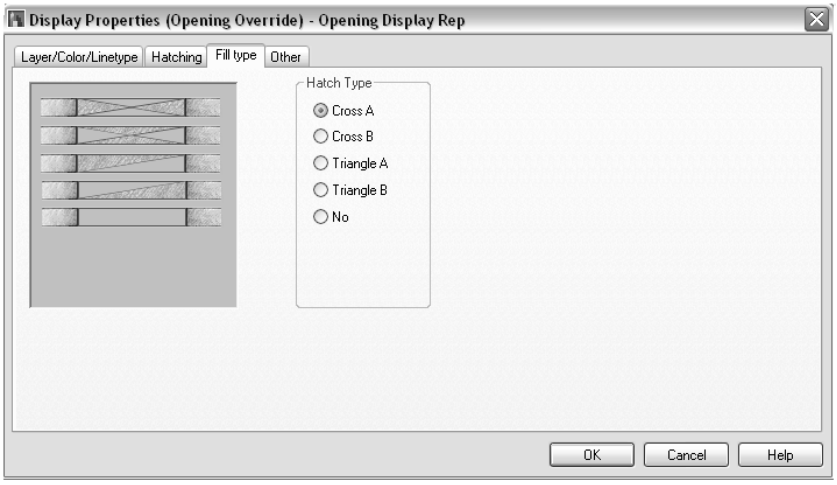
Window Types		
Awning-Transom	Horizontal Pivot	Single Hopper
Double Casement	Passthrough	Single Hung
Double Hung	Picture	Uneven Double Hung
Glider	Single Awning	Uneven Single Hung
Hopper-Transom	Single Casement	Vertical Pivot

Openings

With Autodesk Architectural Desktop, you can easily create an opening that interacts with walls. Simply highlight a wall, right-click, and choose Opening from the wall's insert options. Openings have been enhanced to provide more graphic detail in plan view. New display control over openings lets you represent openings with hatch patterns as well as custom blocks.

New to this release, hatching options include Cross A, Cross B, Triangle A, and Triangle B.

Openings have more display options



Curtain Walls

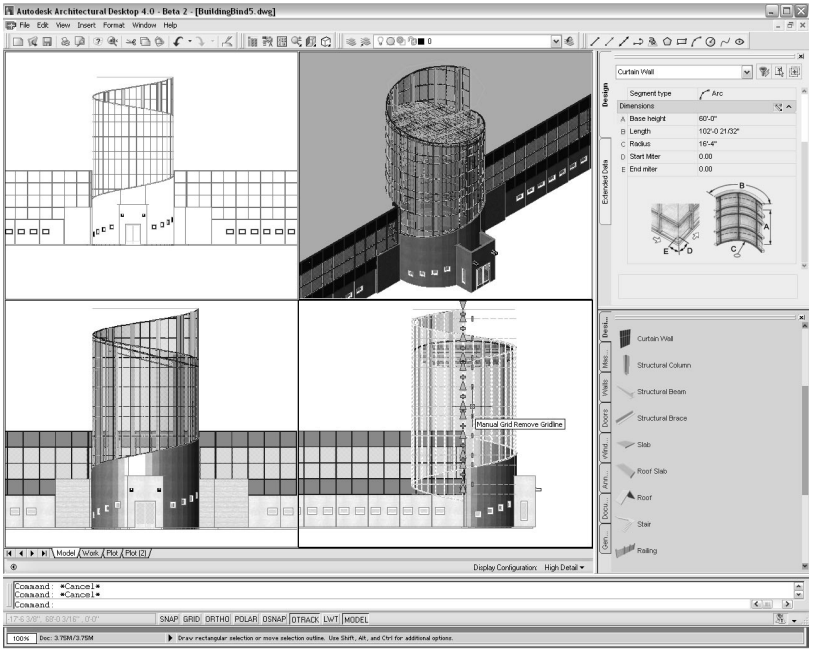
Use Autodesk Architectural Desktop curtain walls to create parametric curtain walls for commercial and institutional project designs. Curtain walls have a high capacity for detail and are easy to use. You can use them as the basis for accurate sections, elevations, and details.

You can also create curtain walls from custom linework, walls, or layout grids and modify them to include doors, windows, window assemblies, curtain wall units, and AEC polygons. Enhancements to curtain walls make it easy to remove framing members below doors.

Enhancements to curtain walls include the following:

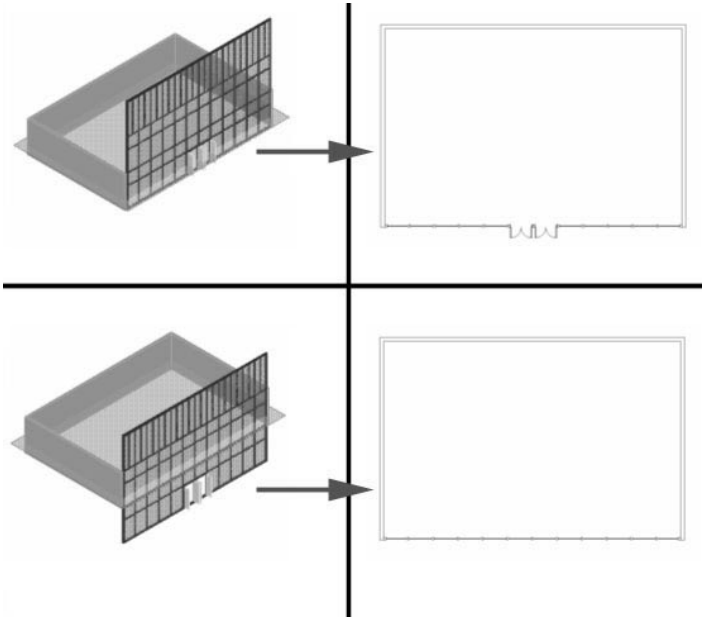
- Edit-in-Place—Easily adjust frame/mullion position and profiles.

Adjust mullion spacing with grips



- New worksheets—For frame and infill overrides.
- Global cut plane—Supports multi-story curtain walls.

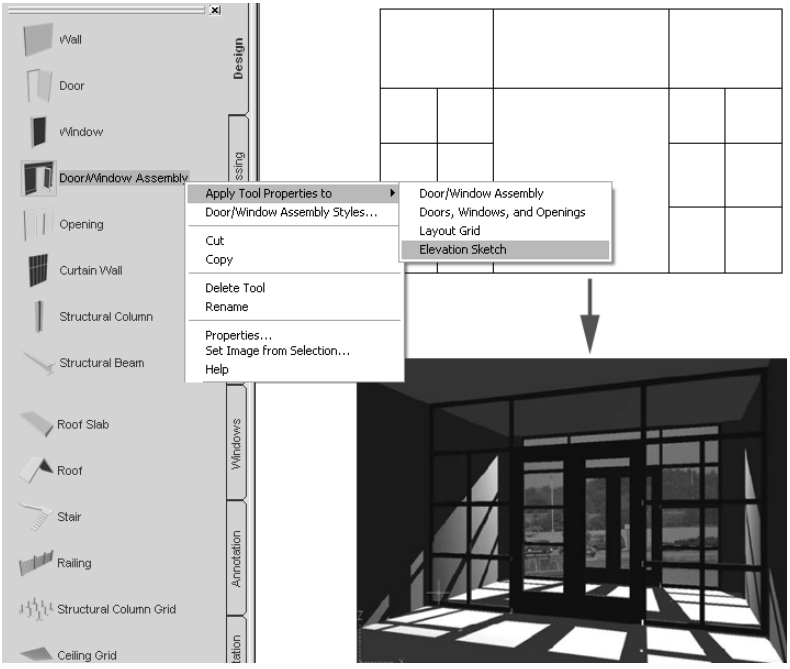
Spanning elements such as curtain walls respect level cut plane heights



Door/Window Assemblies

Door/window assemblies provide a framework for inserting windows or doors that are commonly used in the design of storefront windows. With this framework, you can create complex door or window groupings for insertion into a wall or curtain wall.

Convert elevation sketches into intelligent door/window assemblies



Autodesk Architectural Desktop lets you quickly create door/window assemblies and convert existing linework, walls, or layout grids to window assemblies.

Door/window assemblies offer the following enhancements:

- Sill Plan display representation—You can now display the sill component of your assembly.
- Edit-in-Place—Easily edit assemblies "on the fly" without dialog boxes.
- Parametric behavior—Stretch a door/window assembly and it inserts additional mullions based on design rules that you define.

Stairs

Designing stairs with Autodesk Architectural Desktop is flexible, making it easier to create customized shapes. You can modify stair runs and landings separately and create non-rectangular stairs or landings with tapered edges or a curved shape. Stairs have been enhanced to display more detail in components and allow for improved interaction with other objects.

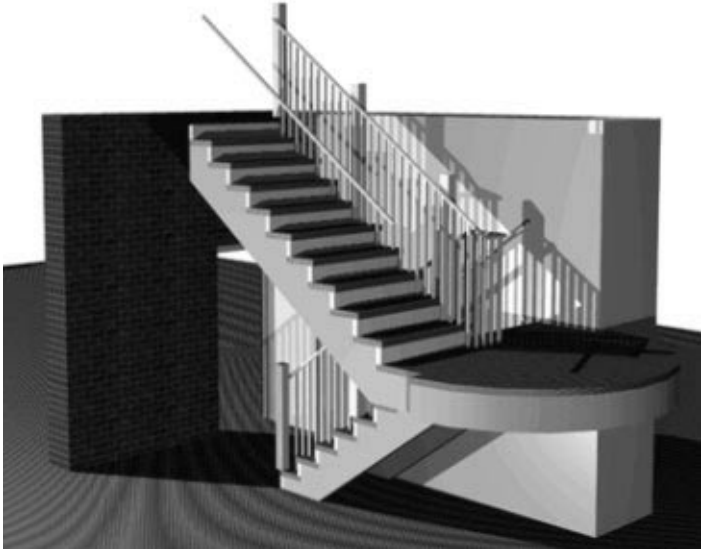
Stairs can be edited and reshaped by grips. Stairs support customized edges based on projection to Autodesk Architectural Desktop objects like walls and AutoCAD entities like polylines. The stairs object also supports sloping risers used in concrete stairs.

The following features make it easy to explore stair design. And because stairs follow proper design codes, you can be confident that your designs are accurate.

Enhancements to stairs include the following:

- General user interface improvements—Greater control in Add, Properties, and Style dialog boxes.
- More detail in components—Riser number display and more stringer types, including Saddled, Housed, Slab, and Ramp.
- Interference with walls and slabs—Automatic openings.
- Multi-flight stair enhancements—Stairs can now cross over themselves.
- Spiral stair enhancements—Stairs can be greater than 360 degrees.
- Landing enhancements—Stairs can now start and end with a landing.

Stairs have been greatly enhanced



Railings

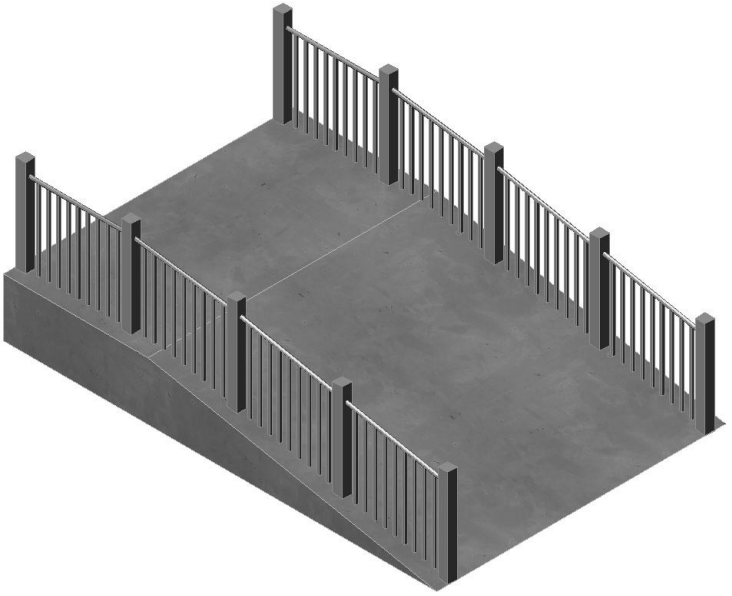
Railings in Autodesk Architectural Desktop let you control every aspect of rail design while still adhering to design standards. Railings are style based; they

support vertical and horizontal railing styles; and they can be freestanding or anchored to stairs.

Enhancements to railing include the following:

- Edit-in-Place—Customize railings "on the fly."
- Extended anchoring—Anchor railings to any AEC object.
- Offsets—Have greater control over the bottom rail component.
- Extensions—Extend posts and balusters below floor level.

Railings anchor to mass elements



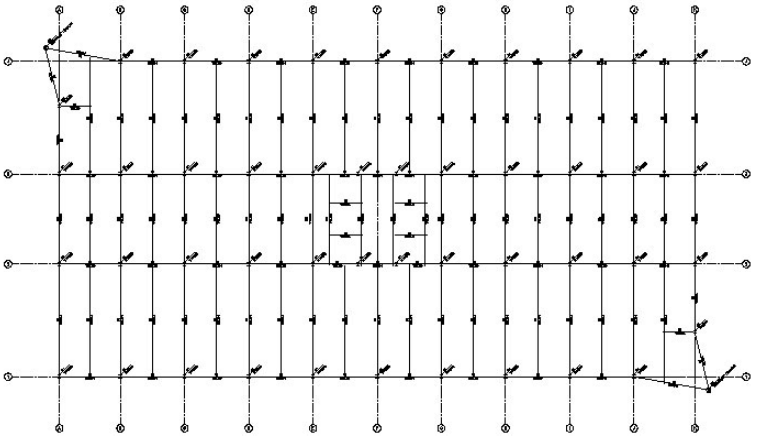
Column Grids

The column grids object lets you structure and organize your designs on grid work that supports standard and irregular building shapes. You have even greater control over the column grid through the following enhancements:

- Expanded shape support—Generate rectangular, radial, and complex custom grids from any linework.
- Gridline control—Manually control gridlines with grip movement.
- Enhanced grid bubbles—Control the appearance and placement of grid bubbles on standard and custom grids for even more graphic detail.

- AEC Dimensions—AEC dimension support has been expanded to include column grids, giving you instant updates as you explore different grid design options.

Easily attach structural members to column grids

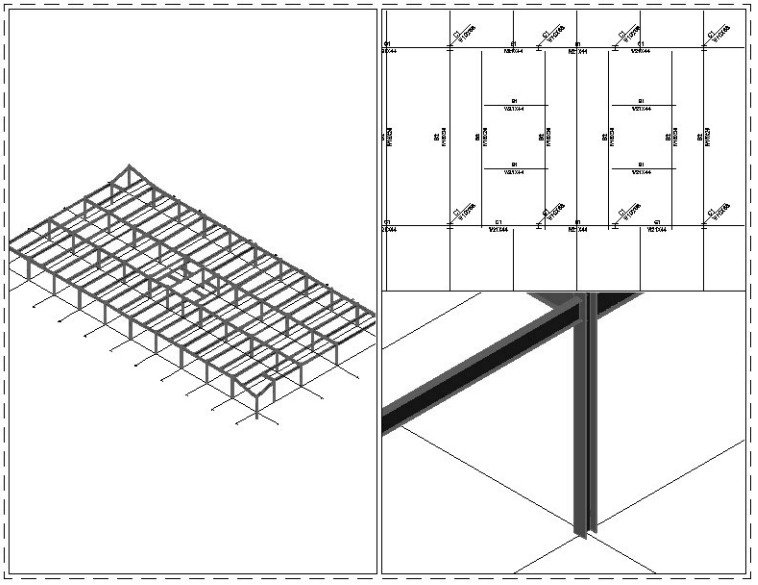


Structural Members

Structural members in Autodesk Architectural Desktop include columns, beams, and braces. Structural information is kept in an extensive catalog that contains industry-recognized steel standards, such as AISC, BS4, CISC, and DIN, as well as cast-in-place and precast concrete, timber, and lumber structural members.

You can add structural members to column grids for structural plans, and you can use structural members to visually check for interferences in your model, improving the accuracy and integrity of your designs.

Use structural members to create framing plans

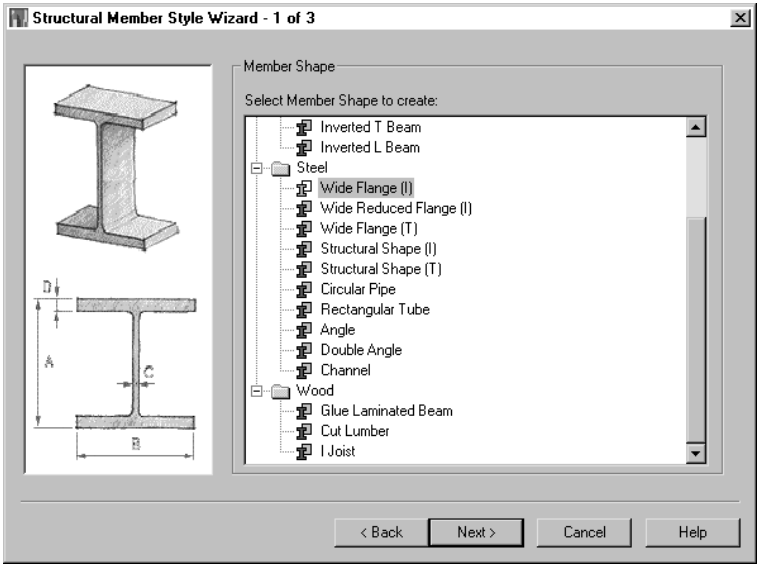


A structural member has several parameters that define its shape. From profile sweeps to custom block additions, a structural member can be customized to any type of shape. Additional options let you make a broad range of shapes, including tapered members.

Other customizing options include the following:

- Trimming-in-Place—Trim Plane editing is supported. The structural member can also be trimmed with other entities like lines and polylines.
- Block attachment—Attach any block to a member in order to modify its shape.
- Start and end shapes—Any component in a structural member can start out as one profile and end as another.
- Structural Member Style wizard—The Structural Member Style wizard supplements the existing structural member catalog by letting you create alternate sizes for standard structural member shapes.

The Structural Member wizard walks you through the creation process



Roof Slabs

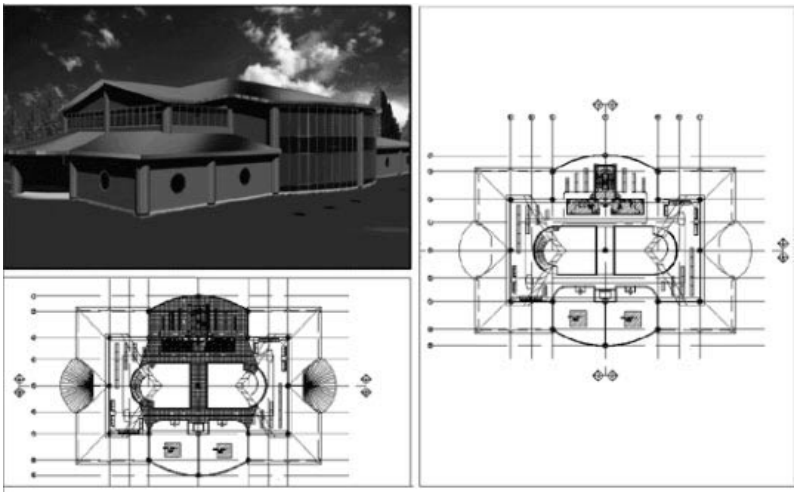
Autodesk Architectural Desktop lets you convert existing roofs into roof slabs for even greater control of design aspects, such as vertical and horizontal offsets, thickness, and slope values. With this palette of slab tools, you can extend, trim, or miter the roof slab object, as well as add or remove holes. These tools are useful on any project, whether it's residential, commercial, or institutional.

Roof slabs support a high level of detail, and through the object's many modification features, you can model complex roofs and reduce documentation time. Because you start with an accurate model, you can extract accurate roof sections and elevations.

Roof slabs offer the following functionality:

- Dormers—Routines automatically generate dormers from walls and roofs.
- Hole creation—Add and remove holes in roof slabs.
- Edge styles—Add soffits and fascias for greater detail.

Roof slabs can be created with fascia and soffit styles



Roof Slab Edges

Roof slabs can be customized to have any edge style, which you can use to create roof fascias and soffits. These edge styles are easy to create through the use of AEC profiles. You can also define edge orientation, such as plumb or square cut. Edit-in-Place functionality lets you make direct changes to fascias and soffits without using dialog boxes.

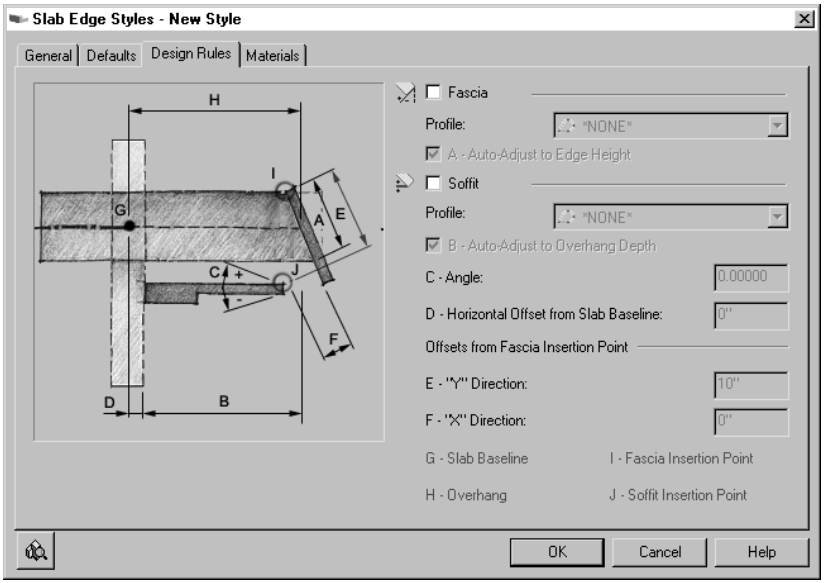
Slabs

Slabs are similar to roof slab objects and support the creation of floors. The flexibility of slab objects gives you greater control over your designs. With slabs, you have the freedom to create flat or sloped floors with edge styles for an even more realistic model, which you can use as the basis for details, sections, and elevations.

Using an extensive palette of slab tools, you can extend, trim, or miter the slab object, as well as add or remove holes.

Slab Edges

As with roof slab edges, you can use slab edge styles to customize floor slabs with fascias and soffits. These edge styles are easy to create through the use of AEC profiles. You can also define edge orientation of slab edges with plumb or square cut options.



AEC Content

Autodesk Architectural Desktop provides a library of industry-recognized metric and imperial symbols that are easily accessible through drag-and-drop technology. Content such as furniture, equipment, detail, and elevation marks simplify the design process through automated layering, command, scale, and text styles that you can customize.

You can add interference conditions to AEC content such as ducts and chases, so that the AEC Content interacts with other objects like walls and slabs for an even more accurate representation of your building information model.

Coordination: Do the Work Once

Because daily revisions are a fact of life in most design projects, it is important to have your designs well coordinated with your construction documents. Autodesk® Architectural Desktop 2004 ensures that your design work is available for immediate use during the documentation process. And because your designs are linked to your construction documents, you can be confident that any change you make in your design is reflected in your construction documentation, helping to reduce errors and omissions.

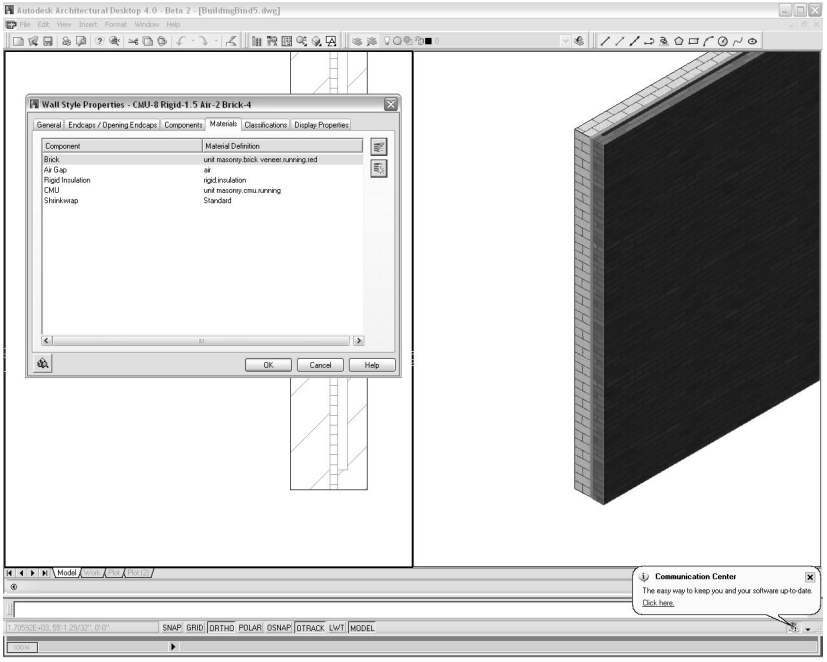
Materials

Materials are a new addition to Autodesk Architectural Desktop. They can be used to provide graphic and non-graphic detail to your drawings for design, documentation, and visualization purposes.

Graphically, materials can be attached to AEC object styles and their respective components for even greater visual detail. For example, you can now specify different materials for a door's panel, frame, stop, and glass components.

Because materials are style based, coordination between designs and construction documents is further enhanced; if you change a material of a wall and its individual components, all sections and elevations derived from that wall are also updated.

Assign materials to AEC objects, such as wall components



Materials also streamline the way presentation graphics are produced. With Autodesk® VIZ Render (for more information, see "Design Visualization: Bring Your Designs to Life" on page 54), you can quickly create visualizations at any stage of the design process in a manner that doesn't disrupt your work. At the click of a button, your Autodesk Architectural Desktop designs, com-

plete with materials, appear in Autodesk VIZ Render for immediate rendering.

Though materials are highly visual by nature, they can also be used to provide nongraphic data. For example, through the use of property set data and formulas (for more information, see "Schedule Tables" on page 48), materials can provide information for keynoting and quantity take-offs.

Materials provide the following graphical uses:

- Plan hatching
- Surface hatching
  - Displays in both 2D sections/elevations and 3D model views.
  - Allows precise control over placement and orientation of hatching per face.
- Section hatching
  - Sectioned components display material hatching in both 2D and 3D live sections.
  - Allows precise control over placement and orientation of hatching per face.
- Rendering
  - Materials display in shaded 3D views.
  - Materials automatically transfer to VIZ Render for visualization.
  - Eliminates material assignment via AutoCAD Color Index (ACI).

Materials provide the following non-graphical uses:

- Labeling—Use materials to aid in keynoting.
- Quantify AEC object components—Combine lengths, areas, and volumes with property sets and formulas (for more information, see "Schedule Tables" on page 48); cost estimates can be extracted.

File and Level Management Tools

Autodesk® Architectural Desktop has also improved coordination by addressing the way your designs are managed. Prior releases simply enabled users to continue to use their existing standards for organizing file structure and xref relationships managing projects. While continuing to respect your practices and standards, this release of Architectural Desktop introduces the new Drawing Management feature for users who want to take advantage of its automated project and level management tools.

Drawing Management

With an emphasis on enhancing coordination through automated xref management, this long-awaited feature formalizes and automates the processes relating to building model design and documentation. This feature provides tools that aid you in the management, viewing, and construction of your building information model and documents.

Because your project files are managed with this feature, you have consistency throughout all aspects of the project. Everyone on your design team will have a centralized project environment for accessing the most current documents—from project templates to sections and elevations.

The Drawing Management feature enables you to create and manage projects, create and manage levels, and automate sheet creation.

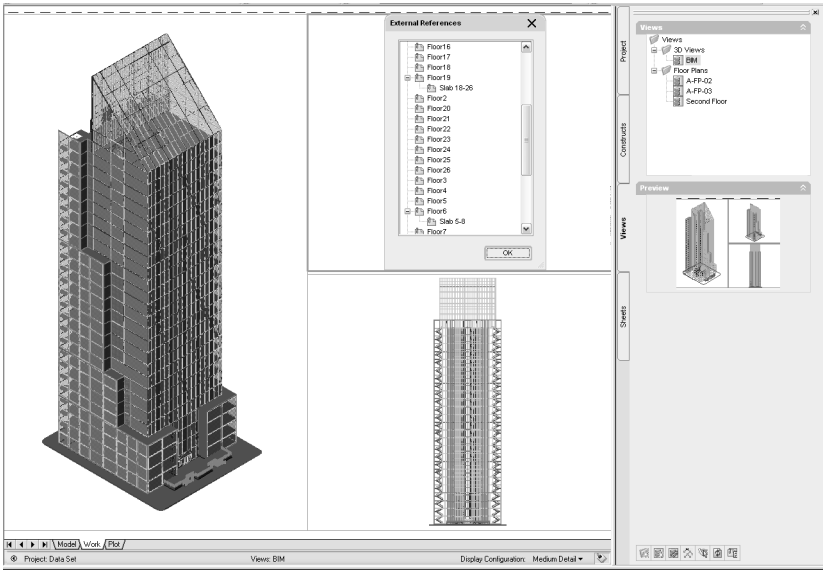
Create and Manage Projects

At the highest level, building information models are organized into projects. A project is conceptually composed of two parts—the building information model and the reports, which are generated from sheets derived from the building information model.

Create and Manage Levels

The Drawing Manager helps you to assign your drawings to levels, which are analogous to floors. Levels contain elevation and floor-to-floor height information.

Manage levels and divisions



Automate Sheet Creation

When you create drawing sheets, Autodesk Architectural Desktop creates and names the appropriate drawing file (according to your project specifications) and places the new drawing in the relevant project folder. All this, including loading pertinent external references (xrefs), is done automatically.

Last, when you create sheets, the viewports, scale, view direction, and display configuration are created according to your predefined specifications. Simply drag and drop your drawing to a layout sheet, and Autodesk Architectural Desktop handles the rest.

Building Model Enhancements

Coordination between designs and construction documents is the cornerstone of Autodesk® Architectural Desktop. Design changes, such as moving a door, adding a window, or substituting construction materials, can have a significant impact on your schedules, sections and elevations, and details.

Autodesk Architectural Desktop improves this type of coordination with the introduction of materials and enhancements to other building model objects such as sections and elevations, live sections, schedules, and AEC dimensions.

Sections and Elevations

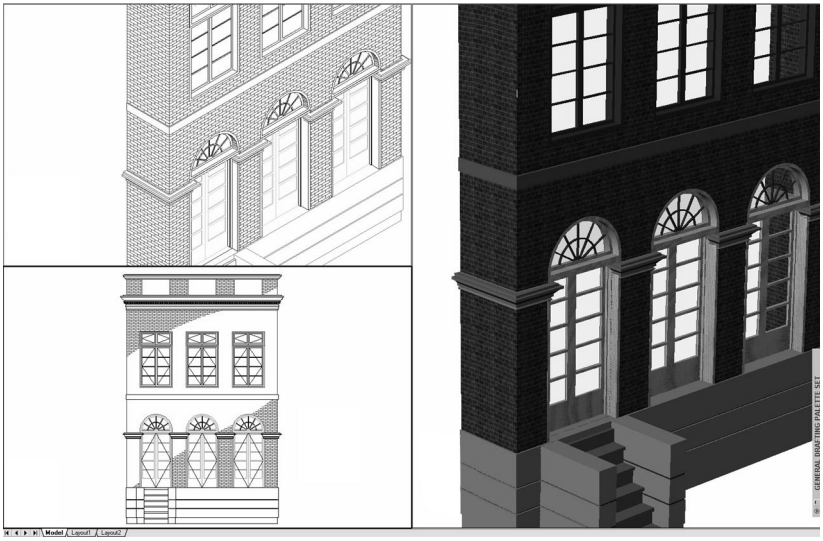
Sections and elevations are style based and remain consistent with your building information model. When you make a change in your design, the sections and elevations are updated, so you save time and can be confident that your data is accurate.

Sections and elevations have a high capacity for detail and can be customized to fit your design needs. For example, sections and elevations can display hidden lines as well as user-defined linework, including other Autodesk Architectural Desktop objects or merged vector entities such as lines, polylines, arcs, and circles.

Enhancements to sections and elevations include the following:

- Edit linework in place—This feature has been enhanced. Now you can select multiple lines simultaneously. Furthermore, user linework edits are applied as soon as sections and elevations are updated, so earlier edits are not lost.
- Integrated section and surface hatching—When sections and elevations are generated from your model, the material assignments in your design generate the appropriate hatch patterns in your sections and elevations, eliminating the need to create manual hatch patterns.
- Material boundaries—Once you have created sections and elevations, you can define boundaries for section and surface hatching for presentation purposes. Simply draw a closed polyline over your section or elevation and convert it to a material boundary. With the boundary in place, you can either limit or mask out specific material hatching and linework. Material boundaries also support direct manipulation with Edit-in-Place functionality. Simply edit the material boundary through grips, and the boundary hatching is updated.

Materials have surface and section hatching (image courtesy of Paul Aubin)

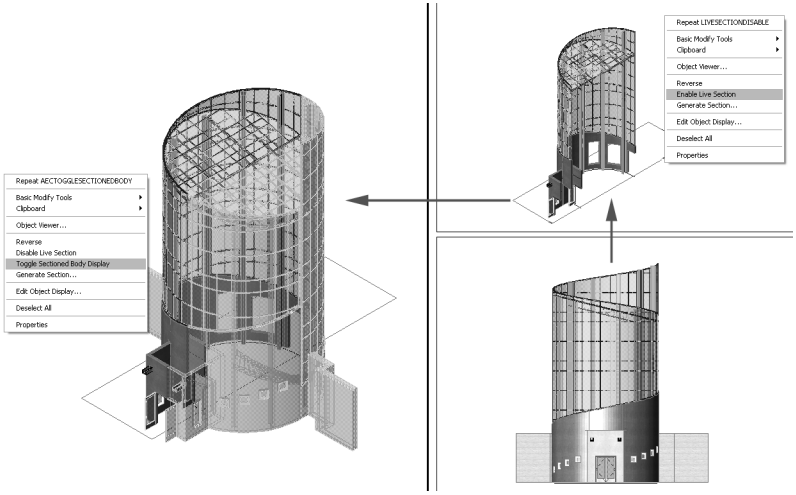


Live Sections

Live sections provide a good way to work on a limited area of a large model, with each design change reflected in real time. You eliminate tedious, manual updating of your designs.

Since live sections now employ materials, they are highly valuable as a design visualization tool. Link a live section to VIZ Render to create stunning presentations.

Create live sections and toggle sectioned body display on or off



Enhancements for Live Sections include the following:

- Integrated display—Toggle live sections on and off via section lines.
- Material based—Use live sections to display design intent.
- Xref functionality—Create live sections across multiple xref files, including your entire building model.
- Sectioned body and face display—Material hatching displays on sectioned bodies.
- Supports multiple section lines.

Schedule Tables

The scheduling features in Autodesk Architectural Desktop provide the ability to track any object or entity in a drawing. Because schedules are dynamically linked to your design data, they are updated as your design changes. You can easily create accurate schedules from the building model, making you more productive than ever. You can create schedule tables with page breaks, tag objects through xrefs, and create schedules of drawings—even of your completed building information model.

Enhancements for Schedule tables also include the following:

- Schedules perform page breaks, with the following definable parameters:
  - Direction—Specifies that page overflow is either right or down from the schedule table's insertion point.
  - Repeat title—Specifies whether to repeat the schedule table's title on each page.

- Repeat headers—Specifies whether to repeat the schedule table's header on each page.
- Manual heights—Specifies whether the height of each page is set manually or controlled by the maximum height that you determine.
- Maximum heights—Specifies maximum height for all pages.
- Spacing—Specifies the spacing between each page.

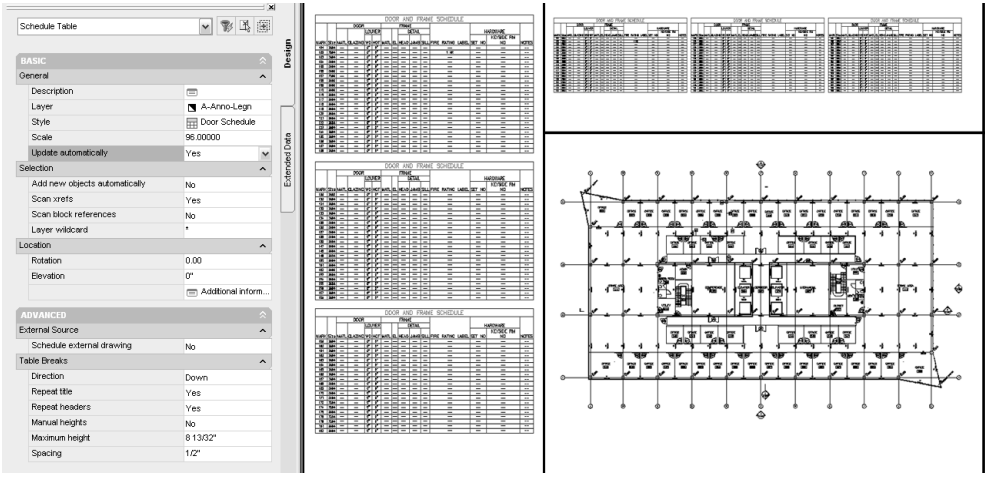
- Improved Display Control
  - Control every aspect of your schedule table's appearance, including color and lineweight.

- Tag through Xrefs
  - Tag drawings through xrefs in both model space and paper space.
  - Multi-tag—Tag multiple objects at once, reducing tedium.

- Alpha-Increment
  - Alphabetic tags increment like their numeric counterparts.

- Extended Scheduling
  - Schedule external drawing files, such as complete 3D models.

Control table break direction



In this release, scheduling functionality has been greatly enhanced by the introduction of formulas, location, and classification properties.

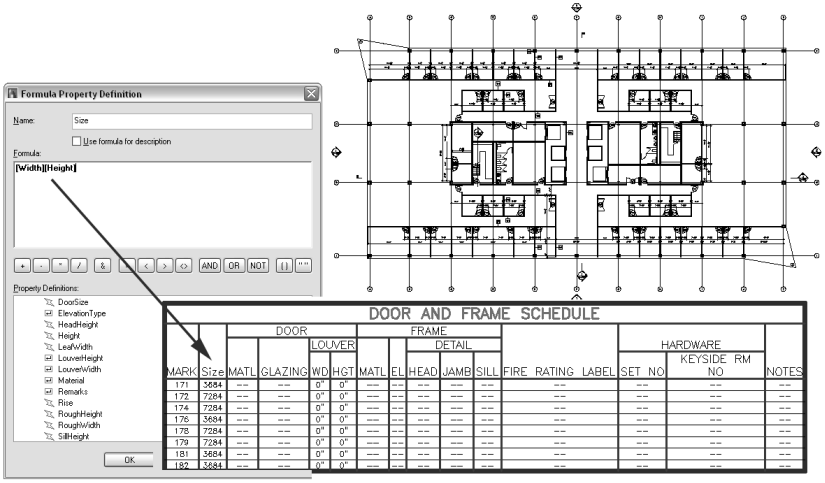
Formulas

Use formulas and schedules to extract and report additional information about your building information model. Formulas let you control how this

information is displayed in your schedules through concatenation (linked properties) and calculation functionality.

For example, you can create a formula that reflects a door's size simply by linking its width and height. A door with a width of 30 and a height of 80 is shown as 3080 in the Size column of your schedule table.

Use formulas to create link schedule information



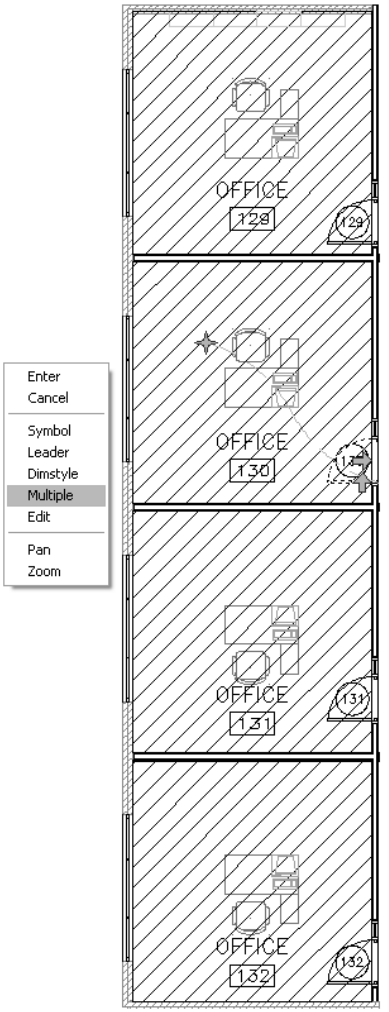
Using formulas as a calculation tool, you can extract even more useful data from your building information model. For example, you can use formulas to determine the area of a wall. If you combine formulas with materials, you can easily calculate cost estimates.

Location Properties

Assign location properties to AEC objects so that even greater detail can be provided about your building information model.

Location properties provide both graphical and non-graphical data for scheduling purposes. For example, you can assign doors to spaces or areas that represent rooms. With the location property in place, door numbers are generated based on the room number.

Use location properties to link doors to room numbers for enhanced tagging

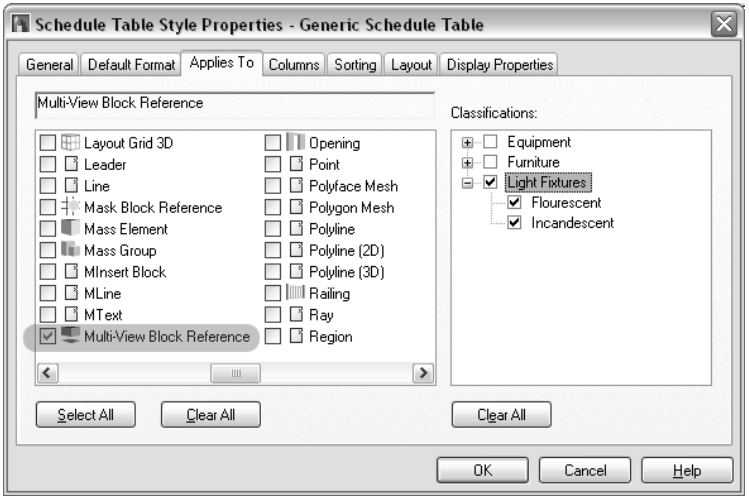


Classifications

Use classifications to create even more precise schedules. When layer filters don't provide enough control, use classifications to create detailed schedules of blocks and other AEC content such as furniture and equipment. For example, if you want to create a schedule of chairs listed on the layer A-Furn, you

can do so without including other objects, such as desks, that are also on that layer.

Use Classifications to schedule generic content



You can create your own custom schedules or choose from the following templates:

- Doors
- Equipment
- Furniture
- Room finish
- Space inventory
- Wall
- Windows

You can use these schedules to track most everything, including quantities and cost. Quantities and cost can be multiplied for even more up-to-date data.

AEC Dimensions

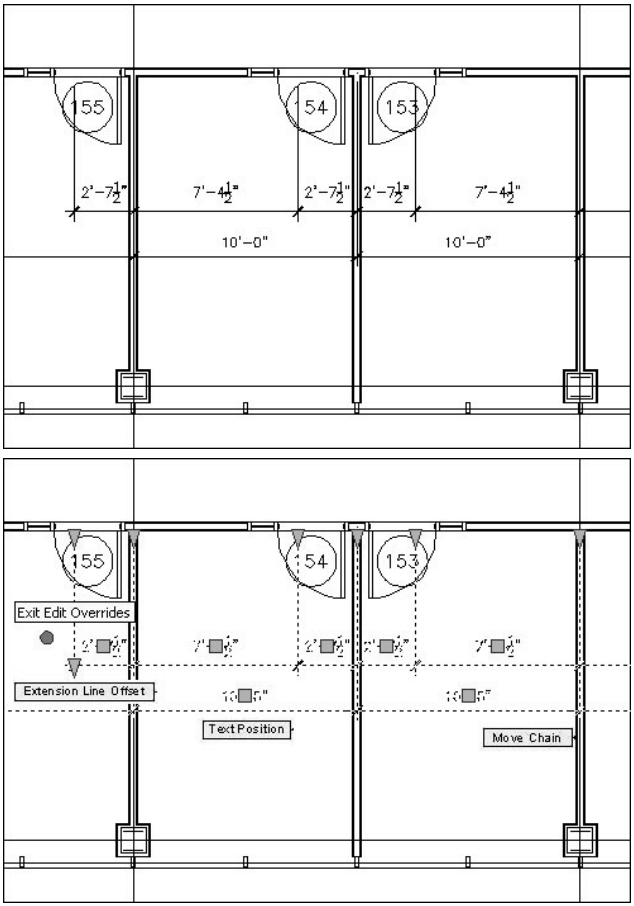
AEC dimensions give you the ability to create associative dimensions for your designs. Associative dimensions update as your designs change, saving you time and eliminating the tedium of updating dimensions manually.

Enhancements for AEC Dimensions include the following:

- Support for column grids

- AEC Dimension wizard guidance to create other dimension styles
- Support for AutoCAD linework (lines, polylines, arcs, circles). Support for endpoint, midpoint, center, quadrant dimension points.
- Dimension objects through xrefs
- Override text and linework by hiding text and underline text, adding prefix or suffix to dimension text, or hiding dimension segments (text and lines).
- Extended Edit-in-Place grip editing. “Edit Override” state to grip edit extension lines and dimension text.

AEC Dimensions have enhanced grip-editing capabilities



Design Visualization: Bring Your Designs to Life

To communicate their design intent effectively, designers require tools to visualize and present their design intent at every stage of the design process in a way that is fluid and non-disruptive. New visualization capabilities in Autodesk® Architectural Desktop make this possible.

Autodesk VIZ Render

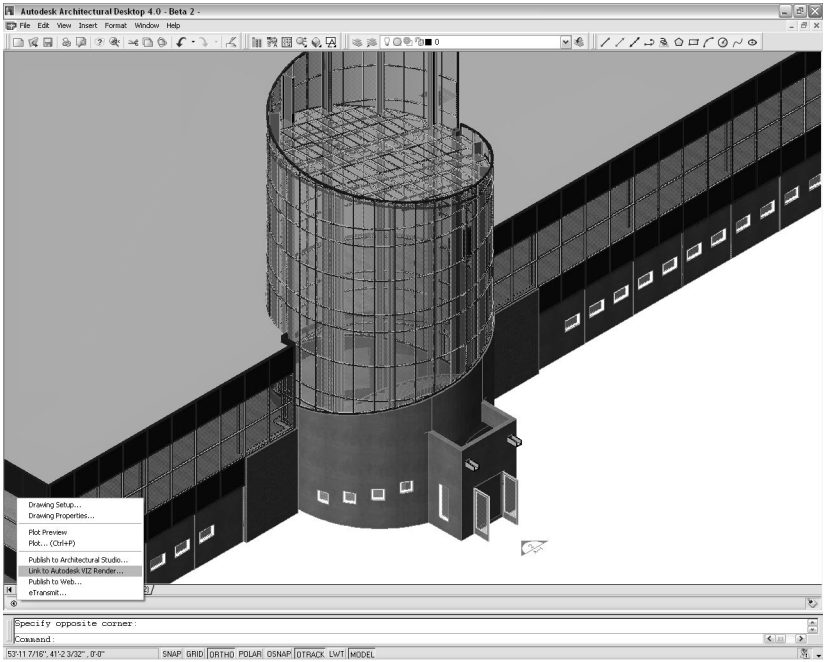
Autodesk® Architectural Desktop 2004 marks the introduction of VIZ Render, an advanced visualization and rendering tool incorporating industry leading technology from Discreet, the creators of 3D Studio Max and Autodesk VIZ. Featuring fully automated data linking, VIZ Render provides a visualization solution that is effectively integrated into the Autodesk Architectural Desktop environment, enhancing design workflow.

VIZ Render provides a streamlined, interactive environment for exploring material finishes and lighting while also offering a range of rendering and presentation options for communicating and marketing design intent.

Import and linking

Data Linking between Autodesk Architectural Desktop and VIZ Render is fully automated, providing enhanced productivity and workflow. Simply select Autodesk VIZ Render from the document fly out and begin visualizing your designs. As you develop your design is Architectural Desktop, incremental changes can be automatically updated.

Link Autodesk Architectural Desktop designs directly to Autodesk VIZ Render



Materials

Materials from Autodesk Architectural Desktop are linked into VIZ Render and are available via the Material palette. In addition, libraries of rendering materials are available for both applications through the Content Browser, including the VIZ Render extensive, ready-to-use catalog of predefined materials.

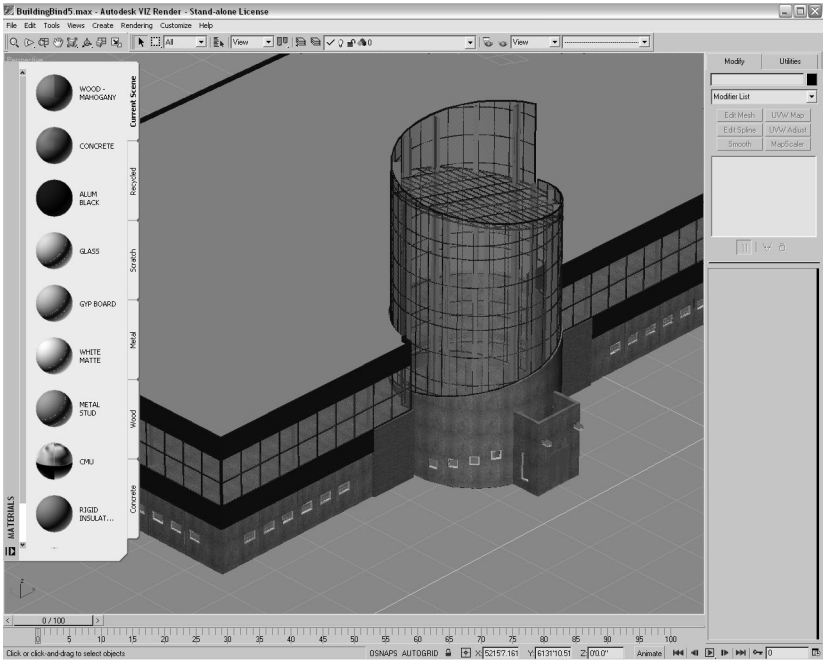
Material placement with Autodesk Architectural Desktop objects has been greatly improved with component-level access. Now, you can simply drag and drop material directly onto any object component, such as the frame on a door. This type of interaction eliminates the need to create multi-sub-object materials, as was the case with Autodesk VIZ. VIZ Render recognizes that components belong to styles and, therefore, material assignments to individual components of objects will be applied to all members of that style.

VIZ Render provides the following features:

- New physically based material type to simplify the process of defining new materials
- Extensive, ready-to-use catalogue of predefined materials

- Interactive viewport for fast and direct feedback on material placement

Autodesk Architectural Desktop materials appear in the current Autodesk VIZ Render scene



Lighting

VIZ Render uses physically based lights so you can intuitively set up and evaluate the lighting in your scenes as you would in the real world. The intensity and color of any light can be specified using photometric units. VIZ Render also supports the industry-standard IES (Illuminating Engineering Society) data format for describing the performance of manufactured lighting fixtures. If desired, designers can obtain luminaire photometric data or complete 3D luminaire models from manufacturer web sites for use in their scenes. Natural sunlight and daylight can be specified by simply indicating the location, date, and time of your scene.

VIZ Render provides the following features:

- Interactive viewport for fast and direct feedback on lighting setup
- Global illumination algorithms, including radiosity and ray tracing
- Support for physically based lighting and luminaires
- Support for natural daylight and sunlight

- Lighting analysis tools

Autodesk VIZ Render uses real-world lighting

Rendering

With VIZ Render, you can leverage the building model to produce design presentations suitable for any stage of design development or marketing. Simply place lights in your scene, choose from a clearly presented selection of rendering and output possibilities, and get fast, high-quality renderings of designs.

VIZ Render provides the following features:

- Multiple output formats, including AVI for walkthrough animations and panoramic images for real-time panning
- Fast high-quality scanline rendering for quick design studies and presentations

- Advanced global illumination rendering for photorealistic images and animations of the highest caliber

Create photorealistic renderings

Substitution

Substitution refers to the ability to replace one or more instances of a particular object in a scene with another object and to streamline the way data migrates from Autodesk Architectural Desktop to VIZ Render. It lets you use the representation of an object that is most appropriate to the application. For example, you may represent a particular light fixture as a 2D symbol block on a reflected ceiling plan. Within VIZ Render, you could easily substitute this 2D representation with a full 3D photometric luminaire that would be suitable for rendering and lighting analysis.

True Color/Color Books Support

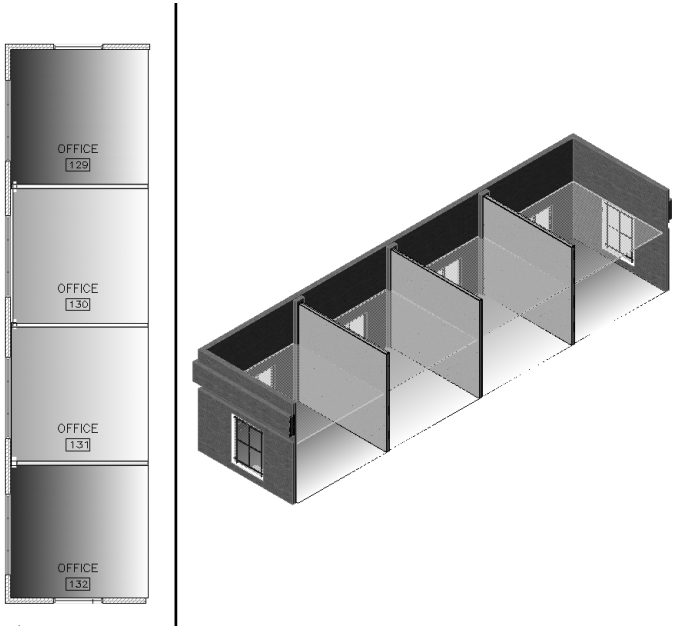
Popular color palettes enhance your ability to create presentation-quality output. The Select Color dialog box has been updated to include multiple tabs. The Index Color tab provides the traditional AutoCAD Color Index palette, while two new tabs enable you to use real-world color palettes in your designs. The True Color tab lets you enter values using either HSL (Hue Saturation Luminance) or RGB (Red Green Blue) color models. The Color Books tab lets you select colors from a variety of PANTONE® and RAL color books.

Gradient Fills

A new Gradient tab available in the Boundary Hatch and Fill dialog box lets you apply gradient coloring to solid hatch patterns. Choose between one- and two-color options, various gradient patterns, and rotation angle to get the gradient you want.

The flexibility of the gradient patterns, combined with the True Color, PANTONE, and RAL color options, enables you to create presentation-quality drawings in Autodesk Architectural Desktop.

Gradient hatching for presentation graphics



Shaded Viewport Plotting

You can plot shaded and rendered 3D isometric views for presentation output. Functionality includes the ability to plot shaded/rendered models from model space as well as paper space layouts.

Generate Perspectives

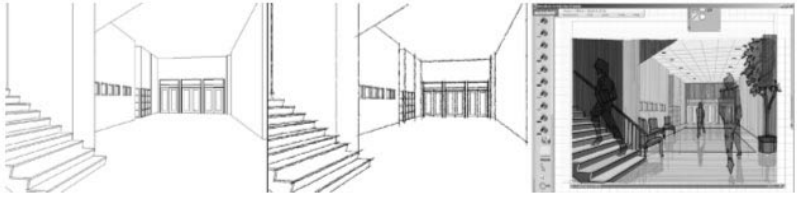
Autodesk® Architectural Desktop provides cameras that you can insert into your building information model to create perspectives. Create layout sheets for shaded perspective views, complete with materials, and plot these views for further analysis and presentation purposes.

Link perspectives created in Autodesk Architectural Desktop to VIZ Render for photorealistic renderings.

Napkin Sketch

Generate Napkin Sketch is a great tool for applying a hand-drawn look to your drawing. You can apply this tool to part of your design, such as an area that has not been finalized. Or, you can apply a hand-drawn effect to your entire design to generate a more artistically pleasing version for presentation purposes. You can then further enhance your design in Autodesk Architectural Studio or Autodesk VIZ Render.

Give designs a hand-drawn effect that can be enhanced in Autodesk Architectural Studio



AEC Polygons

Primarily a tool to create presentation graphics, AEC polygons can be used to provide true color fills for enhancing your designs, such as 3D views of curtain walls and 2D graphic renderings of sections and elevations.

AEC polygons support the following features:

- True color fills

- Hatched boundaries
- Boolean operations to combine, intersect, and subtract objects

Collaboration: Work Effectively with Your Extended Design Team

Autodesk® Architectural Desktop works with other Autodesk building design solutions and services as well as with third-party applications that address specific needs such as estimating or facilities management. Autodesk Architectural Desktop includes extensive tools and business solutions that let you extract vital information from your building information model that can be used to save time and money during analysis, estimating, procurement, construction, and management of the building throughout its life cycle.

AutoCAD 2004 Support

Autodesk Architectural Desktop 2004 is built on AutoCAD® 2004 software—the latest AutoCAD version. The following sections outline some of the software's enhancements. For a complete listing of AutoCAD 2004 enhancements, please refer to the AutoCAD 2004 Preview Guide.

Export to AutoCAD

Collaborating with professionals who need access only to 2D (DWG) design data couldn't be easier. With the Export to AutoCAD feature, you can easily export your designs to AutoCAD 2004 and AutoCAD 2000 DWG and DXF™ formats, making file exchange possible without the use of object enablers. This feature also has an option to append the ACAD prefix or a user-defined prefix to each drawing for easy identification. Combine this functionality with web-enabled tools such as eTransmit or the Autodesk Buzzsaw project hosting service, and you have a great way to exchange and review data with your extended design team.

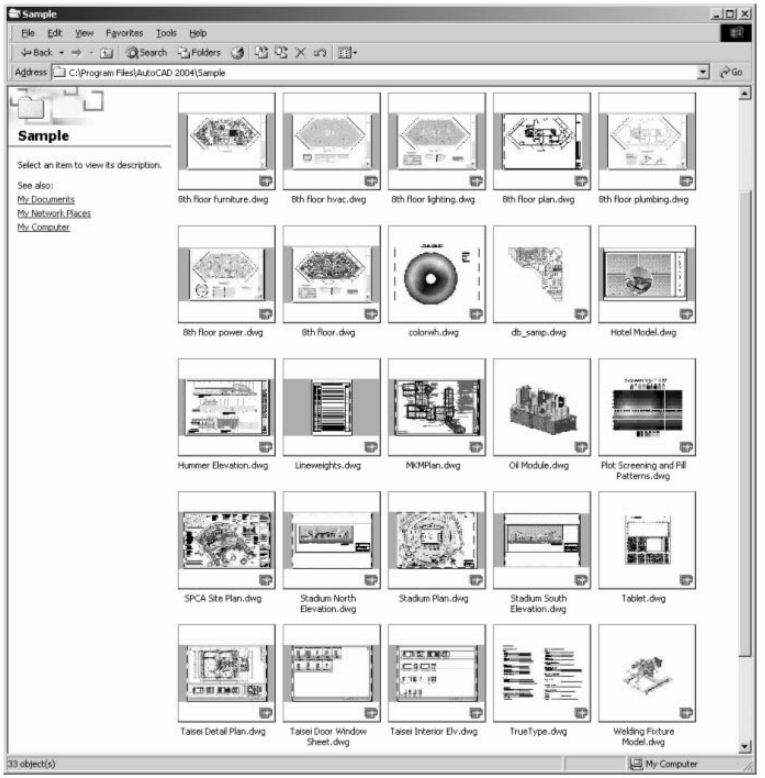
DWG Performance

Because the DWG file format has been optimized, opening and saving drawings is significantly faster than in previous releases, particularly when DWG data is located on a network drive. You save time accessing drawings whether they are stored locally or on a network drive.

Drawing Thumbnails

In Microsoft® Windows® Explorer, you can now view thumbnails (preview images) in your directory folders. This means you can quickly view and access drawings by previewing them first.

Drawing thumbnails in Windows Explorer



Multiline Text (MTEXT)

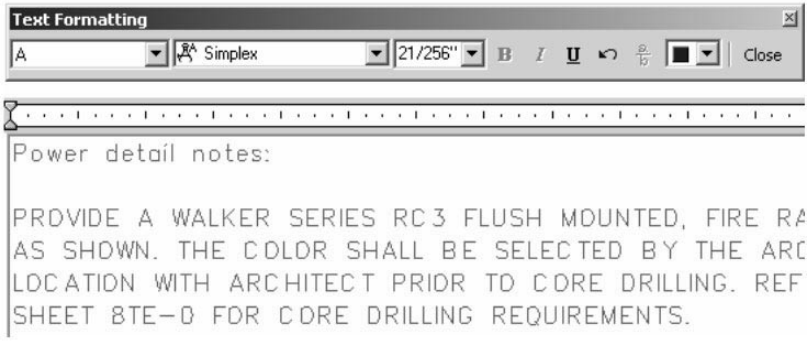
Valuable enhancements to the Multiline text editor offer easy, timesaving functionality for creating and modifying text in drawings.

Key functionality includes:

- A new frameless editor
- A new shortcut menu
- Support for tabs and indents
- Full display text drag

Creating new multiline text or double-clicking an existing multiline text object displays the new frameless editor with ruler as well as the Text Formatting toolbar. If you are zoomed out from the text so that it is too small to read, the Multiline Text Editor displays it in an enlarged view. If you are zoomed too closely to the text, the editor displays it in a reduced view. If the current display of the text is visually appropriate, the editor maintains that size.

Multiline text editor and text formatting toolbar



Drawing Sets

The new Publish feature provides an easy way to publish electronic and paper drawing sets. It gives you the flexibility to publish directly to paper or to an electronic Design Web Format (DWF), which can be distributed instead of paper drawings. The DWF file format has evolved from a representation of a single plot to a container that can hold many sheets. This file format is the electronic representation of a drawing (or plan) set.

These publishing tools let you create complete electronic drawing sets in a single DWF file. You can minimize the number of files being transmitted and avoid confusion regarding file order for viewing and printing. Distributing DWF versus DWG files helps to ensure data security, because unlike DWG files, DWF files cannot be modified. You can further enhance drawing security by using password protection, which prevents unauthorized personnel from viewing or printing the DWF-based drawings.

The enhanced DWF—the best format for exchanging files over the Web—provides the following features:

- Neutral format—Team members don't need AutoCAD-based software to view and plot DWF files.

- Easy distribution—The small file size means speedy transmission; team members can view DWF files with Autodesk® Express Viewer, which can be attached to an email.
- Security—Recipients can view and plot, but not edit, geometry.
- Rich information—Metadata, such as layers and named views, remains intact.
- Fidelity—Plot to scale and get the visual fidelity of an AutoCAD DWG file.
- Flexibility—Combine multiple drawing sheets in a single, convenient file, or create multiple DWF files containing individual sheets.

Autodesk Express Viewer Support

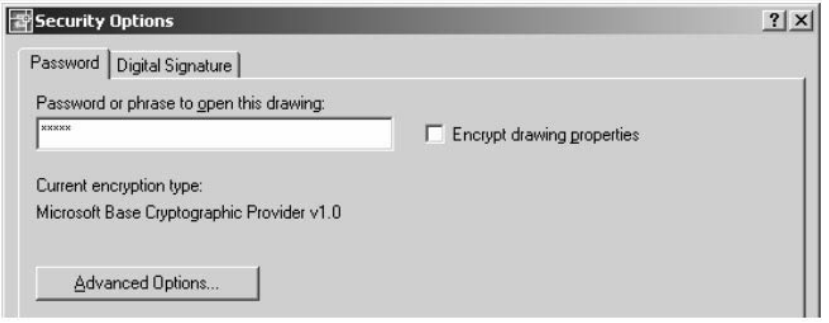
Autodesk Express Viewer is a small, fast viewer with easy-to-use tools for anyone who needs to quickly view and print to scale multi-sheet DWF files. You can open a DWF file either by double-clicking it in the Windows Explorer or by choosing Open from the File menu. Autodesk Express Viewer supports viewing for all DWF file formats, including the new DWF 6.

Autodesk Express Viewer can be distributed as an ActiveX control for Microsoft Internet Explorer or as a stand-alone application. The installation file for Autodesk Express Viewer is less than 2MB and can be emailed to design partners or posted on a project website.

Drawing Security

New security options, such as password protection and digital signatures, offer powerful functionality for transmitting drawings securely.

Security Options dialog box

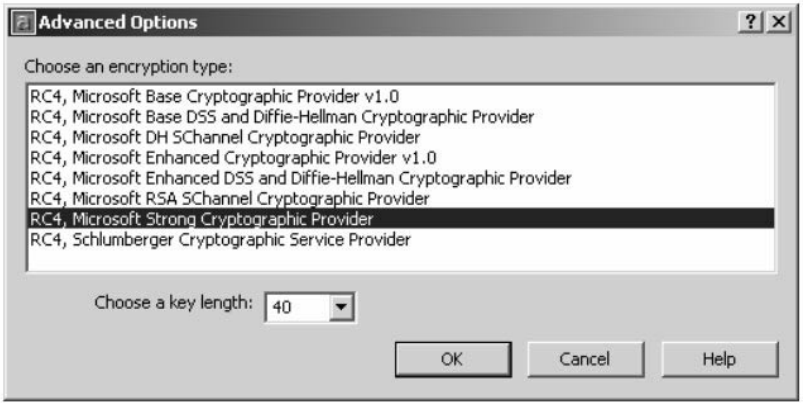


Password Protection

Applying password protection to your drawings means you can distribute them with the assurance that they cannot be opened by an unintended source.

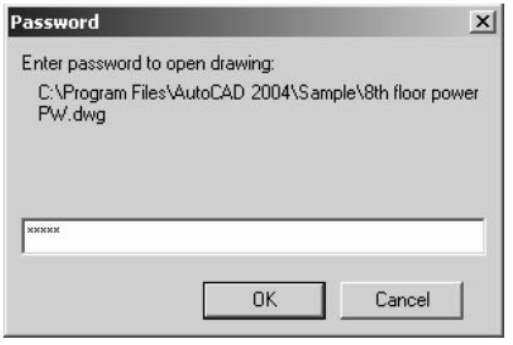
On the Password tab of the Security Options dialog box, you can provide a password that the recipient must enter to open the drawing. In the Advanced Options dialog box, you can choose from various encryption types.

Advanced Options dialog box



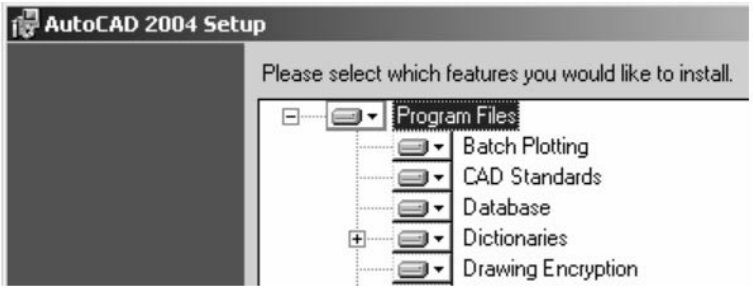
Anyone trying to open a password-protected drawing must enter a password in the Password dialog box.

Password dialog box presented upon opening



IMPORTANT If a password is lost or forgotten, the drawing cannot be recovered. Password-protection functionality can be disabled by selecting a custom installation and turning off the Drawing Encryption feature. If the password feature is disabled, the Password tab does not appear in the Security Options dialog box.

Drawing Encryption option

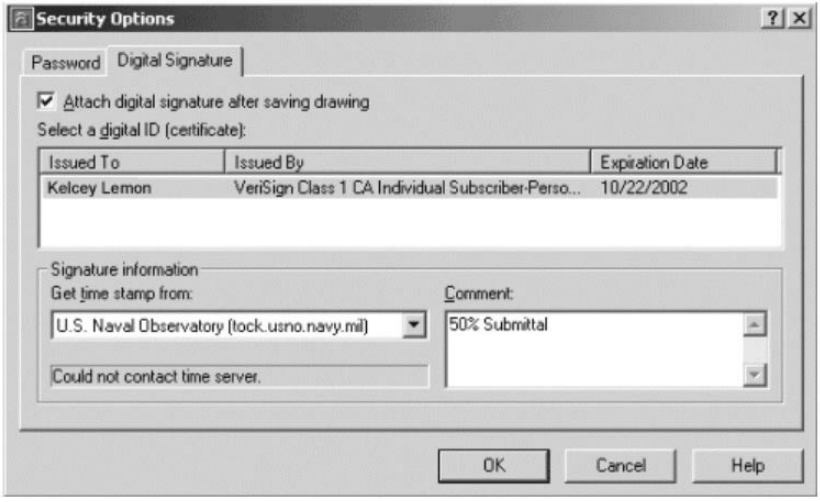


Digital Signatures

Digital signatures functionality provides another way to ensure the security of your digital design data. Digitally signed drawings can be verified for origin (confirming identity of the signer), state (confirming that the drawings have not been changed), and nonrepudiation (signers may not claim that they didn't sign the drawings).

On the Digital Signature tab in the Security Options dialog box, you select an installed signature and attach it to the current drawing. If you have not installed a digital signature, you can use any number of digital certificate providers. Many providers, such as VeriSign, offer a free trial.

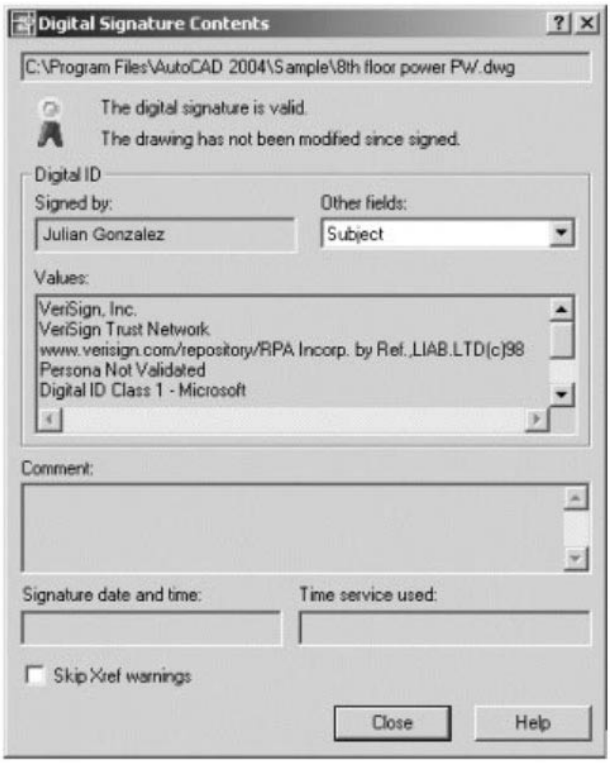
Digital Signature tab



In addition to selecting a digital signature, you can select from a list of time stamps and include a comment with your signature.

Opening a drawing with a digital signature attached displays the Digital Signature Contents dialog box, where you can review information associated with the digital signature.

Digital Signature Contents dialog box

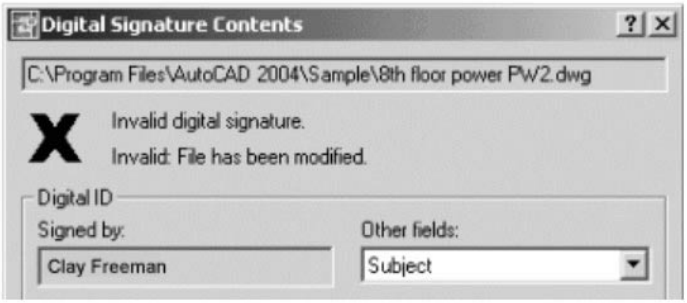


A digital signature icon appears on the status bar, indicating whether an open drawing has a digital signature attached. Additionally, the drawing icon in the Windows Explorer indicates the presence of a digital signature.

Digital Signature icons

Opening and then saving a digitally signed drawing invalidates the signature for security purposes. The signature data, however, is maintained with the drawing.

Invalid digital signature



Software Licensing

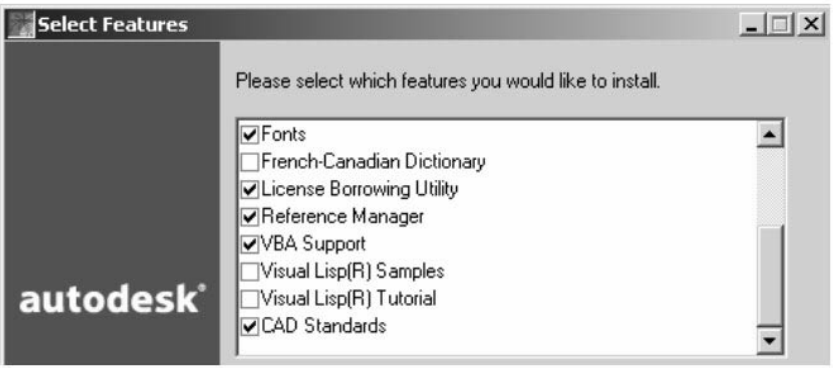
Take advantage of powerful new functionality offered by FLEXlm® 8.3 that helps you to maximize your use of Autodesk Architectural Desktop licenses.

License Borrowing

License borrowing provides the ability to install a time-limited license on your computer while disabling the license on the server for that same period. The license can then be used on your computer, so you can run Autodesk Architectural Desktop without having a connection to the license server. License borrowing is a great benefit if you need to take your computer on a business trip or occasionally work from home.

The license borrowing functionality is a deployment option and must be enabled for users who might need to borrow a network license.

License borrowing option in Deployment wizard

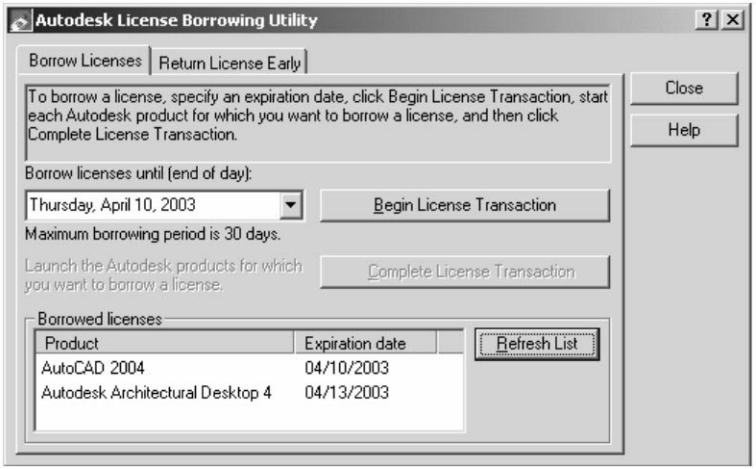


You can control the maximum borrowing period via an environment variable in the Options file, setting it for up to 30 days. The license can be returned to the server at any time before expiration.

The Options file offers new controls, including the ability to set a maximum number of licenses that can be borrowed at any time. Additionally, the system administrator can explicitly allow or deny use of the borrow feature to any user or user group.

Using the License Borrowing Utility, users can borrow a license for up to the maximum borrowing period.

Autodesk License Borrowing Utility



When the borrowing period expires, the license is revoked on the user's computer and is restored on the server, without requiring a connection to the license server. If the specified borrowing period is not needed, the Autodesk License Borrowing Utility can return the license early. Users who need more time after the borrowing period has ended can connect to the server to borrow another license.

License Time-Out

With license time-out you can set a time-out period on your license server to return a license to the server so that it is available for use. License time-out returns a license to the license server when a client connection is lost and prevents a license from being checked out and unused indefinitely on a user's computer.

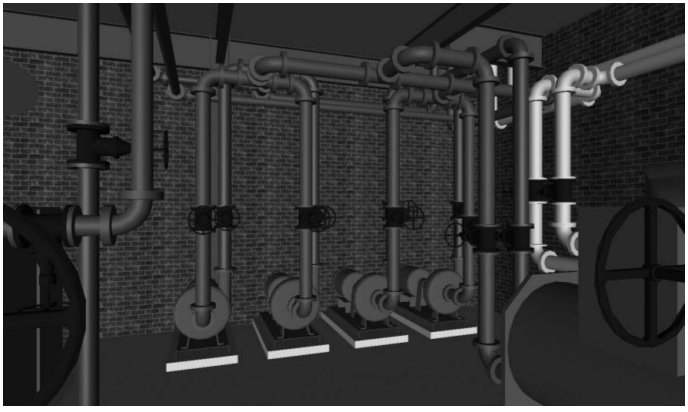
When you set the license time-out flag in the Options file, the license server reclaims the license if the client connection is lost or if the product is idle on a workstation for longer than the defined time-out period.

If a user's license is lost because of the idle time-out, the product attempts to claim a new license when the user restarts the software. If no license is available, the user can save work before the product shuts down.

Autodesk Building Systems Support

Autodesk® Building Systems software is the premier CAD software for design, development, and construction documentation of complex electrical and mechanical building systems. Now a single, stand-alone application, Autodesk Building Systems incorporates mechanical, electrical, and plumbing modules along with Autodesk Architectural Desktop. And because it's built on Autodesk Architectural Desktop software's object technology, multidiscipline firms can use both Autodesk Architectural Desktop and Autodesk Building Systems for architectural, mechanical, plumbing, and electrical design. Combined, these two products ensure that coordination among team members and design teams is easier than ever within the complex building design process.

Autodesk Architectural Desktop drawings seamlessly integrate with Autodesk Building Systems Designs



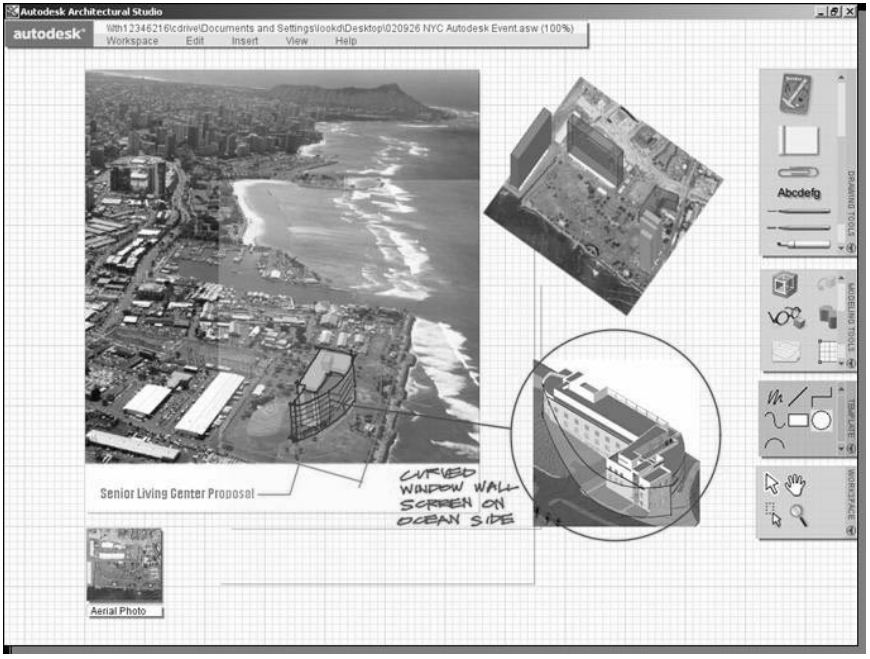
Autodesk Buzzsaw Support

Autodesk Architectural Desktop is integrated with the Autodesk® Buzzsaw™ online project collaboration service, letting you share drawings, documents, and project team communications in one central and secure online location. You can easily access and distribute drawings with a user-friendly direct link to your Autodesk Buzzsaw site.

Autodesk Architectural Studio Support

Autodesk® Architectural Studio complements Autodesk's building design products. Sketches and conceptual models created in Architectural Studio integrate with Autodesk Architectural Desktop. For example, you can create loose, conceptual drawings and models in Architectural Studio and then bring them into Architectural Desktop for further refinement during design development and construction documentation. Then you can return to Architectural Studio to view, annotate, and sketch on top of your drawing.

Use Autodesk Architectural Studio to communicate design intent



Autodesk Architectural Studio enhances an iterative design approach and the communication of design intent within your project team. Your conceptual design data enters the digital workflow from the outset, so it's more tightly integrated with design development and construction documentation. It also means that drawing revisions and critiques among the design team members remain digital, increasing efficiency and reducing drawing errors.

Autodesk Professional Services

Autodesk Professional Services provides integrated consulting, training, and support to help you maximize the value of your investment in Autodesk® technology. Autodesk consulting professionals have advanced product knowledge and industry experience to guide you through projects of any size or complexity. Autodesk training professionals offer the right blend of classes and online learning to ensure that you use your software to its full potential. Autodesk support professionals can help you when problems arise, providing answers that minimize downtime and boost productivity. Whatever your requirements, Autodesk Professional Services helps you to achieve the highest possible return on your technology investment.

Third-Party Support

Many third-party applications worldwide, which run directly in or alongside Autodesk Architectural Desktop, extract and use the intelligent data created by Autodesk Architectural Desktop and address needs such as facilities management, cost estimating, and other niche functions.

If you have professional software developers on staff, the Autodesk Developer Network program offers resources—whether you're developing custom applications or tools for internal use—providing consulting and system integration services, performing research, or writing and publishing learning materials.

For a complete listing of third-party solutions, go to *http://partnerproducts.autodesk.com*.

Setting Up the Environment

II

Topics in Part 2

- The Workspace
- Content Browser
- Drawing Management
- Layer Management
- Display System
- Materials
- Style Manager
- Creating and Saving Drawings

The Workspace

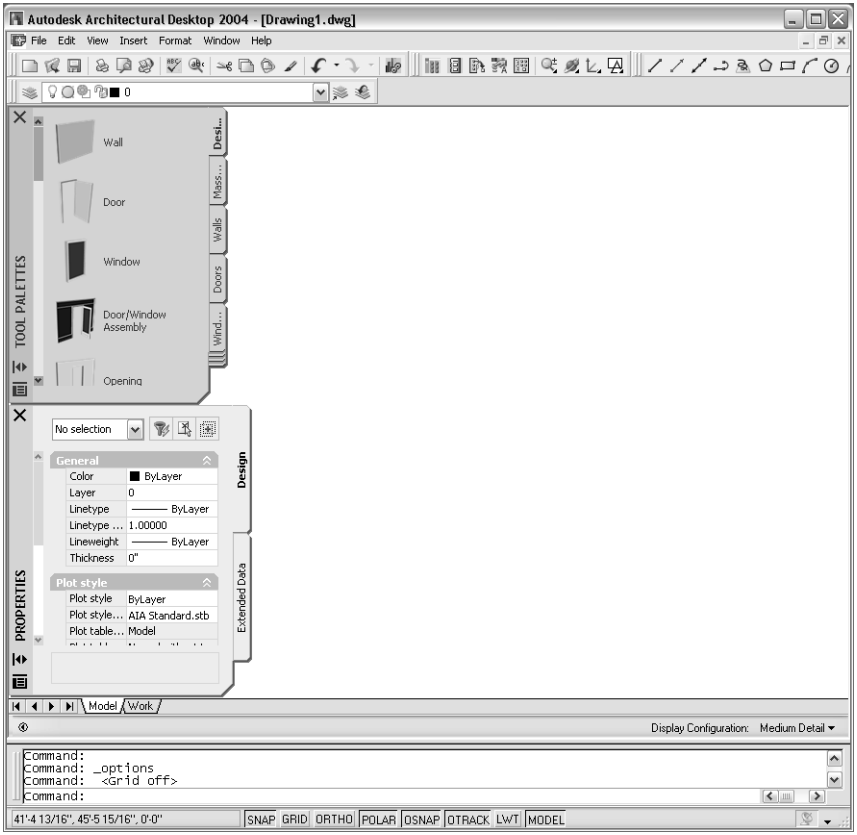
3

A new user interface combines with object technology to bring you the Autodesk® Architectural Desktop 2004 workspace. Designed to appeal to architectural professionals, the workspace presents controls and commands in a visual context.

In this chapter

- The Workspace
- How to Use the Information in this Chapter
- Starting Autodesk Architectural Desktop
- Workspace Components
- Tool Palettes
- Tools
- The Properties Palette
- Direct Editing with Grips and Dynamic Dimensions
- In-Place Editing
- Styles and Support Files
- Integration of Autodesk Architectural Desktop and AutoCAD

The Autodesk Architectural Desktop workspace



Tools and Tool Palettes

Tools and tool palettes provide you with a visual and tactile way to design. A tool can create an architectural object, a block, a schedule, or add a hatch pattern or solid fill to a 2D AutoCAD® object. By simply clicking a tool, you can easily create it in the drawing area. You can use the stock tools provided in the software, or you can create your own tools and organize them in tool palettes for easy access. Customized tools and tool palettes can be saved in a tool catalog and accessed from the Content Browser. For more information, see "Tools" on page 123 and "Content Browser" on page 171.

Properties Palette

As you draw an object with a tool, the Properties palette displays the properties of the object. After you draw the object, use the properties palette to edit the object properties. Design options are arranged hierarchically in the Prop-

erties palette, beginning with the most basic design options and ending with the more advanced worksheet options. For more information, see "The Properties Palette" on page 142.

Content Browser

The Content Browser is a new utility that stores tools and design content. The Content browser provides a central location where you can store project-specific tools to share among your design team. You can browse tool catalogs in the Content Browser and drag-and-drop tools onto your tool palettes. When you change a tool in the Content Browser, you can refresh it in Autodesk Architectural Desktop, so that it is updated with the changed tool properties. You can also easily drag-and-drop tools and tool palettes from Autodesk Architectural Desktop to the Content Browser to fill and modify your tool catalogs. For more information, see "Tool Palettes" on page 108 and "Content Browser" on page 171.

Direct Manipulation

With the enhanced grip functionality, you can make quick design changes directly in the workspace without using dialog boxes. Now, in a single click you can perform changes such as adjusting door width and window height, modifying a wall roofline, or reversing the wall direction. For some grips, the CTRL-key gives you additional manipulation options. This is indicated in the grip tips of the grips. An added enhancement is the introduction of dynamic dimensions. As you make design changes, dynamic dimensions appear, ensuring that your changes are precise and accurate. You can enter values directly in the drawing, which eliminates the need to enter numeric input at the command line. For more information, see "Direct Editing with Grips and Dynamic Dimensions" on page 149.

In-Place Editing

In-place editing allows you to make direct on-screen changes to object components. These include wall endcaps, roof and floor lines, and any kind of profile-based custom components, such as rails and posts or curtain wall mullions and frames. Additionally, you can in-place edit a 3D body modifier on a wall, and the surface hatch of a material. You can save changes from the in-place edit session back to the style you started from or create a new style. For more information, see "In-Place Editing" on page 157.

Templates and Styles

Autodesk®Architectural Desktop offers metric and imperial template sets for designing the building model and creating plotting sheets. The templates have been designed to work optimally with the new Drawing Management feature. For more information, see "Drawing Management" on page 209.

To make the templates smaller, all object styles have been moved out of the templates and into the Styles drawings. The new tool palette concept makes

it easy to define the style location of each tool you use. For more information, see "Tools" on page 123 and "Styles and Support Files" on page 167.

Drawing Management
The Drawing Management feature formalizes and automates the processes related to building model design and documentation. The feature provides automated tools that aid you in the management, viewing, and construction of your building information model and documents. You have consistency throughout all aspects of the project with Drawing Management. Every user on the design team has a centralized project environment for accessing the most current documents, from project templates to sections and elevations. For more information, see "Drawing Management" on page 209.

Related Topics and Procedures

- How to Use the Information in this Chapter
- Starting Autodesk Architectural Desktop
- Workspace Components
- Tool Palettes
- Tools
- The Properties Palette
- Direct Editing with Grips and Dynamic Dimensions
- In-Place Editing
- Styles and Support Files
- Integration of Autodesk Architectural Desktop and AutoCAD

How to Use the Information in this Chapter

This chapter offers a general overview over the new workspace components and the workspace concepts introduced in Autodesk Architectural Desktop 2004. You will find high-level descriptions of the user interface and workflow changes in the application and examples of how to use them. For detailed instructions for using the new workspace with specific objects, refer to the chapters for the individual objects.

For example, the Properties Palette section in this chapter introduces the concept of accessing and using object properties from a palette. It describes how to start the Properties palette, how to set its appearance, and how to work with its tabs.

For detailed information about using the Properties palette for creating a specific object—for example a wall—refer to the appropriate object's chapter,

such as "Creating a Wall with User-Specified Settings" on page 1760. This section contains all of the specific steps for creating a wall with the Properties palette.

Starting Autodesk Architectural Desktop

You can start Autodesk®Architectural Desktop three ways:

- Double-click the Autodesk Architectural Desktop 2004 icon on your desktop.

  The icon displays on your desktop if you choose to create it when you installed the software.

- Windows 2000 only: On the Start menu, click Programs ➤ Autodesk ➤ Autodesk Architectural Desktop ➤ Autodesk Architectural Desktop 2004.
- Windows XP only: On the Start menu, click All Programs ➤ Autodesk ➤ Autodesk Architectural Desktop ➤ Autodesk Architectural Desktop 2004.

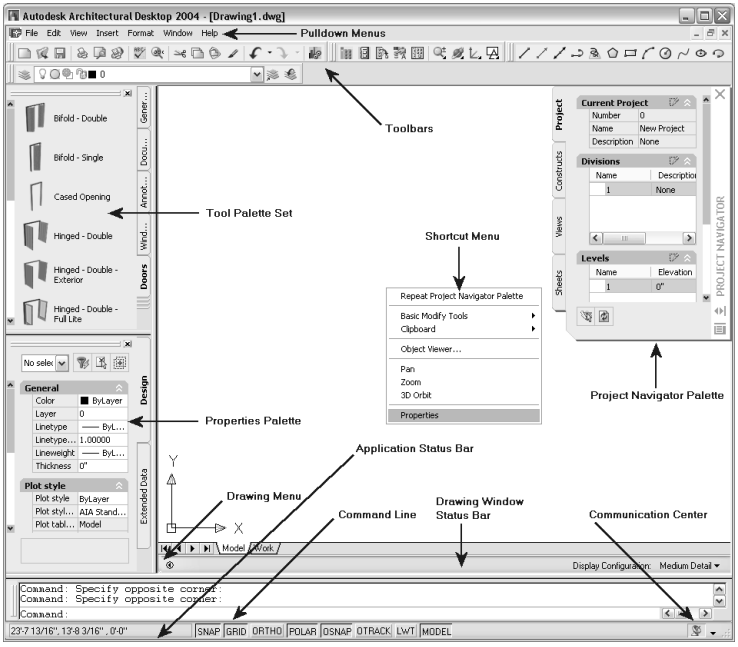
Customizing Startup
You can use command line switches in the shortcut properties of the desktop icon to specify Autodesk Architectural Desktop startup options:

- Run a start-up script when you start the software
- Start the software with a specific template
- Start the software with a specific profile (ARG file)
- Create several desktop icons, each with different start-up options

For more information, see Customize Startup in the online *AutoCAD 2004 User's Guide*.

Workspace Components

You use the workspace environment as you design and interact with an architectural project. With this release of Autodesk®Architectural Desktop, a number of new, intuitive workspace components have been added to enhance the architectural workflow. You can configure the workspace according to your needs and processes and save specific workspace layouts in a user profile.



This sections presents an overview of the available workspace components.

Related Topics and Procedures

- Pulldown Menus
- Toolbars
- Shortcut Menu
- Tool Palettes
- Properties Palette
- Command Line
- Drawing Window Status Bar
- Application Status Bar
- Communication Center
- Project Navigator Palette
- Creating and Saving a Workspace Configuration
- A Guideline to the New User Interface
- How to Create a Workspace for Transitioning from Autodesk Architectural Desktop 3.3

Pulldown Menus

The pulldown menus have been restructured for Autodesk® Architectural Desktop 2004. While in previous releases most of the object-related commands could be accessed from pulldown menus, the current pulldown menus have been consolidated to only display general drawing-wide commands, such as the drawing setup or accessing Style Manager and Display Manager. Objects and object-related commands are now primarily accessed from the tool palettes, the Properties palette, the shortcut menu, and through grip-editing.

Pulldown menu commands are grouped according to the workflow.

Menu	Contents
File	drawing file commands, access to the Project Browser, drawing utilities, and drawing transmittal commands
Edit	standard Microsoft Windows editing commands, such as Copy and Paste
View	commands that change the working view
Insert	general insertion commands for external files and file types, access to DesignCenter
Format	formatting and management commands, including Display Manager, Layer Manager, and Style Manager
Window	commands that affect the workspace and the windows contained within the workspace; includes commands that add the CAD Manager menu, the AutoCAD 3D Solids menus, and the Autodesk Architectural Desktop 3.3 legacy pulldown menus to the menu bar
Help	access to the online Help, online tutorials, and other resources to help you learn and use Autodesk Architectural Desktop

In addition to the standard pulldown menus, you can load these menus:

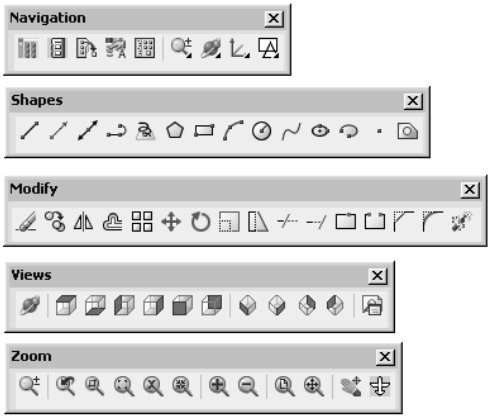
Menu	Contents
Design	contains a pulldown menu similar to the Design menu of Autodesk Architectural Desktop 3.3. Note that this menu does not contain all commands of the original Design menu; it is meant as a tool for transitioning seamlessly between Autodesk Architectural Desktop 3.3 and Autodesk Architectural Desktop 2004
Document	contains a pulldown menu similar to the Documentation menu of Autodesk Architectural Desktop 3.3. Note that this menu does not contain all commands of the original Documentation menu; it is meant as a tool for transitioning seamlessly between Autodesk Architectural Desktop 3.3 and Autodesk Architectural Desktop 2004
CAD Manager	contains advanced features like the VBA Editor, the LISP Editor, the Script command, Visual Audit, and Explode AEC Objects. When the CAD Manager menu is loaded, you have also access to the CAD Manager toolbar that contains buttons for Style Manager, Display Manager, Visual Audit, and the AutoCAD features Configure Standards, Check Standards, and Layer Translator
3D Solids	gives access to the AutoCAD® 3D Solids objects and commands

To load the additional pulldown menus, click Pulldowns on the Window menu, and then select the menu you want to add to the menu bar.

Toolbars

The concept of the toolbars has been restructured for this release of Autodesk® Architectural Desktop. While in previous releases most of the objects and object-related commands could be accessed from toolbars, the new toolbars contain only those commands that the user will often need at any point in the drawing sessions, like those items found on the Standard toolbar, the Navigation toolbar, the Shapes toolbar. Objects and object-related commands are now accessed primarily from the tool palettes, the Properties palette, the shortcut menu, and through grip-editing.

Some frequently used toolbars



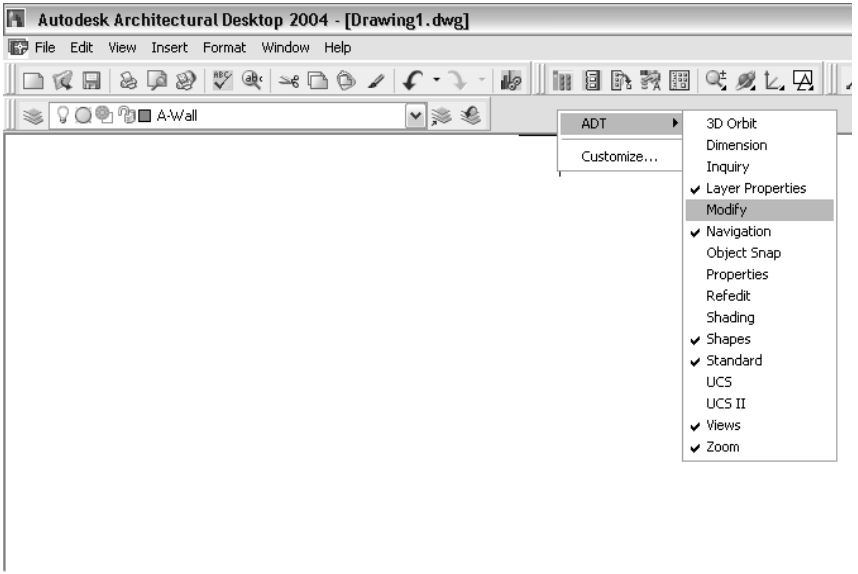
These toolbars available in Autodesk Architectural Desktop:

Toolbar	Contents
Standard	standard drawing commands, like opening, saving, publishing and printing drawings. Contains also Copy, Paste, Undo, and Regenerate Model.
Navigation	commands for opening the Content Browser, the Project Navigator Palette, the Tool Palettes Set, the Properties Palette, and DesignCenter. Contains also flyout toolbars for Zoom, Views, UCS, and Shading.
Layer Properties	commands to start the Layer Manager and change the status of a layer
Shapes	commands for adding 2D AutoCAD objects, like lines, arcs, polylines and splines
3D Orbit	commands for moving the model in 3D space
Dimension	commands for working with AutoCAD dimensions
Inquiry	commands for measuring distances, areas, and volumes. Also contains the AutoCAD Point tool and the List command.
Modify	standard commands for editing objects and linework. Includes Copy, Erase, Move, Scale, Mirror, Offset, Array, Stretch, Trim, Extend, Break, Chamfer, Fillet, and Explode. **NOTE** These commands are also available from the general shortcut menu.

Toolbar	Contents
Object Snap	commands for setting the Object Snap
Properties	commands for changing color, linetype, lineweight and linetype scale for an object
Refedit	commands for working with external references in the drawing
Shading	commands for different shade modes
UCS, UCS II	commands for setting and changing the UCS of the drawing
Views	commands for switching between 2D and 3D views of the drawing
Zoom	commands for zooming and panning the drawing

To access the toolbars, right-click into the toolbar area below the menu, and click ADT. A flyout in the shortcut menu displays the available toolbars.

Accessing the toolbars

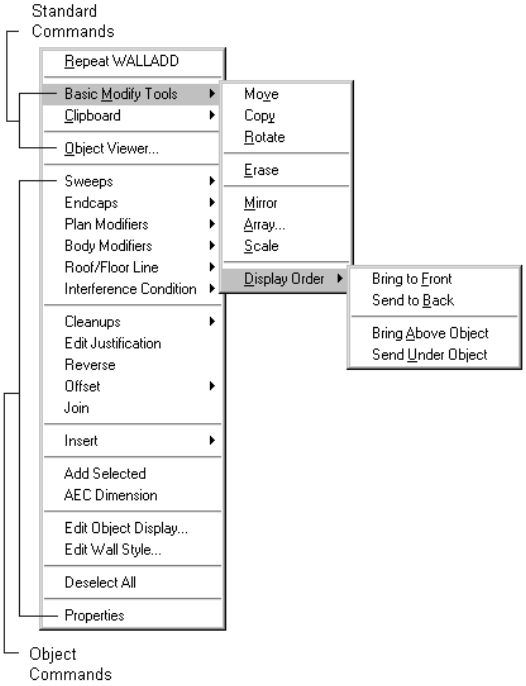


Shortcut Menu

The shortcut menu of an object is the central location for any object-related commands. Different objects have different shortcut commands, depending on the object type. To prevent this menu from becoming too big, the existing standard commands—like Copy, Paste, Move, and Rotate—have been restructured.

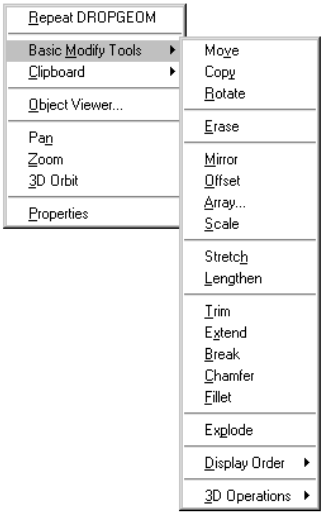
To access the shortcut menu of an object, select the object, and right-click on it.

Shortcut menu of a wall



A general shortcut menu is also available when you right-click into the drawing area without an object selected. This general shortcut menu contains all general modify commands.

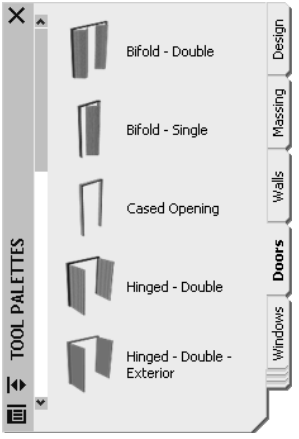
General drawing shortcut menu



Tool Palettes

Tool palettes provide the main method for accessing tools to create objects in your model. You can have tools for standard objects in your drawing and for objects with specific styles and specific properties. Tool palettes are organized in a tool palettes set. You can easily create your own tool palettes or copy existing tool palettes from the Content Browser.

Tool palette with door tools

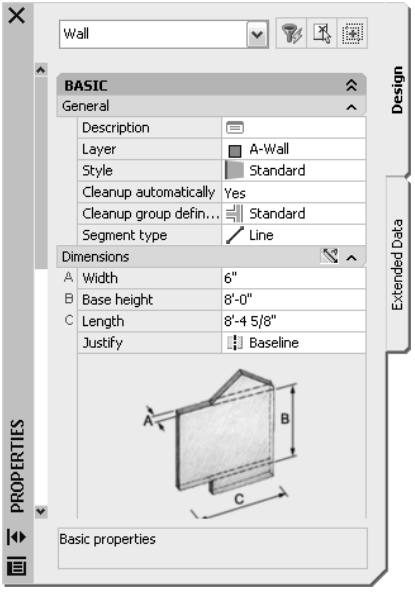


For more information, see “Tool Palettes” on page 108 and “Tools” on page 123.

Properties Palette

The Properties palette offers you a centralized location to enter and change object properties. You can enter information about the style, dimensions, location, property set data, and other important properties. You will typically keep the Properties palette permanently open during an Autodesk® Architectural Desktop session.

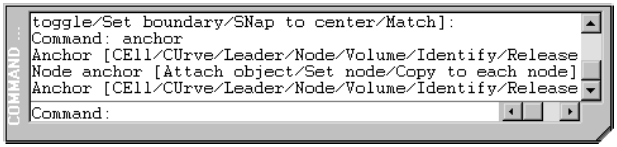
Properties palette of a wall



For more information, see “The Properties Palette” on page 142.

Command Line

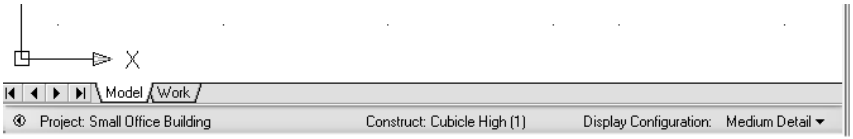
You can directly enter commands using the command line. For a list of available commands, enter **arx** on the command line and then **c** (commands). This gives you a list of all available commands.



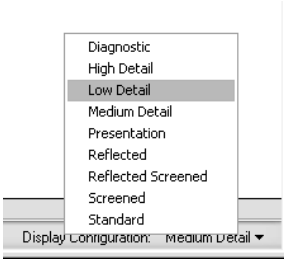
Drawing Window Status Bar

The drawing window status bar provides a quick and intuitive way to display status information about the current drawing:

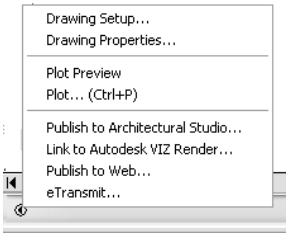
Drawing window status bar



- Project information: If the drawing is part of an Autodesk Architectural Desktop project, the drawing window status bar displays the name of the project, as well as the file type of the drawing. For more information, see "Drawing Management" on page 209.
- Display configuration of the active viewport: You can see and change the current display configuration.



- Drawing menu: When you click in the drawing window status bar, a shortcut menu with frequently used commands in the drawing is displayed. These commands are available on the regular pulldown menus as well; the Drawing menu provides a shortcut to them.



Application Status Bar

The application status bar contains settings valid for the whole drawing session in Autodesk Architectural Desktop.

The application status bar gives access to these settings:

- Snap: On/Off/Settings
- Grid: On/Off/Settings
- Ortho: On/Off
- Polar Tracking: On/Off/Settings
- Object Snap: On/Off/Settings
- Object Track: On/Off/Settings
- Lineweight: On/Off/Settings
- Model Space/Paper Space

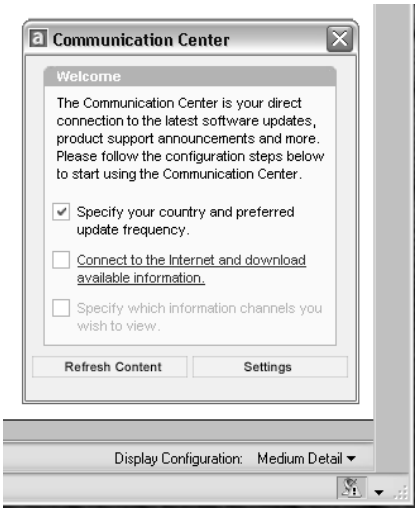
To turn one of these components on or off, click on its button. To change the settings for one of these components, right-click the button, and select Settings.

Communication Center

This in-product notification system keeps you up-to-date on service pack availability as well as information for Autodesk®Subscription Program members, such as extension availability, product tips and tricks, and product support information. You can set the Communication Center to automatically notify you of any updates and other important information at specified intervals. Alternatively, you can update on demand.

When new updates are available, the Communication Center icon displays with a yellow exclamation mark . When you click on the icon, the Communication Center is displayed, allowing you to download the latest updates. To set the update properties, click the Communication Center icon, and click Settings.

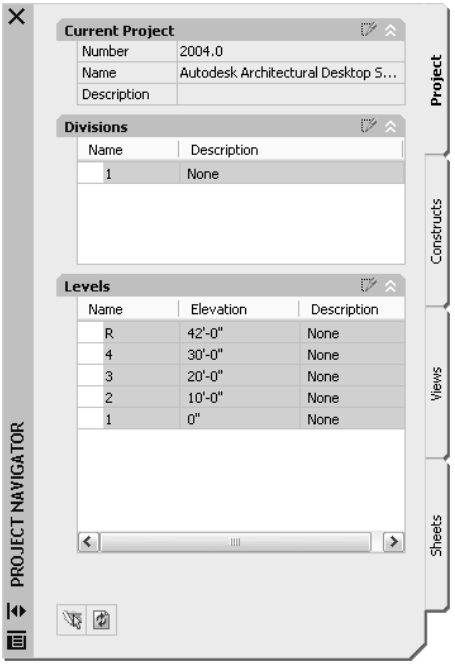
Communication Center dialog box



Project Navigator Palette

The Drawing Management feature formalizes and automates the processes relating to building model design and documentation. This feature provides automated tools that aid you in the management, viewing, and construction of your building information model and documents.

Project Navigator Palette



The Project Navigator Palette is the central location to create, modify, and access Autodesk® Architectural Desktop project files. You will typically have the Project Navigator Palette open in the workspace while you are working on a project. For more information, see "Drawing Management" on page 209.

Creating and Saving a Workspace Configuration

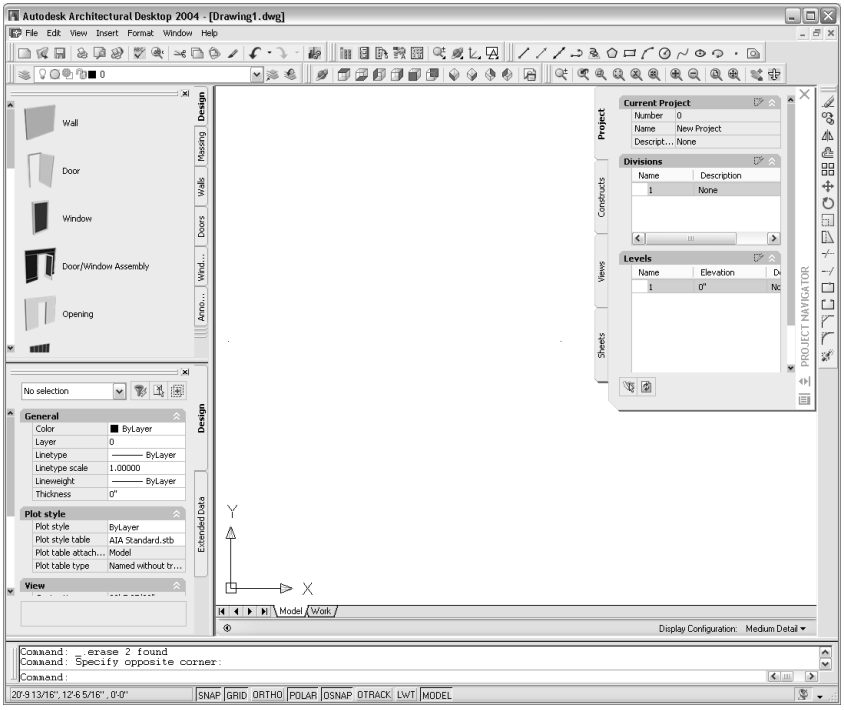
Autodesk® Architectural Desktop offers a number of user interface components to choose from and flexibility in combining and arranging those components. To ensure that a specific workspace configuration—including tool palettes, menus, toolbars, Properties palette, and Project Navigator Palette—remains unchanged, you can create a user-defined profile that contains your settings.

For detailed information on the display of the individual user interface components, see the sections for the individual components.

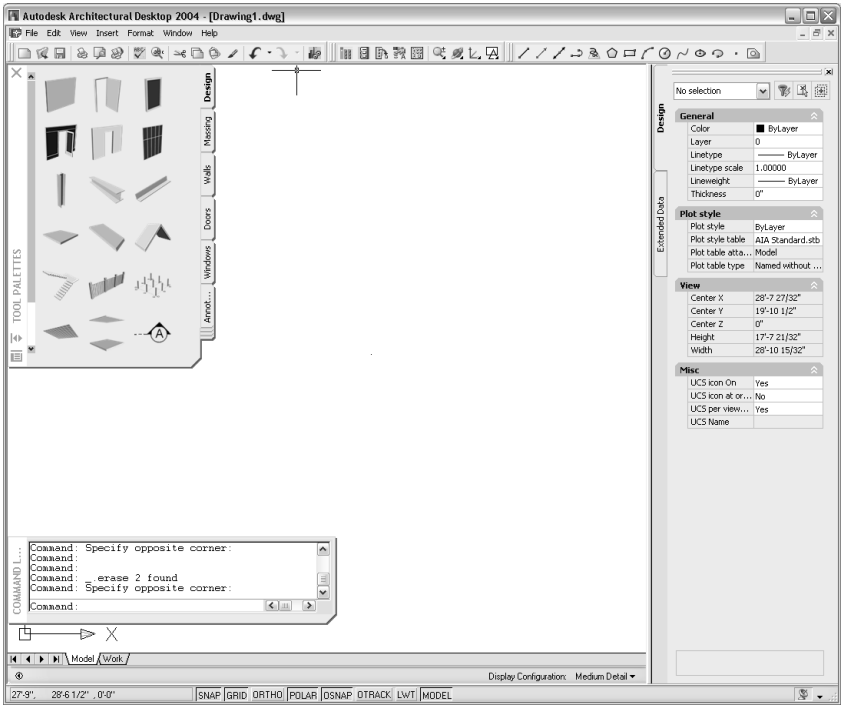
The following user interface characteristics are saved in the user profile:

- On/Off state of the tool palettes set, the Properties palette, the Project Navigator Palette, the toolbars, menus, and the command line window
- Size and position of the tool palettes set, the Properties palette, the Project Navigator Palette, the toolbars, and the command line window
- View settings of the Properties palette and the tool palettes set
- Support file path to the tool palettes set

Workspace layout



Changing workspace layout



You can save any number of workspace layouts in Autodesk Architectural Desktop.

1. On the Format menu, click Options.
2. Click the Profiles tab.
3. Click Add to list, and enter a name for the new workspace profile.
4. Click Apply&Close.
5. Select the profile in the list, and click Set Current.
6. If you want to use a different tool palettes set, click the File tab, and enter the path to the correct tool palettes set under Tool Palettes File Location.

   For detailed information, see “Specifying Different Tool Palettes for the Tool Palettes Set” on page 114 and “Creating a New Tool Palettes Set from Autodesk®Architectural Desktop” on page 114.
7. Click OK.
8. In the Autodesk Architectural Desktop workspace, arrange palettes, toolbars, and other user interface components according to your needs.

The configuration you create is linked to the currently selected workspace profile. Whenever you set this profile current, the associated workspace configuration is restored.

NOTE You cannot create a workspace layout on screen and then save that configuration to a new profile. In that case, the currently selected profile is overwritten with the new configuration.

A Guideline to the New User Interface

The new user interface offers visual workflow and intuitive access to objects and commands. The new user interface is considerably different from the user interface of previous releases, so that users of previous releases might, at first glance, ask themselves "Where are my objects and commands?" To help you find your way through the new user interface, refer to the following guidelines.

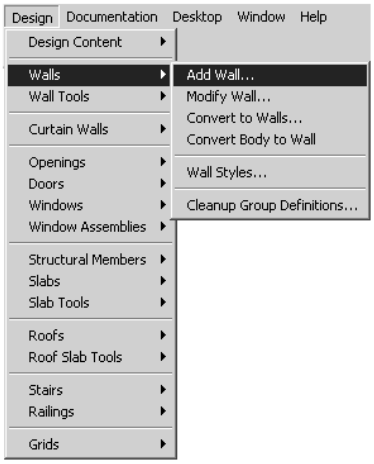
Related Topics and Procedures

- Adding Objects
- Modifying Objects
- Object-related Command Tools
- Other Commands

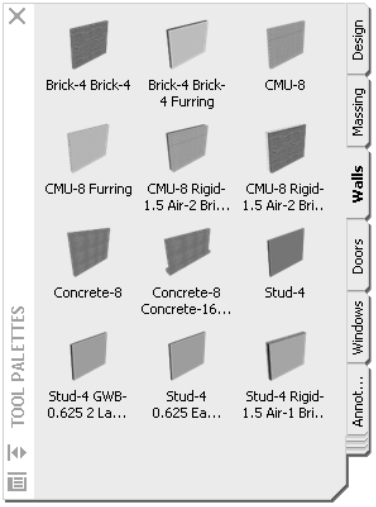
Adding Objects

In previous releases of Autodesk® Architectural Desktop, objects would mainly be added to the drawing via pulldown menus and object toolbars.

In the new workspace, you add objects to the drawing with tools.

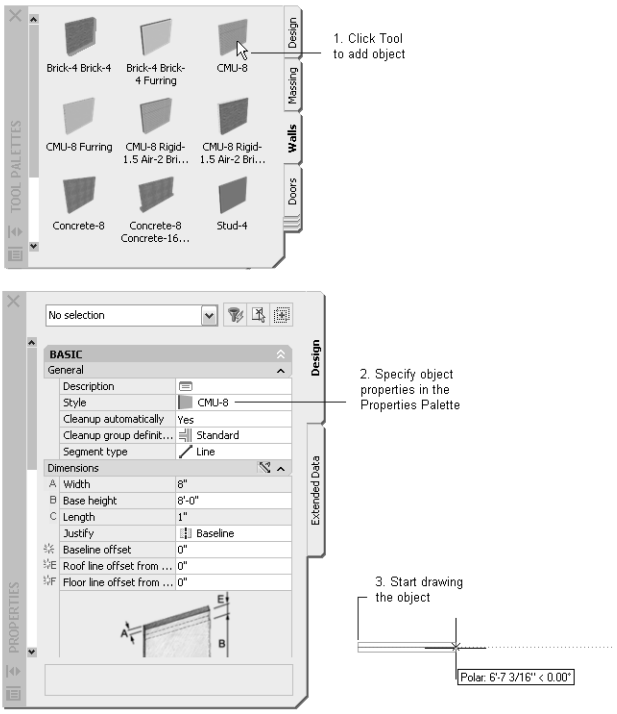


Autodesk Architectural Desktop 3.3



Autodesk Architectural Desktop 2004

When you click on an object tool to add an object in the drawing, the Properties palette opens so you can enter properties for the new object, similar to the old Add dialog boxes. The difference is that unlike the old method, tools can have preset creation parameters to enable 'one-click add' of an object without even the need to change properties before placement. For detailed information, see “Tools” on page 123.



Tools are arranged on tool palettes for easy access. To open the tool palettes, click Tool Palettes on the Window menu.

The Autodesk Architectural Desktop Sample Palette catalog is installed by default and contains the following tool palettes:

Tool Palette	Content
Design	This tool palette is a good starting point for exploring the new workspace. Because this palette contains tools for all standard design objects. All of the objects on this palette are inserted with the Standard style, and with standard properties. The Design Tool palette contains the following objects: ■ Wall ■ Door ■ Window ■ Opening ■ Door/Window Assembly ■ Curtain Wall ■ Structural Column ■ Structural Beam ■ Structural Brace ■ Slab ■ Roof Slab ■ Roof ■ Stair ■ Railing ■ Structural Column Grid ■ Ceiling Grid ■ Space ■ Auto Generate Spaces ■ Space Boundary ■ Section Line ■ Elevation Line

Tool Palette	Content
Massing	This tool palette contains tools for all predefined mass element shapes. The mass elements are inserted with the Standard style. The Massing Tool palette contains the following mass elements: ■ Arch ■ Barrel Vault ■ Box ■ Pyramid ■ Isosceles Triangle ■ Right Triangle ■ Cone ■ Cylinder ■ Dome ■ Sphere ■ Gable ■ Drape ■ Extrusion ■ Revolution This palette also contains the following tools: ■ Mass Groups ■ Slice ■ Camera
General Drafting	This tool palette contains tools for frequently used AutoCAD commands. Note that the tools on the General Drafting palette do not necessarily represent objects, but rather AutoCAD commands. The General Drafting Tool palette contains the following tools: ■ Point ID tool ■ Distance tool ■ Area Tool ■ Fillet - 0" ■ Fillet - 24" ■ Chamfer ■ Line Hatch ■ Hatch and Gradient Tool ■ Sample Pantone hatch tools These are sample tools. You can copy and paste them on the tool palette to create new tools.

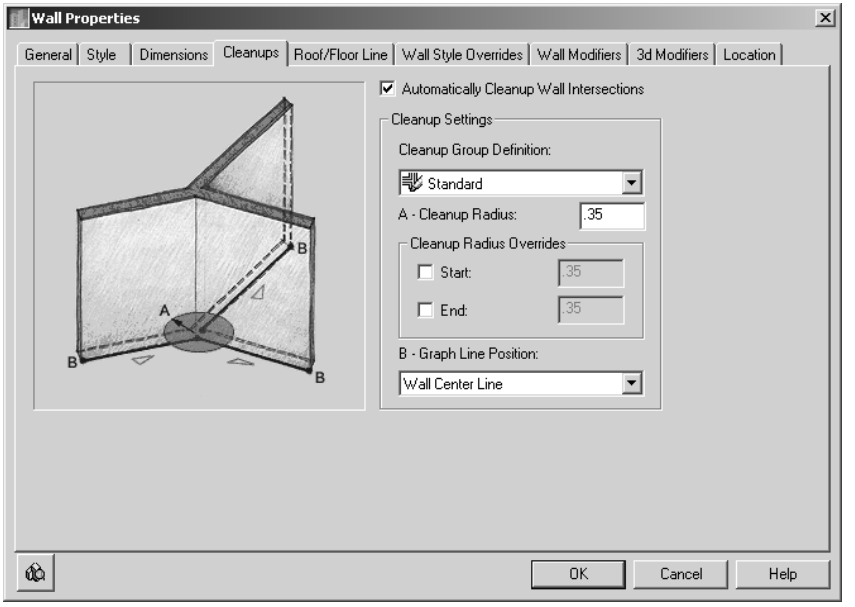
Tool Palette	Content
Documentation	This tool palette contains tools for the documentation phase of the architectural workflow. The Documentation Tool Palette contains the following object tools: ■ Door schedule (Sample) ■ Window schedule (Sample) ■ Space Inventory schedule (Sample) ■ Room Finish schedule (Sample) ■ Area ■ Area Group ■ Area Group from Template In addition, the Documentation palette contains these command tools: ■ Area Evaluation ■ Browse Property Data ■ Renumber Data For more information about command tools, see "Object-related Command Tools" on page 105 and "Creating a Command Tool" on page 134.
Annotation	This tool palette contains tools for the annotation of a drawing. The Annotation Tool Palette contains the following tools: ■ AEC Dimension ■ Manual AEC Dimension ■ Text Tools ■ Plan Elevation Label ■ Door/Window Tag ■ Section/Elevation Marks ■ Detail Boundaries ■ Revision Clouds The annotation symbols are sample tools and can also be dragged into a tool palette from DesignCenter. For more information, see "Creating a Tool from AEC Content in DesignCenter" on page 133.
Walls	This tool palette contains a number of wall style tools representing the wall styles from the Wall Styles drawings. When you start a wall style tool, a wall with this style is inserted in the drawing.
Doors	This tool palette contains a number of door style tools representing the door styles from the Door Styles drawing. When you start a door style tool, a door with this style is inserted in the drawing.

Tool Palette	Content
Windows	This tool palette contains a number of window style tools representing the window styles from the Window Styles drawings. When you start a window style tool, a window with this style is inserted in the drawing.

Modifying Objects

In previous releases of Autodesk® Architectural Desktop, you could modify objects through the object property dialog box.

Wall Properties dialog box in Autodesk Architectural Desktop 3.3

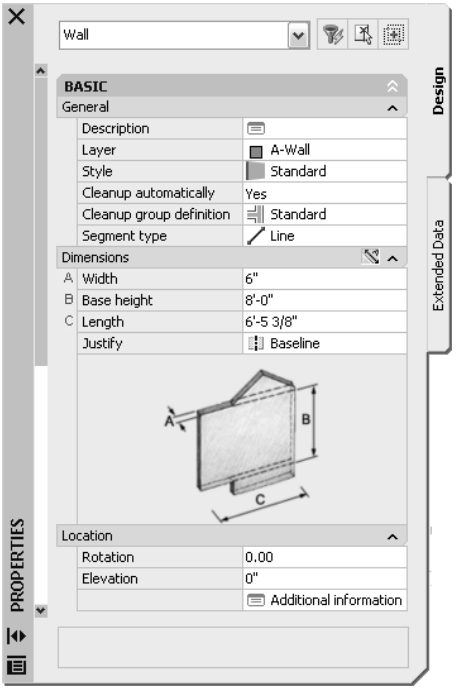


In the new workspace, you can modify an object using any of the following methods:

- Properties palette: The Properties palette is the central location for entering and changing information about an object. This palette has categories that correspond to the tabs in the old Properties dialog boxes.

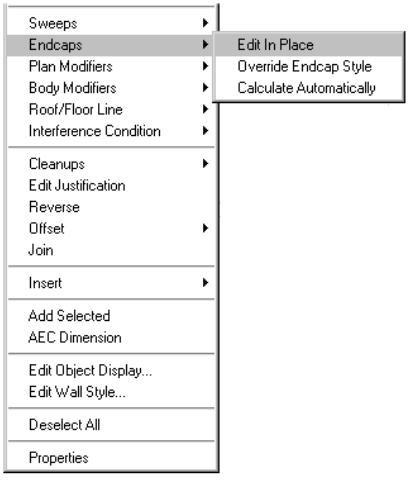
  For detailed information, see "The Properties Palette" on page 142.

Modifying a wall with the Properties palette



- Shortcut menu: A number of object-related commands have been added to the shortcut menus. Right-click the object to display its available shortcut commands.

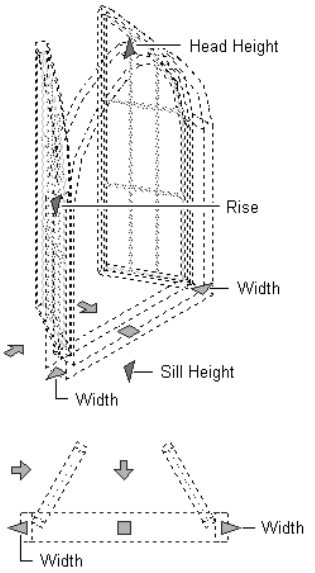
Shortcut menu for a wall



- Direct editing with grips: A number of commands for modifying objects are now accessible from the object's grips. Click on an object in two-dimensional (2D) or three-dimensional (3D) view to display its grips.

  For detailed information about object grips, see "Direct Editing with Grips and Dynamic Dimensions" on page 149. Information about grip-editing is also covered in the individual object chapters.

Window grips for direct editing

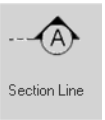


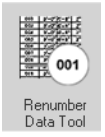
Object-related Command Tools

The tool palettes contain a number of object-related commands. These tools are called command tools or helper tools, because they do not represent objects but rather utilities for working with objects.

You can create your own command tools. For more information, see "Creating a Command Tool" on page 134.

In the Autodesk® Architectural Desktop Sample Palette catalogs, the following command tools are available:

Tool	Location	Description
	Design Palette	Automatically generates spaces from walls and linework
	Design Palette	Creates a building section line

Tool	Location	Description
	Design Palette	Creates a building elevation line
	Massing Palette	Creates a slice through a building model
	Massing Palette	Creates user-defined perspective views of the building model
	Annotation Palette	Starts the AutoCAD Mtext tool
	Documentation Palette	Creates an evaluation document for areas and area groups
	Documentation Palette	Renumbers property data in selected property sets by increment or by a user-defined number
	Documentation Palette	Allows you to browse the existing property data of all objects in the drawing, including external references

Other Commands

The pulldown menus from the previous releases of the software are now consolidated to ensure more intuitive and direct user interaction. The main menu for accessing commands is the Format menu. The Format menu provides access to these features:

- Drawing Setup, Drafting Settings, Drawing Limits, and Drawing Options
- Style Manager, Display Manager, Layer Manager

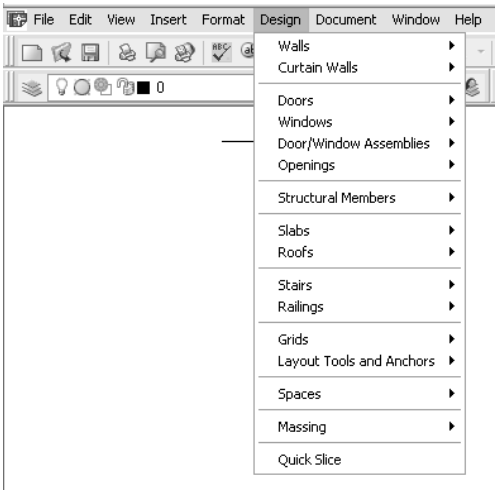
- Structural Member Catalog
- Structural Member Wizard, AEC Dimension Style Wizard, and AEC Content Wizard
- Plotter Manager and Plot Style Manager
- Blocks, Multi-View Blocks, and Profiles
- Material and Classification Definitions
- AutoCAD® Text Style, Point Style, Color, Linetype and Lineweight Settings

How to Create a Workspace for Transitioning from Autodesk Architectural Desktop 3.3

Use this procedure to add two transitional pulldown menus to Autodesk® Architectural Desktop 2004 that resemble the Design and Documentation menus of Autodesk Architectural Desktop 3.3.

If you are a user of a previous version of Autodesk Architectural Desktop, you may need time to get used to the new workspace concept. If you are in the middle of a project and want to use the new version without having to adapt to the new user interface immediately, you can use a transitional user interface. This transitional interface provides access to the new workspace components such as the tool palettes set, the Properties palette, and the Content Browser, while at the same time offering you a menu structure that is similar to Autodesk Architectural Desktop 3.3.

Transitional Design menu



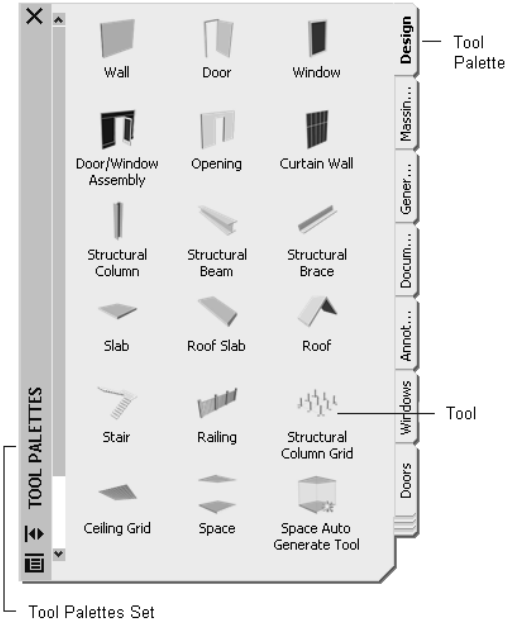
1 On the Window menu, click Pulldowns.

2 Display the appropriate pulldown menu.

If you want to . . .	Then . . .
display the Design menu	click Design Pulldown.
display the Documentation menu	click Document Pulldown.

Tool Palettes

Tool palettes provide instant access to a complete inventory of Autodesk® Architectural Desktop tools—such as walls, doors, and windows—in one consistent user interface. Highly visual, tool palettes include a preview of each style. You can create a set of custom tool palettes that address your specific design needs. For example, you can create a palette to store a list of commonly used curtain wall, stair, and window tools.



Tool Palettes Set

Tool palettes are organized in a tool palettes set, and you can add, remove, and rearrange palettes in the set. Additionally, you can rename the tool pal-

ettes set. A tool palettes set with default tools is available when you start Autodesk Architectural Desktop. Additional tool palettes are stored in the Content Browser, and you can drag and drop them onto the tool palettes.

You can add tool palettes to the tool palettes set from a tool catalog. For example, you could create one tool catalog for imperial tools and another for metric tools. For more information, see "Creating and Saving a Workspace Configuration" on page 93 and "Specifying Different Tool Palettes for the Tool Palettes Set" on page 114.

Only one tool palettes set can be active simultaneously during an Autodesk Architectural Desktop session, although you can set different tool palettes for different user profiles. You do this by collecting tool palettes from several locations (paths) in a profile and let the workspace combine them into the one tool palettes set.

Tool Palettes

Tool palettes are the individual tabs of the tool palettes set. A number of default tool palettes are available from the Autodesk Architectural Desktop Sample Palette catalogs. You can create new tool palettes in Autodesk Architectural Desktop or in the Content Browser. Usually you place tools on tool palettes according to tool type or design phase. For example, you could place all your wall tools on a tool palette called "Walls" or all of your preliminary conceptual tools on a tool palette called "Massing Study." When you create a tool palette in the Content Browser, you can link it to Autodesk Architectural Desktop. Whenever the tool palette is updated in the Content Browser, the changes are updated in the tool palette in Autodesk Architectural Desktop too. This is very useful for large projects where consistency of styles and tools is necessary. For more information, see "Working with Tool Palettes from a Central Location" on page 120.

Tools

Tools represent the individual objects you can add to a drawing. A tool contains creating parameters about the object it creates.

When you add an object with a specific object tool, the object has the settings you defined in the tool. This eases the design process immensely and enhances consistency across a project.

For example, if you might define a wall tool that contains the style "CMU 8 Furring" and that has automatic cleanup and a baseline offset of 1". Whenever you add a wall with this wall tool, the wall will be of the style "CMU 8 Furring," clean up automatically, and have an offset of 1". For more information, see "Tools" on page 123.

Tool Palettes and the Content Browser

When you are working on a large project with multiple users, consistency of tools is especially important. Typically the objects for the project, their styles and properties are set up by a CAD manager or system administrator and then distributed to the team. This administrator can then put tools and palettes in a central location in the Content Browser and link them to the individual users' computers. Whenever the tools or palettes are updated in the Content Browser, the tools or palettes are updated on the users' computers too. Users cannot individually change tools and tool palettes, thus preventing accidental modification of standard tools.

For more information, see "Working with Tool Palettes from a Central Location" on page 120 and "Working with Tools from a Central Location" on page 136.

Related Topics and Procedures

- Opening the Tool Palettes Set
- Setting the Appearance of the Tool Palettes Set
- Specifying Different Tool Palettes for the Tool Palettes Set
- Creating a New Tool Palettes Set from Autodesk®Architectural Desktop
- Creating a New Tool Palette
- Setting the Appearance of the Tool Palettes
- Working with Tool Palettes from a Central Location

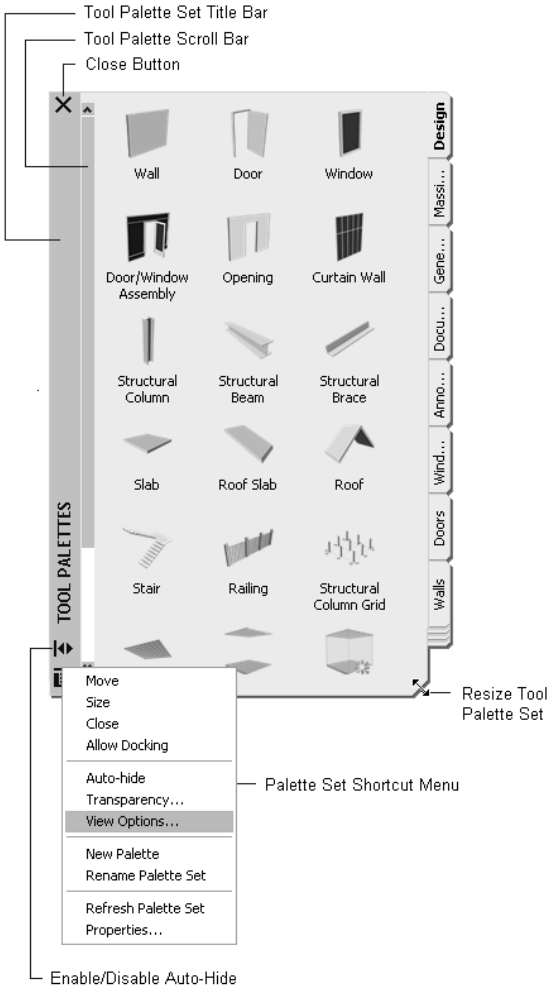
Opening the Tool Palettes Set

Use this procedure to open the tool palettes set.

- On the Window menu, click Tool Palettes.

  Alternatively, you can click on the Navigation toolbar, or press CTRL+3.

Components of the tool palettes set



Setting the Appearance of the Tool Palettes Set

Typically, the tool palettes remains open during the Autodesk® Architectural Desktop session, since it is the central location from which you add objects to the drawing and start object-related commands. To work optimally with the tool palettes set, it has a number of user-definable display options to integrate it seamlessly with your workspace.

Related Procedures

- Docking the Tool Palettes Set
- Hiding the Tool Palettes Set
- Adjusting the Transparency of the Tool Palettes Set
- Renaming the Tool Palettes Set

Docking the Tool Palettes Set

Use this procedure to dock the tool palettes set on the left or right side of your workspace.

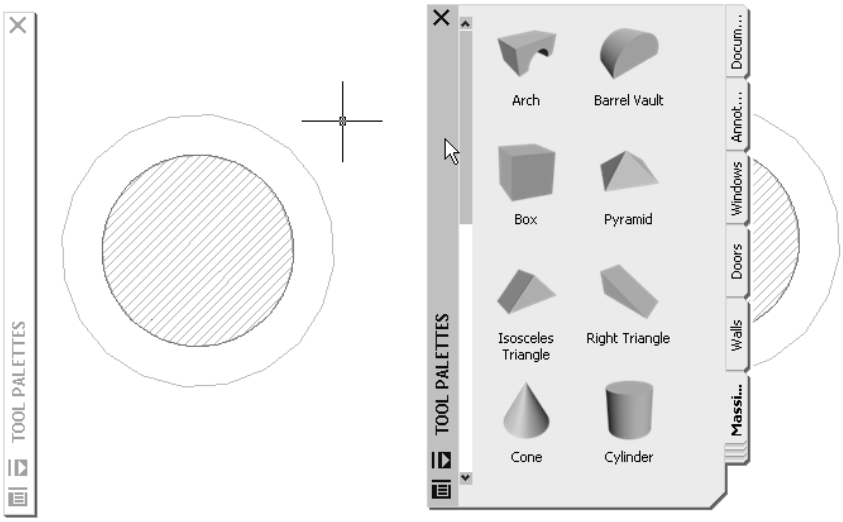
1. In the title bar of the tool palettes set, click , and then click Allow Docking.
2. Position the cursor over the title bar, and drag the tool palettes set to one side of your workspace.

   A preview graphic shows you the new position of the tool palettes set.
3. Release the tool palettes set when it is in the location you want.

Hiding the Tool Palettes Set

Use this procedure to hide the tool palettes set when not in use. The tool palettes set automatically hides when you move the cursor away from it, leaving only the title bar visible. When you move the cursor over the title bar, the tool palettes set is re-displayed.

Tool palettes set hidden (left) and re-displayed (right)



1. In the title bar of the tool palettes set, click (Auto-hide).
   The tool palettes set is hidden, except for the title bar.
2. To re-display the tool palettes set, move the cursor over the title bar.

Adjusting the Transparency of the Tool Palettes Set

Use this procedure to adjust the transparency of the tool palettes set. The more transparent the tool palettes set is, the more easily you can see objects in your drawing underneath it.

NOTE Transparency is not available if hardware acceleration is enabled.

1. In the title bar of the tool palettes set, click , and then click Transparency.
2. To adjust the transparency of the tool palettes set, move the slider.
3. To turn off transparency, select Turn off window transparency.
4. Click OK.

Renaming the Tool Palettes Set

Use this procedure to rename the tool palettes set. You may want to name it with a project or company name.

1. In the title bar of the tool palettes set, click , and then click Rename Palette Set.
2. Enter a name for the tool palettes set, and press ENTER.

Specifying Different Tool Palettes for the Tool Palettes Set

Use this procedure to switch between different palette combinations in the tool palettes set.

Only one tool palettes set can be active simultaneously during an Autodesk Architectural Desktop session. You can, however, set different tool palettes to be included in it for different user profiles. You do this by collecting tool palettes from several locations (paths) in a profile and let the workspace combine them into the one tool palettes set.

For information about user profiles, see "Creating and Saving a Workspace Configuration" on page 93.

1. On the Format menu, click Options.
2. Define the tool palettes used for the current session.

   - If you have created a workspace profile containing a tool palettes path, click the Profiles tab, select the desired profile, and click Set Current.
   - If you have created no workspace profile, click the Files tab, and click the Tool Palettes File Location entry. Then, click Browse, and browse for a folder containing the desired tool palette (ATC).

     Add paths to all additional tool palettes to be included in the tool palettes set of this profile.
3. Click OK.

Creating a New Tool Palettes Set from Autodesk® Architectural Desktop

Use this procedure to create a new tool palettes set from Autodesk Architectural Desktop.

1. On the Format menu, click Options.
2. Click the Profiles tab.
3. Click Add to List, and create a new profile that will contain the new tool palettes set, for example "Design - Metric Palette Set. "

4 Select the new profile, and click Set Current.

5 Click the Files tab.

6 Under Tool Palettes File Locations, set the support path for the tool palettes set to an empty folder in which you want to create the new tool palettes set.

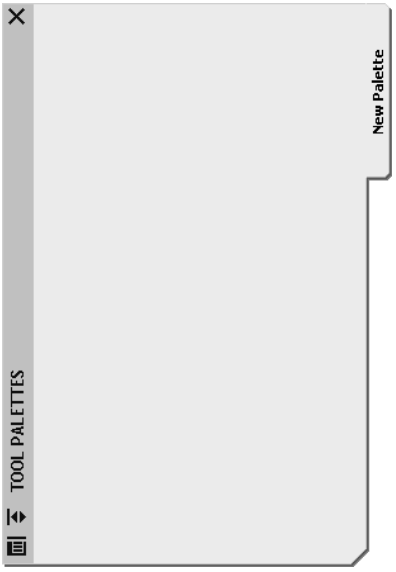
NOTE If you point to a folder already containing a tool palettes set (ATC) file, no new tool palettes set is created; instead the existing tool palettes set will be used in the profile.

---

7 Click OK.

8 In the Autodesk Architectural Desktop workspace, an empty tool palettes set is displayed.

New tool palettes set



9 To rename the tool palettes set, click , and then click Rename Palette Set.

10 Add tool palettes and tools to the new set.

If you want to . . .	Then . . .
add a new empty tool palette	see "Creating a New Tool Palette" on page 116.
add a tool palette from the Content Browser	see "Adding a Tool Palette from a Tool Catalog in the Content Browser" on page 121.
add a tool to a palette	see "Creating a Tool from an Object in the Drawing" on page 131.

The changes you make are saved to the tool palettes set.

Creating a New Tool Palette

Use this procedure to add an empty tool palette to your tool palettes set.

After creating the tool palette, you can add tools to it. For more information, see "Tools" on page 123.

1 In the title bar of the tool palettes set, click , and then click New Palette.

2 Enter a name for the new tool palette, and press ENTER.

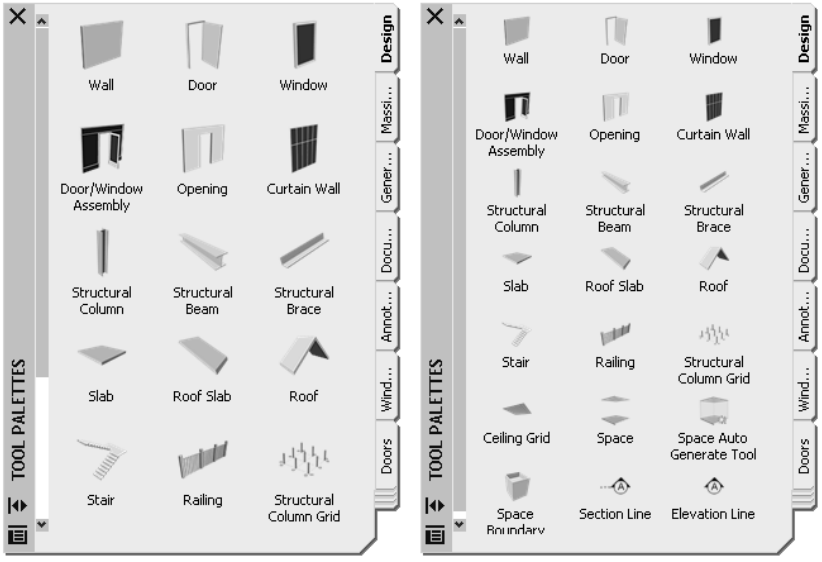
Setting the Appearance of the Tool Palettes

Use this procedure to define the appearance of individual tool palettes.

The display of the tool palettes set depends on the settings you choose for the overall tool palettes set, as described in "Setting the Appearance of the Tool Palettes Set" on page 111 and the settings you choose for the individual tool palettes. In the tool palettes set, you set the transparency of the tool palettes set, its size and position, as well as whether to auto-hide the tool palettes set when not using it.

In the tool palette, you set the size of the tool images and their arrangement on the tool palette.

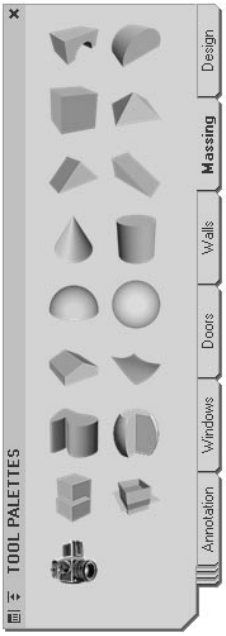
Setting the tool size for a tool palette



When you set your tool images to a smaller size, you can display more tools on a tool palette. This might become important if you display different palettes as well, such as the Properties palette or the Project Navigator palette.

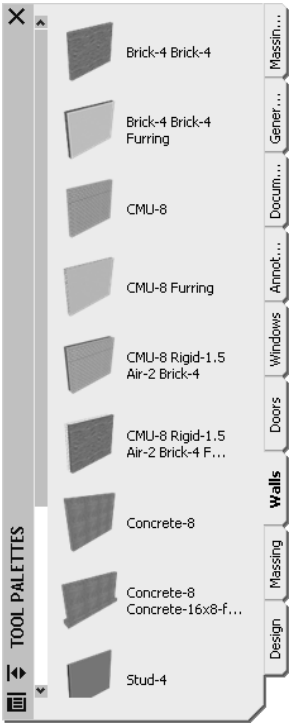
To save space, you can also display only tool images without tool text below them. This method is best suited when the icons for your tools are easy to differentiate. If the icon alone proved insufficient to identify a tool, the tool tips for each icon provide additional guidance.

Icon-only display in the tool palette



You can also display your tools in a single column list within the tool palette. When you are using the list view, tool texts are always displayed.

Tool palette in list view



1 Open the tool palette that you want to change.

2 Right-click the palette, and click View Options.

3 In the View Options worksheet, select the appearance of the tool palette:

If you want to . . .	Then . . .
view only tool icons	select Icon only for View style.
view tool icons and tool text	select Icon with text for View style.
view tool icons and tool text in a single column list	select List view for View style.

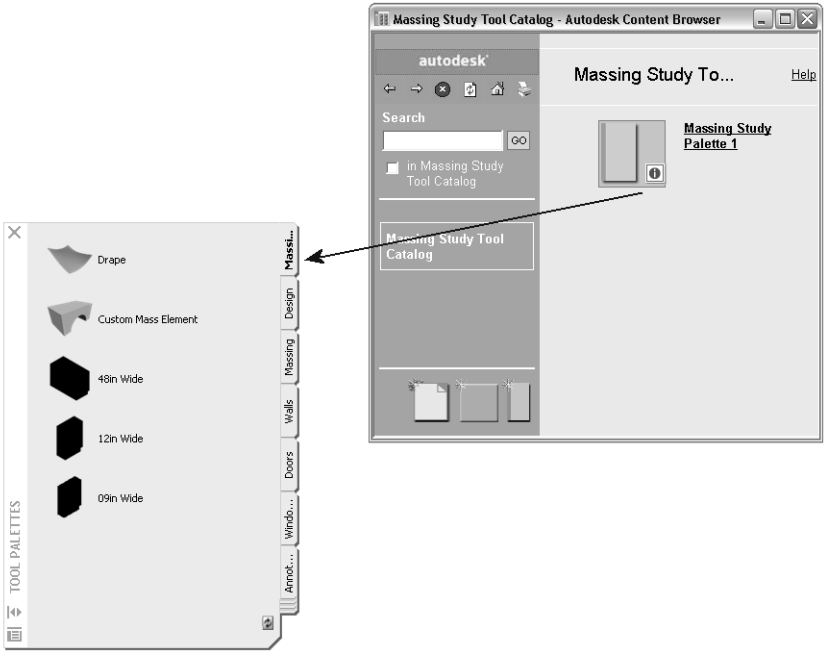
4 To apply these changes to all palettes in the tool palettes set, select All Palettes for Apply to.

5 Click OK.

Working with Tool Palettes from a Central Location

When you are working on a large project with multiple users, consistency of tools is especially important. Typically the objects for the project, their styles and properties are set up by a CAD manager or system administrator and then distributed to the team. This administrator can then put tools and palettes in a central location in the Content Browser and link them to the individual users' machines. Whenever the tools or palettes are updated in the Content Browser, they are updated on the users' computers too. Users cannot individually change tools and tool palettes, thus preventing accidental deletion of standard tools.

Using tool palettes from the Content Browser



Related Procedures

- Adding a Tool Palette from a Tool Catalog in the Content Browser
- Updating a Tool Palette from a Tool Catalog in the Content Browser

Adding a Tool Palette from a Tool Catalog in the Content Browser

Use this procedure to link a tool palette from a tool catalog in the Content Browser to the tool palettes set in Autodesk® Architectural Desktop.

For information on how to create tool palettes in the Content Browser, see "Adding Content to a Tool Catalog" on page 189.

1. On the Window menu, click Content Browser.

   Alternatively, you can click on the Navigation toolbar, or press CTRL+4.

2. Open the tool catalog containing the tool palette you want to copy.

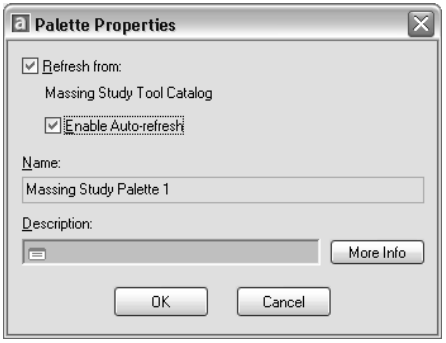
3. Move the pointer over the i-drop® icon next to the tool palette so that the pointer image changes to an eyedropper ( ).

   To copy multiple tool palettes, press and hold CTRL while clicking each palette; then position the eyedropper over any of the selected palettes.

4. Drag the palette to the tool palettes set in the Autodesk Architectural Desktop workspace.

   The tool palette is dropped into the tool palettes set.

5. Right-click into the palette, and click Properties.



   The text below the check box displays the name of the catalog in the Content Browser from which the palette is updated.

   If you click on that name, it will jump to the catalog from which the tool palette was linked.

6 Select or clear Auto-Refresh.

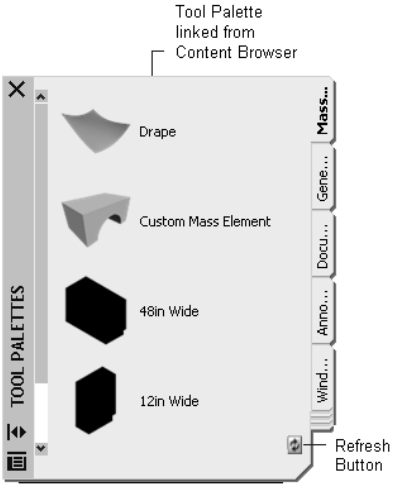
If you want to . . .	Then . . .
automatically update the linked tool palette from the Content Browser when starting Autodesk Architectural Desktop	select Enable Auto-Refresh.
update the linked tool palette manually with one of the methods described in "Updating a Tool Palette from a Tool Catalog in the Content Browser" on page 122	clear Enable Auto-Refresh.

The name of the tool palette in the Content Browser from which the selected tools palette is updated is displayed under Name.

7 Click OK.

Updating a Tool Palette from a Tool Catalog in the Content Browser

Use this procedure to update a linked tool palette in the tool palettes set from its source tool catalog in the Content Browser.



1 Link a tool palette from a catalog in the Content Browser to the tool palettes set, as described in "Adding a Tool Palette from a Tool Catalog in the Content Browser" on page 121.

When a tool palette is linked to the tool palettes set from a catalog in the Content Browser, a Refresh button is displayed at the bottom.

2. Click the Refresh button to update your local tool palette with the latest changes from the catalog in the Content Browser.

   Alternatively, you can right-click the palette, and click Refresh Palette.

NOTE You can also update the whole palette set by clicking in the tool palettes set, and then clicking Refresh Palette Set. This command updates all linked tool palettes in the tool palettes set.

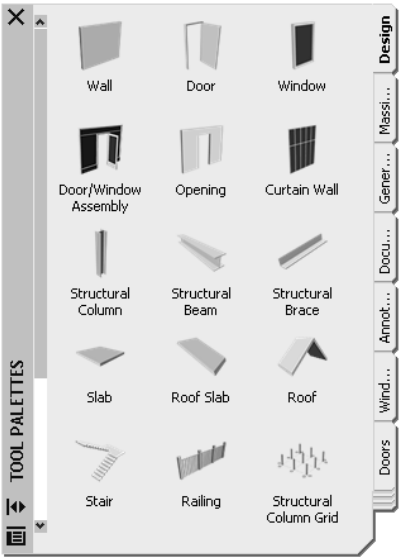
Tools

Tools represent the individual objects you can add to a drawing. A tool contains creation parameters about the object it represents.

Whenever you add an object with a specific object tool, the object has all of the settings you have defined in the tool. This eases the design process immensely and enhances consistency across a project.

For example, if you might define a wall tool that contains the style "CMU 8 Furring" and that has automatic cleanup and a baseline offset of 1". Whenever you add a wall with this wall tool, it will be of the style "CMU 8 Furring," clean up automatically, and have an offset of 1".

Standard object tools



In a tool, you can define these general properties:

- Tool name
- Tool description

> **NOTE** The description you enter for the tool is used as a tooltip; additionally it is used as the tool description when the tool is copied to a tool catalog in the Content Browser.

- Description of objects inserted with this tool
- Layer key of objects inserted with this tool
- Layer overrides of objects inserted with this tool
- Object style
- Location of object style

In addition, you can define all object-specific properties that apply to this tool type. For example, if you create a wall tool, you can set the wall cleanup, width, height, baseline settings, and the roof/floor lines of walls that are inserted with this tool.

Style Location

In this release of Autodesk® Architectural Desktop, the object styles have been moved out of the templates and into the Styles drawings. If you want to assign a style to an object tool, you can either point to a style in the drawing or to a style in an external drawing. For more information, see "Styles and Support Files" on page 167.

Tool Types

Tools in Autodesk Architectural Desktop fall into one of the following categories.

Tool Type	Description
Object tools	An object tool inserts a design object—such as a wall or a window assembly—into a drawing. An object tool has a specific style and specific object properties: for example, a wall tool with the style "Brick-4 Brick-4".
Command tools	Command tools are a graphical representation of an object-related command. For example, the Browse Property Data tool opens a dialog box for browsing the property data of all objects in a drawing. Another example is the Renumber Data tool, which renumbers property data in selected property sets by increment or by a user-defined number. In addition, you can create your own tools for each command in Autodesk Architectural Desktop. For a list of available command tools, see "Object-related Command Tools" on page 105 and "Creating a Command Tool" on page 134.
AEC Content tools	You can create tools for frequently used AEC Content items that have been created with the AEC Content Wizard. For more information, see "Creating a Tool from AEC Content in DesignCenter" on page 133 and "Custom Content" on page 2343.

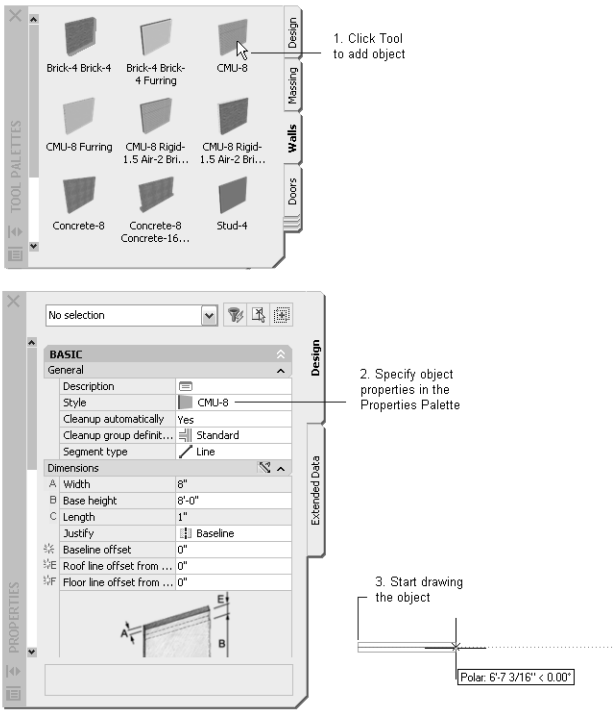
Related Topics and Procedures

- Creating an Object with a Tool
- Changing the Tool Properties
- Changing a Tool Icon
- Refreshing a Tool Icon
- Creating a Tool from an Object in the Drawing
- Copying a Tool from a Tool Palette
- Creating a Tool from the Style Manager
- Creating a Tool from AEC Content in DesignCenter
- Creating a Command Tool

- Working with Tools from a Central Location
- Applying the Properties of a Tool to an Existing Object
- Re-Importing Styles for a Tool
- Deleting a Tool

Creating an Object with a Tool

Use this procedure to create an object with a tool.



1 On the Window menu, click Tool Palettes.

2 Click the tool palette that contains the tool for the object you want to insert.

For example, if you want to insert a bifold double door, click the Doors palette, and navigate to the Bifold Double Door tool.

3 Click the tool.

4 In the Properties palette, enter all necessary values and settings.

NOTE Certain values can be set only when inserting the object; for example, the position of a door along the wall it is inserted into can only be defined when inserting the door. You cannot change the position later for an existing door. Values you can set only during insertion are marked with a in the Properties palette.

5 Click in the drawing where you want to insert the object.

6 Proceed with the steps for creating the object in the drawing, and then press ENTER.

Changing the Tool Properties

Use this procedure to define the properties of a tool in a tool palette.

You can set these general properties for an object tool:

- Tool name
- Tool description

NOTE The description you enter for the tool is used as a tooltip; additionally it is used as the tool description when the tool is copied to a tool catalog in the Content Browser.

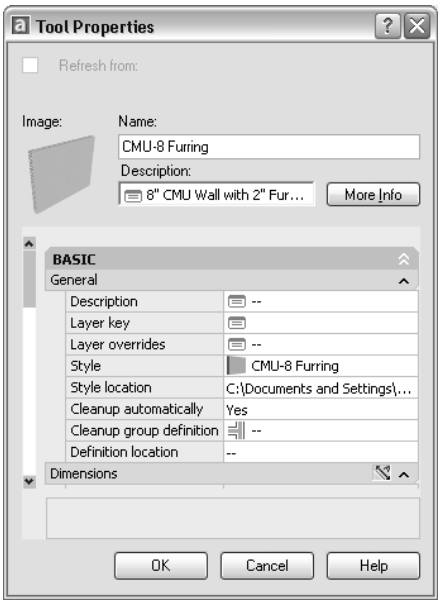
- Description of objects inserted with this tool
- Layer key of objects inserted with this tool
- Layer overrides of objects inserted with this tool
- Object style
- Location of object style

In addition, you can define all object-specific properties that apply to this object type. For example, if you create a wall tool, you can set the wall cleanup, width, height, baseline settings and the roof/floor lines for all walls inserted with this tool.

1 On the Window menu, click Tool Palettes.

2 Click a tool palette.

3 Select the tool, right-click, and click Properties.



4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.
6. Expand Basic, and expand General.
7. Enter a description of the objects that you can create using this tool.
8. Specify a layer key and any layer key overrides; otherwise, the layer assignments specified in the layer key style in the drawing are used.
9. Select an object style, and select a style location, if the location is other than the current drawing.
10. Add object-specific properties.

> **NOTE** When you click a property to add a value that you do not select from a drop list, the property value underneath the current property is hidden and the property field highlighted. This is intended behavior. Enter a value for the current property in the appropriate location.

11. Click OK.

Changing a Tool Icon

Use this procedure to change the display icon of a tool.

A new tool is inserted with either the tool icon of the tool it was copied from or with a default icon. You can change this by selecting a new icon from an image file or from an object in the drawing.

Changing the tool icon

You can use the following image formats for tool icons:

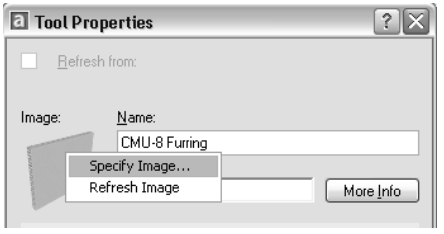
- PNG
- GIF
- JPG
- BMP
- TIFF

NOTE PNG is the recommended image format for tool icons. It supports lossless compression and background transparency; all the other formats will leave a background to the tool image.

Icons in the tool palettes can have a maximum size of 64x64 pixels. Larger images are scaled when inserted.

In the tool itself, you can only define the tool icon. To change the display size of the tool on the palette, see "Setting the Appearance of the Tool Palettes" on page 116.

1. On the Window menu, click Tool Palettes.
2. Click the tool palette that contains the tool for which you want to select a new icon.
3. Select the tool, right-click, and click Properties.
4. In the Tool Properties worksheet, right-click on the existing icon, and click Specify Image.



5 In the Select Image dialog box, select the image you want to use as a tool icon, and click Open.

6 Click OK.

To create an icon from an object in the drawing, select the tool in the tool palette, right-click, and click Set Image from Selection. Then, select the object in the drawing you want to use as a tool icon, and press ENTER.

When you create a tool icon from an object in the drawing, it is created with the last used view direction and display configuration set in the viewer of the properties of this tool type. For example, if the tool viewer of the last used wall is set to TOP view and the Medium Detail display configuration, any wall you select in the drawing as a tool icon is displayed in TOP view and with the Medium Detail display configuration.

You cannot create icons from custom blocks. If you need to create an icon based on a custom block, specify an external image.

Refreshing a Tool Icon

Use this procedure to refresh a tool icon after editing the viewer settings of the tool.

1 On the Window menu, click Tool Palettes.

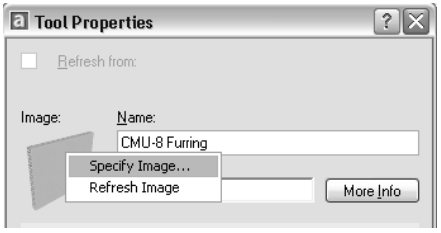
2 Click the tool palette that contains the tool the icon of which you want to refresh.

3 Select the tool, right-click, and click Properties.

4 In the Tool Properties worksheet, change the Viewer settings of the tool.

For example, switch from a SW Isometric view to a TOP view.

5 Right-click on the existing icon, and click Refresh Image.

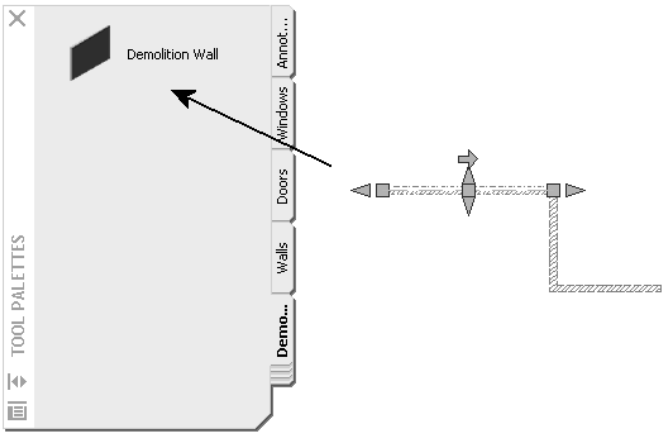


6 Click OK.

Creating a Tool from an Object in the Drawing

Use this procedure to create a tool from an object in the drawing.

You can only create object tools with this method. For information on creating command tools, see "Creating a Command Tool" on page 134.



1 Create an object with the appropriate style and properties in the drawing.

> **NOTE** The drawing containing the style should be saved and located in a location where it will be available in the future or the tool will not be able to access the style, and will revert to the Standard style.

2 Open the tool palette where you want to create the new tool.

3 Select the object, and drag it to the tool palette.

4 Define additional properties for the tool, if necessary.

For more information, see "Changing the Tool Properties" on page 127.

Copying a Tool from a Tool Palette

Use this procedure to copy a tool from one tool palette to another.

1 Open the tool palette that contains the tool you want to copy.

2 Select the tool, right-click, and click Copy.

3 Open the tool palette onto which you want to copy the tool, right-click, and click Paste.

4 Change the properties of the tool, if necessary.

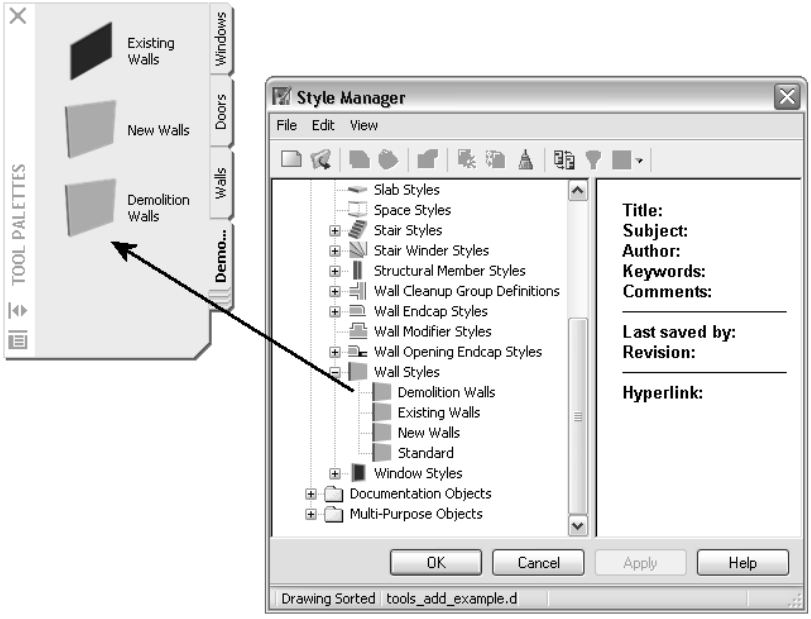
For more information, see “Changing the Tool Properties” on page 127.

Creating a Tool from the Style Manager

Use this procedure to create a tool from a style in the Style Manager.

NOTE You can create tools only from object styles. You cannot, for example, create a tool from a 2D section style or a property set definition.

Creating a tool from the Style Manager



1. Open the tool palette where you want to create the new tool.
2. On the Format menu, click Style Manager, and navigate to the style you want to use.

   For example, if you want to create a wall tool with the Demolition style, expand Wall Styles, and select the Demolition style.
3. Drag the style to the tool palette.

   A new tool with the selected style is inserted in the tool palette.
4. Close the Style Manager.
5. Define additional properties for the tool in the tool palette, if necessary.

For more information, see “Changing the Tool Properties” on page 127.

Creating a Tool from AEC Content in DesignCenter

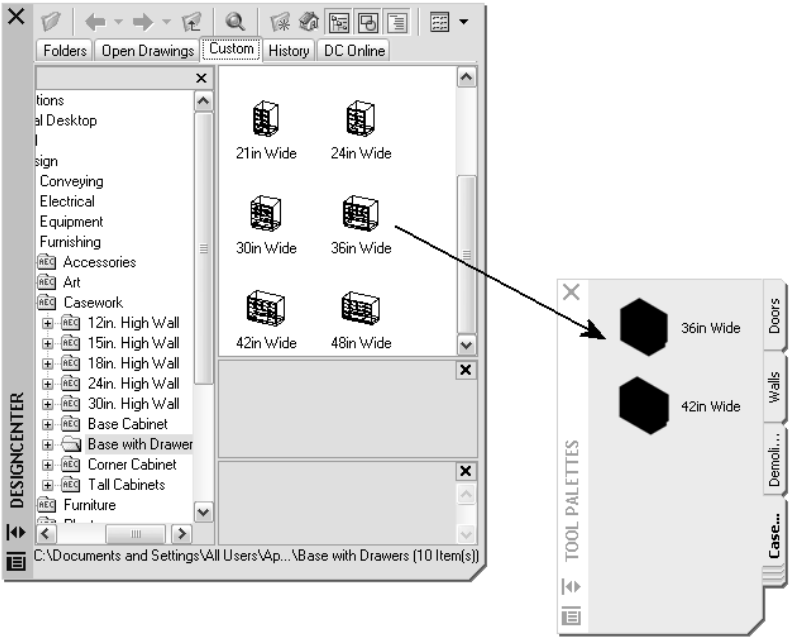
Use this procedure to create a tool on a tool palette from an AEC Content item in DesignCenter.

NOTE You can also create tools from blocks in DesignCenter, but they have slightly different tool options.

You can drag and drop AEC content items from a DesignCenter folder to a tool palette. For more information on creating AEC Content, see “Custom Content” on page 2343.

Autodesk Architectural Desktop provides the Design Tool Catalog and the Documentation Tool Catalog in the Content Browser, which already have tools set up for all predefined AEC Content and sample object styles. These catalogs are available for both metric and imperial units.

Adding an AEC Content item to a tool palette



1. Open the tool palette where you want to create the new tool.
2. On the Insert menu, click DesignCenter, and navigate to the AEC Content item you want to create a tool from.
3. Drag the item to the tool palette.

   A new tool is inserted in the tool palette.

   To change the icon of the new tool, see "Changing a Tool Icon" on page 128.

NOTE An AEC Content tool uses the last used Viewer settings of this tool type for the automatic generation of the tool icon. If the last used Viewer setting has been a Gouraud 3D view, and the user then creates a tool from a 2D AEC Content item, the tool icon will be invisible. In this case, you need to change the Viewer setting of the tool to a TOP view, and wireframe.

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4. Define additional properties for the tool, if necessary.

   For more information, see "Changing the Tool Properties" on page 127.

Creating a Command Tool

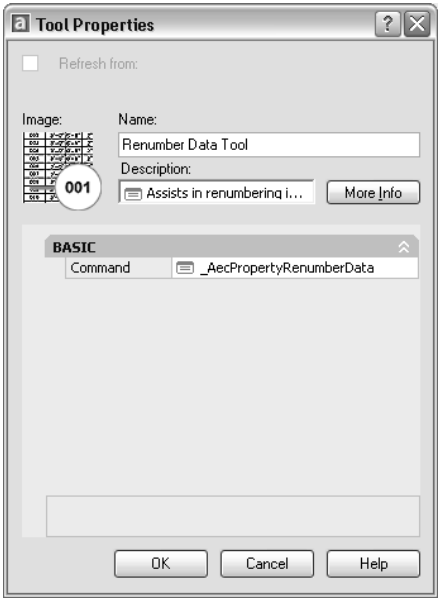
Use this procedure to create a tool for a command in Autodesk® Architectural Desktop.

Tools usually represent objects or AEC content items; however, you can also create a tool for a command in Autodesk Architectural Desktop.

You can either copy an existing command tool from one of your tool palettes and exchange its command, or use the Stock Command Tool from the Stock Tool Catalog in the Content Browser.

For a list of predefined command tools, see "Object-related Command Tools" on page 105.

Command tool properties



1 Place a copy of a command tool on another tool palette:

If you want to . . .	Then . . .
copy an existing command tool from a tool palette	navigate to the tool palette, right-click the command tool, and click Copy. Then, navigate to the tool palette on which you want to insert the new command tool, right-click, and click Paste.
use the Stock Command Tool from the Stock Tool Catalog	open the Content Browser, and navigate to Stock Tool Catalog ➤ General Purpose Tools ➤ Helper Tools. Then, move the pointer over the i-drop icon next to the tool, and drag the Stock Command Tool to the tool palette where you want to create the new command tool.

2 Select the command tool, right-click, and click Properties.

3 For Command, enter the command that should be initiated when starting the tool.

TIP For a list of all available Autodesk Architectural Desktop commands, type **arx** on the command line, and then **c** (Commands).

4 Click OK.

Working with Tools from a Central Location

You can use the Content Browser to store and organize your tools in a catalog in a central location. In the Content Browser, a number of stock tools are available in the Autodesk® Architectural Desktop Stock Tool Catalog. Additionally, there are a number of sample catalogs containing tools with the styles from the Styles drawings. You can copy these tools to a tool palette and modify them. You can also create your own tool palettes and tools in a catalog in the Content Browser, copy them to a tool palette, and still retain the link from the Content Browser to the tool palette. In this case, the tool is refreshed in the tool palette when it is modified in the catalog in the Content Browser.

NOTE If you want to link a complete tool palette from Content Browser to Autodesk Architectural Desktop, see "Adding a Tool Palette from a Tool Catalog in the Content Browser" on page 121.

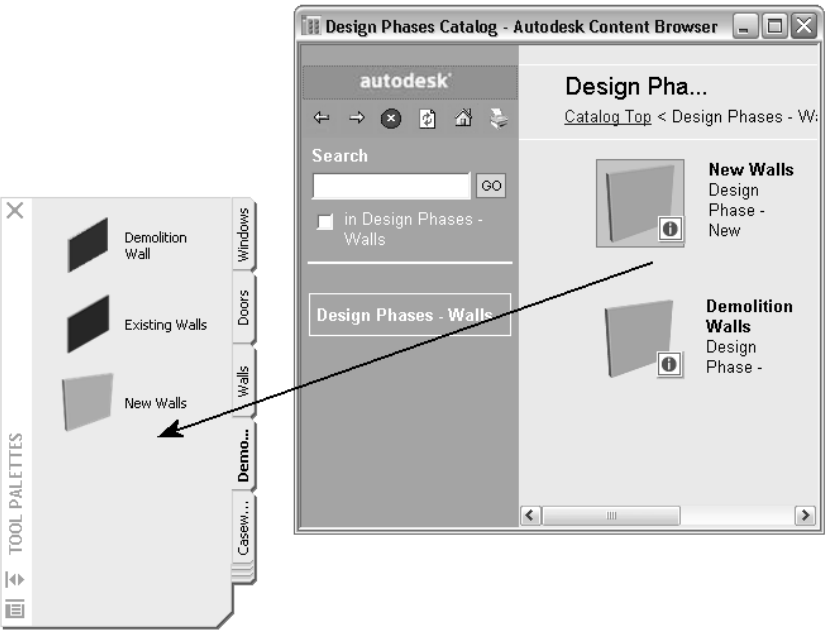
Related Procedures

- Linking a Tool from a Catalog in the Content Browser
- Updating a Tool in Autodesk Architectural Desktop from the Content Browser
- Updating a Tool in the Content Browser from a Linked Tool in Autodesk Architectural Desktop
- Removing the Link of a Tool to a Catalog in the Content Browser

Linking a Tool from a Catalog in the Content Browser

Use this procedure to link a tool from a catalog in the Content Browser to a tool palette in Autodesk Architectural Desktop.

Linking a tool from a catalog in the Content Browser



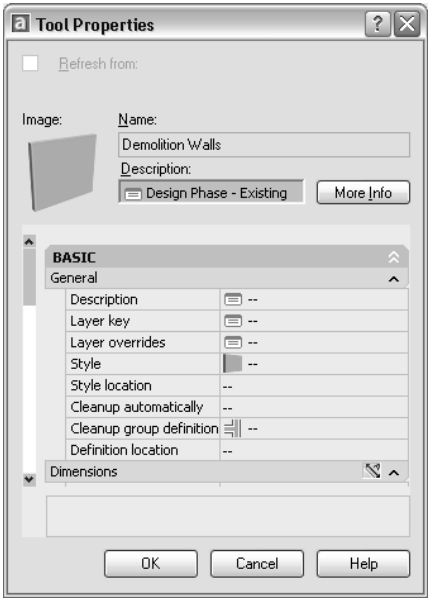
1. Open the tool palette on which you want to place a tool from the Content Browser.
2. On the Window menu, click Content Browser, and navigate to the tool palette or category in the tool catalog that contains the tool you want to copy.

   For more information, see "Searching for Items in a Tool Catalog" on page 187.
3. Move the pointer over the i-drop icon next to the tool, so that the pointer image changes to an eyedropper ( ).

   To copy multiple tools, press and hold CTRL while clicking each tool; then position the eyedropper over any of the selected tools. You can also select all the tools in the current category by right-clicking, and clicking Select All.
4. Drag the eyedropper to a tool palette in the tool palettes set.
5. To refresh the tool, select it, right-click and click Refresh Tool.

   Alternatively, you can select the tool in the tool palette, right-click, and click Properties. Then, select Refresh from in the Properties worksheet.

Updating a tool from the Properties worksheet



NOTE When you select Refresh from, all tool properties in the worksheet are set to read-only. Properties for this tool must be changed in the Content Browser.

6 Click OK.

Updating a Tool in Autodesk Architectural Desktop from the Content Browser

Use this procedure to update a tool in an Autodesk Architectural Desktop palette that has a link to the Content Browser.

NOTE You cannot change and update tools from the Stock Tool Catalog in the Content Browser. These tools are read-only.

1 Open the tool palette that contains the tool you want to update.

2 Select the tool that you want to update, right-click, and click Refresh Tool.

Updating a Tool in the Content Browser from a Linked Tool in Autodesk Architectural Desktop

Use this procedure to update a tool in a catalog in the Content Browser with the properties of a linked tool from Autodesk Architectural Desktop.

For example, perhaps you have a tool in the Content Browser that adds a Box mass element of 3x3x3 meters. You want to change the tool so that it adds a Box mass element of 4x4x4 meters. In this case, you would first link the mass element tool from the Content Browser to a tool palette in Autodesk® Architectural Desktop. You would then temporarily deactivate the link of the tool to the Content Browser and change the dimension properties of the tool to 4x4x4 meters. When you finish changing the tool properties, you copy the tool back to the Content Browser. The Content Browser catalog is updated with the new tool properties. To recreate the link from the Content Browser tool to the Autodesk Architectural Desktop palettes, reactivate the linking.

1. Link a tool from a catalog in the Content Browser to a tool palette as described in "Linking a Tool from a Catalog in the Content Browser" on page 136.
2. Select the tool in the tool palette, right-click, and click Properties.
3. In the Tool Properties worksheet, clear Refresh from.

   The tool properties can now be edited.
4. Make the necessary changes to the tool properties.
5. Click OK.
6. Select the tool in the tool palette, and copy it back to its original location in the Content Browser catalog.

NOTE You can copy a tool to a catalog in the Content Browser by either using the Copy and Paste commands from the shortcut menu, or by dragging the tool onto the Content Browser icon in the Windows task bar. To select multiple tools in a tool palette, use CTRL-A to select all or drag while holding the CTRL key to create a selection window.

---

7. Click Yes when prompted to overwrite the previous version of the tool.
8. If you want the tool in the Autodesk Architectural Desktop tool palette to refresh from the new version stored in the Content Browser, go back to the Autodesk Architectural Desktop tool, right-click, and in the Tool Properties worksheet, reactivate Refresh from.

Removing the Link of a Tool to a Catalog in the Content Browser

Use this procedure to permanently remove the link of a tool to its source tool in the Content Browser.

NOTE This action cannot be undone.

1. Open the tool palette that contains the tool you want to unlink from a catalog in the Content Browser.
2. Select the tool, right-click, and click Remove Catalog Link.

Applying the Properties of a Tool to an Existing Object

Use this procedure to apply the properties of a tool to an existing object.

You can apply the properties of a tool to an existing object in two different ways:

- Applying the properties of a tool to an object of the same type: You can apply the properties of a tool to objects of the same type, for example, apply the properties of a wall tool to an existing wall. In previous versions of Autodesk Architectural Desktop, you would use the Match command to do this. All object tools have this functionality.
- Applying the properties of a tool to a different object type: When you apply the properties of a tool to a different object type, you convert the object to an object of the same type as the tool. For example, when you apply the properties of a wall tool to a polyline, the polyline is converted to wall with the settings defined in the wall tool. Depending on their type, various object tool types may have commands for converting other objects, or not. For detailed information, see the chapters for the individual objects.

1. Open the tool palette that contains the tool the properties of which you want to apply to a different object.
2. Select the tool, and right-click.

3 Define to which object type you want to apply the tool properties.

if you want to . . .	Then . . .
apply the properties of the tool to an object of the same type	click Apply Tool Properties to <Object>. For example, to apply the tool properties of a door tool to an existing door, click Apply Tool Properties to Door.
apply the properties of the tool to an object of a different type	click Apply Tool Properties to ➤ <Object>. For example, to apply the tool properties of a wall to tool to an AutoCAD polyline, click Apply Tool Properties to ➤ Linework.

4 Select the object to which you want to apply the tool properties in the drawing, and press ENTER.

Re-Importing Styles for a Tool

Use this procedure to re-import the style of a tool that uses a style from an external Styles drawing.

When you create a tool, you can choose if you are assigning it a style from the current drawing or from an external Styles drawing. Usually you define a style from a Styles drawing, so that the tool can be used in other drawings as well.

When the style in the external Styles drawing has been changed, you need to update the tool to reflect these changes.

NOTE When you update the style of a tool, all existing objects inserted with this tool are updated, too.

1 Open the tool palette that contains the tool for which you want to update the style.

2 Select the tool, right-click, and click <Style Name> <Object Name> Style.

For example, if you want to update the Brick-4 Furring-4 style of a wall tool, click Import 'Brick-4 Furring-4' Wall Style.

Deleting a Tool

Use this procedure to delete a tool from a tool palette.

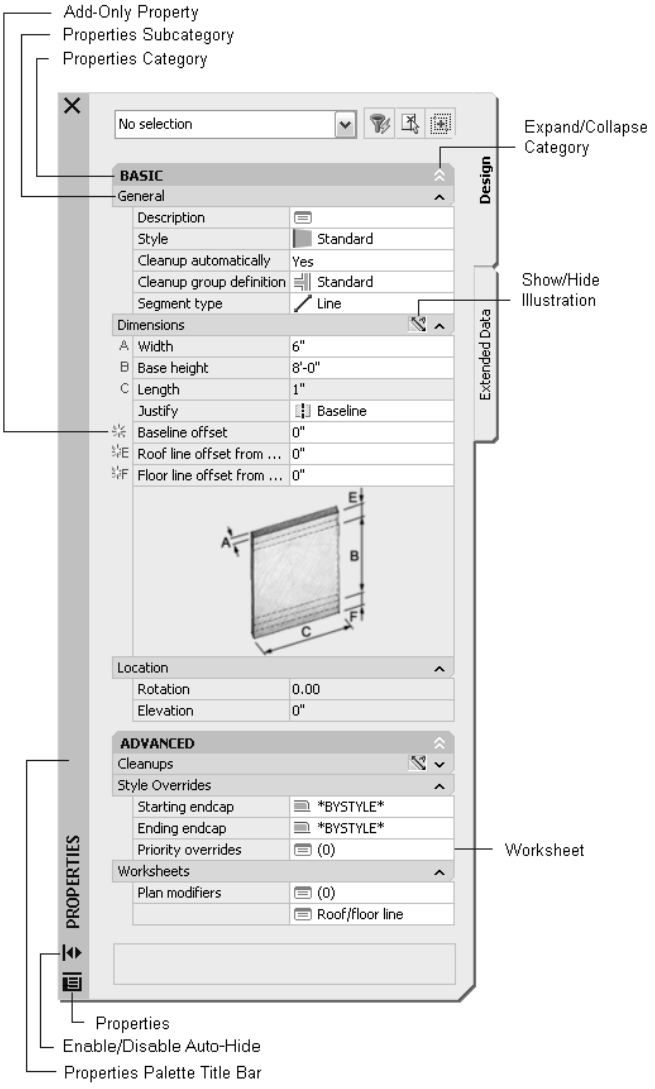
When you delete a tool from a tool palette, existing objects in the drawing that have been inserted with this tool are not deleted.

NOTE If you have linked a tool palette from the Content Browser to the tool palettes set as described in "Adding a Tool Palette from a Tool Catalog in the Content Browser" on page 121, you cannot delete individual tools from it. To delete the tool, you need to delete it from the palette in the Content Browser, and then update the palette in Autodesk Architectural Desktop as described in "Updating a Tool Palette from a Tool Catalog in the Content Browser" on page 122.

1. Open the tool palette that contains the tool you want to delete.
2. Select the tool, right-click, and click Delete Tool.

The Properties Palette

The Properties palette provides a central location to enter and change the properties of an object. You can enter information about the style, dimensions, location, property set data, and other important characteristics of an object. You will typically keep the Properties palette open during an Autodesk® Architectural Desktop session.



Related Topics and Procedures

- Opening the Properties Palette
- Setting the Appearance of the Properties Palette
- The Design Tab
- The Extended Data Tab

- Worksheets

Opening the Properties Palette

Use one of these procedures to open the Properties palette:

- On the Window menu, click Properties Palette.
- Click on the Navigation toolbar.
- Press CTRL+1.
- Select an object in the drawing, right-click, and click Properties.
- Double-click an object in the drawing.

Setting the Appearance of the Properties Palette

The Properties palette is usually kept open during the Autodesk® Architectural Desktop session, since it is the central location from which you add and change properties of an object.

Related Procedures

- Docking the Properties Palette
- Hiding the Properties Palette
- Adjusting the Transparency of the Properties Palette

Docking the Properties Palette

Use this procedure to dock the Properties palette on the left or right side of your workspace.

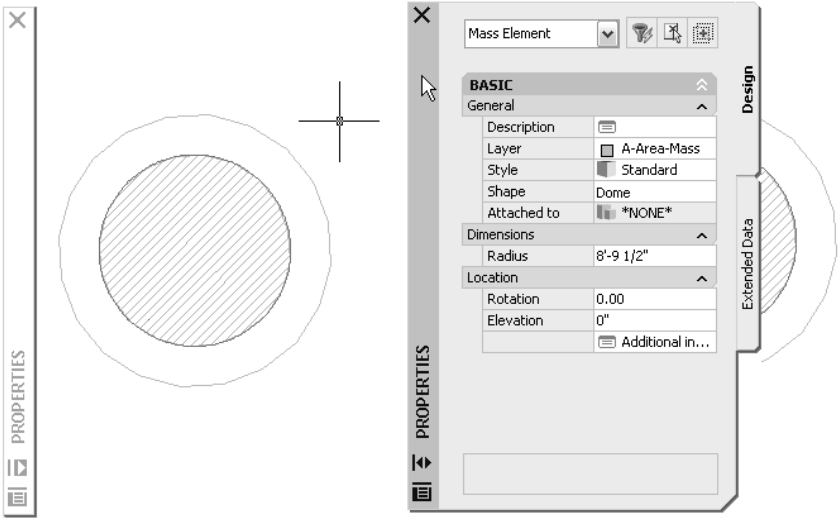
1. In the title bar of the Properties palette, click , and then click Allow Docking.
2. Position the cursor over the title bar, and drag the Properties palette to one side of your workspace.

   A preview graphic shows you the new position of the Properties palette.
3. Release the Properties palette at the location you want.

Hiding the Properties Palette

Use this procedure to hide the Properties palette when not in use. The Properties palette can be configured to automatically hide when you move the cursor away from it, leaving only the title bar visible. When you move the cursor over the title bar, the Properties palette is re-displayed.

Properties palette hidden (left) and re-displayed (right)



1. In the title bar of the Properties palette, click (Auto-hide).
   The Properties palette is hidden, except for the title bar.
2. To re-display the Properties palette, move the cursor over the title bar.

Adjusting the Transparency of the Properties Palette

Use this procedure to adjust the transparency of the Properties palette. The more transparent the Properties palette is, the better you can see objects in your drawing underneath it.

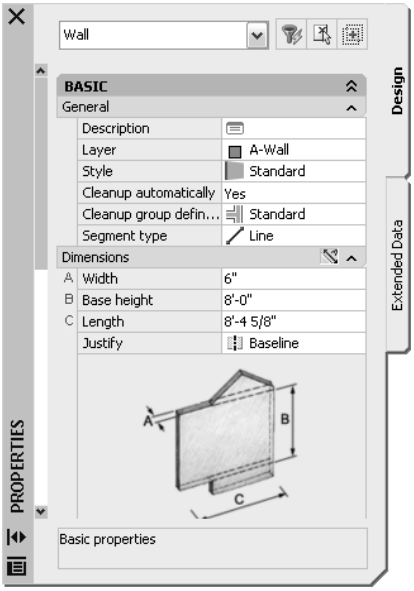
NOTE Transparency is not available if hardware acceleration is enabled.

1. In the title bar of the Properties palette, click , and then click Transparency.
2. To adjust the transparency of the Properties palette, move the slider.
3. To turn off transparency, select Turn off window transparency.
4. Click OK.

The Design Tab

Most properties of an object are entered on the Design tab of the Properties palette.

Design tab of a wall



In the Design tab, you can enter a number of general object properties:

- Description of the object
- Layer key of the object
- Layer overrides of the object
- Object style
- Location of object style

As a default, these properties are defined by the properties you have set in the tool used to create the object. You can change these properties for an individual object instance. For more information, see "Changing the Tool Properties" on page 127.

On the Design tab, you also enter object-specific design properties. The object properties that are available depends on the object you are editing:

- **Dimensions:** Most objects in Autodesk®Architectural Desktop have dimension settings for width, height, and other basic dimensions. Many

objects have additional settings. A wall, for example, has additional length and baseline justification settings.

- **Location:** Most objects in Autodesk Architectural Desktop have settings for the object location. Anchored objects, like windows and doors, also have Anchor properties.

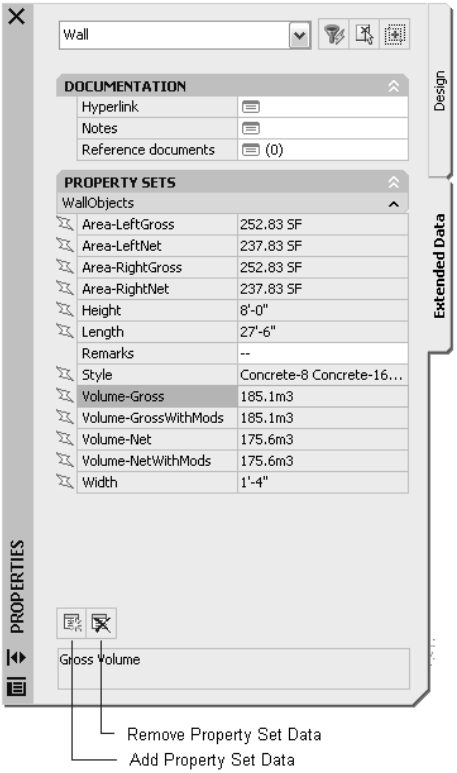
For detailed information about entering properties for a specific object, see the individual object chapters.

The Extended Data Tab

The Extended Data tab of the Properties palette contains the following object properties:

- **Hyperlink:** You can add a hyperlink to an object. For more information, see "Add Hyperlinks to a Drawing" in the *AutoCAD 2004 User's Guide*.
- **Text Notes and Reference Files:** You can add a note or an associated reference file to an object.
- **Property Set Data:** You can add, edit, and remove property set data for an object. For more information, see "Attaching Property Set Data to Objects" on page 2205.

Property set data in the Properties palette

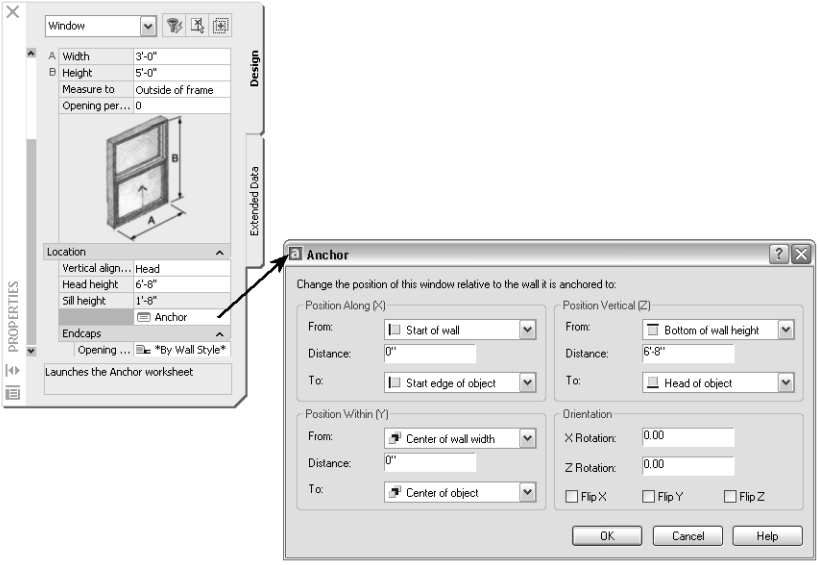


Worksheets

The properties of an object are entered and changed in the Properties Palette. Most properties are directly entered and immediately updated on screen. Some objects have complex properties that are entered in worksheets within the Properties Palette.

Worksheets are designed to focus on a particular task of an object. They will only appear when they are launched from a palette or from an object. They cannot be accessed from the pulldown menus, as they always refer to a specific object or object tool.

Opening the Anchor worksheet

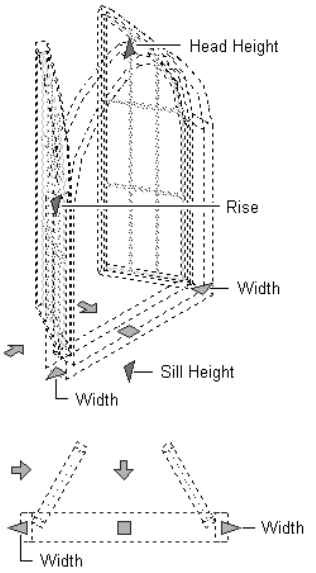


A worksheet is a modal dialog box that must be closed before continuing to work in the drawing.

Direct Editing with Grips and Dynamic Dimensions

With the enhanced grip functionality, you can make quick design changes directly in the workspace without using dialog boxes. Now in a single click, you can perform design changes such as adjusting the door width and the window height, modifying the wall roofline, or reversing the wall direction. For some grips, the CTRL-key gives you additional manipulation options. This is indicated in the grip tips of the grips. For example, the “Width” grip of a wall can either maintain the wall baseline when dragging or the opposite face of the wall. To switch between these two options, you use the CTRL-key. An added enhancement is the introduction of dynamic dimensions. As you make design changes, dynamic dimensions appear and ensure that your changes are precise and accurate.

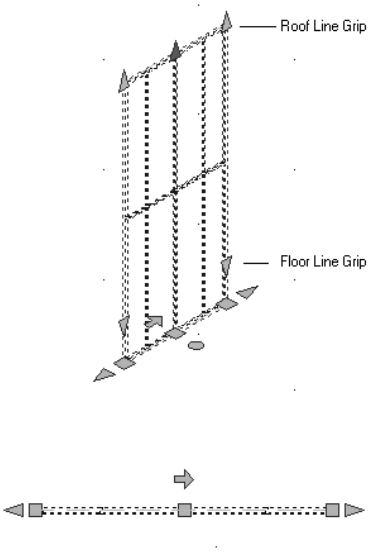
Window dimension grips in Plan view and Model view



Depending on the object type, different grips are available. For example, a wall and a freestanding railing have a direction (arrow) grip to change the direction of the object. A railing that is attached to a stair or a structural member does not have a direction grip.

Objects can have different grips depending on the view they are in. For example, a structural beam has an additional "Roll" grip in Model views that is not visible in Plan views. Because rolling a beam is a 3D operation that you can only perform in an isometric view, it makes no sense to display the Roll grip in Plan views. Similarly, roof and floor line grips are only useful in a 3D view; therefore, they are displayed only in Model views.

Curtain wall grips in Plan view and Model view



For detailed information about the grips for Autodesk®Architectural Desktop objects, refer to the illustrations and descriptions in the grip-editing sections of the individual object chapters.

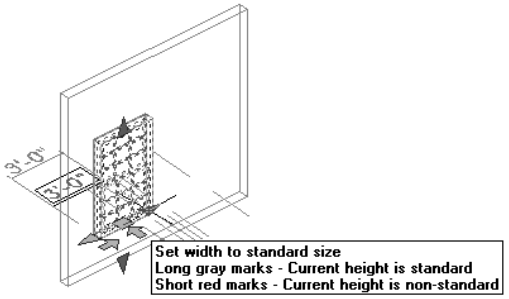
Related Topics and Procedures

- Grip Tips
- Grip Color
- Using the CTRL Key with Grips
- Trigger Grips
- Grip Constraints
- Temporary Grip Coordinate Systems
- Dynamic Dimensions

Grip Tips

For a quick description of the function of a specific grip, you can hover over the grip to display its grip tip. Each grip has its name displayed in the grip

tip, for example, “Flip” or “Lengthen.” In some cases, the grip tip contains additional information about the grip functionality.

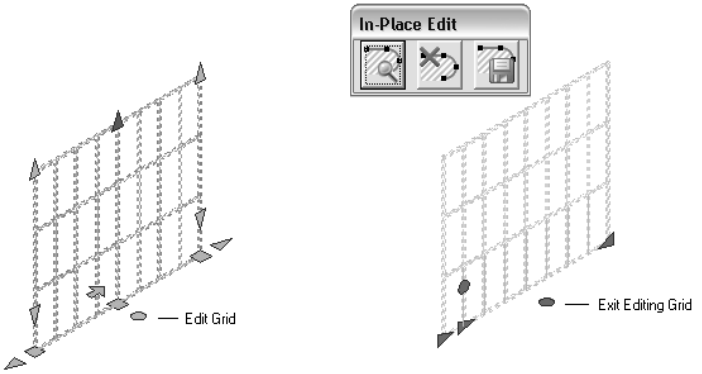


Grip Color

The color of a grip specifies whether the grip modifies a selected object or other objects in a drawing when you use it. Typically, a grip is used to change a property of a selected object. However, some grips might change the properties of all other objects in a drawing with the same style as the selected object. Other grips do not change the selected object at all, but are used to change the grip editing mode of the object.

Grip Type and Default Color	Function
Object (Cyan)	changes a property of a selected object
Style (Magenta)	changes a property of a selected object and all other objects with the same style in the current drawing
Auxiliary (Gray)	does not change any property of any object

Different grip types display in different colors in an in-place editing session



You can change the color of these grips on the AEC Editor tab in the Options. For more information, see "Changing the AEC Editor Settings" in the online *Autodesk Architectural Desktop 2004 User's Guide*.

Using the CTRL Key with Grips

Some object grips have multiple functions. For example, a face grip on a free-form mass element has these possible grip modes:

- Move ortho
- Move
- Move plane
- Pull ortho
- Pull
- Push ortho

When a grip has multiple modes, this information is displayed in the grip tip. To switch between the different grip modes, use the CTRL key.

1. Select the object with the grip.
2. Hover over the grip, to see what grip modes are available.

   The first mode listed is the mode that will be started when you select the grip without using the CTRL key.
3. Select the grip.
4. Press CTRL to toggle to the next editing mode.

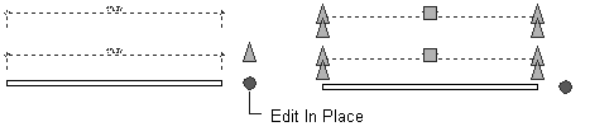
NOTE You just need to press the CTRL key once, and then release it. This toggles the grip to the next editing mode. After releasing the CTRL key, you

can start editing the grip. Do not keep pressing CTRL while editing the grip.

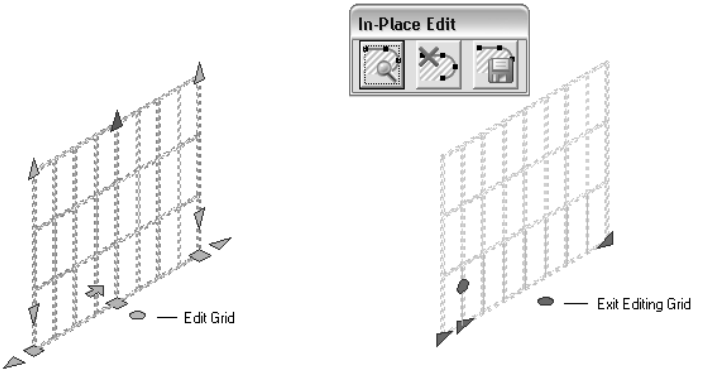
Trigger Grips

Trigger grips are a special type of grip. A trigger grip immediately performs an action on an object when you select it, as opposed to a normal drag grip, which changes a dimension property only when you drag it. You can use trigger grips to set discrete properties of an object, such as the swing direction of a door or the justification of a wall. You can also use trigger grips to change the grip edit mode of an object. For example, selecting the Edit Grid grip in a curtain wall initiates an in-place editing mode for the curtain wall grid. Selecting the Edit In Place grip in an AEC dimension activates additional grips for the individual dimension chains, text strings, and extension lines. A trigger grip typically displays with a circle or an arrow.

AEC dimension before and after activating Trigger grip



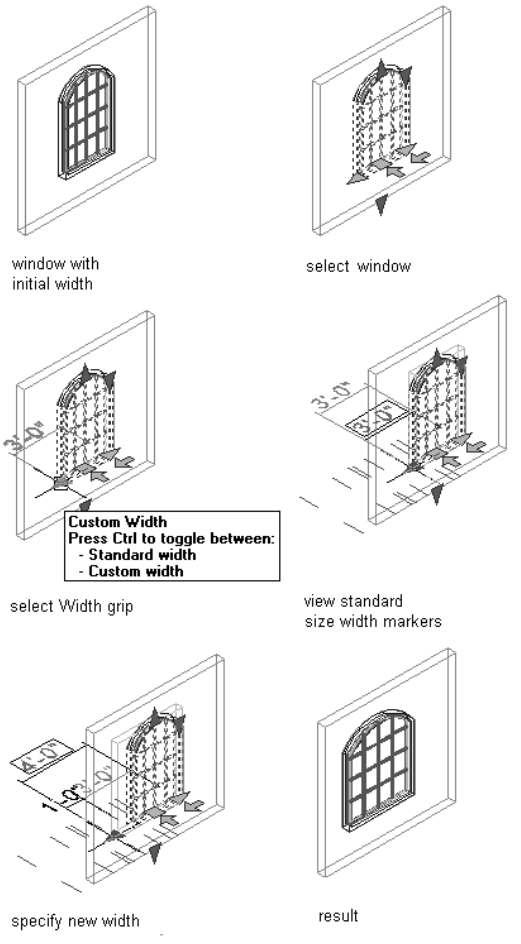
In some cases, such as with the AEC dimension Trigger grip, the grip edit mode is exited when you deselect the object. In other cases, you must click the Trigger grip again to exit the grip edit mode.



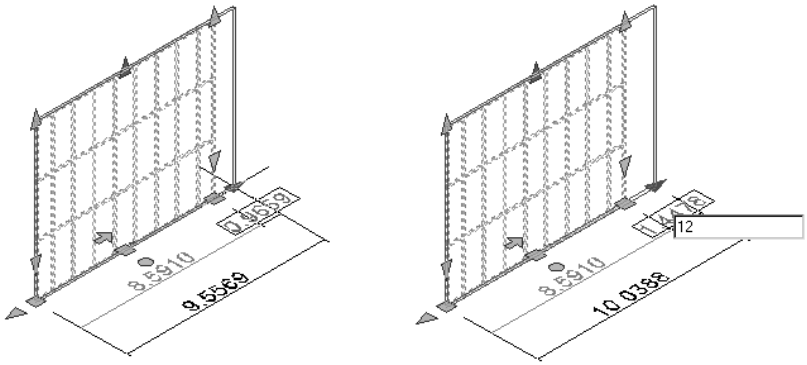
Dynamic Dimensions

When you use grips to change the dimensions of an object, temporary dimension objects show you the changes you are making.

Dynamic dimensions for changing the window width



These dynamic dimensions give you instant feedback about your changes. You can also use the dynamic dimensions to enter new dimension values directly on screen.



Three types of dynamic dimensions display on grips:

- Focal dimensions, which display in a rectangular box in magenta text. If you type a value while a dynamic dimension is focused, an edit box immediately displays at the dimension text location.
- Editable dimensions, which display in black or white text. If you press TAB while a dynamic dimension is focused, the dimension focus shifts forward to the next editable dimension. You can continue pressing TAB to cycle forward through all editable dimensions, or press SHIFT+TAB to cycle backwards through all editable dimensions.
- Non-editable dimensions, which display in gray text. These dimensions typically display the current value of a property that you can modify with a grip.

You can set the color of the focal dynamic dimension text on the AEC Editor tab in the Options. For more information, see "Changing the AEC Editor Settings" in the online *Autodesk Architectural Desktop 2004 User's Guide*.

NOTE When a dimension edit box displays, pressing ENTER sets the value of the property that you are editing and ends the grip operation. Pressing TAB sets the value, changes the focused dimension, and continues the same grip editing operation.

NOTE When one or more editable dimensions display, you can always press TAB to a state where no dimension has focus, during which you can use normal direct distance entry on the command line. You can always reach this non-focused state by pressing SHIFT+TAB immediately after selecting a grip.

1 Select the grip representing the dimension you want to change.

For example, to change the length of a curtain wall, select one of its Lengthen grips.

2. Directly enter the new value on screen, and press ENTER.

Grip Constraints

When you select and drag a grip, its final position might not be the same as the current cursor position, which might be constrained in some way. For example, for the Lengthen grip on a linear wall, the cursor position is projected to the nearest point on the wall. Whenever the constrained position of a grip differs from the current cursor position, a set of dotted lines or arcs are drawn from the cursor to the grip to indicate how the grip was constrained.

A square-shaped grip typically indicates that the cursor movement is constrained to a plane. An isosceles triangle-shaped grip indicates that the cursor movement is constrained to a line or curve.

Temporary Grip Coordinate Systems

When you drag a grip, the current cursor position is typically projected to the *XY* plane of the current User Coordinate System (UCS). Some grip editing operations are not possible in the current coordinate system. For example, if the current UCS is in plan, you cannot change the height of a wall while in an isometric view. For this reason, some grips have their own coordinate system that is temporarily set while the grip is active. Once the grip editing operation is complete, the UCS is set back to its previous state. To identify whether or not a grip is setting a temporary coordinate system, set UCSICON to on, and display the icon at the origin.

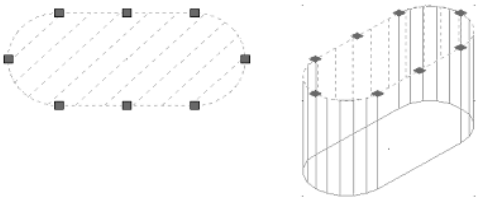
In-Place Editing

In-place editing is a special editing mode for making direct on-screen changes to components of an object. For example, you can edit wall endcaps, wall or curtain wall roof lines, profile based railing posts, or extruded mass element outlines with in-place editing. While in-place editing mode is active, all other commands and objects in the drawing are "frozen." To access the commands and objects again, exit the in-place editing mode.

When you enter an in-place editing session, a temporary in-place edit profile is drawn around the object being edited. After making your changes to the in-place edit profile, exit the in-place edit session, and save the changes. You

may also discard all changes upon exiting the in-place session, and revert the object to the state before the in-place editing session began.

In-place edit profile of extruded mass element

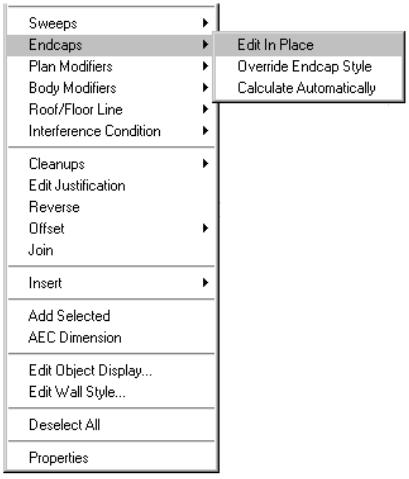


The in-place edit profile is displayed in a different color and hatching from the object it outlines. You can change the display of the in-place edit profile by changing its colors, lineweights, and hatching.

Sometimes, multiple in-place editing entities are created in a single in-place editing session. This is the case for walls that have multiple sweeps or modifiers or for roof slabs and slabs that have both a fascia and a soffit profile.

The in-place editing work mode is invoked from the shortcut menu of an object.

Invoking in-place editing from the shortcut menu of a wall



To access the shortcut menu, select the object, and right-click. Then, select the appropriate in-place editing command. When you enter the in-place editing mode, a special toolbar displays that helps you to zoom to the cur-

rently active in-place profile, to save changes to the component, or to discard all changes. When you exit the in-place editing mode, the toolbar is closed.

Related Topics

- In-Place Editing of Polyline-Based Components
- In-Place Editing of Profile-Based Objects and Components
- In-Place Editing of 3D Body Modifiers
- In-Place Editing of Material Hatches

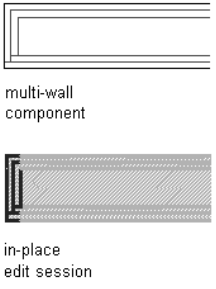
In-Place Editing of Polyline-Based Components

The following objects in Autodesk®Architectural Desktop can have custom components based on polylines attached to them:

- Wall endcaps
- Wall/Curtain wall roof and floor lines
- Wall plan modifiers

Once you have assigned a polyline-based component to an object—for example, a wall endcap to a wall—you can edit it directly on screen with in-place editing. During an in-place editing session, the selected polyline is isolated for editing, so that you can perform changes on its shape, such as grip-editing or adding and removing vertex points. Before you exit the in-place edit session, you can save the changes to the existing style, save to a new style, or discard the change.

Endcap polyline highlighted for in place editing

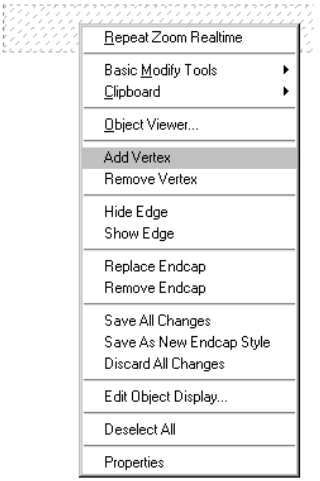


You can use in-place editing to modify the polyline-based components of a wall either in two-dimensional (2D) Plan views or in three-dimensional (3D) Model views.

When you edit a component in a 3D view, the UCS is automatically aligned to the component, so that you can easily add and remove vertices and grip-edit the component.

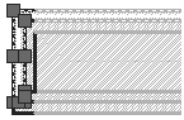
The available editing commands for polyline-based components in an in-place edit session are available on the shortcut menu of the in-place editing profile.

Shortcut menu for wall endcap in-place edit profile

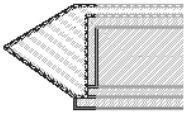


To access the shortcut menu, select the in-place editing profile, and right-click. The available commands for editing polyline-based objects vary, depending on the object type. For example, a wall endcap in-place edit profile has commands for adding and removing vertices and hiding and replacing endcap components; the in-place edit profile of a wall roof/floor line has commands for adding gables and steps and projecting the roof and floor lines to a polyline. For more information, see the chapters on the individual objects.

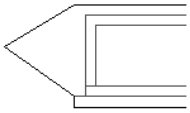
In-place editing: Adding a vertex to a wall endcap



select endcap component



add vertex



save changes

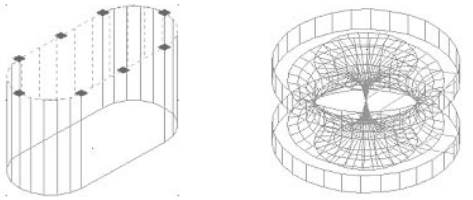
In-Place Editing of Profile-Based Objects and Components

You can use in-place editing for profile-based objects and object components. You can change the shape of the profile, add and remove rings, and, for some profiles, move the insertion point.

The following objects are profile-based or can have profile-based components to edit with in-place editing:

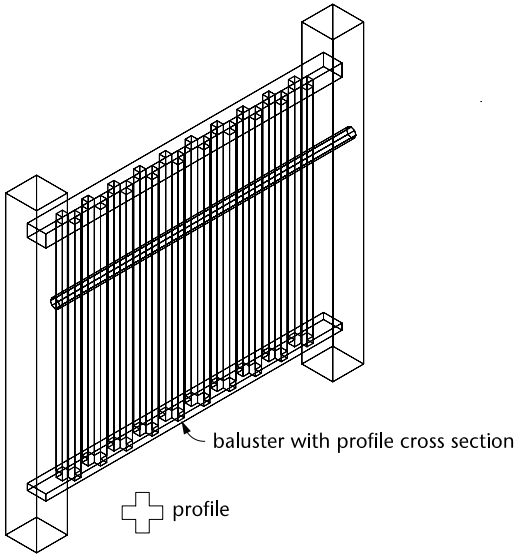
- Mass elements (extrusions)
- Mask blocks
- Wall sweeps
- Fascia and soffits of roof slabs and slabs
- Frames and mullions of curtain walls, curtain wall units, and window assemblies
- Custom (profile-based) shapes of doors, openings, windows, and window assemblies
- Custom (profile-based) shapes of rails and posts in railings

In-place edit profile on extruded mass elements

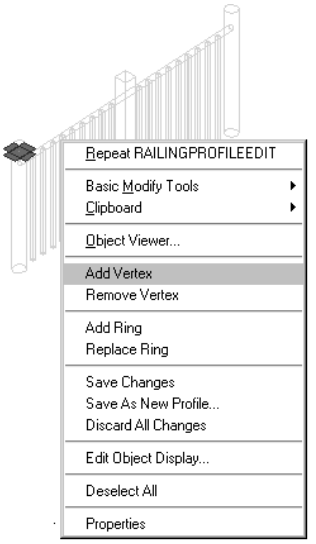


NOTE In-place editing for the objects listed above is available only if one or more components of the object have been based on profiles. For example, if you have a railing where no rails or posts have been based on profiles, the in-place editing command is not available. However, if one or more railing components are based on a profile definition, you can select the appropriate in-place editing command from the shortcut menu of the object.

Profile-based baluster in a railing



Shortcut menu of railing component in-place edit profile



The following commands are available to edit a profile-based object component:

Command	Description
Add Vertex	adds a vertex to the selected profile
Remove Vertex	removes a vertex from the selected profile
Add Ring	adds a closed polyline, circle, ellipse, or spline to the selected profile; you have the option to add the ring to the profile or to subtract it
Replace Ring	replaces the selected profile with a closed polyline, circle, ellipse, or spline
Save Changes	saves the changed geometry back to the profile
Save as New Profile	saves the changed geometry to a new profile definition
Discard All Changes	discards all changes to the geometry of the profile and reverts back to the profile shape before the in-place edit session

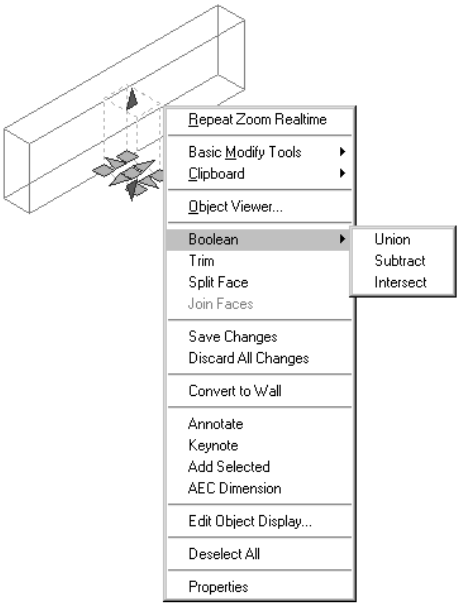
Command	Description
Edit Object Display	changes the display of the in-place edit profile; you can change the display of the profile boundary, the profile hatch and—for polyline-based profiles—the display of the modifiable and hidden edges

For detailed information, see the chapters for the individual objects.

In-Place Editing of 3D Body Modifiers

You can use in-place editing for editing a 3D body modifier on a wall. You can change the shape of the body and perform boolean operations on the 3D body modifier.

Shortcut menu of 3D body modifier in in-place edit mode



The following commands are available to edit a 3D body modifier:

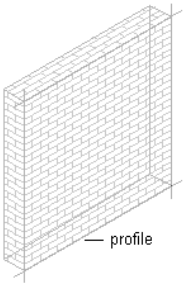
Command	Description
Boolean ➤ Union	joins the body modifier with a selected 3D object

Command	Description
Boolean ➤ Subtract	subtracts a selected 3D object from the 3D body modifier
Boolean ➤ Intersect	creates an intersection object of the 3D body modifier and a selected object
Split Face	Splits a face of the selected 3D body modifier
Join Faces	Joins two previously split faces of a 3D body modifier
Save Changes	saves the changed geometry back to the 3D body modifier
Discard All Changes	discards all changes to the geometry of the 3D body modifier and reverts back to the body shape before the in-place edit session
Edit Object Display	changes the display of the in-place edit profile.

In-Place Editing of Material Hatches

You can make changes to the surface hatch of an object with an in-place edit profile, provided the surface hatch is coming from a material. Unlike the other in-place edit types, you do not change the shape of the object with in-place editing but only the display of the hatch on a specific object face.

In-place edit profile on a hatched wall



When you use the in-place edit profile to change the appearance of a surface hatch on an object face, you create a hatch override.

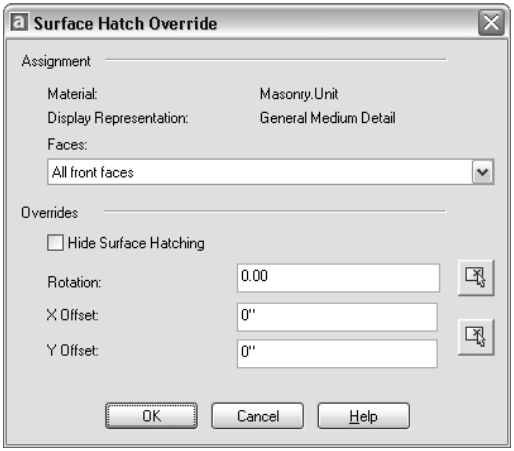
You can perform the following changes to a material hatch with in-place editing:

- display/hide the surface hatch

- Change the rotation of the hatch pattern
- Change the vertical and horizontal offsets of the hatch pattern

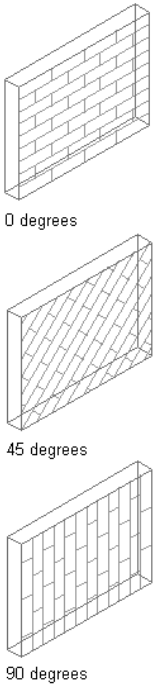
You can apply these overrides to all corresponding object faces with the same material or to only the selected object face.

In-place editing a surface hatch



For more information, see “Working with Surface Hatches” on page 504.

Changing the hatch rotation with in-place editing



Styles and Support Files

With this release of Autodesk® Architectural Desktop, the location of styles, templates, and other support files have changed. For example, styles are no longer integrated into the templates but are instead contained in Styles drawings from which you select styles to add to your drawing. In previous releases these same style drawings existed and contained all the same styles that were also in the templates. This ensures smaller templates and a clearer structure of your drawings. In addition, to conform to Microsoft® Windows® standards some file paths have changed.

Support files are in the following locations:

Files	Location
Plotter Configurations	C:\Documents and Settings\<Username>\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Plotters
Plot Styles	C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Plot Styles
DesignCenter Content	C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\AEC Content
PropertySetDefs.dwg	C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\AEC Content\<Imperial or Metric>\Documentation\Schedule Tags
Layer Standards drawing	C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Layers
Styles drawings	C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles
Drawing templates	C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Templates
Area Evaluation templates	C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Templates\Evaluation Templates
Sample Drawing Management Project	\\Program Files\Autodesk Architectural Desktop 2004\Sample\ADT Sample Project
Default Used Workspace Catalog	C:\Documents and Settings\<Username>\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Support\WorkspaceCatalog (Imperial/Metric)
Stock Tool Catalog	\\Program Files\Autodesk Architectural Desktop 2004\Catalogs\StockToolCatalog
Structural Member Catalog	\\Program Files\Autodesk Architectural Desktop 2004\Catalogs\Structural

Files	Location
Sample Tool Palette Catalogs	\\Program Files\Autodesk Architectural Desktop 2004\Sample
Sample Render Material Catalog	\\Program Files\Autodesk Architectural Desktop 2004\Sample\Autodesk Render Material Catalog
VIZ Sample Catalogs	\\Program Files\Autodesk Architectural Desktop 2004\Default Catalogs\ToolCatalogs

Integration of Autodesk Architectural Desktop and AutoCAD

Autodesk® Architectural Desktop 2004 is integrated with the AutoCAD® 2004 design platform. The commands and features of both applications are blended within the tool palettes, menus, and toolbars. There are some differences between working in a pure AutoCAD environment and accessing AutoCAD commands from within Autodesk Architectural Desktop. These differences are listed in this section.

AutoCAD Tools

Differences with the AutoCAD tools include:

- You cannot create a block or hatch tool by dropping a sample object in the drawing to the tool palette. You must do this from DesignCenter.
- AutoCAD tools do not use the Properties Palette during adding them to the drawing.
- AutoCAD tools do not have the same tool properties as Architectural Desktop tools, for example the layer key.
- AutoCAD Hatch tools and Block tools cannot have a user-defined tool image.
- The tool properties of AutoCAD tools cannot be applied to an existing AutoCAD object in the drawing.

AutoCAD Tool Palettes

Differences with the AutoCAD tool palettes include:

- When you are working in plain AutoCAD, you cannot create and link AutoCAD tool palettes from the Content Browser.
- When you are working in plain AutoCAD, AutoCAD tool palettes do not support palette properties.

Other Differences

Other differences with AutoCAD include:

- **Properties Palette:** When you are working in plain AutoCAD, you cannot set the AutoCAD Properties palette to transparent.
- **Materials:** Render materials created by VIZ Render and used by Autodesk Architectural Desktop materials use 256 character naming abilities. If you are working with the AutoCAD **rmat** dialog box, only 16 characters are displayed. It is recommended that you create your Render materials through VIZ Render and not through AutoCAD.
- **Revision clouds:** The Revision cloud feature in AutoCAD is not identical to the Revision Cloud feature in Autodesk Architectural Desktop. Revision clouds in Autodesk Architectural Desktop have addition1al scaling and layer key functionality, as well as the option of adding a Delta symbol.
- **Layers:** Running the **layer** command from the command line opens the Autodesk Architectural Desktop Layer Manager. If you want to open the AutoCAD Layer Manager, enter **_.layer** on the command line.
- **Units:** Running the **units** command from the command line opens the Autodesk Architectural Desktop Drawing Setup dialog box. If you want to open the AutoCAD Units dialog box, enter **ddunits** on the command line.

WARNING! To change the drawing setup of Autodesk Architectural Desktop, you must use the Drawing Setup command of Autodesk Architectural Desktop. If you change the units in the AutoCAD Units dialog box, Autodesk Architectural Desktop drawing units are not affected.

Content Browser

4

The Content Browser lets you store, share, and exchange Autodesk® Architectural Desktop content, tools, and tool palettes. The Content Browser runs independently of the software, allowing you to exchange tools and tool palettes with other Autodesk applications, such as VIZ® Render.

In this Chapter

- Tool Catalogs and Websites
- Catalog Libraries
- Tool Catalogs Supplied with Autodesk Architectural Desktop
- Exploring the Content Browser
- Managing Your Catalog Library
- Searching for Items in a Tool Catalog
- Adding Content to a Tool Catalog
- Using Tool Catalog Items in Autodesk Architectural Desktop
- Working with Multiple Content Browser Windows
- Starting the Content Browser from a Windows Command Prompt

Tool Catalogs and Websites

Autodesk Architectural Desktop tools and content are shared in the Content Browser using tool catalogs and websites. A tool catalog can contain one or more of the following items:

- Tools; for example, a tool to create a customized wall used throughout a building project.
- Tool palettes, which contain tools used to support a particular workflow or task. For example, a tool palette may contain a set of annotation tools used in a project or a set of tools to draw each type of door used in a project. A tool palette is treated as a single object.
- Tool packages, which are collections of tools that users can select and use. For example, a tool package may contain a set of productivity tools and utilities.

A single copy of a tool catalog can be shared among users on your local area network. If tools in the catalog are updated, you have immediate access to the latest version of the tools.

Websites containing Autodesk Architectural Desktop tools, and content that you can download using i-drop® technology, can also function as tool catalogs.

Several tool catalogs are provided with Autodesk Architectural Desktop, and you can create additional catalogs of your own.

Catalog Libraries

Tool catalogs are organized into catalog libraries, and each Autodesk Architectural Desktop user has a personal catalog library.

Tool catalog data is not stored in the catalog library. Rather, the catalog library contains pointers to the physical tool catalogs. It is like the card catalog in a real library—it tells you where to find a book, but it does not contain the book itself.

You cannot create additional catalog libraries, but you can open catalog libraries created by other users if you are authorized to do so.

Tool Catalogs Supplied with Autodesk Architectural Desktop

The following tool catalogs are supplied with your personal catalog library:

Catalog Name	Contents
Autodesk® Architectural Desktop Stock Tool Catalog	A catalog that contains the standard, stock tools in Autodesk Architectural Desktop.
Autodesk® Architectural Desktop Sample Palette Catalog - Imperial	A sampling of tools in imperial units for objects such as doors, walls, and windows
Autodesk® Architectural Desktop Sample Palette Catalog - Metric	A sampling of tools in metric units for objects such as doors, walls, and windows
Architectural Desktop Design Tool Catalog - Imperial	Content tools in imperial units for design and documentation of multi-view blocks and symbols
Architectural Desktop Design Tool Catalog - Metric	Content tools in metric units for design and documentation of multi-view blocks and symbols
Architectural Desktop Documentation Tool Catalog - Imperial	Content tools in imperial units for annotation and documentation
Architectural Desktop Documentation Tool Catalog - Metric	Content tools in metric units for annotation and documentation
Autodesk® Sample Render Material Catalog	Architectural render materials for use with Autodesk Architectural Desktop and Autodesk VIZ Render
My Tool Catalog	An empty tool catalog provided so that you can create your own tool set
Autodesk® Architectural Desktop Tutorial Palette Catalog	A catalog of the tools used in the metric-based Autodesk Architectural Desktop tutorial
Autodesk® Architectural Desktop Tutorial Tool Catalog	A catalog of the tools used in the imperial-based Autodesk Architectural Desktop tutorial
Architectural Desktop VIZ Render Plug-ins	Links to 3rd party plug-ins for Autodesk Architectural Desktop.

You cannot add or remove items from the Autodesk-supplied tool catalogs, but you can create your own tool catalogs. You can also copy other tool catalogs and website links into your catalog library.

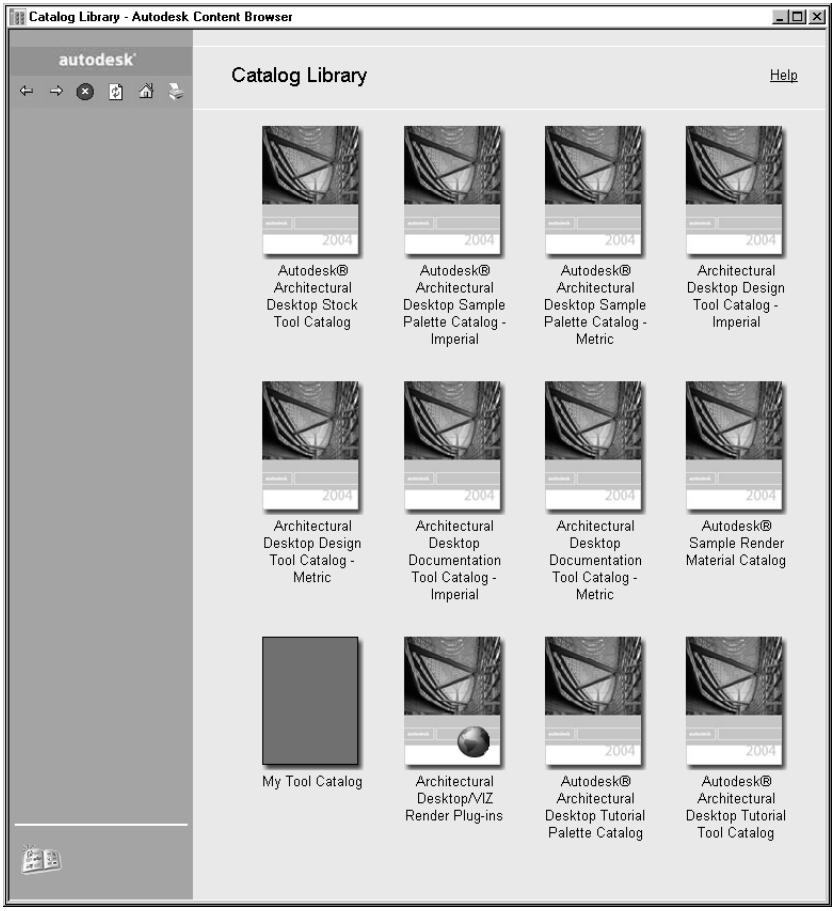
Related Topics and Procedures

- Exploring the Content Browser
- Managing Your Catalog Library
- Searching for Items in a Tool Catalog
- Adding Content to a Tool Catalog
- Using Tool Catalog Items in Autodesk Architectural Desktop
- Working with Multiple Content Browser Windows
- Starting the Content Browser from a Windows Command Prompt

Exploring the Content Browser

To open the Content Browser, click on the Navigation toolbar.

Content Browser window at opening



The Content Browser window is usually divided into two panes (web pages displayed in the Content Browser occupy the entire window). Tool catalogs and their contents are displayed in the right pane. When you start the Content Browser, your personal catalog library, named *<user_name>'s Catalog Library,* displays in the right pane. The left pane is used mostly for navigation; it contains toolbar buttons and other controls that determine what displays in the right pane. The buttons at the top of the left pane work much like the equivalent controls in a web browser. If you click the currently open catalog library displays in the right pane.

You can have more than one instance of the Content Browser open at a time. To open an additional Content Browser window, press CTRL+N. For more information, see "Working with Multiple Content Browser Windows" on page 204.

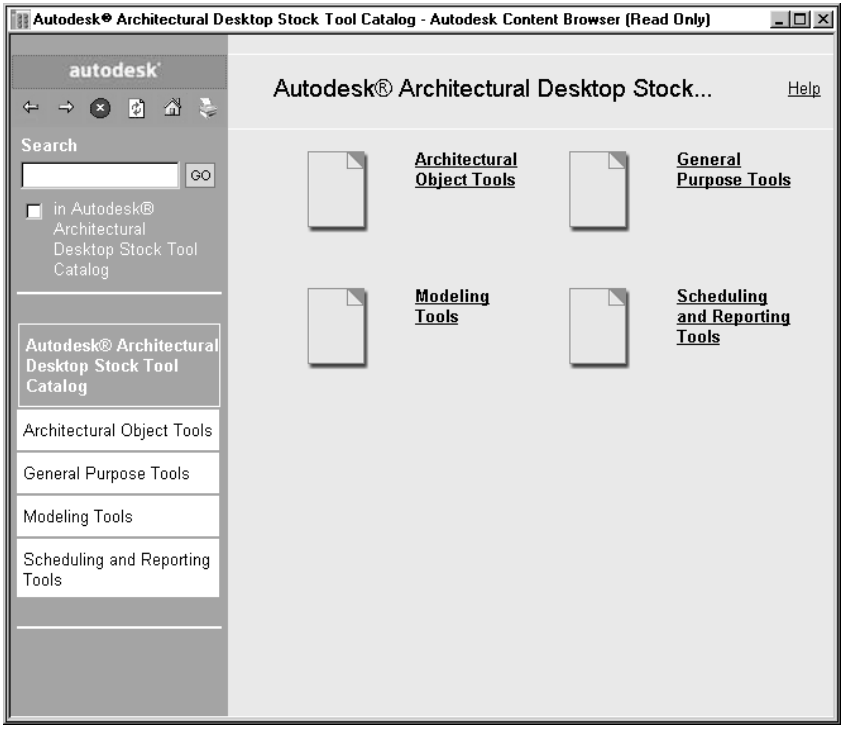
Related Topics and Procedures

- Viewing a Tool Catalog
- Using the Items in a Tool Catalog

Viewing a Tool Catalog

To view a tool catalog, click the catalog in the catalog library. For example, click the Stock Tool catalog to display a window like the following illustration:

View of the Stock Tool catalog



When you open the Stock Tool catalog, a cover page describing the catalog is displayed in the right pane. If no cover page is defined for a tool catalog,

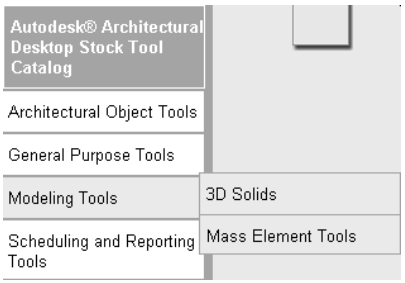
items contained in the tool catalog are displayed in the right pane. For information about specifying a cover page, see "Editing Tool Catalog Properties" on page 185.

To continue past the cover page to the contents of the tool catalog, click the catalog name in the left pane of the Content Browser window.

The contents of a tool catalog may be organized into categories. When a tool catalog is open in the right pane, any categories are listed in the left pane. For example, the Stock Tool catalog is organized into the categories shown in the previous illustration.

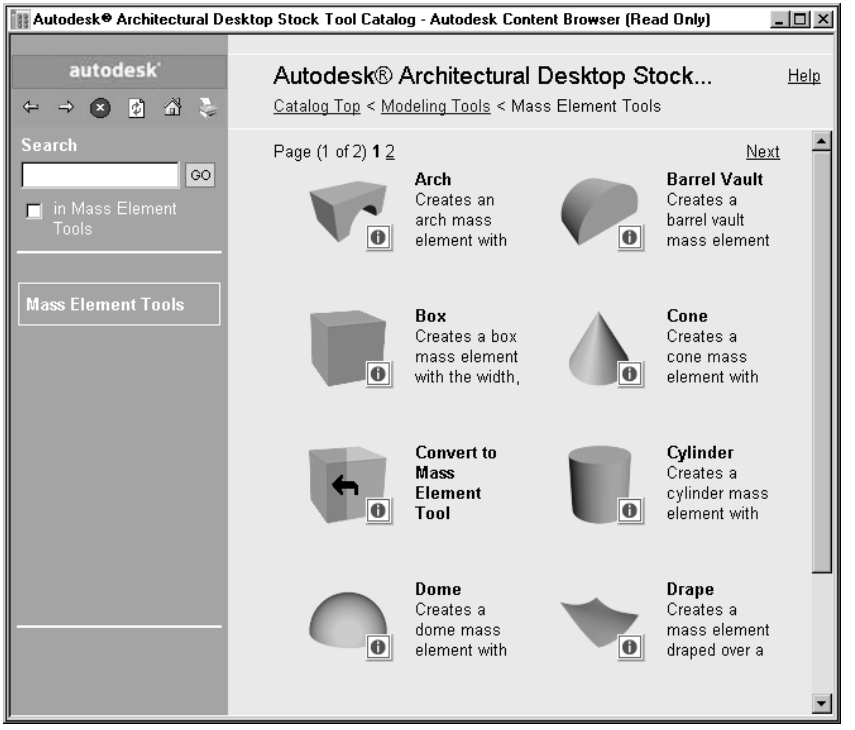
Categories can be subdivided into one or more levels. A list of subcategories, appears when you move the pointer over the category. For example, in the Stock Tool catalog, move the pointer over Modeling Tools to see the Mass Element Tools and 3D Solids subcategories.

Displaying subcategories in a category



To open a category or subcategory, click it. For example, click Mass Element Tools to display the following window:

Mass Element Tools category of the Stock Tool catalog



Associated with each item in the tool catalog is the following i-drop®icon: .

You click the i-drop icon to drag a tool or other tool catalog item into the Autodesk Architectural Desktop workspace or into another catalog, tool palette, or tool package.

You can modify the contents and properties of a tool catalog if you are authorized to do so, unless the catalog is read-only. Read-only tool catalogs are identified in the Content Browser title bar when you open the catalog. For example, the following title bar identifies the Stock Tool catalog as read-only:

Viewing the Content Browser title bar

A tool catalog category may contain more items than can fit on a page. If multiple pages are needed, navigation controls appear at the top and bottom of each page. The Mass Element Tools category shown earlier requires two pages to display its contents. You can specify the page to be displayed by clicking the page number or by clicking Next or Prev. (Note that these controls appear at the bottom of the page too.) You can also change the number of items that display on a Content Browser page.

Specifying the Number of Rows on a Content Browser Page

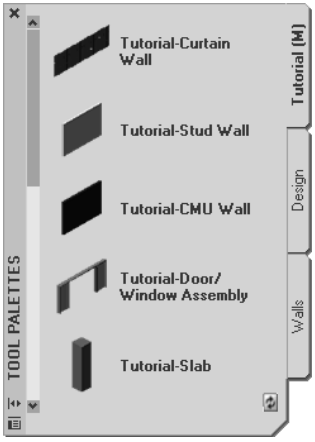
Use this procedure to specify the number of rows that display on a Content Browser page.

1. Click to display the catalog library.
2. Right-click the catalog library name, and click View Options.
3. In the View Options dialog box, enter the number of rows to be displayed on each page. You can specify up to 100 rows, and must specify at least 5.
4. Click OK.

Using the Items in a Tool Catalog

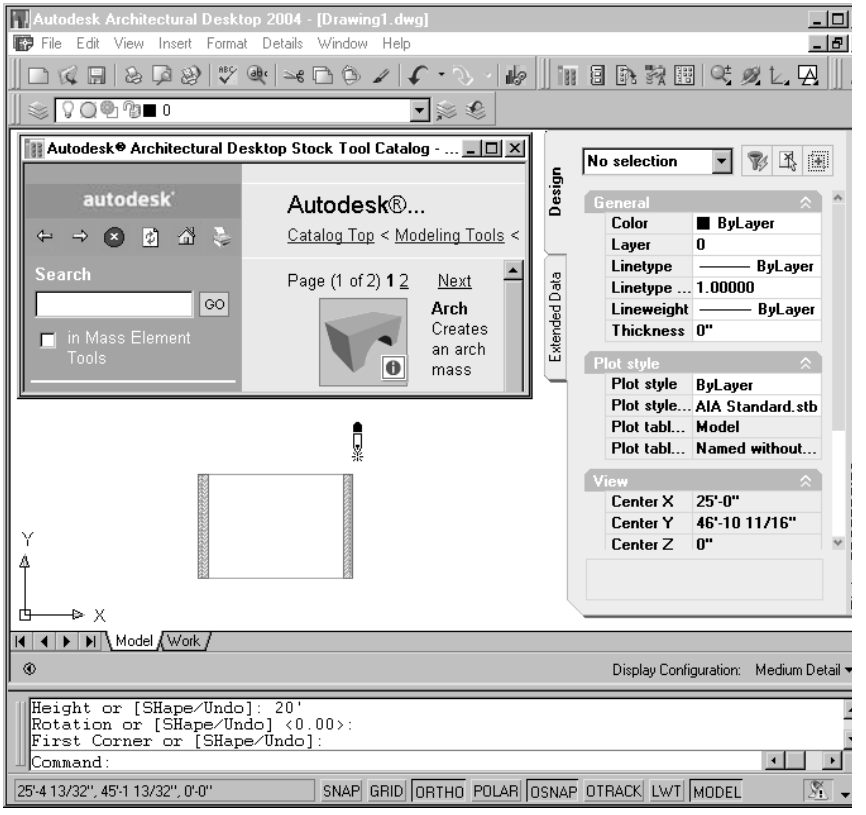
To use a tool catalog item in Autodesk®Architectural Desktop, drag the item into the software's workspace. Dragging a tool palette into the workspace adds the tool palette to the default tool palette set.

Autodesk Architectural Desktop tool palette set, with added tool palette



Once added to the tool palette set, the palette remains a part of the set and is available each time you start Autodesk Architectural Desktop.

You can use a catalog tool immediately in the drawing area from the Content Browser. For example, with the Mass Element Tools category open in the Stock Tool Catalog, drag the Arch tool into the drawing area with the i-drop icon to begin adding an arch mass element to your drawing.



If you use a tool frequently, it will save you time if you add the tool to a palette in the tool palette set, where you can access it without using the Content Browser.

Managing Your Catalog Library

You manage your catalog library by adding and deleting tool catalogs and website links and by setting catalog properties as needed. You can create a catalog from scratch or copy an existing catalog and tailor it to your needs.

You can reorganize tool catalogs by moving and copying items between them.

Related Topics and Procedures

- Creating a New Tool Catalog
- Adding an Existing Tool Catalog to Your Catalog Library
- Copying a Tool Catalog
- Moving a Tool Catalog
- Adding a Website to Your Catalog Library
- Editing Tool Catalog Properties
- Removing a Tool Catalog or Website Link
- Opening a Different Catalog Library
- Renaming a Catalog Library

Creating a New Tool Catalog

Use this procedure to create a new tool catalog in your catalog library.

1 Click to display the catalog library.

2 Click to create a catalog.

3 In the Add Catalog dialog box, select Create a new catalog.

4 Enter a name for your tool catalog.

Tool catalog names can include spaces and can contain any characters except the following:

\ / : * ? " < > |

The name you assign is used for both the file containing the catalog definition and the folder containing the catalog's contents. The name is also used in the title identifying the tool catalog in the catalog library. You can change the title displayed in the catalog library without affecting the file and folder name. For information about changing the title, see "Editing Tool Catalog Properties" on page 185.

5 Identify the folder in which to store your tool catalog:

If you want to . . .	Then . . .
store the tool catalog in the default location	click OK.

If you want to . . .	Then . . .
store the tool catalog in a different location	click Browse, select the folder in which to store the catalog, and then click OK.

NOTE The full path name of the catalog file cannot exceed 255 characters, so be careful about using long catalog names.

The tool catalog is displayed in the catalog library with the following default graphic image:

For information about changing the graphic image and other tool catalog properties, see "Editing Tool Catalog Properties" on page 185.

Adding an Existing Tool Catalog to Your Catalog Library

Use this procedure to add an existing tool catalog to your catalog library.

Adding a tool catalog to a catalog library does not physically move or copy any files. Instead, a pointer to the catalog's location is added to the catalog library. If you add a tool catalog that resides on another computer and then a tool in that catalog is updated, you always reference the latest version of the tool in the catalog library.

1 Click to display the catalog library.

2 Click to create a catalog.

3 In the Add Catalog dialog box, select Add an existing catalog or website.

4 Enter the location of the tool catalog you want to add, or click Browse and select a catalog.

Tool catalog files typically have the extension *.atc*.

5 Click OK.

Copying a Tool Catalog

Use this procedure to make a copy of a tool catalog. You can then customize the contents of the catalog or create a new catalog using the original as its basis.

1. Click to display the catalog library.
2. Right-click the tool catalog you want to copy, and click Copy 'Catalog Name.'
3. In the Copy Catalog dialog box, specify the folder location for the copy of the catalog.
4. Click OK.

The new file is named *Copy of <catalog_name>*.

NOTE You cannot copy a tool catalog using the Copy command in Microsoft® Windows Explorer. The tool catalog file contains internal references that must be updated when the catalog is copied to a new location. The Content Browser updates these references during Copy operations.

Moving a Tool Catalog

Use this procedure to move a tool catalog from one folder to another. This procedure works like Copy, except that the original catalog is deleted.

1. Click to display the catalog library.
2. Right-click the tool catalog you want to move, and click Move.
3. In the Move Catalog dialog box, specify the new folder location for the tool catalog.
4. Click OK.

After the tool catalog is moved, the new location is reflected in the catalog library. You can verify the location by right-clicking the catalog, clicking Properties, and then looking at the value in File or Target.

NOTE You cannot move a tool catalog using the Move command in Windows Explorer. The tool catalog file contains internal references that must be updated when the catalog is moved to a new location. The Content Browser updates these references during Move operations.

Adding a Website to Your Catalog Library

Use this procedure to add a website link to your catalog library. Links are useful for websites containing Autodesk Architectural Desktop tools and content that you can download using i-drop® technology.

You can also add a website link by dragging the URL from the Address bar of Internet Explorer into the Content Browser window.

1 Click to display the catalog library.

2 Click to create a catalog.

3 In the Add Catalog dialog box, select Add an existing catalog or website.

4 Enter the location of the website to link:

If you want to . . .	Then . . .
link to a website on the Internet or on an intranet	enter the URL of the website, including the *http://* prefix. **TIP** Here is the easiest way to specify a URL: 1. Open a web browser, such as Internet Explorer. 2. Open the web page you want to link to. 3. Copy the URL from your browser's Address bar. 4. Paste the URL into the Add Catalog dialog box.
link to a web page in an HTML file on your computer or on your network	enter the file name, or click Browse and select the file you want to link to.

5 Click OK.

The link to the website is represented in the catalog library by a default graphic image, which you can change. For information about changing this image and other Tool Catalog properties, see "Editing Tool Catalog Properties" on page 185.

Opening Web Pages in the Content Browser

Use this procedure to open a web page through a website link in your catalog library.

TIP If you have any problem viewing a web page in the Content Browser window, try opening the page in Internet Explorer.

- Move your pointer over the website link you want to open, and do one of the following:

If you want to . . .	Then . . .
view the web page in the Content Browser window	click the link.
view the web page in a new Content Browser window	right-click the link, and click Open in New Window.
view the web page in a new Internet Explorer window	right-click the link, and click Open With Internet Explorer.

Editing Tool Catalog Properties

Use this procedure to view and modify the properties of a tool catalog. If you have write access to the tool catalog, you can select a different source file or target, and you can change the cover page.

1. With the catalog library open in the right pane of the Content Browser, right-click the desired tool catalog, and click Properties.
2. Edit the properties:

If you want to . . .	Then . . .
change the graphic image that represents the tool catalog in the catalog library	click the image in the Properties dialog box, and then select a graphic file to use. You can use a BMP, JPEG, PNG, or TIFF file for your graphic. The graphic image is displayed at 90 ×120 pixels. If you specify an image of a different size, the image is scaled to fit. **NOTE** The graphic file you select is copied into the tool catalog's image folder.
change the title displayed beneath the tool catalog's graphic image in the catalog library	enter a new title.

If you want to . . .	Then . . .
change the descriptive text that displays when you move the pointer over the tool catalog's graphic image	enter a new description.
change the tool catalog file or website	enter the new file in File or Target, or click Browse to select a tool catalog file.
change or specify the HTML file that displays when the tool catalog is opened	enter the new HTML file in Cover Page, or click Browse to select a cover page.
change the publisher of the tool catalog	enter a new publisher name.

3 Click OK.

Removing a Tool Catalog or Website Link

Use this procedure to remove a tool catalog or website link from your catalog library.

When you remove a tool catalog or website link, only a pointer to the item is removed; no files or web pages are physically deleted.

1 With the catalog library open in the right pane of the Content Browser, right-click the tool catalog or website link to delete, and click Remove from Library.
2 When prompted, click Yes to confirm deletion, or click No to cancel deletion.

Opening a Different Catalog Library

Use this procedure to open a catalog library other than your personal catalog library or to reopen your personal catalog library.

A catalog library is stored in a file having the extension *.cbl*. The default file name for your personal catalog library is *ContentBrowserLibrary.cbl*; it is stored in the folder *My Documents\My AEC Content Browser Library*.

1 Click to display the current open catalog library.
2 Right-click the catalog library name, and click Open New Library.
3 In the Open dialog box, select the catalog library that you want to open.

Renaming a Catalog Library

Use this procedure to rename the currently open catalog library. The name change affects the title of the catalog library displayed in the Content Browser, but no files are renamed.

1. Click to display the catalog library.
2. Right-click the catalog library name, and click Rename Library.
3. Enter the new library name, and click OK.

Searching for Items in a Tool Catalog

You can use the Search feature to help you find a particular tool. You can search a tool catalog, a tool palette, or a tool package. For example, if you are looking for a tool to help you create a roof dormer, you could search on the keyword *roof* or the keyword *dormer*.

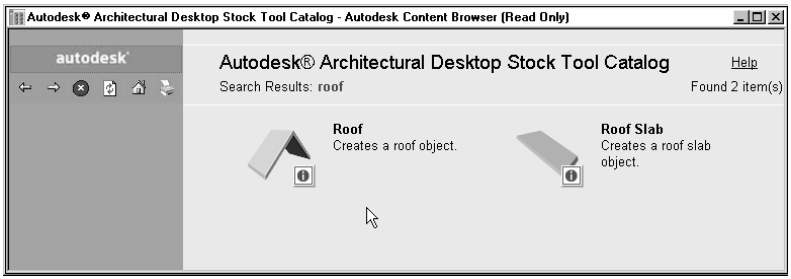
The Search feature looks at the text in the following properties of tool catalog items for the keywords you specify:

- Name
- Description
- Keywords

The Search tool is only as helpful as the tool names and descriptions that you assign. A tool name should indicate the tool's function, and the description should indicate the tool's use.

If you enter a search term containing more than one word, the Search feature looks for items containing any of the words you entered. Only one catalog can be searched at a time.

Search results are displayed in the right pane of the Content Browser window. The following illustration shows the results of a search on the term *roof* in the Stock Tool catalog:



The search term and the number of items found are listed on the line below the tool catalog name. If multiple pages are returned, you can specify the page to display by clicking the page number or by clicking Next or Prev.

Related Procedures

- Performing a Search

Performing a Search

Use this procedure to search all or part of a tool catalog.

1 Open the tool catalog you want to search:

If you want to . . .	Then . . .
search for tools only within a specific category and its subcategories	open the category you want to search, and select the box labeled *in <category name>*.
search for tools only in a specific tool palette	open the tool palette you want to search, and select the box labeled *in <palette name>*.
search for tools anywhere in the open catalog	leave the box under the search term deselected.

2 Enter the term to search for under Search.

If you enter more than one word, items containing any of those words are returned. The Search feature does not recognize operators such as AND and AND NOT.

3 Click GO.

Items that match your search criteria are displayed in the right pane of the Content Browser.

4 To perform another search, click the button located near the top of the left pane.

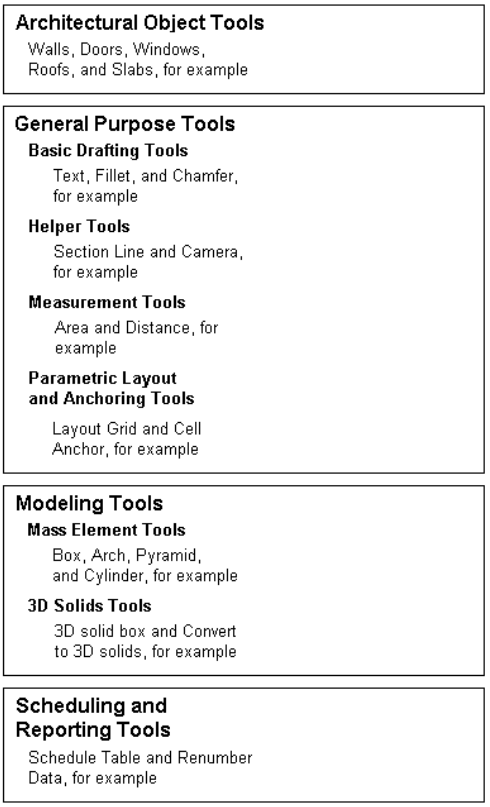
Adding Content to a Tool Catalog

Tool catalogs can contain tools, tool palettes, and tool packages, which may be organized into categories.

Categorizing the Items in a Tool Catalog

You can define categories and subcategories in a tool catalog to organize a large number of items. For example, the Stock Tool catalog contains dozens of tools. If these tools were not grouped into categories, you would have to scroll through page after page to find a particular tool. To make it easier to find tools, the Stock Tool catalog is organized into categories and subcategories, as shown in the following diagram:

Organizational structure of the Stock Tool catalog



About Tool Palettes

A tool palette is a collection of tools used to support a task. For example, a palette might contain tools to create the different types of doors (single-hinged, double-hinged, revolving, and so on) used in a building project. Storing a tool palette in a tool catalog makes the palette available to multiple users.

The date and time at which the tool palette was created and last modified are identified in the Tool Palette Properties dialog box. To view the dialog box, right-click the tool palette, and click Properties. For information about other tool palette properties, see "Adding a Tool Palette to a Tool Catalog" on page 193.

About Tool Packages

A tool package is a group of tools stored together for distribution. For example, a package might contain a set of productivity tools and utilities.

The date and time at which the tool package was created and last modified are identified in the Tool Package Properties dialog box. To view the dialog box, right-click the tool package, and click Properties. For information about other tool package properties, see "Adding a Tool Package to a Tool Catalog" on page 193.

Customizing Tools

You customize a tool by copying it to a palette in the Autodesk Architectural Desktop tool palette set, modifying the tool's properties, and then copying it back to its original location in the tool catalog.

Related Topics and Procedures

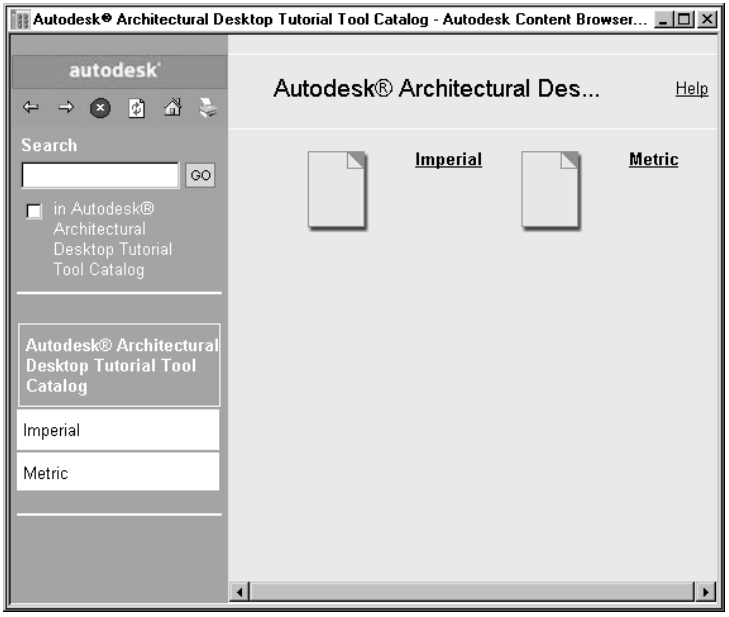
- Defining Categories in a Tool Catalog
- Adding a Tool Palette to a Tool Catalog
- Adding a Tool Package to a Tool Catalog
- Adding Tools to a Tool Catalog
- Copying and Moving Tool Palettes and Tool Packages
- Copying and Moving Tools
- Customizing a Tool
- Deleting Tool Catalog Items

Defining Categories in a Tool Catalog

Use this procedure to define categories and subcategories in a tool catalog.

Categories are listed in the left pane of the Content Browser, below the name of the open tool catalog.

List of categories in the Tutorial Tool catalog



1 Open the tool catalog in which to define categories.

2 Select the location for the new category:

If . . .	Then . . .
the tool catalog already has one or more categories defined and you want to add a subcategory	in the left pane of the Content Browser, navigate to the desired category, and click the category name.
the tool catalog is not currently divided into categories and is open to a cover page	in the left pane of the Content Browser, click the catalog name.
the tool catalog is not currently divided into categories and the content page is displayed	do nothing; this is where you define your first category.

3 In the right pane of the Content Browser window, right-click a blank area, and click Add Category.

4 Enter a name for the category, and click OK.

5 To define additional categories and subcategories, continue from step 2.

Adding a Tool Palette to a Tool Catalog

Use this procedure to add a tool palette to a tool catalog. You must have write access to the tool catalog in order to add a palette.

You can also drag a tool palette from the Autodesk Architectural Desktop workspace into a tool catalog. Click in the tab of the tool palette to drag it.

1 In the Content Browser, open the tool catalog in which to add the tool palette.

To add the palette to a specific category in the catalog, open that category.

If no graphics appear at the bottom of the left pane, the tool catalog is read-only, and you cannot add a tool palette.

2 Click in the left pane of the Content Browser.

3 In the Tool Palette Properties dialog box, enter a name for the tool palette, and enter any other desired properties:

If you want to . . .	Then . . .
add a description to be displayed in the tool catalog and queried in catalog search operations	enter a description.
define terms that will be found during a search of the tool catalog	enter the terms for Keywords.
identify the publisher of the tool palette	enter a publisher.

Adding a Tool Package to a Tool Catalog

Use this procedure to add a tool package to a tool catalog. You must have write access to the tool catalog in order to add a package.

1 In the Content Browser, open the tool catalog in which to add the tool package.

To add the package to a specific category in the catalog, open that category.

2 Click in the left pane of the Content Browser.

3 In the Package Properties dialog box, enter a name for the tool package, and enter any other desired properties:

If you want to . . .	Then . . .
add a description to be displayed in the tool catalog and queried in catalog search operations	enter a description.
define terms that will be found during a search of the tool package	enter the terms in Keywords.
identify the publisher of the tool package	enter a publisher.

If the tool catalog is read-only, the Package Properties dialog box is displayed, but you cannot enter anything in it.

Adding Tools to a Tool Catalog

Use this procedure to add a tool to a tool catalog or to a tool palette or tool package stored in a catalog. You must have write access to the tool catalog in order to add a tool to it.

You can also drag a tool from a tool palette in the Autodesk Architectural Desktop workspace to a tool catalog in the Content Browser.

1 In the Content Browser, open the tool catalog in which to add a tool.

If you are adding the tool to a specific category in the catalog or to a palette or package in a specific category, open that category.

2 Double click the image to open the palette or package if you are adding the tool to a tool palette or tool package.

3 In the Autodesk Architectural Desktop workspace, open the tool palette that contains the tool to add to the tool catalog.

4 Right-click the tool, and click Copy.

5 In the right pane of the Content Browser window, right-click in a blank area, and click Paste.

NOTE If there is no Paste option on the shortcut menu, then the pointer is probably positioned over a tool, even though the space may appear to be blank. Move the pointer and try again.

Copying and Moving Tool Palettes and Tool Packages

Use this procedure to copy or move tool palettes or tool packages between tool catalogs or between categories in the same catalog. To copy an item, you must have write access to the catalog you are copying to. To move an item, you must have write access to both the catalog you are copying from and the catalog you are copying to.

You can also open multiple Content Browser windows and drag tool palettes and tool packages from one window to another. For information about using multiple windows to copy and move items, see "Dragging Catalog Items Between Content Browser Windows" on page 206.

1 Open the tool catalog containing the tool palette or tool package to copy or move. If the item is located in a specific category of the catalog, open that category.

2 Right-click the item, and select an action:

If you want to . . .	Then . . .
add a copy of the tool palette or tool package in another location	click Copy.
move the tool palette or tool package to another location, deleting it from its original location	click Cut.

3 Select the item's destination:

If the destination is . . .	Then . . .
a category within the current tool catalog	click that category in the left pane of the Content Browser window.
another tool catalog	click to return to the catalog library, then click the tool catalog.
a category in another tool catalog	click to return to the catalog library, click the tool catalog you are copying to, and then select its category in the left pane of the Content Browser window.

4 In the right pane of the Content Browser window, right-click in a blank area, and click Paste.

NOTE If there is no Paste option on the shortcut menu, then the pointer is probably positioned over a catalog item, even though the space may appear to be blank. Move the pointer and try again.

Copying and Moving Tools

Use this procedure to copy or move tools between tool palettes, tool packages, or tool catalogs.

You can also open multiple Content Browser windows and drag items from one window to another. For information about using multiple windows to copy and move items, see "Working with Multiple Content Browser Windows" on page 204.

1 Open the tool catalog containing the tool to copy or move.

2 Open the item containing the tool to copy or move:

If the tool is in . . .	Then . . .
a category of the tool catalog	open the category.
a tool palette in the tool catalog	open the category for that tool palette, if necessary, and then click the tool palette.
a tool package in the tool catalog	open the category for that tool package, if necessary, and then click the tool package.

3 Right-click the tool, and select an action:

If you want to . . .	Then . . .
add a copy of the tool in another location	click Copy.
move the tool to another location, deleting it from its original location	click Cut.

4 If the destination of the tool is in a different tool catalog, click to return to the catalog library, and then click the tool catalog to open it.

5 Open the destination of the tool:

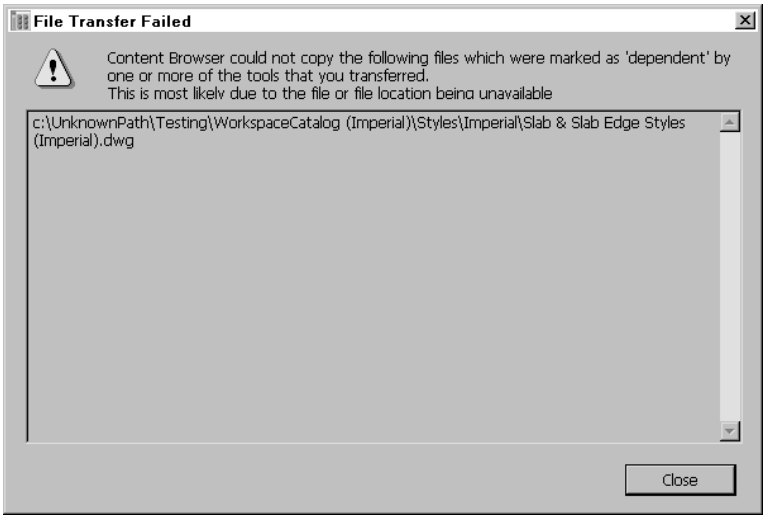
If the destination is . . .	Then . . .
a category of the tool catalog	open the category.
a tool palette in the tool catalog	open the category for that tool palette, if necessary, and then click the tool palette.
a tool package in the tool catalog	open the category for that tool package, if necessary, and then click the tool package.

6 In the right pane of the Content Browser window, right-click in a blank area, and click Paste.

NOTE If there is no Paste option on the shortcut menu, then the pointer is probably positioned over a catalog item, even though the space may appear to be blank. Move the pointer and try again.

Tool File Dependencies

A tool definition may refer to drawing files. For example, a slab tool may refer to a style that is defined in a specific drawing file. If the file resides on a remote server, or is referenced through a drive letter that is mapped to a remote server, the file is copied to the destination catalog when you copy or move the tool. If the drawing containing the style is not available at the time the tool is copied (for example, if the server is down, or the drawing file is referenced by a drive letter that the server is not currently mapped to), the following message appears:



The error message identifies the file or files that were not available. The tool is still copied to the destination folder, but it may no longer behave the same as the original tool. To correct this, reestablish the connection to the server containing the dependent files, and copy the tool again.

Customizing a Tool

Use this procedure to modify a tool that is stored in a tool catalog.

When you begin this procedure, both the Autodesk Architectural Desktop tool palette set and the Content Browser window should be visible, so that you can drag items between them.

1. In the Content Browser, open the tool catalog that contains the tool to customize. If the tool is located in a specific category of the catalog, open that category.
2. Move the pointer over the i-drop icon next to the tool you want, so that the pointer image changes to an eyedropper ( ).
3. Click the eyedropper and drag it to a palette in the tool palette set.

   If the tool palette does not accept the tool, it might be because the palette is set to allow updates only from a linked tool palette in a tool catalog. To check this, right-click on the palette, click Properties, and look at the Refresh from setting. If Refresh from is selected, the palette is linked to a palette in a tool catalog. To break the link, clear Refresh from. For more

information about linked tool palettes, see "Using the Items in a Tool Catalog" on page 179.

4 Right-click the copy of the tool in the tool palette set, and click Properties.

5 In the Tool Properties worksheet, clear Refresh from.

If Refresh from is selected, the tool is linked to its source in the tool catalog and can be updated only from the source tool.

6 Make any property changes, and then click OK.

7 Drag the tool from the tool palette set back to its original location in the Content Browser.

TIP Right-click the title bar of the Autodesk Content Browser, and select Always on Top before dragging the tool to the Content Browser.

8 When prompted to confirm catalog item replacement, click Yes.

Deleting Tool Catalog Items

Use this procedure to delete a tool palette, tool package, or tool in a tool catalog. You must have write access to the tool catalog in order to delete items.

1 Open the tool catalog containing the item to delete. If the item is located in a specific category of the catalog, open the category.

2 Right-click the item, and click Delete.

3 When prompted, click Yes to delete the item, or click No to cancel deletion.

Using Tool Catalog Items in Autodesk Architectural Desktop

You can use a tool immediately in the drawing area or store it in a palette in the tool palette set. You can add a catalog tool palette or tools in a tool package to the tool palette set.

TIP When working with both the Autodesk Architectural Desktop workspace and the Content Browser, you may find it helpful to keep the Content Browser window displayed on your screen at all times. To keep the Content Browser win-

dow in view while other applications are active, right-click the title bar of the Autodesk Content Browser, and select Always on Top.

Linked and Unlinked Tool Catalog Items

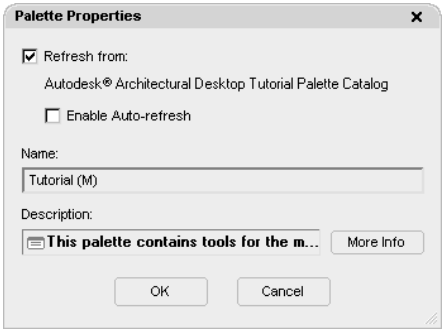
When you copy a tool or tool palette from the Content Browser to the tool palette set, you can choose whether the copy retains its association with the original. Linking the copy to the original means that, if you copy the item back to its original location, the Content Browser assumes you are updating the original item. This is the default behavior. If you change the original, you can update a linked copy using a single mouse click.

An unlinked copy of a tool or tool palette is treated as a new item, with no relationship to the original item. If you copy an unlinked item back to its original location in a tool catalog, the Content Browser simply adds it to the catalog; you end up with two copies of that item with the same name.

Any time you copy an item from the Stock Tool catalog to the tool palette set, the item is treated as unlinked.

You can tell whether an item in the tool palette set is linked by right-clicking the item and clicking Properties. If Refresh from is available and lists a source, the item is linked. The following illustration shows the properties of a palette linked to the Autodesk Architectural Desktop Tutorial Tool catalog:

Refresh from property of a linked palette



You can have linked tool palettes updated automatically each time you start Autodesk Architectural Desktop. If you select automatic updating, any changes made to the tool palette and its contents in the tool catalog will be reflected in the tool palette set when you open the software.

Related Topics and Procedures

- Using a Tool in the Autodesk Architectural Desktop Workspace
- Copying a Tool Palette to the Autodesk Architectural Desktop Workspace
- Copying a Tool Package to the Autodesk Architectural Desktop Workspace
- Refreshing Linked Tools
- Specifying Refresh Options for Linked Tool Palettes

Using a Tool in the Autodesk Architectural Desktop Workspace

Use this procedure to use a tool from a tool catalog in the Autodesk Architectural Desktop workspace. You can also copy tools stored in a tool package to a tool palette in the tool palette set.

A tool copied into the tool palette set can be linked or unlinked. A linked copy remains connected to the original in the tool catalog, so that you can update the copy with any changes made to the original. An unlinked copy is treated as a new tool, with no relationship to the original. For more information about linked and unlinked tools, see "Using the Items in a Tool Catalog" on page 179.

1. Open the tool catalog containing the tool you want to use. If the tool is located in a specific category of the catalog, open that category.
2. Move the pointer over the i-drop icon next to the tool, so that the pointer image changes to an eyedropper ().

   To select multiple tools to copy, press and hold CTRL while clicking each tool; then position the eyedropper over any of the selected tools. You can also select all the tools in the current category by right-clicking and clicking Select All.

3. Drag the eyedropper according to the desired action:

If you want to . . .	Then . . .
use the tool immediately	click the eyedropper and drag it into the drawing area.
store a linked copy of the tool on a tool palette in the tool palette set	click the eyedropper and drag it to a tool palette in the tool palette set.

If you want to . . .	Then . . .
create an unlinked copy of the tool on a tool palette in the tool palette set	press and hold ALT, then click the eyedropper and drag it to a tool palette in the tool palette set.

NOTE If a tool palette does not accept a tool, it might be because the palette is set to allow updates only from a linked tool palette in a tool catalog. To check this, right-click on the palette, click Properties, and look at the Refresh from setting. If Refresh from is selected, the palette is linked to a palette in a tool catalog. To break the link, clear Refresh from.

Copying a Tool Palette to the Autodesk Architectural Desktop Workspace

Use this procedure to store a copy of a tool palette in the tool palette set.

You can create a linked or unlinked copy of the tool palette. A linked copy remains connected to the original in the tool catalog, so that you can easily update the copy with any changes made to the original. An unlinked copy is treated as a new tool palette, with no relationship to the original. For more information about linked and unlinked tool palettes, see "Using the Items in a Tool Catalog" on page 179.

1. Open the tool catalog containing the tool palette to copy to the tool palette set. If the palette is located in a specific category of the catalog, open that category.
2. Move the pointer over the i-drop icon next to the tool palette, so that the pointer image changes to an eyedropper ( ).

   To copy multiple tool palettes, press and hold CTRL while clicking each palette; then position the eyedropper over any of the selected palettes.
3. Drag the eyedropper according to the desired action:

If you want to . . .	Then . . .
store a linked copy of the tool palette in the tool palette set	click the eyedropper and drag it to a tool palette in the tool palette set.
create an unlinked copy of the tool palette in the tool palette set	press and hold ALT, then click the eyedropper and drag it to a tool palette in the tool palette set.

Copying a Tool Package to the Autodesk Architectural Desktop Workspace

Use this procedure to copy a tool package to a palette in the tool palette set.

You can create linked or unlinked copies of the tools in the package. A linked copy remains connected to the original in the tool catalog, so that you can easily update the copy with any changes made to the original. An unlinked copy is treated as a new tool, with no relationship to the original. For more information about linked and unlinked tools, see "Using the Items in a Tool Catalog" on page 179.

1. Open the tool catalog containing the tool package to copy into the tool palette set. If the package is located in a specific category of the catalog, open that category.
2. Move the pointer over the i-drop icon next to the tool package, so that the pointer image changes to an eyedropper ( ).

   To copy multiple tool packages, press and hold CTRL while clicking each package; then position the eyedropper over any of the selected packages.
3. Drag the eyedropper according to the desired action:

If you want to . . .	Then . . .
store linked copies of the package's tools in the tool palette set	click the eyedropper and drag it to a tool palette in the tool palette set.
create unlinked copies of the package's tools in the tool palette set	press and hold ALT, then click the eyedropper and drag it to a tool palette in the tool palette set.

Refreshing Linked Tools

Use this procedure to update a linked tool with the contents of its source copy in a tool catalog.

- In the tool palette set, right-click the tool you want to refresh, and click Refresh Tool.

  If Refresh Tool is not listed on the shortcut menu, click Properties, and then, in the Tool Properties worksheet, select Refresh from.

Refreshing Linked Tool Palettes

Use this procedure to update a linked tool palette with the contents of its source copy in a tool catalog.

- In the tool palette set, right-click the tool palette you want to refresh, and click Refresh Palette.

  If Refresh Palette is not listed on the shortcut menu, click Properties, and then, in the Tool Palette Properties worksheet, select Refresh from.

Specifying Refresh Options for Linked Tool Palettes

Use this procedure to determine whether a linked tool palette and its tools are refreshed automatically from the tool catalog when you start Autodesk Architectural Desktop.

1. In the tool palette set, right-click the desired tool palette, and click Properties.
2. Select an Auto-refresh option:

If you want . . .	Then . . .
the tool palette and all its tools to refresh automatically when you start Autodesk Architectural Desktop	select Enable Auto-refresh. **NOTE** Refresh from must also be selected in order to enable Auto-refresh.
no automatic refreshing of the tool palette	clear Enable Auto-refresh.

3. Click OK.

Working with Multiple Content Browser Windows

You can open more than one copy of the Content Browser and you can move or copy items by dragging them between the windows. You can copy tool palettes, tool packages, and tools; you cannot copy tool catalogs between Content Browser windows. Only one catalog library can be open at any time.

When you drag tool catalog items between Content Browser windows, the following rules apply:

- If a different catalog is open in each Content Browser window, dragging an item copies it to the new location and leaves the original copy in place.
- If the same catalog is open in both Content Browser windows, dragging items from one window to the other moves the item (for example, from one category to another), removing the original copy.

If you have the same tool catalog open in multiple windows, and you add an item to the catalog, the tool catalog display is updated in all open Content Browser windows.

Opening Additional Content Browser Windows

You can open a new instance of the Content Browser by pressing CTRL+N in the Content Browser. You can also open a specific tool catalog, tool palette, or tool package in a new Content Browser window.

Closing Content Browser Windows

Closing one Content Browser window has no effect on other Content Browser windows. You can close all open Content Browser windows at once by right-clicking in the title bar of any window and selecting Close All Windows.

Related Topics and Procedures

- Opening a Tool Catalog in a New Content Browser Window
- Opening Catalog Items in a New Content Browser Window
- Dragging Catalog Items Between Content Browser Windows

Opening a Tool Catalog in a New Content Browser Window

Use this procedure to open a tool catalog in a new Content Browser window or display an open catalog in a new Content Browser window.

- With the catalog library displayed in the right pane of the Content Browser window, right-click the catalog to open, and click Open in New Window.

  or

- If a tool catalog is already open in the right pane of the Content Browser window, right-click in a blank area of the catalog, and click New Window.

You can open a specific category of the tool catalog in a new Content Browser window by opening the category.

Opening Catalog Items in a New Content Browser Window

Use this procedure to open a tool palette or tool package in a new Content Browser window.

1. Open the catalog containing the desired tool palette or tool package. If the item is located in a specific category of the catalog, open that category.
2. Right-click the tool palette or tool package, and click Open in New Window.

Dragging Catalog Items Between Content Browser Windows

Use this procedure to send tools, tool palettes, or tool packages from one catalog location to another by dragging them between two Content Browser windows. Moving an item removes it from its original location, while copying an item retains the original.

NOTE You must have write access to the original catalog before you can move it.

---

1. Open two Content Browser windows.
2. In the first Content Browser window, display the catalog item that you want to move or copy.
3. In the second Content Browser window, open the catalog, category, tool palette, or tool package to send the item to (only tools can be sent to palettes and packages).

4 In the first Content Browser window, move the pointer over the i-drop icon associated with the item to be moved, so that the pointer image changes to an eyedropper ( ).

If you want to . . .	Then . . .
move an item from one location to another within the same catalog	right-click and drag the item to its destination catalog or category in the second Content Browser window, and click Copy Here.
copy an item from one location to another in the same catalog	press CTRL; then click and drag the item to its destination catalog or category in the second Content Browser window.
move an item to a different catalog	press CTRL; then click and drag the item to its destination catalog or category in the second Content Browser window.
copy an item to a different catalog	click and drag the item to its destination catalog or category in the second Content Browser window.
move a tool to a tool palette or tool package in the same catalog	click and drag the item to its destination palette or package in the second Content Browser window.
copy a tool to a tool palette or tool package in the same catalog	press CTRL; then click and drag the item to its destination palette or package in the second Content Browser window.
move a tool to a tool palette or tool package in a different catalog	press CTRL; then click and drag the item to its destination palette or package in the second Content Browser window.
copy a tool to a tool palette or tool package in a different catalog	click and drag the item to its destination palette or package in the second Content Browser window.

Starting the Content Browser from a Windows Command Prompt

Use this procedure to open the Content Browser from a Windows command prompt, even if Autodesk Architectural Desktop is not currently open.

1. From the Windows Start menu, click Command Prompt.

   The location of the Command Prompt application varies from one version of Windows to another. It is most likely to be found either in Programs or on the Accessories menu within Programs.

2. At the command prompt, specify the Autodesk Architectural Desktop program folder as the current directory.
3. Enter the command *aeccb*, followed optionally by the path to the tool catalog you want the Content Browser to open. For example:

   aeccb "c:\my documents\my aec content browser library\mystuff\mystuff.atc"

Drawing Management

5

The Drawing Management feature formalizes and automates the processes relating to building model design and documentation. The feature provides automated tools that aid you in the management, viewing, and construction of your building information model and documents.

Because your project files are being managed with this feature, you can have consistency throughout all aspects of the project. Everyone on your design team has a centralized project environment for accessing the most current documents, from project templates to sections and elevations.

The Drawing Management feature enables you to create and manage projects, create and manage levels, and automate sheet creation.

Related Topics

- Concepts of Drawing Management
- Before You Begin: External References within a Project

In this Chapter

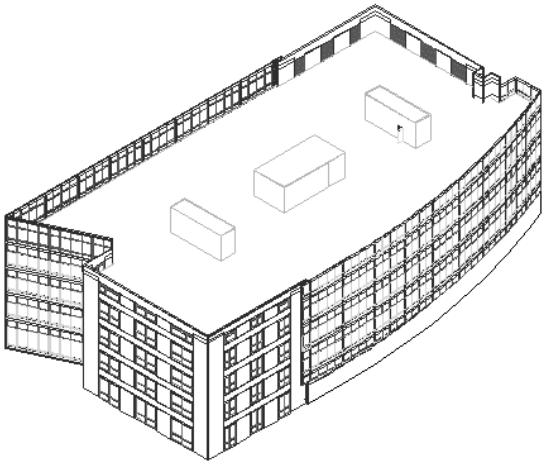
- Concepts of Drawing Management
- Process Overview
- The Project Browser
- The Project Navigator
- Levels
- Divisions
- Categories
- Constructs
- Elements
- Views
- Plotting Sheets
- Updating (Re-Pathing) the Project
- Refreshing the Project View
- Object Display in External References
- Annotating a Building Project
- Working with Cut Planes in a Project
- Running Drawing Management from the Command Line
- Frequently Asked Questions

- Before You Begin: Working in a Network Environment
- Process Overview: Working in a Project Environment
- The Project Browser
- The Project Navigator
- Levels
- Divisions
- Categories
- Constructs
- Elements
- Views
- Plotting Sheets
- Updating (Re-Pathing) the Project
- Refreshing the Project View
- Object Display in External References
- Annotating a Building Project
- Working with Cut Planes in a Project
- Running Drawing Management from the Command Line
- Frequently Asked Questions about Drawing Management

Concepts of Drawing Management

The Drawing Management feature of Autodesk®Architectural Desktop lets you create large building projects distributed among many drawing files, levels, and divisions (wings). The key concepts of the feature are described here.

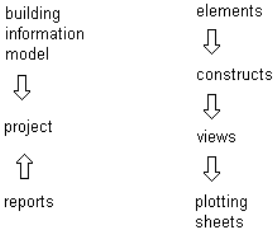
3D view of building project



Project

At the highest level, building information models are organized into projects. A project is composed of two parts: the building information model and the reports generated from the model. The building information model is composed of constructs and elements, while reports consist of views and plotting sheets. Within a project, elements are referenced into constructs, constructs are referenced into views, and views are referenced into plotting sheets.

For more information on projects, see "The Project Browser" on page 223.



External Reference Management

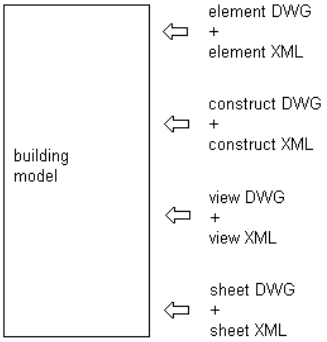
The basis of the Drawing Management feature is a sophisticated external reference mechanism that has been enhanced from its standard functionality. Powerful linking features ensure that your source files can be distributed over many different locations on your computer or on a network. You can assign schedule tables, annotation tags, and dimensions to external references easily. Different people can work simultaneously on the same project without time delays.

For more information on external references, see "Reference Other Drawing Files (Xrefs)" in the *AutoCAD 2004 Online User Guide*.

For more information on annotating external references in a project, see "Annotating a Building Project" on page 341.

XML Structure

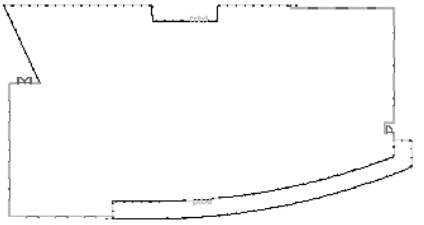
A project has an underlying XML structure. For each drawing file you create within a project—for example a floor drawing or a structural drawing—an accompanying XML file is created. The XML file contains project-relevant information, such as level and division information. You can reuse any drawing file created within a project outside the project as well, because the drawing file itself does not contain project-relevant information.



Constructs

A construct describes one unique portion of a building project and is assigned to a specific level and division within the project. Spanning constructs, like curtain walls, can be assigned to multiple levels and divisions.

Plan view of curtain wall spanning construct



For example, the first level of your building project may consist of an exterior shell construct, a first-level core construct, and a first-level interior partitions construct.

A construct can contain drawing objects, like walls and doors, external references to elements, or a combination of both. For example, a first-level core construct can contain the core walls directly drawn into the construct and an elevator element inserted as an external reference.

Constructs are referenced into views.

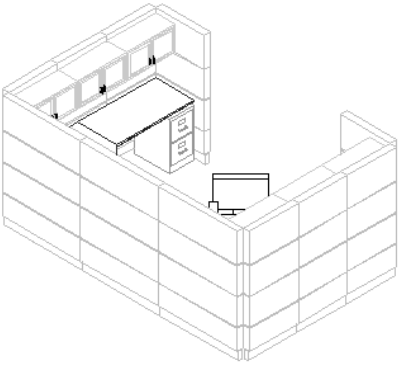
You can create and modify constructs within the current project. You can also import drawings and then convert them and add them to constructs. You can import constructs into the project physically or by creating a link.

For more information, see "Constructs" on page 268.

Elements

Elements are used for pieces of the building that are repeated multiple times within the building. For example, you could use an element to create a repeating design object like a desk/chair combination to be used for a number of cubicles in an office building.

3D view of cubicle element



An element is a generic building block for multiple use. The element knows nothing about which level or division it is placed on; that is determined by the construct it is referenced into. If you create a bathroom layout as an element, you can use it on the second floor of the west wing just as well as on the first floor of the east wing. To place the element on a specific floor and wing, you need to reference it into a construct. A construct has a level and division assignment. For example, you could create an element named "Generic Bathroom Layout" and reference it into constructs named "First Floor—Left Apartment," "First Floor—Middle Apartment," First Floor—Right Apartment," and so on.

Because the enhanced Schedule feature allows you to annotate instances of an external reference individually, you can use the same element and annotate it differently depending on its position.

You cannot automatically reference an element into a view, but you can reference an element directly into a plotting sheet. This might be done for title blocks or the documentation of a detail on the plotting sheet.

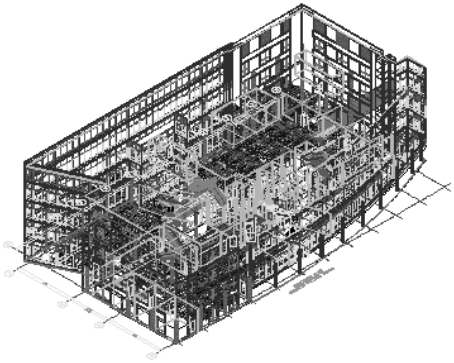
For more information, see "Elements" on page 290.

Views

Once the structure of the building information model is defined and constructs are assigned to levels and divisions, you can begin creating reports of the data. A view automatically references a number of constructs to present a specific view of the building project. To create a view you first decide what portion of the building you wish to look at and the type of view to generate. You could, for example, create a first-floor reflected ceiling plan or a second-floor framing plan. You could also create a composite view of all floors in the building. Views automatically reference the appropriate constructs according to their location within the building. For example, to create a floor plan of

the west wing of the second floor, you would create a view that references all constructs assigned to the second floor and the west wing. This would also include a curtain wall spanning the first through fifth floors. You can reference additional constructs that do not lie on that floor but which you want to see in the view, such as a building outline or grid.

3D view of entire building view



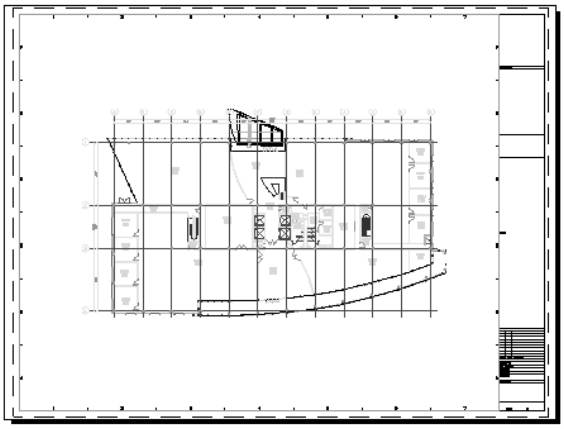
In the view you can also add project-wide data like annotation, dimensions, and schedule tables. Whether to create the annotation in the view or in a plotting sheet is a decision you make based on your workflow and individual needs. New functionality has been added to the Schedule feature for generating annotation data in a view and a plotting sheet.

For more information, see "Views" on page 307.

Plotting Sheets

Plotting sheets are used to plot plans of your building project. The plotting sheet references views. When a view is dragged onto a layout in a sheet, it is referenced into model space. A viewport is created on the layout large enough to fit the view at the zoom specified by the view. The viewport is zoomed to match the scale specified by the view and has the display configuration assigned as specified by the view. The viewport may also have a layer snapshot applied as specified by the view.

Plotting sheet with building plan view



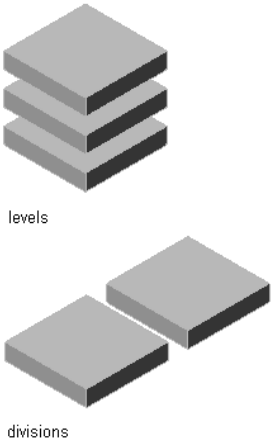
In the plotting sheet, you can add annotation like tags, dimensions, and schedule tables. Whether to create the annotation in the view or in a plotting sheet is a decision you make based on your workflow and individual needs. New functionality has been added to the Schedule feature for generating annotation data in a view and a plotting sheet.

For more information, see "Plotting Sheets" on page 324.

Levels and Divisions

The building information model provides a framework of levels and divisions (also called wings). By default, a new project consists of one level and one division. You can add levels and divisions throughout the lifetime of a project. The matrix of levels and divisions act as labels to help uniquely identify the building information model. For example, you could have a construct in your building named "First Floor—West Wing."

Levels and divisions schematic



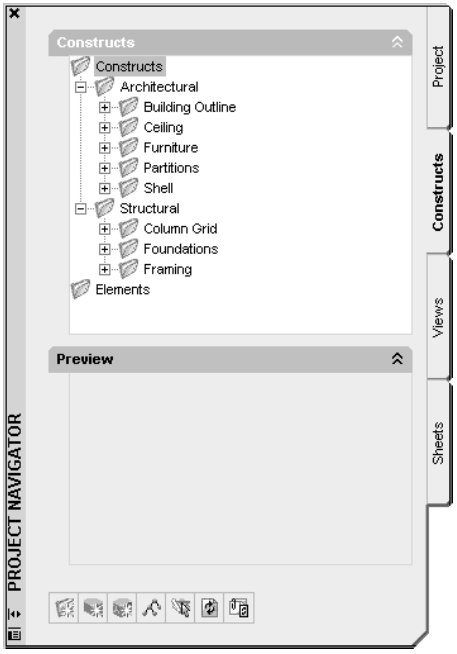
Building objects can span multiple levels and divisions. You can use a spanning construct for curtain walls, elevator shafts, and similar building elements.

For more information, see “Levels” on page 250, and “Divisions” on page 257.

Categories

To help organize the building information model, the parts of the building project—elements, constructs, views, and sheets—can be categorized. You can use categories like shell, core, and interior partitions. You can also use design-phase categories like conceptual design, building design, and documentation. Categorizing a construct also acts as a label for the construct that can be used when generating views.

Construct categories in the Project Navigator

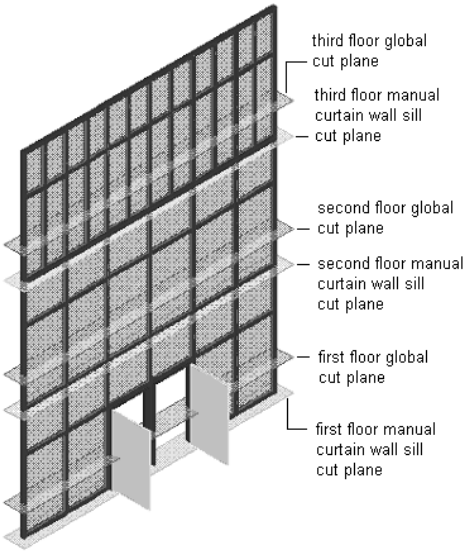


For more information, see “Categories” on page 260.

Cut Planes

When working on a complex building, you need optimal control over the cut plane settings. The Drawing Management feature provides the ability to define a global cut plane that is applied to a building level. You can define visible ranges above and below the cut plane offering flexibility when creating plans. In addition, objects such as walls, curtain walls, and slabs can use an individual cut plane set in the object or the object style.

3D view of curtain showing global and manual cut planes at each level



For more information, see "Working with Cut Planes in a Project" on page 362.

Converting Legacy Drawings to Project Drawings

You may have a set of drawing files that you want to convert into a project. You have the option to save any existing DWG file as an element, a construct, a view, or a sheet. Furthermore, you can use an existing folder structure as a categorization scheme by dragging and dropping entire folders with subfolders into the Project Navigator.

For more information, see "Converting a Legacy Drawing to an Element" on page 296, and "Converting a Legacy Drawing to a Construct" on page 276.

NOTE Views and plotting sheets are not well suited for conversion from legacy drawings. Because they contain project-specific settings that are not present in regular drawing files, it is easier to create views and plotting sheets from scratch.

Before You Begin: External References within a Project

The Drawing Management feature uses external references as a means to create a project and maintain it. Elements are referenced into constructs, constructs are referenced into views, and views are referenced into plotting sheets. The mechanism of referencing is identical to the regular AutoCAD External References Management. However, the background methods employed have additional features.

Whenever you define a project drawing, an accompanying XML file is created. That XML file contains information about level and division assignments and viewport and content information appropriate for the type of drawing. This XML file is vital for the project. Under no circumstances should you delete it (unless you are deleting the entire project).

The Project Navigator has a number of commands for referencing project files—like elements, constructs, and views—into other project files.

If you are working in a project environment, use the Project Navigator commands to reference project drawings into other project drawings. Do not use the standard AutoCAD Xref Manager to reference project drawing files into other project drawing files. The AutoCAD Xref Manager cannot differentiate between project drawings (with an accompanying XML file) and non-project drawings (plain DWG files). If you reference a non-project file into a project file by mistake, you cannot use the full set of Drawing Management functionality on that file. For example, a drawing file referenced into a project file via the AutoCAD Xref Manager is not assigned a project category and does not display in the Project Navigator tree.

Keep these considerations in mind when working with a project:

- Do not delete any XML files the Drawing Management feature generates. They are vital for the project.
- Use the commands of the Project Navigator to create, modify and reference project files within the project. If you want to use existing non-project files in a project, convert them to project files first. For more information, see "Converting a Legacy Drawing to an Element" on page 296 and "Converting a Legacy Drawing to a Construct" on page 276.

Before You Begin: Working in a Network Environment

When you are working on a large project, the project will often be hosted on a network server and be accessed by multiple users simultaneously. There are two points to note to create a seamless workflow:

- **Access restrictions on the network server:**

  You can limit other users' ability to edit and delete project files by using the network permissions. You can limit the Delete rights for the entire project, so that users cannot delete files from the project or move files around within the project. You might also consider just limiting the delete rights to the top project folder (containing the APJ file) and allow deleting in the subfolders.

- **Keeping the project tree current:**

  When multiple users are working on the same project simultaneously, the situation can occur that one user's view of the project gets out of sync with the changes of another user.

  For example, you might have one user who is adding/moving/deleting constructs in a project. At the same time, another user is annotating some plotting sheets. The user that is working on the plotting sheets is not automatically notified that his coworker has removed some constructs from the project. So if he tries to open a removed construct from his Project Navigator, he will get an error message.

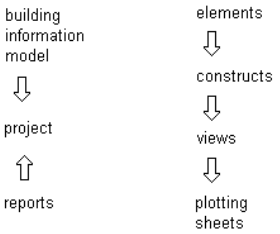
  To prevent this situation, it is necessary to frequently refresh the project view. When you refresh the project view, all items are updated to reflect the current project status.

  For more information, see "Refreshing the Project View" on page 334.

Process Overview: Working in a Project Environment

Working in a project environment is a new way of working within Autodesk® Architectural Desktop. In previous releases you worked on individual drawings, which contained architectural objects, annotation, and plot information. Now you can choose to work within a project environment, where

drawing files are interlinked and connected by a project file. You select numerous settings for the project, such as template locations, folder categories, and building data like levels and divisions. A drawing created within a project environment is edited and saved within the project structure. You can create specific views of your building constructs, and define tailor-made plot sheets for views. You can define categories such as Architectural, Structural, or HVAC into which your constructs are saved.



The Drawing Management feature has two main components—the Project Browser and the Project Navigator. In the Project Browser, you define the current project, create new projects, and set high-level project information such as default templates, file prefixes, and user-defined additional information like contact, financial, or legal details. In the Project Navigator, you perform all project-specific tasks, like creating project drawings or plotting sheets and setting levels and divisions.

The following basic steps lead you from start to finish through your project:

Step 1: Open the Project Browser.

Step 2: Create a new project or select an existing project, and define it as the current project environment.

For information on creating new projects, see "Creating a New Project" on page 229.

For information on selecting a project environment, see "Selecting the Current Project" on page 229.

Step 3: If necessary, change the high-level project data, such as default template locations or contact, financial, or legal information.

For more information, see "Changing the Project Properties" on page 235 and "Adding Project Details" on page 231.

Step 4: Close the Project Browser.

For more information, see "Closing the Project Browser" on page 238.

Step 5: Open the Project Navigator, if it is not already open.

Step 6: Define levels and divisions for the project selected in step 2.

For more information, see "Levels" on page 250 and "Divisions" on page 257.

Step 7: Create the elements and constructs of your building project.

For more information, see "Elements" on page 290 and "Constructs" on page 268.

Step 8: Create views of your building project: for example, a first-floor view or a structural view.

For more information, see "Views" on page 307.

Step 9: Create plotting sheets for the building project, including property set data, annotation tags, and dimensions.

For more information, see "Plotting Sheets" on page 324 and "Annotating a Building Project" on page 341.

The Project Browser

In the Project Browser, you perform high-level project-related tasks, such as creating a new project, selecting the current project, and setting default templates for elements, constructs, views, and sheets.

Related Topics

- Setting the Project Browser to Display at Startup
- Using the Project Browser
- The Project Structure
- Selecting the Current Project
- Creating a New Project
- Adding Project Details
- Creating a New Project with the Structure of an Existing Project
- Copying a Project
- Opening a Drawing File from the Project Browser
- Changing the Project Properties
- Moving a Project
- Renaming a Project
- Closing a Project
- Closing the Project Browser

- Deleting a Project
- Removing the Project Context

Setting the Project Browser to Display at Startup

By default, the Project Browser does not appear directly at startup. If you want to start the Project Browser each time you start Autodesk®Architectural Desktop, you can set this in the options.

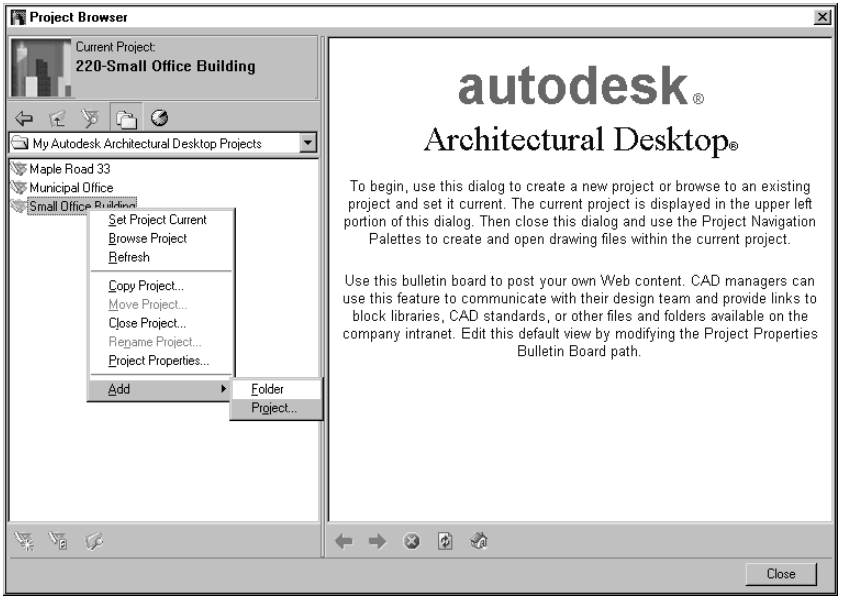
NOTE The Project Browser displays after the AutoCAD startup dialog box.

1. On the Format menu, click Options.
2. Click the AEC Project Defaults tab.
3. Select Show Project Browser at Startup.
4. Click OK.

Using the Project Browser

In the Project Browser, you create new projects, assign high-level project information, and select the current project.

Project Browser



On the left side of the Project Browser, you select the current project, create new projects, browse existing projects, edit project details, close a project, and refresh the project after making changes. All information you enter here pertains to the project as a whole. On the right side of the Project Browser, an embedded Internet Explorer allows you to browse your project home page.

NOTE The projects you create in the Project Browser will appear as files and folders in Internet Explorer. As a general rule you should not, however, perform any file operations on a project file there, except in those cases where a procedure explicitly states that you should. Changes in Internet Explorer will not always be updated correctly in the Project Browser, so that you might get an inconsistent view of your project data. Any changes you make to the project within the Project Browser are managed and coordinated by Autodesk Architectural Desktop. Changes made outside of the software might not be correctly updated and processed.

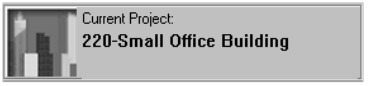
Related Topics

- The Project Header
- The Project Navigation Bar

- The Project Selector
- The Embedded Internet Explorer View

The Project Header

The currently selected project is displayed in the upper-left area of the Project Browser. The header contains the project name, project number, a user-selected bitmap representing the project, and an optional short project description. You enter this information when you create a new project or edit an existing one.



The Project Navigation Bar

Below the project header, toolbar buttons help you to navigate in your folder structure.

Button	Description
	Returns you to the previously displayed folder.
	Displays the folder structure one level above the currently displayed folder.
	Takes you to the Project File Navigator, where you can browse for project (APJ) files
	Displays the projects in the folder selected in the list below. For detailed information, see "The Project Selector" on page 226.
	Displays a historic list of projects sorted by various criteria. For detailed information, see "The Project Selector" on page 226.

The Project Selector

The project selector on the left side of the Project Browser displays the projects you have created in Architectural Desktop. You have several options for displaying projects:

View Option	Description
By Folder	When you click in the Navigation bar, the list below displays the folder structure of your computer. The contents of the currently selected folder are displayed in the project selector. Project files are displayed with the project icon .
By History	When you click in the Navigation bar, the list below presents display options: ■ If you select Most Recently Used, the last eight projects you have made current are displayed in descending order in the project selector. ■ If you select By Date, a list of project dates is displayed, sorted by current day, current week, and previous weeks. ■ If you select By Project, a list of project names is displayed, sorted alphabetically. ■ If you select By Location, a list of folders containing project files is displayed, in alphabetical order. If you double-click a folder, the projects contained in it are displayed.

The Embedded Internet Explorer View

When you create a new project, you can connect it to an HTML page. You might do this, for example, to provide a link to your company's home page or a project web site. The HTML page is displayed in the right window of the Project Browser. At the bottom of the page, there is a standard Internet

Explorer navigation bar with buttons for Back, Forward, Stop, Refresh and Project Home.

The Project Structure

When you are creating a new project, Autodesk® Architectural Desktop automatically creates a project environment to connect the individual files into one project.

Related Topics

- The Project (APJ) File
- The Default Category Structure

The Project (APJ) File

The project (APJ) file is the highest level of the project. It contains general information like project name, number, level and division information, default templates for new elements, constructs, views, and sheets. The project file also contains a user-configurable detail sheet in which you can put additional information, such as contractor information or legal details. You typically set up the project file once during the lifetime of the project, changing only details about it when necessary.

NOTE The APJ file is a well-formed XML document. If you open it in an XML editor, you can change it there.

The Default Category Structure

The categories within a project are represented by file folders.

When you create a new project, the following default category structure is created:

- **<MyProjectName>:** The top category uses the name you have given your project.
- **Constructs:** The default category for constructs in the project.
- **Elements:** The default category for elements in the project.

- **Views:** The default category for views in the project.
- **Sheets:** The default category for plotting sheets in the project.

When you create a new project, these categories are empty.

These top four categories cannot be changed. You can however create subcategories in each of these basic categories. Categories are very useful within a project. For more information, see "Categories" on page 260.

Selecting the Current Project

Use this procedure to select the current project.

If you want to work on a project, you must first define the current project. Only one project per session can be current and all project operations you perform, such as adding elements and constructs or changing levels and divisions, are done within the current project.

When you select a project as the current one, its project header and default HTML bulletin board are displayed in the Project Browser.

NOTE If your Project Browser does not yet contain any projects, see "Creating a New Project" on page 229.

---

1. On the File menu, click Project Browser.
2. In the project selector, select a project.
   Projects are displayed with a project icon .
3. Right-click, and click Set Project Current.

   NOTE Alternatively, you can double-click the project.

   The selected project is loaded in Autodesk®Architectural Desktop, and you can work with it until you close it or select another one.

Creating a New Project

Use this procedure to create a new project.

1. On the File menu, click Project Browser.
2. In the project selector, locate the folder in which you want to place the new project.
3. Create a new project in one of these ways:

- Right-click in the project selector, and click Add ➤ Project.
- In the toolbar below the project selector, click .

4 Define the settings for the new project:

Setting	Description
Number	Each project needs a unique identification number. You can use numerals, alphabetic characters, or a combination, such as 100A. The project number appears in the project header. **NOTE** The number you assign here can be used as a prefix for all drawings you create in the project. **NOTE** You can also use the number as a property for a title block. For more information, see "Creating a Title Block for a Project" on page 356.
Name	Enter the project name here. This appears in the project header. **NOTE** You can also use the name as an automatic property for a title block. For more information, see "Creating a Title Block for a Project" on page 356.
Description	This field is optional. The description you enter here should be brief; it appears in the project header. Click the setting for Description, enter a short description of the project, and click OK. Note that this is not usually the place where you enter details about the project—you have a separate worksheet to do this. For information about adding detailed information on the project, see "Adding Project Details" on page 231.
Bulletin Board	You can connect a project in the Project Browser with an HTML file, pointing to your company home page or a project web site. Click the setting for Bulletin Board, and click . Then, select the HTML page to appear in the Project Browser, and click Open. The page selected is displayed in the right side of the Project Browser in an embedded Internet Explorer.

Setting	Description
Project Image	You can select a BMP image for the project header. Click the setting for Project Image, and click . Then, select the bitmap file to appear in the project header, and click Open. **TIP** Due to the relatively small size of the header (64x64 pixels), a simple image with clear contrasts creates the best effect.
Prefix Filenames with Project Number	When you select Prefix Filenames with Project Number, drawing files created within this project have the project number prefixed to their file names. You could create file names like "100A-First Floor" or "100A-Structural." If you select No, no prefix is added to drawing files created within this project. **NOTE** Omitting a prefix has no influence on whether drawing files are assigned to the project. Every drawing file you create and save within a project is connected to that project, regardless of prefixes. **TIP** When you add or change the prefix setting in an existing project, only the new files created within the project reflect the prefix change. Existing files still have the old prefix settings.
Default Sheet/View/ Construct/Element Template	Click the setting for the appropriate template, and click .Then, select a drawing template, and click OK. The template you set here is used by default for all new drawing files of the selected type. For example, if you set the *Architectural Sheet (Imperial - stb).dwt* as the default sheet template, all new plotting sheets are created with that template. **NOTE** Autodesk®Architectural Desktop is shipped with default templates for sheets, elements, constructs, and views. The default location for drawing templates is at *\\Documents and Settings\All Users\Local Settings\Application Data\Autodesk\Architectural Desktop 2004\R16.0\enu\Template*.

5 When you are finished with the project settings, click OK.

Adding Project Details

Use this procedure to add detailed information about the project.

Detailed information might include contact information about contractors, legal representatives, or others. You can also track changes and improvements to the project here.

You can create detail categories and detail items. A detail category could be "Financial Data." A possible detail item in it could be "Loan Amount" or "Grant Amount." The structure of the details worksheet lets you create an information model that meets your needs.

You can use project details later to create schedule tables of your project or title blocks for plotting sheets. For more information, see "Annotating a Building Project" on page 341.

NOTE The information you enter here is saved in the APJ file in XML format. You can open the APJ file in an XML editor in order to edit the detail information. For more information, see "The Project (APJ) File" on page 228.

---

1. On the File menu, click Project Browser.
2. Create a new project or select an existing project, right-click, and click Project Properties.
3. Click .

   By default, a list of proposed details and categories has already been set up. The details themselves have not yet been filled in. You can use those categories or delete them and create different ones.
4. Design your project information model:

If you want to . . .	Then . . .
add content to a detail item	enter the content in the right column of the appropriate detail row.
add a detail category	click . Then, enter a name for the new detail category, and click OK.
add a detail item within a detail category	select the category, and click . Then, enter a name for the new detail, and press ENTER.
remove a detail item	select the detail item, and click .

If you want to . . .	Then . . .
remove a detail category	first delete all detail items in the detail category; then select the category, and click .

5 Click OK twice to finish editing the detail information of your project and to return to the Project Browser.

Creating a New Project with the Structure of an Existing Project

Use this procedure to create a new project with the structure of an existing project.

Creating a new project based on an existing project saves a lot of time because many settings are already defined. Settings copied to the new project include the following:

- Project number (appended with a numeral)
- Project name (appended with a numeral)
- Project prefix
- Project location
- Default element, construct, view, and sheet template path locations
- HTML bulletin board
- Project image
- Project details
- Project structure (categories)
- Levels and divisions

NOTE The files contained in the source project are not copied to the new project.

1 On the File menu, click Project Browser.

2 In the project selector, locate the folder in which the project you want to copy is located.

3 Select the project you want to copy, right-click, and click Copy Project Structure.

4 Define the settings for the new project:

Setting	Description
Number	Each project needs a unique identification number. You can use numerals, alphabetic characters, or a combination, such as 100A. The project number appears in the project header. **NOTE** The number you assign here can be used as a prefix for all drawings you create in the project. **NOTE** You can also use the number as a property for a title block. For more information, see "Creating a Title Block for a Project" on page 356.
Name	Enter the project name here. This appears in the project header.
Description	This field is optional. The description you enter here should be brief; it appears in the project header. Click the setting for Description, enter a short description of the project, and click OK. Note that this is not usually the place where you enter details about the project—you have a separate worksheet to do this. For information on adding detailed information on the project, see "Adding Project Details" on page 231.
Copy To...	Select a folder in which you want to save the copied project. Click the setting for Copy To, and click . Then, browse to the desired folder location.

5 When you are finished with the project settings, click OK.

Copying a Project

Use this procedure to copy a project with all of its files.

To copy a project and its files, use Internet Explorer. To rename it correctly, use the Project Browser.

NOTE It is recommended that you close Autodesk® Architectural Desktop before copying a project.

1 In Internet Explorer, navigate to the folder of the project you want to copy.

2 Copy the folder, and paste it to the desired folder location.

3 Open Autodesk Architectural Desktop.

4 On the File menu, click Project Browser.

5 In the project selector, navigate to the folder to which you have copied the project folder.

The copied project is listed in the new location, but still with its old name.

6 Select the project, right-click, and click Rename Project.

7 Enter the new name, and click OK.

Opening a Drawing File from the Project Browser

Use this procedure to open a drawing file from the Project Browser.

NOTE Usually, you open project drawing files from the Project Navigator. For information, see "The Tabs of the Project Navigator" on page 241.

---

1 On the File menu, click Project Browser.

2 Click .

3 Browse your hard disk or a server volume for the DWG file that you want to work on.

4 Click Open.

The selected project is opened in the drawing area. You are able to work on it after you have closed the Project Browser.

Changing the Project Properties

Use this procedure to change the default templates, the bulletin board, or the project details of an existing project.

1 On the File menu, click Project Browser.

2 In the project selector, select the project for which to change the properties, right-click, and click Project Properties.

3 Change the properties as needed. For detailed information about project properties, see "Creating a New Project" on page 229, and "Adding Project Details" on page 231.

4 Click OK to finish editing the project properties, and return to the Project Browser.

Moving a Project

Use this procedure to move a project with all its associated files to a different file location.

When you move a project, all internal paths between the project files are automatically updated, so that all relationships between drawings are kept current.

To move a project to a different file location, it must be closed. For more information, see "Closing a Project" on page 237.

NOTE Do not move a project file to a different file location with the Internet Explorer. This might result in inconsistent project data.

---

1. On the File menu, click Project Browser.
2. Select the project you want to move, right-click, and click Move Project.
3. Select the location into which you want to move the project.
4. Click OK.

   The project and all its files and folders are moved to the new location.

Renaming a Project

Use this procedure to rename an existing project.

Renaming a project performs the following changes on the project files:

- Renames the project in Project Browser
- Renames the APJ file
- Renames the top project folder

When you rename a project, all internal paths between the project files are automatically updated, so that all relationships between drawings are kept current.

Renaming a project renames both the APJ file and the project folder.

To rename a project, it must be closed. For more information, see "Closing a Project" on page 237.

NOTE Do not rename the project file in the Internet Explorer. This might result in inconsistent project data.

---

1. On the File menu, click Project Browser.
2. In the project selector, select the project you want to rename, right-click, and click Rename Project.
3. Enter the new name, and click OK.

Closing a Project

Use this procedure to close a project.

If you do not want to work in a project environment in Autodesk® Architectural Desktop, you have the option of closing the current project, so that the program is in a non-project related state. You could do this if you are working on non-project drawing files, and do not want to accidentally make changes to a project.

To work with a project again, you need to set a project current, as described in "Selecting the Current Project" on page 229.

1. Open the Project Browser.
2. In the project selector, locate the currently active project.

NOTE The currently active project is listed in the project header.

3. Select the project, right-click, and click Close Current Project.

Deleting a Project

Use this procedure to delete a project.

Deleting a project is a system administrator task. Therefore, you do not perform it from within the Project Browser but from Internet Explorer.

Deleting the project folder deletes all DWG files, XML files, and the APJ file. Before you do this, make sure that you really do not need any of these files anymore. If you do not work on a project any longer but still want to save the DWG files in it, it is often sufficient to just remove the project context, as described in "Removing the Project Context" on page 238.

NOTE Before you delete a project, make sure that is not the current project in Autodesk Architectural Desktop.

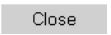
1. In Internet Explorer, navigate to the folder of the project you want to delete.

2 Delete the project there.

Closing the Project Browser

Closing the Project Browser leads you to the next phase, where you are working on the actual building project, as represented by elements, constructs, building views, and plotting sheets. In this phase, you work mainly with the Project Navigator. For more information, see "The Project Navigator" on page 239.

Close the Project Browser with one of these buttons:

Button	Description
	Click the Autodesk® Architectural Desktop button in the dialog box header, right-click, and click Close.
	Click the Close button in the lower-right corner of the Project Browser.
	Click the Windows Close button in the upper-right corner of the Project Browser.

Removing the Project Context

Use this procedure to remove all project-related information from the drawing files of a project. You could call this "exploding" a project.

NOTE You remove the project-specific information in Internet Explorer.

In some cases, you need to revert project-related files to plain drawing files. You could do that if you wanted to hand over the files to a contractor who does not work with the latest version of Autodesk® Architectural Desktop, or if the project does not exist any longer but you do not want to delete the drawing files.

Much of the project-related information of a drawing file does not reside in the drawing file itself, but in the accompanying, automatically created XML file of the drawing. This means that you can use all of your project files at any time in a non-project related drawing context. However, if you want to permanently work without the project context, it is recommended that you clean your file set of the unused project files.

All of the project related information resides in the following files:

- The APJ file: contains the general, high-level project data, like name, number, and project details.
- The accompanying XML files of the drawing files: stores the project information of the individual drawing files.

If you delete these files, the remaining drawing files have no connections to a project anymore. They are regular Autodesk Architectural Desktop drawing files and can be copied, edited, and deleted like any other drawing file.

1. In Internet Explorer, navigate to the folder containing the project.
2. In the project folder, delete the APJ file. For example, if you have a project named "Office Building," delete the "Office Building.apj" file.
3. Open the Elements, Constructs, Sheets, and Views folders, and delete the accompanying XML files of your drawing files.

   For example, if you have a drawing named "First Floor Construct.dwg" in your Constructs folder, select the accompanying "First Floor Construct.xml" file, and delete it.

4. Repeat step 3 for each drawing file.
5. If necessary, organize the remaining drawing files in a different folder structure.

NOTE If you reorganize files into a difference file structure you will have to manually reset each of the drawings external reference paths, if they have them.

The Project Navigator

Once you have selected a project in the Project Browser, you open the Project Navigator to create the actual building and documentation data. Here you create elements, constructs, views, sheets, and connect them with one another.

NOTE The project files and categories you create in the Project Navigator will appear as files and folders in the Internet Explorer. You should not, however, perform any file operations on a project file there. Do not move, copy, delete, or rename project files from Internet Explorer. These changes will not be updated in the Project Navigator, so that you might get an inconsistent view of your project data. Any changes you make to the project within the Project Navigator

are managed and coordinated by Autodesk Architectural Desktop. Changes made outside of the software might not be correctly updated and processed.

NOTE When you have made changes to a project file in the Project Navigator, such as renaming, deleting, or changing the properties of a project file, you cannot undo these changes by using the AutoCAD Undo commands.

Related Topics

- Opening the Project Navigator
- Working in the Project Navigator without an Open Drawing
- The Tabs of the Project Navigator
- Using the Project Navigator
- The Project Status Bar

Opening the Project Navigator

Use this procedure to open the Project Navigator.

NOTE You can open the Project Navigator only when a drawing file is open in Autodesk® Architectural Desktop.

1. On the Window menu, click Project Navigator Palette.
2. Click the tab you want to display.

Working in the Project Navigator without an Open Drawing

When you start Autodesk® Architectural Desktop, a new drawing is automatically opened. When a drawing is open, you can access the Autodesk Architectural Desktop commands for opening the Project Browser and opening the Project Navigator. If you close all open drawings, you cannot open the Project Browser and the Project Navigator.

However, if the Project Navigator is open while you close all open drawings, it remains open and works in a reduced way.

WARNING! When you perform changes in the Project Navigator that require re-pathing files in the project, such as renaming a file or moving it to a different location, the re-pathing process is not initiated upon exiting the application. All

changes to the project are lost. For information on re-pathing files, see "Updating (Re-Pathing) the Project" on page 333.

In a program state with no open drawings you can do the following:

- Open existing project drawings
- Create categories in the Project Navigator tabs

It is strongly recommended that you always have a drawing file open when working in the Project Navigator.

The Tabs of the Project Navigator

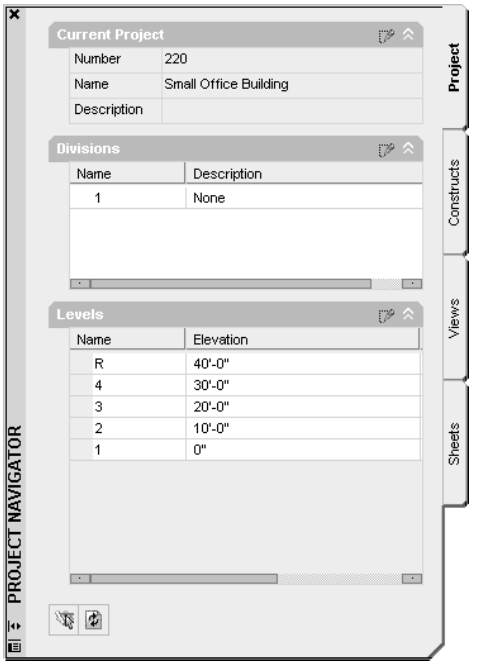
The Project Navigator has four tabs on which you can enter project data. The tabs correspond to the main phases of project creation: general project information (levels and divisions), creating building data (elements and constructs), and creating building documentation (views and sheets).

Related Topics

- The Project Tab
- The Constructs Tab
- The Views Tab
- The Sheets Tab

The Project Tab

In the Project tab, you enter information pertaining to the entire project.

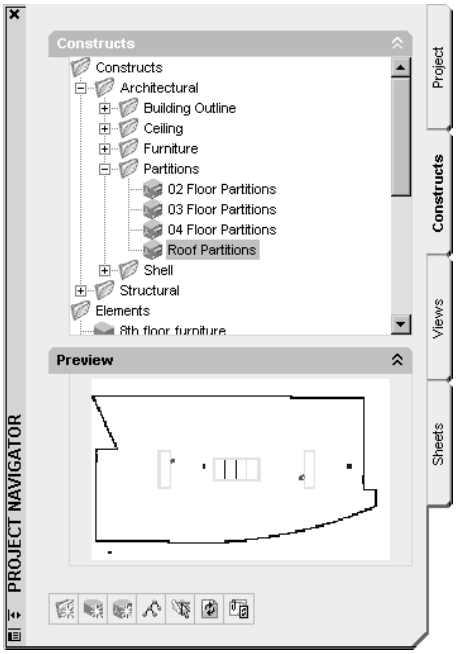


In the Project tab, you can perform the following actions:

- Adding, modifying, and deleting levels. For more information, see "Levels" on page 250.
- Adding, modifying, and deleting divisions. For more information, see "Divisions" on page 257.
- Changing project information.
- Launching the Project Browser.

The Constructs Tab

In the Constructs tab, you add the basic building data for your project.

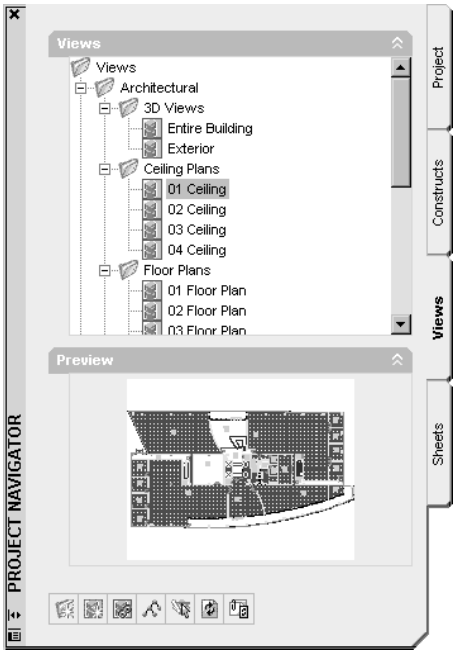


In the Constructs tab, you can perform the following actions:

- Adding, modifying, and deleting elements and constructs within the project. For more information, see "Elements" on page 290 and "Constructs" on page 268.
- Opening existing element and construct drawings. For more information, see "Opening and Closing an Element" on page 299 and "Opening and Closing a Construct" on page 279.
- Creating categories for elements and constructs. For more information, see "Categories" on page 260.
- Referencing elements into constructs. For more information, see "Attaching an Element as an External Reference to a Construct" on page 283 and "Overlaying an Element as an External Reference to a Construct" on page 283.

The Views Tab

In the Views tab, you assemble individual views of your project. Views are created from constructs within the project.

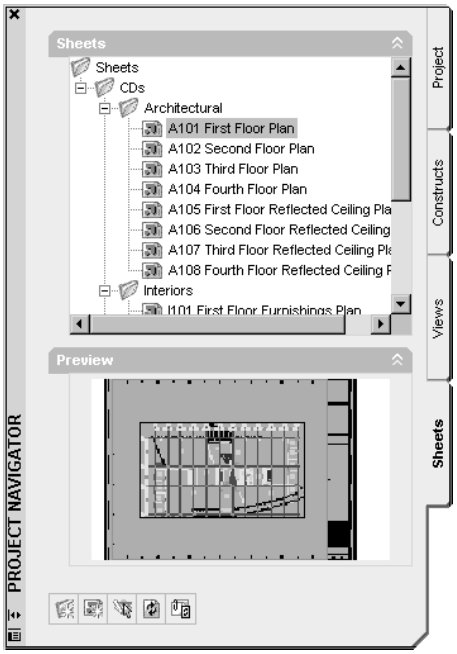


In the Views tab, you can perform the following actions:

- Adding, modifying, and deleting views in the project. For more information, see "Views" on page 307.
- Opening existing views. For more information, see "Opening and Closing a View" on page 320.
- Changing the contents of views. For more information, see "Changing the Properties of a View" on page 321.
- Creating categories for views. For more information, see "Categories" on page 260.

The Sheets Tab

In the Sheets tab, you create plotting sheets for your project. Plotting sheets contain referenced views and annotation and are used exclusively for plotting drawings. In the plotting sheet you typically define plot-related settings like plot style tables and specific print layouts.



In the Sheets tab, you can perform the following actions:

- Adding, modifying, and deleting plotting sheets in the project. For more information, see "Plotting Sheets" on page 324.
- Opening existing plotting sheets. For more information, see "Opening and Closing a Plotting Sheet" on page 328.
- Creating categories for plotting sheets. For more information, see "Categories" on page 260.

Using the Project Navigator

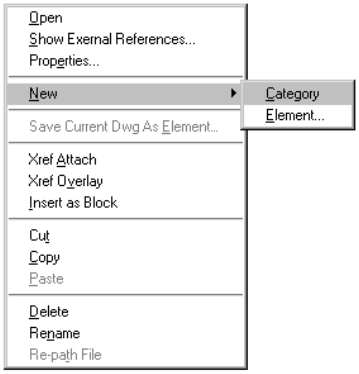
The Project Navigator is the main point from which you work with the project. Its four tabs have a number of interface components you can work with.

Related Topics

- The Shortcut Menu
- The Project Navigator Toolbar
- Drag and Drop in the Project Navigator

The Shortcut Menu

Each tab of the Project Navigator except the Project tab has a tree where the associated project drawing files—elements, constructs, views, and sheets—are displayed. Within the tree you can select a drawing file, and right-click it to display its shortcut menu.



The commands on the shortcut menu may vary slightly depending on the type of project file selected, but they have a common structure:

Command	Description
Open	Opens the selected project drawing file within Autodesk® Architectural Desktop.
Show External References	Displays a worksheet that lists all external references in the selected project drawing file.
Properties	Opens the properties of the selected project drawing file. Depending on the file type, the properties can differ. A construct, for example, has settings for level and division assignment; a view has a list of constructs assigned to it. For detailed information on file properties, see the appropriate sections for the individual file types.
New ➤ Category	Creates a new category for the file type selected: for example, an element category or a construct category. For more information, see "Categories" on page 260.
New ➤ Element/ Construct/View/Sheet	Creates a new project file of the specified type. For more information, see "Creating a New Element" on page 294, "Creating a New Construct" on page 272, "Creating a New View" on page 313, and "Creating a New Plotting Sheet" on page 327.

Command	Description
Save Current DWG as Element/Construct/ View/Sheet	Converts legacy drawings (created outside the project environment) into project file drawings. **NOTE** The legacy file must be open to run this command.
Xref Attach	Attaches the selected drawing as an external reference to the currently active drawing in Autodesk Architectural Desktop. **NOTE** The drawing must be closed when you attach it.
Xref Overlay	Overlays the selected drawing as an external reference to the currently active drawing in Autodesk Architectural Desktop. **NOTE** The drawing must be closed when you overlay it.
Insert as Block	Inserts the selected drawing as a block into the currently active drawing. **NOTE** The drawing must be closed when you insert it as a block.
Cut	Cuts the selected file from the tree. Use this command together with Paste to relocate drawing files within the tree. **NOTE** You cannot cut a file that is currently open.
Copy	Copies the selected file. Use this command together with Paste to copy a file to a different location.
Paste	Pastes a cut or copied file to a new file location. When you have pasted a file in a different location, you should re-path the project to update the file information.
Delete	Deletes the selected file. **NOTE** You cannot delete a file that is currently open.
Rename	Renames the selected file. **NOTE** You cannot rename a file that is currently open. When you have renamed a file, you should re-path the project to update the file information.
Re-path File	Updates all path and file information for project files. You should do this every time you have renamed or moved a project file.

The Project Navigator Toolbar

Each Project Navigator tab has a toolbar at the bottom. The toolbar helps you to perform the tasks on each tab. The buttons on the toolbar may vary

depending on the tab selected, but they have a common structure:

Button	Description
	Launches the Project Browser from within the Project Navigator. This button is available from every tab on the Project Navigator.
	Refreshes the project information in the project tree. The Refresh button guarantees that your tree and preview are updated to the current state and synchronized with information added or changed by other users. This button is available from every tab on the Project Navigator. **NOTE** Refreshing the project frequently is especially important when you are working with a project on a network server.
	Adds a new category for elements, constructs, views, and sheets. You can nest categories and create an organizational tree. Note that the category type is determined by the tab sheet; when you create a new category in the Views tab, a view category is created. This button is available from all tabs except the Project tab. **NOTE** Alternatively, you can create a new category from the shortcut menu.
	Creates a new element. This button is available only from the Constructs tab. **NOTE** Alternatively, you can create a new element from the shortcut menu.
	Creates a new construct. This button is available only from the Constructs tab. **NOTE** Alternatively, you can create a new construct from the shortcut menu.
	Shows the external references attached to the selected project file drawing. This button is available from all tabs except the Project tab. **NOTE** Alternatively, you can display the external references from the shortcut menu.
	Use this button to update the file names and paths in the project after moving, copying, or renaming files. To guarantee current project information, you should run this command after each change. This button is available from all tabs except the Project tab.

Button	Description
	Use this button to create a new view. This button is available only from the Views tab. **NOTE** Alternatively, you can create a new view from the shortcut menu.
	Use this button to reload all of the external references needed to generate the selected view after editing external references in the view, or adding new references. This button is available only from the Views tab. **NOTE** Alternatively, you can regenerate a view from the shortcut menu.
	Use this button to create a new plotting sheet drawing. This button is available only from the Sheets tab. **NOTE** Alternatively, you can create a new sheet from the shortcut menu.

Drag and Drop in the Project Navigator

The Project Navigator allows comfortable drag-and-drop operations within the Project Navigator tabs, from the Project Navigator to the Autodesk® Architectural Desktop drawing area, and to and from Internet Explorer.

The following drag-and-drop operations are supported:

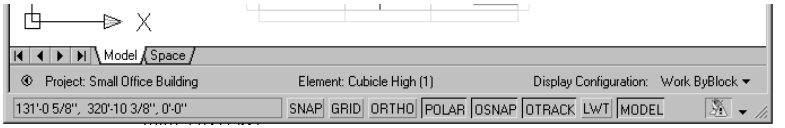
- Dragging elements, constructs, views, and sheets from one category in the tree to another
- Dragging elements, constructs, views, and sheets from the tree into the Autodesk Architectural Desktop drawing area
- Dragging and dropping objects from an open drawing in the drawing area onto an element or construct in the Project Navigator
- Dragging drawing files from Internet Explorer to the Project Navigator tree; depending on where you drag them, drawing files are converted to elements, constructs, views, or plotting sheets.

For detailed information on dragging and dropping files, see the appropriate sections for the project files.

The Project Status Bar

When you are working with a drawing in a project, the project status bar of the Autodesk®Architectural Desktop drawing area displays the name of the current project, the name of the project file, and the project file type. When

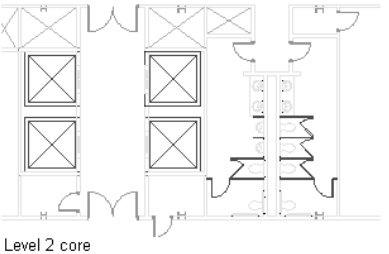
you open a drawing that does not belong to a project, no project information is displayed.



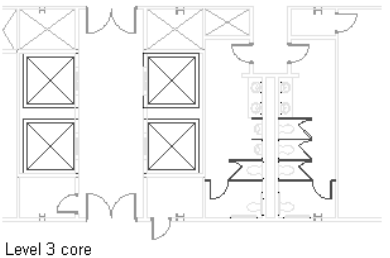
Levels

Buildings are segmented into levels in the vertical plane. When you create a project, you determine the number of levels, their floor-to-floor height, and their floor elevation. When you add or remove levels, the project is updated with the new level information.

Plan view of identical building core levels



Level 2 core



Level 3 core

Level Cut Plane

The cut plane is not set directly in the level. To set a cut plane for a level, you typically create a view for the level—for example, "First Floor"—and set the cut plane height in the display configuration of the First Floor view. For more information, see "Working with Cut Planes in a Project" on page 362.

Level Defaults

By default, the first level is present in each new project. It has a floor elevation of zero and represents the ground floor. The unit in which the level height is displayed is dependent on the drawing defaults of the currently active drawing. You can change the elevation value for the first level, which is then used as the default elevation for each new level you insert.

Copying Levels with Constructs

You can quickly and easily duplicate floors with identical plans. After creating one level and assigning the floor plan constructs to it—for example, a layout of apartments on the first floor—you can easily create new levels, which have copies of the first level's constructs assigned to them. You can edit and rename these constructs later in the Constructs tab.

TIP If you duplicate floor plans in this way, a construct is created for each new level. If you edit the floor plan later, for example, to add an extra door, you need to edit each level and construct individually. If your floor plans are going to be absolutely identical, you can avoid this task. Create an element containing the floor plan, and reference it into the first construct. Then copy the constructs to the levels. Each of the copied constructs have the same reference, and you can change them quickly by changing the referenced element once.

For information on creating constructs and assigning them to levels, see "Creating a New Construct" on page 272.

For information on creating elements and referencing them into constructs, see "Creating a New Element" on page 294, and "Attaching an Element as an External Reference to a Construct" on page 283.

Related Topics

- Creating a New Level
- Copying a Level with Assigned Constructs
- Changing the Properties of a Level
- Deleting a Level
- Changing Levels: Interactions with the Project

Creating a New Level

Use this procedure to add levels to a building.

1. On the Window menu, click Project Navigator Palette.
2. Click the Project tab.

3 Under Levels, click .

4 If you want each new level to take its floor elevation from the height of the level below, click Auto-Adjust Elevation.

5 Add a level in one of the following ways:

If you want to . . .	Then . . .
add a level above the current level	click . The default floor-to-floor height of the new level is identical to the level below. If you have selected Auto-Adjust Elevation, the level's floor elevation starts on top of the previous level. **NOTE** Alternatively, you can select the level above which you want to add a level, right-click, and click Add Level Above.
add a level below the current level	select the level below which you want to add a level, right-click, and click Add Level Below. **NOTE** If you add a level below the ground floor and you have selected Auto-Adjust Elevation, the elevation of the new level is a negative height.

NOTE If you add a level between existing levels and you have selected Auto-Adjust Elevation, the elevations of all levels above or below the new level are automatically adjusted.

6 If necessary, edit the properties of the new level:

If you want to . . .	Then . . .
change the name of the level	click the name, and enter a new one. Note that you cannot give the same name to two different levels—the name is the unique identifier of the level when assigning constructs.
change the base elevation of the level	enter a new value. If you have selected Auto-Adjust Elevation, the base elevation fits with the elevation and floor height of the level below, and you won't need to make changes here. **NOTE** The base elevation of a level determines where the level starts on the horizontal plane. Usually, the base elevation of a level is determined by the floor-to-floor height of the level below.

If you want to . . .	Then . . .
change the floor-to-floor height of the level	enter a new value. If you add levels above this level and you have selected Auto-Adjust Elevation, they use the floor height of this level is used as the base elevation.
change the ID of the level	enter a new ID. The ID can be used in schedule tables. For more information on scheduling a project, see "Annotating a Building Project" on page 341.
add a description to the level	enter a description for the level.

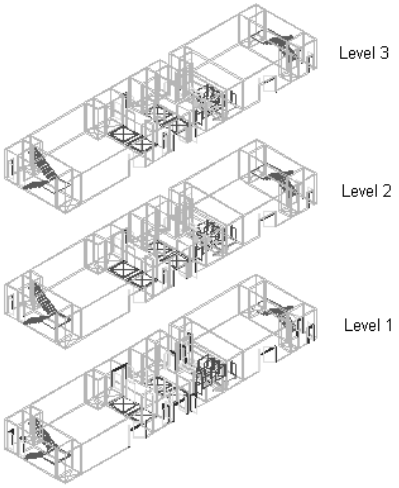
7 When you are finished adding levels to the project, click OK.

8 Click Yes in the subsequent dialog box to update the changed level information throughout the project.

Copying a Level with Assigned Constructs

Use this procedure to copy an existing level and all its assigned constructs within the building.

3D view of copied levels with assigned constructs



When you create a new level, it is empty and has no constructs assigned. After you have assigned constructs to the level, as described in "Creating a New Construct" on page 272, you can copy that level and its constructs within the building. For example, perhaps you have created a first-floor level

and assigned three apartment constructs to it. To create a second-floor level with exactly the same layout, you can copy and paste the first level with its apartment constructs and rename it "Second Floor."

1. Create a level and assign constructs to it.

   For more information, see "Creating a New Construct" on page 272.

2. On the Window menu, click Project Navigator Palette.
3. Click the Project tab.
4. Under Levels, click .
5. Select the name of the level you want to copy, right-click, and click Copy Level and Contents.
6. Click the level above or below the one on which you want to place the copied level, right-click, and click Paste Level Above or Paste Level Below.
7. Rename the pasted level accordingly: for example, "Second Level."
8. If necessary, edit the description and the ID.
9. Click OK.
10. Click Yes in the subsequent dialog box to update the changed level information throughout the project.
11. Click the Constructs tab.
12. Locate the Constructs category.

    The constructs that were created by copying the level and constructs are below the original construct. For example, if you copied the first-floor-level with a construct named "First Floor—Left Apartment," you now have two constructs: "First Floor—Left Apartment" and "First Floor—Left Apartment (2)."
13. If necessary, rename the copied construct with an appropriate name: for example, "Second Floor—Left Apartment."
14. To update the tree in the Project Navigator, click .

Changing the Properties of a Level

Use this procedure to change the properties of a level.

1. On the Window menu, click Project Navigator Palette.
2. Click the Project tab.
3. Under Levels, click .

4 Change the level information as needed:

If you want to . . .	Then . . .
change the name of the level	click the name, and enter a new one.
change the elevation of a level	click the floor elevation, and change it. **NOTE** If you have selected Auto-Adjust Elevation, the levels above and below the level are changed accordingly. To prevent this, clear Auto-Adjust Elevation before making changes to the elevation.
change the floor-to-floor height of a level	click the floor-to-floor height, and change it. **NOTE** If you have selected Auto-Adjust Elevation and there are levels above the changed level, their elevations are changed to accommodate the new height. If you do not want that effect, clear Auto-Adjust Elevation before making changes to the height.
change the ID of a level	click the ID, and change it.
change the description of a level	click the description, and change it.

5 Click OK.

6 Click Yes in the subsequent dialog box to update the changed level information throughout the project.

Deleting a Level

Use this procedure to delete a level from a building.

1 On the Window menu, click Project Navigator Palette.

2 Click the Project tab.

3 Under Levels, click .

4 Click the name of the level to delete.

5 Delete the level in one of these ways:

- Right-click, and click Delete Level.
- Click .

6 Click OK.

7 Click Yes in the subsequent dialog box to update the changed level information throughout the project.

Changing Levels: Interactions with the Project

Changes made to one part of a project frequently influence other parts of the project. The following information describes the changes you can make to a level and the effects of the changes on other parts of the building project:

- **Adding new levels:** When you add a new level to a project, you must fill it with constructs. You also need views and plotting sheets to represent that level.

  For more information, see "Constructs" on page 268, "Views" on page 307, and "Plotting Sheets" on page 324.

- **Changing the level name:** When you change the name of a level, the constructs assigned to it are automatically updated with the new name. For example, if you change the name of a level from "1" to "First Floor," the constructs assigned to that level are automatically updated to be assigned to "First Floor."
- **Changing the level ID:** Level IDs can be used in schedule tables. If you change the information here, the information in your schedule table changes.
- **Changing the floor-to-floor height of a level:** When you change the floor-to-floor height of a level and you have selected Auto-Adjust Elevation, all levels above the changed level are adjusted. For example, if you change the height of the first floor from 3 meters to 4 meters, the elevation of the second level changes from 3 meters to 4 meters. If you have chosen not to auto-adjust levels, you need to update all other levels manually to avoid gaps or overlapping levels. In any case, make sure that the objects in the assigned constructs retain the correct height for the level after changing it. That way, you avoid displaying 4 meter walls in a 3 meter level.
- **Changing the floor elevation of a level:** If you are changing the elevation of a level, the elevation above the level is adjusted. The floor-to-floor height of the level below the selected level is also changed. For example, if you change the elevation of the second floor from 2.5 meters to 2.6 meters, the floor-to-floor height of the first floor below it is changed from 2.5 meters to 2.6 meters. Also, the floor elevation of all levels above the second level will be heightened by 0.1 meter.
- **Deleting a level:** When you delete a level, constructs assigned to that level are not deleted with it. They remain in the project, but they are "orphaned" i.e., have lost their level. You can chose what to do with them:

- Delete them, because the level on which they are placed no longer exists.
- Assign them to a different level within the project.

When you delete a level that has been used for a view, the view is not deleted from the project. If you update the view however, it is missing this level. You can choose among these actions:

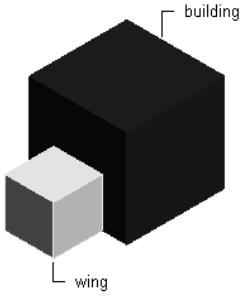
- Delete the view, because the level it was displaying no longer exists.
- Create a new selection set for the view.

For more information, see "Views" on page 307.

Divisions

Divisions segment the building in the horizontal plane. A division might be a wing of a building or a center shaft. By default, each new project in Autodesk® Architectural Desktop has one division. You can add divisions, change their properties, and delete them.

Building and wing schematic



NOTE A division contains no geometric information. The width and length of a division are determined by the constructs assigned to it. The division itself does not "know" anything about its dimensions.

In smaller projects, like residential homes, you often work with only one horizontal division.

Related Topics

- Creating a New Division

- Changing a Division
- Deleting a Division
- Changing Divisions: Interactions with the Project

Creating a New Division

Use this procedure to add divisions to a project.

1. On the Window menu, click Project Navigator Palette.
2. Click the Project tab.
3. Under Divisions, click .
4. Add a division in one of these ways:
   - Right-click in the list, and click Add Division.
   - Click .
5. If necessary, edit the division settings:

If you want to . . .	Then . . .
change the name of the division	click the name, and enter a new one. Note that you cannot give the same name to two divisions; the name is the unique identifier of the division when assigning constructs to it.
change the ID of the division	enter a new ID. The ID can be used for schedule tables. For more information on scheduling a project, see "Annotating a Building Project" on page 341.
add a description to the division	enter a description, and press ENTER.

NOTE The division names are displayed in the order of their creation.

6. When you have finished adding new divisions to the project, click OK.

Changing a Division

Use this procedure to change the properties of a division.

1. On the Window menu, click Project Navigator Palette.
2. Click the Project tab.

3 Under Divisions, click .

4 Change the division information as needed:

If you want to . . .	Then . . .
change the name of the division	click the name, and change it.
change the ID of the division	click the ID, and change it. The ID can be used in schedule tables.
change the description of the division	click the description, and change it.

5 Click OK.

Deleting a Division

Use this procedure to delete a division from the building project.

1 On the Window menu, click Project Navigator Palette.

2 Click the Project tab.

3 Under Divisions, click .

4 Click the name of the division to delete.

5 Delete the division in one of these ways:

- Right-click, and click Delete Division.
- Click .

6 Click OK.

7 Click Yes in the subsequent dialog box to update the changed division information throughout the project.

Changing Divisions: Interactions with the Project

Changes made to one part of a project frequently influence other parts of the project. The following information describes the changes you can make to a division, and the effects of the changes on other parts of the building project:

- **Adding new divisions:** When you add new divisions to a project, you must fill them with constructs. You also need views and plotting sheets to rep-

resent that division. For example, you might create a view named "South Wing" and a plotting sheet "Plan—South Wing."

For more information, see "Creating a New View" on page 313.

- **Changing the division name:** When you change the name of a division, the constructs assigned to it are updated with the new name. For example, if you change the name of a division from "SW" to "South Wing," the constructs assigned to that division are updated to be assigned to "South Wing."
- **Changing the division ID:** Division IDs can be used in schedule tables. If you change the information here, the information in your schedule table changes.
- **Deleting a division:** When you delete a division, constructs assigned to that division are not deleted with it. They are "orphaned" and have lost their division. You can choose among the following actions:

  - delete the constructs because the division in which they were placed no longer exists
  - assign them to a different division within the project

  When you delete a division that has been used for a view, the view is not deleted from the project. If you update the view, however, the deleted division is missing. You can choose among the following actions:

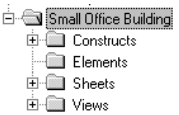
  - delete the view because the division it was displaying no longer exists
  - create a new selection set for the view

Categories

Categories are a folder structure within the project and help you to organize your project files according to disciplines, drawing types, design phases, and workflows.

The Basic Project Categories

Every building project in Architectural Desktop has the following basic category structure:



- **<ProjectName>:** The top node in the project, represented by a folder with the project name.

- **Constructs:** The default folder for constructs in the project. When you create a construct, it is saved into the Constructs category or one of its subcategories. For more information on constructs, see "Constructs" on page 268.
- **Elements:** The default folder for elements in the project. When you create an element, it is saved into the Elements category or one of its subcategories. For more information on elements, see "Elements" on page 290.
- **Views:** The default folder for views in the project. When you create a view, it is saved into the Views category or one of its subcategories. For more information, see "Views" on page 307.
- **Sheets:** The default folder for plotting sheets in the project. When you create a plotting sheet, it is saved into the Sheets category or one of its subcategories. For more information, see "Plotting Sheets" on page 324.

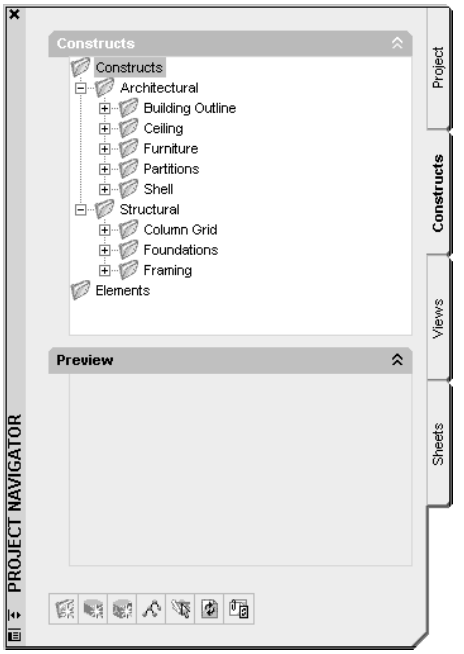
The basic project structure is fixed; you cannot delete these basic categories from the project.

User-defined Categories

Below the fixed category structure, you can create subcategories and subcategory trees. Subcategories usually represent components of your workflow. You might set up subcategories by discipline, by phase, by view type (working, presentation, sections, rendering, and so on), by sheet type (floor plans, ceiling plans, elevations, and so on), or by any other system that you find helpful.

NOTE You cannot mix basic category types. For example, you cannot create a construct subcategory within the Views category or an element subcategory within the Sheets category.

Your Constructs tab might look like this:



The Benefits of Categories

There are many benefits of using user-defined categories in your project:

- Categories reflect your workflow. By creating categories for different phases and stages of the project, your practical day-to-day work is accurately reflected in the project, making it easier to work intuitively and efficiently.
- Categories offer optimal organization and transparency. Even small building projects contain a large number of individual drawings that are difficult to track. Putting them into descriptive categories helps you quickly find the correct files.
- Categories help to assemble views. When you create views of your building data, you can use categories as selection criteria. For example, for a complete view of framing constructs in your building, you could set up a view that references the "Framing" subcategory, thereby referencing all drawing files from that category. If you add more framing drawings to the Framing category later, the view is updated. For more information, see "Creating a View: Selecting the Constructs" on page 316.

Methods of Creating Categories

You can create categories in several ways:

- Creating a category in the tabs of the Project Navigator
- Creating a category by adding a folder to Internet Explorer
- Create a category by dragging a folder from Internet Explorer to the Project Navigator

Related Procedures

- Creating a Category in the Project Navigator
- Creating a Category by Dragging a Folder from Internet Explorer to the Project Navigator
- Changing the Subcategory of a Project File
- Deleting a Category

Creating a Category in the Project Navigator

Use this procedure to create a new category within the Project Navigator.

1. On the Window menu, click Project Navigator Palette.
2. Depending on the category type you want to create, navigate to the appropriate tab:

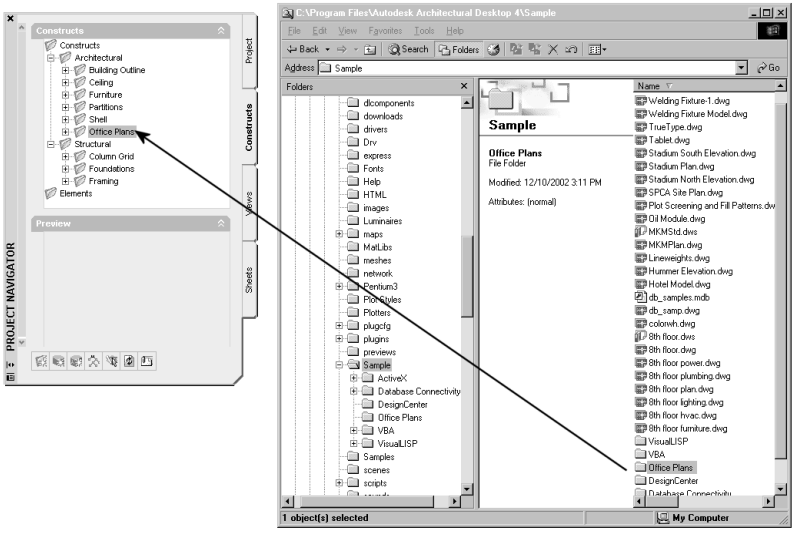
If you want to . . .	Then . . .
create an element or construct category	click the Constructs tab.
create a view category	click the Views tab.
create a plotting sheet category	click the Sheets tab.

3. To create a category under an existing category, click the existing category in the tree, and create a new subcategory in one of these ways:
   - Right-click, and click New ➤ Category.
   - Click in the Project Navigator toolbar at the bottom of the tab.
4. Enter a name for the category, and press ENTER.

   You can now add project files to the new category.

Creating a Category by Dragging a Folder from Internet Explorer to the Project Navigator

Use this procedure to create a new category by dragging a folder from Internet Explorer into the Project Navigator.



1. On the Window menu, click Project Navigator Palette.
2. Depending on the category type you want to create, navigate to the appropriate tab:

If you want to . . .	Then . . .
create an element or construct category	click the Constructs tab.
create a view category	click the Views tab.
create a plotting sheet category	click the Sheets tab.

3. Start Internet Explorer and position it next to the Project Navigator.
4. Select the folder in Internet Explorer from which you want to create a category.

5 Place the folder in the tree of the selected tab of the Project Navigator:

If you want to . . .	Then . . .
move the folder into the selected project folder location, and create a new category from it	drag the folder into the desired location in the tree of the selected tab in the Project Navigator.
copy the folder into the selected project folder location, and create a new category from it	CTRL-drag the folder into the desired location in the tree of the selected tab in the Project Navigator.

NOTE If the folder you are dragging into the Project Navigator contains drawing (DWG) files, you are prompted to convert them to project files. For example, if you drag a folder into the Elements category in the Project Navigator, you are prompted to convert all DWG files within that folder into elements. For detailed information on converting existing drawing files into project files, see the appropriate sections for the individual file types.

6 To update your project with the new file information, select the new category in the Project Navigator tree, right-click, and click Re-Path Files.

7 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

Changing the Subcategory of a Project File

Each drawing file you create within a project belongs to one of the basic, predefined categories of Elements, Constructs, Views, or Sheets. If you make no specific assignment, the file is assigned to the base category folder of that specific project file type—element, construct, view, or sheet. Once you have created a more detailed category system for your project, you can move drawing files into the subcategories.

Related Procedures

- Creating a File in a Subcategory
- Changing the Category of an Existing File

Creating a File in a Subcategory

Use this procedure to create a project file within a subcategory.

1 On the Window menu, click Project Navigator Palette.

2 Depending on the file type you want to create, navigate to the appropriate tab:

If you want to . . .	Then . . .
create an element or construct	click the Constructs tab.
create a view	click the Views tab.
create a plotting sheet	click the Sheets tab.

3 Locate the subcategory in which you want to create a new project file.

4 Select the subcategory, right-click, and click New ➤ Element/Construct/View/Sheet.

NOTE Alternatively, you can use the Add button at the bottom of the tab.

5 Specify the properties of the new file.

For more information on specifying new project files, see the appropriate sections for the individual file types.

Changing the Category of an Existing File

Use this procedure to change the category of an existing file.

1 On the Window menu, click Project Navigator Palette.

2 Depending on the file type you want to change, navigate to the appropriate tab:

If you want to . . .	Then . . .
change an element or construct	click the Constructs tab.
change a view	click the Views tab.
change a plotting sheet	click the Sheets tab.

3 Locate the project file you want to move to another category.

4 Change the file category in one of these ways:

- Select the file, right-click, and click Properties. In the Modify dialog box, change the file category.
- Select the file, and drag it into another subcategory.

5 To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.

6 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

Deleting a Category

Use this procedure to delete unneeded categories from a project.

If you delete a category that contains drawings, the drawings are deleted with the category.

NOTE Do not delete a category from the Internet Explorer. This might result in inconsistent project data.

1 On the Window menu, click Project Navigator Palette.

2 Depending on the category type you want to delete, navigate to the appropriate tab:

If you want to . . .	Then . . .
delete an element or construct category	click the Constructs tab.
delete a view category	click the Views tab.
delete a plotting sheet category	click the Sheets tab.

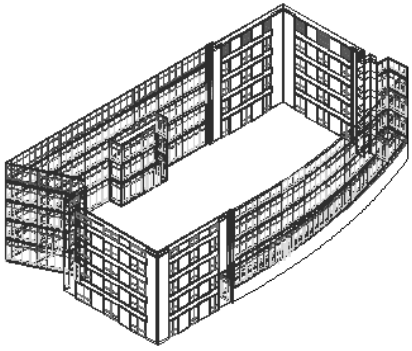
3 Select the category you want to delete, right-click, and click Delete.

4 Click Yes in the subsequent dialog box.

Constructs

Constructs are the main building blocks of the building model. A construct describes one unique portion of a building. A construct can be, for example, an elevator shaft, a flight of stairs, an apartment, or an entire floor. The construct needs to be assigned to a level and a division within the project. Spanning constructs, like curtain walls, can be assigned to multiple levels and divisions.

3D view of spanning curtain wall construct



Constructs and Levels and Divisions

Constructs are assigned to a level and a division. For example, an architectural construct named "Office—First Floor/South Wing" is assigned to the first level and the south wing division of the building. The structural construct "Framing—First Floor/South Wing" is also assigned to the first level and south wing division, but it has a different purpose. Constructs can span more than one level, a requirement for objects such as curtain walls, elevator shafts, or other core elements.

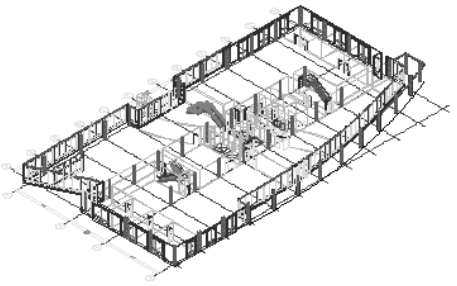
When you remove a level or a division from a project, the constructs assigned to that level or division are "orphaned" and need to be either removed from the project or assigned to a different level or division.

Constructs and Views

Constructs are used to create views of a project. You could create a view named "First Floor," which displays the constructs "Office—First Floor/South Wing," "Framing—First Floor/South Wing," "Ceiling—First Floor/South Wing," and "Spanning Front Curtain Wall." This view would contain all objects on the first floor as well as objects that are partly on the first floor, like the part of the spanning curtain wall that crosses the first floor. The user

selects the constructs to include in the view. Constructs can be added or removed from views.

3D view of building first floor



Converting Legacy Drawings to Constructs

You can convert an existing drawing file into a construct within a project. You specify the subcategory into which to move or copy the source drawing. When you copy the source drawing, you do not lose your original drawing, and you can continue to use it outside the project.

When you convert a legacy drawing file into a construct, the following process is performed within the software:

- The drawing file is either moved, copied, or connected via a link to the project category you specify.
- You assign a level and a division to the construct (multiple assignments are possible).
- If necessary, you give the construct a different name, and add a description to it.
- An accompanying XML file with the necessary project information is automatically generated.

For detailed information, see "Converting a Legacy Drawing to a Construct" on page 276.

Construct Files

A construct is a drawing (DWG) file. As opposed to other non-project related drawing files, an additional XML file with the same name is created. The accompanying XML file contains information to connect the construct to the project.

NOTE The XML file is created and updated automatically. You do not need to edit it, but be careful not to accidentally delete it in Internet Explorer.

Construct Templates
When you create a project, you set a default template for new constructs. If you convert an existing drawing file to a construct, it might be based on a different template. If necessary, import styles, layer information, and other settings from the default template into the legacy drawing before or after converting it to a construct.

For more information on project templates, see "Creating a New Project" on page 229.

Copying Constructs to Levels
In multi-story buildings, levels may have identical floor plans. You can create the constructs for one level and copy them to the other levels in one quick step. For detailed information, see "Copying Constructs to Levels" on page 275.

Related Topics

- When to Start with Constructs
- Processing Constructs in the Building Project
- The Content of Constructs
- Creating a New Construct
- Copying Constructs to Levels
- Converting a Legacy Drawing to a Construct
- Opening and Closing a Construct
- Dragging Objects into a Construct
- Referencing Elements into Constructs
- Referencing an Element into Multiple Constructs
- Displaying External References of a Construct
- Changing the Properties of a Construct
- Deleting a Construct
- Converting a Construct to an Element
- Changing Constructs: Interactions with the Project

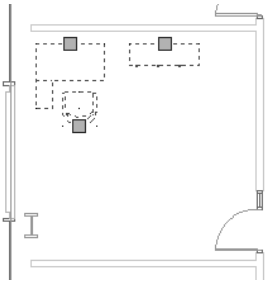
When to Start with Constructs

You would start creating constructs in the following cases:

- when you want to assemble the basic structure of your building project
- when you have identified the unique portions of the building
- when you have identified the repeating, non-unique units of the project, and have created elements for them

Typically, you begin a project by creating constructs. Adding details like elements often comes later in the process. For example, perhaps you know how many offices you need on a floor before you know the exact furniture layout of the offices. Therefore, you would first create the construct for the office, "First Floor—Office Space." Later, you could create elements for cubicle/desk combinations or generic printer/copier layouts and reference them into the construct.

Plan view of construct with highlighted furniture elements



Keep these considerations in mind when creating constructs:

- A construct can contain building objects, referenced elements, or a combination of both.
- A construct represents a unique portion of a building. If you want to reuse a construct within the project, create an element instead. For more information, see "Elements" on page 290.

Processing Constructs in the Building Project

Constructs are the main building blocks of the building model. A construct can contain referenced elements and building objects, such as walls, roofs, and doors. It can also contain more abstract information, like structural grids, building outlines, and footpaths. After creating constructs, you can create different views of your building data. A view might contain the framing constructs for floors 1–4, the foundation construct, and the column grid construct. Or, a view of the first floor might include the partition walls of the first floor, the framing of the first floor, and the shell components of the building.

The Content of Constructs

There are three different types of content you can place in a construct:

- **Drawing objects:** You can draw an apartment layout, a frame drawing, or a ceiling grid as a construct. Also, spanning objects like curtain walls or elevator shafts are usually created directly as constructs.
- **Element references:** You can display repeating components within the construct, such as desk/chair combinations, bathroom layouts, or stairs. For more information, see "Referencing Elements into Constructs" on page 282, and "Referencing an Element into Multiple Constructs" on page 284.
- **A combination of drawing objects and element references:** If you have a floor with different office types, but repeating furniture elements, you could draw the office walls directly in the construct but reference the furniture as elements.

You should not, as a general rule, reference constructs into constructs. A construct has a defined level and division assignment. If a construct were to be referenced into another construct, it would have two contradicting level and division assignments. However, there are situations where the necessity to do this can occur. For example, when you are checking the correct vertical alignment of a ceiling in the building, you could view a ceiling construct with an overlaid floor plan construct in it. Or, you might want to display alternating versions of a two car garage and a three car garage within a plan construct. If you encounter a situation where you would need to do this, there are several options of working around it:

- Convert the first construct to an element, as described in "Converting a Construct to an Element" on page 287, and then reference it into the other construct.
- Overlay the construct onto the other construct.

WARNING! Do not attach property set data to an overlaid construct from within the host construct. This data is processed incompletely. If you want to attach property data to a construct that will be overlaid into another construct, attach the property data locally in the overlaid construct.

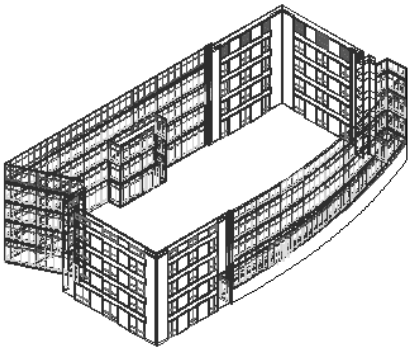
- Create a view into which you reference both constructs. For more information, see "Creating a New View" on page 313.

Which of theses options is best for you largely depends on your workflow and the results you want to achieve.

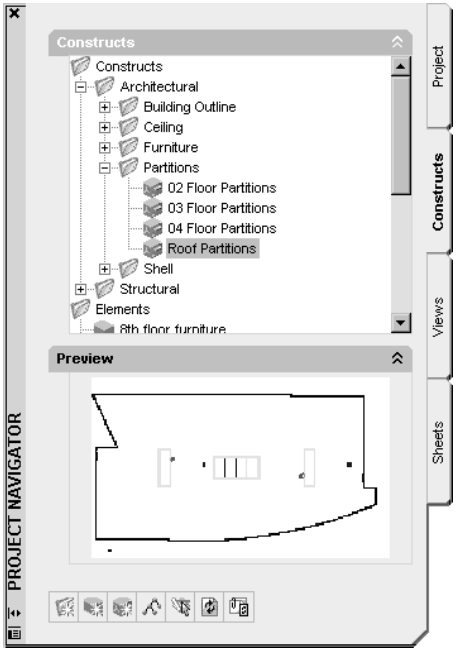
Creating a New Construct

Use this procedure to create a new construct.

3D view of spanning curtain wall construct



1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. In the tree, locate the Constructs category or any subcategory of the Constructs category.



4. Add a new construct to the project in one of the following ways:

- Right-click the category in which to place the new construct, and click New ➤ Construct.
- In the toolbar at the bottom of the Constructs tab, click .

5 Define the construct properties:

If you want to . . .	Then . . .
name the new construct	enter a name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
enter a description for the construct	click the setting for Description, enter a description of the construct, and click OK.
change the category of the construct	select one from the Category list. By default, the category you chose in step 3 is suggested.
select a different template file	click , and browse for a new template. By default, the default template set for constructs in the project is used.
assign the construct to a level and a division	select the correct level and division in the assignments table. Select the desired level row and the division column, and check the appropriate box. **NOTE** Unless you are defining a spanning construct, you should check only one level and division. Multiple levels and divisions create spanning constructs.

6 Click OK.

7 Open the construct, as described in "Opening and Closing a Construct" on page 279.

8 Edit the construct as necessary:

- Add objects to the construct.
- Reference elements into the construct.

  For information on adding content to constructs, see "The Content of Constructs" on page 271.

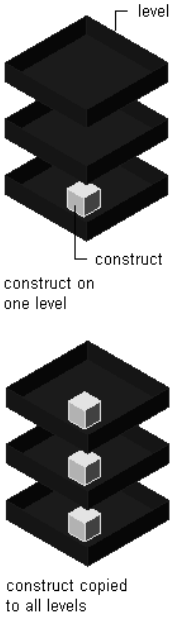
9 To update the tree in the Project Navigator, click .

Copying Constructs to Levels

Use this procedure to copy a construct to multiple levels.

Copying constructs to levels offers you an easy way to fill multi-story buildings with content. You draw the construct for the first level, and then create a copy of that construct for each level you select.

Copying constructs to all levels schematic



1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. Select the construct to copy to multiple levels, right-click, and click Copy Construct to Levels.
4. Select the levels on which to create a copy of the construct.

> **NOTE** The level on which the original construct is situated is selected by default. You cannot clear the selection here.

5. Click OK.

In the Constructs tab, a new construct is created for each level selected. The level number is appended in brackets after the construct name.

NOTE If necessary, rename the constructs. Select a copied construct, right-click, and click Rename.

Converting a Legacy Drawing to a Construct

You may have legacy drawing files in Autodesk® Architectural Desktop that you want to convert into constructs.

When you convert a legacy drawing into a construct, the following process is performed by the software:

- The drawing file is either moved, copied, or connected via a link to the project category you specify.
- You assign a level and a division to the construct (multiple assignments are possible).
- If necessary, you give the construct a different name, and add a description to it.
- An accompanying XML file with the necessary project information is automatically generated.

There are two ways to convert a legacy drawing file into a construct: you can open the drawing file in Autodesk Architectural Desktop and save it as a construct, or you can drag a drawing file from Internet Explorer to the Project Navigator.

Related Procedures

- Converting Drawing Files to Constructs by Opening and Saving
- Converting Drawing Files to Constructs by Dragging and Dropping from Internet Explorer

Converting Drawing Files to Constructs by Opening and Saving

Use this procedure to convert a legacy drawing file to a construct by opening the file in Autodesk® Architectural Desktop and then saving it as a construct.

1. On the File menu, click Open, and open the desired drawing file.
2. On the Window menu, click Project Navigator Palette.
3. Click the Constructs tab.
4. In the tree, locate the Constructs category or any of its subcategories.

5 Right-click, and click Save Current Dwg as Construct.

6 Define the construct properties:

If you want to . . .	Then . . .
change the name of the drawing file	enter a new name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
enter a description for the construct	click the setting for Description, enter a description of the construct, and click OK.
change the category of the construct	select one from the Category list. By default, the category you chose in step 4is suggested.
assign the construct to a level and a division	select the correct level and division in the assignments table. Select the desired level row and the division column, and check the appropriate box. **NOTE** Unless you are defining a spanning construct, you should check only one level and division. Multiple levels and divisions create spanning constructs.

7 Click OK.

8 To close the construct, on the File menu, click Close.

9 Click Yes to save the changes in the drawing.

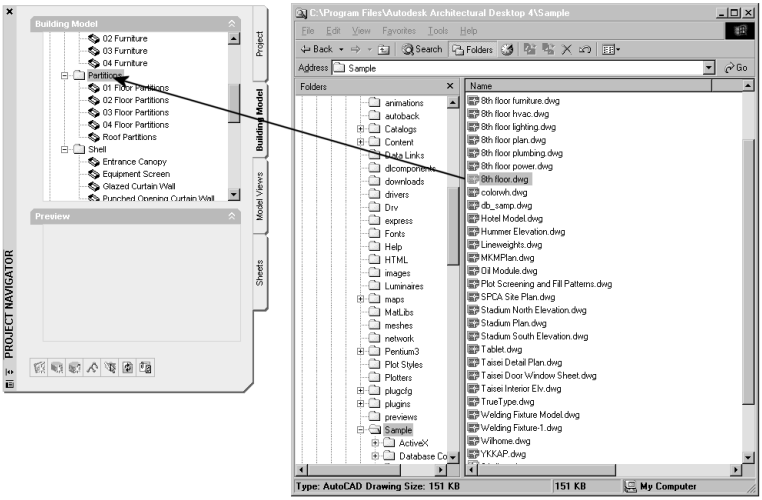
10 To update the tree in the Project Navigator, click .

Converting Drawing Files to Constructs by Dragging and Dropping from Internet Explorer

Use this procedure to convert legacy drawing files to constructs by dragging and dropping them from Internet Explorer.

Internet Explorer offers three different modes of conversion:

- Converting a file to a construct and moving it into a project folder
- Copying a file, and converting the copy to a construct in a project folder
- Converting a file to a construct and creating a link to its original location



1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. Start Internet Explorer, and position it next to the Project Navigator.
4. In Internet Explorer, open the folder that contains the legacy document.
5. Place the legacy drawing in the Constructs category or one of its subcategories:

If you want to . . .	Then . . .
move the legacy drawing into the selected category, and convert it to a construct	drag the drawing into the desired location in the Project Navigator.
move a copy of the legacy drawing into the selected category, and convert it to a construct	CTRL-drag the drawing into the desired location in the Project Navigator.
create a link to the legacy drawing in its original location, and convert it to a construct	ALT-drag the drawing into the desired location in the Project Navigator.

NOTE You can also drag an entire legacy folder into the project. The folder is converted into a category, and all drawings within it are converted to constructs. For instructions on converting legacy folders to categories, see "Cre-

ating a Category by Dragging a Folder from Internet Explorer to the Project Navigator" on page 264.

6 Define the construct properties:

If you want to . . .	Then . . .
change the name of the drawing file	enter a new name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
enter a description for the construct	click the setting for Description, enter a description of the construct, and click OK.
change the category of the construct	select from the Category list. By default, the category you chose in step 5 is suggested.
assign the construct to a level and a division	select the correct level and division in the assignments table. Select the desired level row and the division column, and check the appropriate box. **NOTE** Unless you are defining a spanning construct, you should check only one level and division. Multiple levels and divisions create spanning constructs.

7 Click OK.

8 To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.

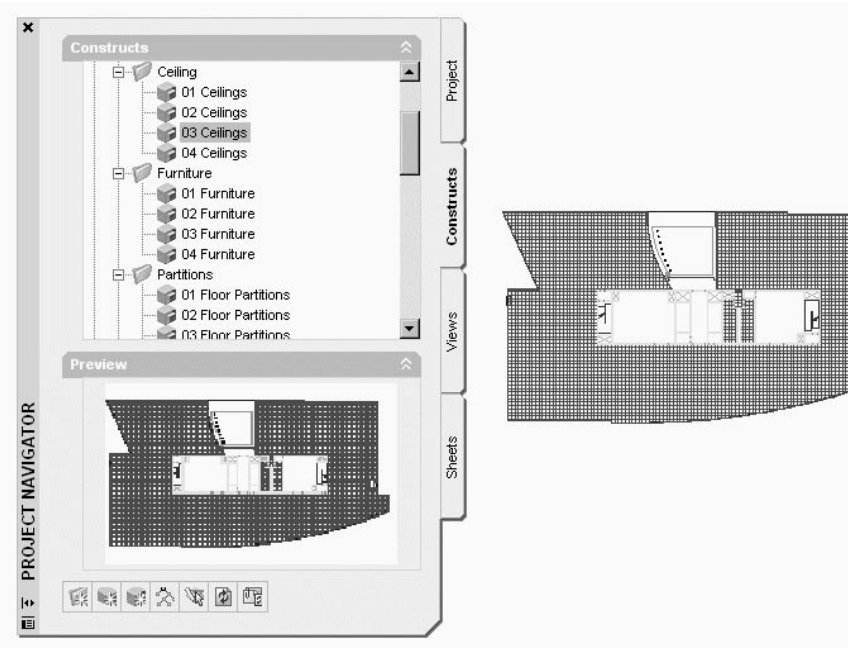
9 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

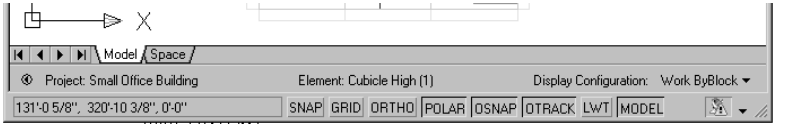
10 To update the tree in the Project Navigator, click .

Opening and Closing a Construct

Use this procedure to open and close a construct.



When you open a construct, the status line in the Autodesk® Architectural Desktop drawing area displays the name of the associated project.



1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. In the tree, locate the Constructs category or the subcategory that contains the construct to open.
4. Open the construct in one of these ways:

   - Select the construct, right-click, and click Open.
   - Double-click the construct.

   The construct is opened in the drawing area of Autodesk Architectural Desktop.

5. To close the construct, click File ➤ Close, and save the changes, if necessary.

6 To update the preview of the construct in the Project Navigator, click .

Dragging Objects into a Construct

Use this procedure to drag and drop objects into a construct.

When you create a new construct, you have several choices for adding content to it. You can draw objects within the construct, you can reference elements into a construct, or you can drag and drop objects from other drawing files into a construct.

1 Open the drawing that contains the objects you want to drag and drop into the construct.

NOTE The drawing containing the objects is not required to be a part of a project.

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2 On the Window menu, click Project Navigator Palette.

3 Click the Constructs tab.

4 In the tree, locate the Constructs category or the subcategory that contains the construct to which you want to add objects from another drawing file.

5 In the open drawing file, select the objects you want to drag and drop into the construct.

6 Move or copy the objects into the construct.

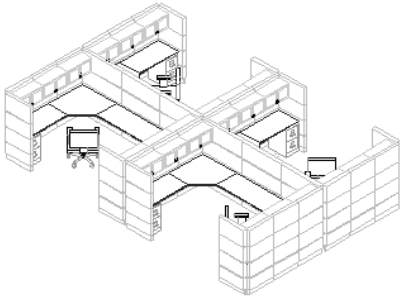
If you want to . . .	Then . . .
move the objects from the open drawing to the construct	drag them from the drawing onto the desired construct in the Project Navigator.
copy the objects from the open drawing to the construct	CTRL-drag them from the drawing onto the desired construct in the Project Navigator.

Referencing Elements into Constructs

There are several ways to reference an element into a construct:

If you want to . . .	Then . . .
attach an element as an external reference	create a link from the element to the construct. Any changes to the referenced element are displayed in the construct when it is opened or refreshed. For more information, see "Attaching an Element as an External Reference to a Construct" on page 283.
overlay an element as an external reference	create a link from the element to the construct. An overlaid reference is not included when the construct is attached or overlaid as a reference to a view. For more information, see "Overlaying an Element as an External Reference to a Construct" on page 283.
insert an element as a block reference	cut off the link between the element and the construct. The inserted element is converted to a block and is not updated when the reference element is changed. You can, however, edit the block in the construct. For more information, see "Inserting an Element as a Block into a Construct" on page 284.

3D view of cubicle element referenced four times into office space construct



Related Procedures

- Attaching an Element as an External Reference to a Construct
- Overlaying an Element as an External Reference to a Construct
- Inserting an Element as a Block into a Construct
- Referencing an Element into Multiple Constructs

■ Displaying External References of a Construct

Attaching an Element as an External Reference to a Construct

Use this procedure to attach an element as an external reference to a construct.

For detailed information on attaching external references to drawings, see "Reference Other Drawing Files (Xrefs)" in the *AutoCAD 2004 Online User's Guide*.

1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. Locate the construct into which to reference an element.
4. Select the construct, right-click, and click Open.
5. In the Project Navigator, locate the element to attach.
6. Reference the element into the construct in one of these ways:

   ■ Select the element, and drag it into the open construct drawing.
   ■ Select the element, right-click, and click Xref Attach.

   The element is inserted as an external reference into the construct.

NOTE If you cannot see the element, it may be inserted at a very small scale. Use the AutoCAD Zoom Extents command to display it.

Overlaying an Element as an External Reference to a Construct

Use this procedure to overlay an element as an external reference to a construct.

For detailed information on overlaying external references to drawings, see "Reference Other Drawing Files (Xrefs)" in the *AutoCAD 2004 Online User's Guide*.

1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. Locate the construct into which to reference an element.
4. Select the construct, right-click, and click Open.
5. In the Project Navigator, locate the element to overlay.
6. Select the element, right-click, and click Xref Overlay.
   The element is inserted as an external reference into the construct.

NOTE If you cannot see the element, it may be inserted at a very small scale. Use the AutoCAD Zoom Extents command to display it.

Inserting an Element as a Block into a Construct

Use this procedure to insert an element as a block into a construct.

For detailed information on blocks, see, see "Create and Insert Symbols (Blocks)" in the *AutoCAD 2004 Online User's Guide*.

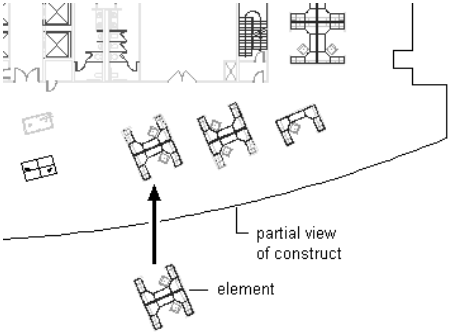
1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. Locate the construct into which to insert an element as a block.
4. Select the construct, right-click, and click Open.
5. In the Project Navigator, locate the element to insert as a block.
6. Select the element, right-click, and click Insert as Block.
7. Specify the Insert options—such as insertion point, scale and rotation angle—and click OK.

Referencing an Element into Multiple Constructs

Use this procedure to reference an element into multiple constructs.

This procedure is useful for updating a number of similar floor constructs in a building.

Referencing an element into a construct



1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. Locate the element to reference into multiple constructs.

4 Select the element, right-click, and click Attach Elements to Constructs.

5 Check the boxes of the constructs into which to reference the element.

NOTE As a shortcut, you can select an entire category for referencing.

6 Define the referencing method:

If you want to . . .	Then . . .
attach the element as an external reference	select the construct, right-click, and click Set to Attach. **NOTE** If the Set to Attach command is unavailable, the element is already set to attach.
overlay the element as an external reference	select the construct, right-click, and click Set to Overlay. **NOTE** If the Set to Overlay command is unavailable, the element is already set to overlay.

7 Repeat steps 5-6 for each construct the element should be attached to.

8 Click OK.

Displaying External References of a Construct

Use this procedure to display the external references of a construct.

1 On the Window menu, click Project Navigator Palette.

2 Click the Constructs tab.

3 In the tree, locate the construct for which to display external references.

4 Select the construct.

5 Display the external references in one of these ways:

- Right-click, and click Show External References.
- Click .

A worksheet with the external references of the construct is displayed. You can expand or collapse the list by clicking individual items.

6 Click OK to close the worksheet.

NOTE You can also display external references by opening the construct in the Autodesk® Architectural Desktop drawing area, and using the AutoCAD Xref Manager. For more information, see "Reference Other Drawing Files (Xrefs)" in the *AutoCAD 2004 Online Users Guide*.

Changing the Properties of a Construct

Use this procedure to change the properties of a construct.

NOTE The construct must be closed in order to change its properties.

1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. In the tree, locate the Constructs category or the subcategory that contains the construct you want to change.
4. Select the construct, right-click, and click Properties.
5. Change the construct properties:

If you want to . . .	Then . . .
change the name of the drawing file	enter a name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
enter a description for the construct	click the setting for Description, enter a description of the construct, and click OK.
change the category of the construct	select one from the Category list. By default, the category you chose in step 3 is suggested.
assign the construct to a different level and a division	select the correct combination of both in the assignments table. Select the desired level row and division column, and check the appropriate box. **NOTE** Unless you are defining a spanning construct, you should check only one level and division. Multiple levels and divisions create spanning constructs.

6. Click OK.
7. To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.

8 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

Deleting a Construct

Use this procedure to delete a construct.

For information on the consequences of deleting constructs, see "Changing Constructs: Interactions with the Project" on page 289.

The construct must be closed in order to delete it.

NOTE Do not delete a construct from the Internet Explorer. This might result in inconsistent project data.

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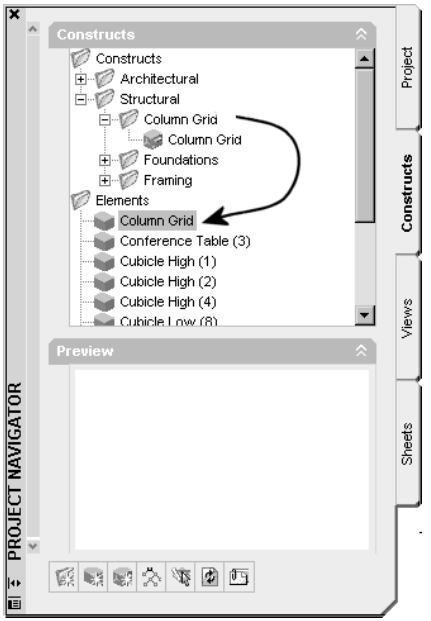
1 On the Window menu, click Project Navigator Palette.
2 Click the Constructs tab.
3 In the tree, locate the Constructs category or subcategory that contains the construct to delete.
4 Select the construct, right-click, and click Delete.
5 Click Yes in the subsequent message box.

Converting a Construct to an Element

Use this procedure to convert a construct to an element.



You may create a construct, and then realize that this is actually a repeating element. For example, you might create a column grid and then decide to use it on another floor. You can easily convert the construct to an element and reference it into multiple constructs.

NOTE When you convert a construct to an element, the level and division information is lost. Should you later convert the element back to a construct, you must redefine the level and division.

NOTE Do not drag a construct into the Elements folder within Internet Explorer. This will result in inconsistent project data.

1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. In the tree, locate the construct to convert to an element.
4. Select the construct, and drag it into the Elements category or one of its subcategories.
5. Specify the element properties, as described in "Creating a New Element" on page 294.

6 To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.

7 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

NOTE If you want to convert the element back to a construct, drag the element to the Constructs category.

Changing Constructs: Interactions with the Project

Changes made to one part of a project frequently influence other parts of the project. The following information describes the changes you can make to a construct and the effects of the changes on other parts of the building project:

- **Adding a new construct:** When you add new constructs to a project, you must fill them with drawing objects or referenced elements. Also, you must create views in which to display them. For more information, see "Creating a New View" on page 313.
- **Changing the construct name and category (location):** Constructs can contain external element references and are referenced into views. Therefore, any name and location changes to a construct need to be updated throughout the project. To update the path, re-path the project, as described in "Updating (Re-Pathing) the Project" on page 333.
- **Changing the level and division of a construct:** If you change the level and division, (for example, if you switch an apartment from the first floor to the second floor), an empty space remains in the original location. You must either fill the space with a different construct or erase the level and division altogether. Also, be careful not to reference double constructs into a location. An apartment layout and a structural grid could have the same level/division assignment, as they exist in the same location; however, two different apartment layouts could not exist in the same location.
- **Deleting a construct:** If you delete a construct that has been referenced into a view and update the view, that view is now incomplete and has missing references. Furthermore, you have an empty space in your building. That could be the desired effect, if, for example you are erasing a level from a building. In any case, check to see if the construct is still used elsewhere.

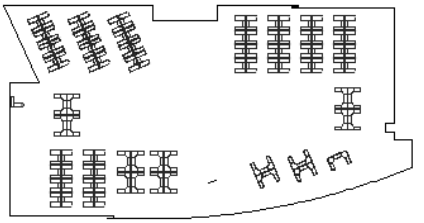
For detailed information on deleting constructs, see "Deleting a Construct" on page 287.

For detailed information on views, see "Views" on page 307.

Elements

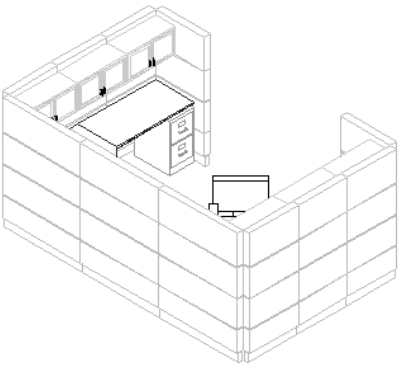
Elements represent pieces that are used multiple times within a building. For example, you can create an element for a repeating design object like a desk/chair combination to be placed in a number of cubicles. You can also create an element for a typical bathroom layout and reference it multiple times into an apartment construct. Because you can annotate individual instances of an external reference, you can use the same element and annotate it differently depending on its position.

Plan view of furniture layout



For information on scheduling repeating elements, see "Attaching Property Sets to Objects from External References" on page 349.

3D view of single cubicle element



Element Files

An element is a drawing (DWG) file. As opposed to other non-project related drawing files, an additional XML file with the same name is created. The accompanying XML file contains information to connect the drawing file to the project.

NOTE The XML file is created and updated automatically. You do not need to edit it, but be careful not to accidentally delete it in Internet Explorer.

Converting Legacy Drawings to Elements

You can convert an existing drawing file into an element within a project. You specify the subcategory into which to move or copy the source drawing. When you copy the source drawing, you do not lose your original drawing, and you can continue to use it outside the project.

When you convert a legacy drawing file into an element, the following process is performed within the software:

- The drawing file is moved, copied, or linked to the project category you specify.
- You can assign a different name and add a description to the file.
- An accompanying XML file with the project information is generated.

Element Templates

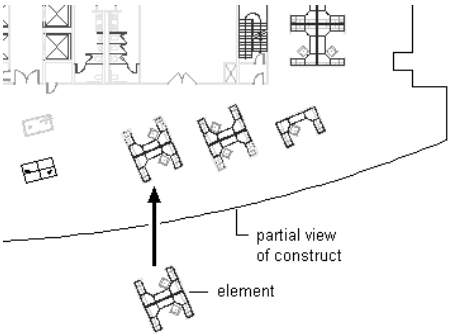
When you create a project, you set a default template for new elements. If you convert an existing drawing file to an element, it might be based on a different template. If necessary, import styles, layer information, and other settings from the default template into the legacy drawing before or after converting it to an element.

For more information about project templates, see "Creating a New Project" on page 229.

Elements and Constructs

An element is a generic building block for multiple use. The element knows nothing about which level or division it is placed on; this information is set by the construct it is referenced into. If you create a bathroom layout as an element, you can use it on the second floor of the west wing just as well as on the first floor of the east wing. To place the element on a specific floor and wing, you need to reference it into a construct. A construct has a level and division assignment. For example, you could create an element named "Generic Bathroom Layout" and reference it into constructs named "First Floor—Left Apartment," "First Floor—Middle Apartment," First Floor—Right Apartment," and so on.

Referencing an element into a construct



Referencing Elements to Multiple Constructs

In multi-story buildings, levels may have identical elements. You can create an element once, and then reference it into multiple constructs in one single, convenient step. For detailed information, see "Referencing an Element into Multiple Constructs" on page 284.

Related Topics

- When to Start with Elements
- Processing Elements in the Building Project
- Creating a New Element
- Converting a Legacy Drawing to an Element
- Opening and Closing an Element
- Dragging Objects into an Element
- Changing the Properties of an Element
- Deleting an Element
- Referencing an Element into Another Element
- Displaying External References of an Element
- Converting an Element to a Construct
- Changing Elements: Interactions with the Project

When to Start with Elements

You would start a project with creating elements in the following cases:

- when you can identify generic building blocks in your project
- when you start the design process from the inside-out
- when you have not yet decided on the larger structures of your building

Elements can be small units like a desk/chair combination or large units like an entire apartment layout or a generic furniture layout. You might use an element as a placeholder until you have more specific information, like placing a generic furniture layout on a office floor or placing a building core with bathrooms, elevator shafts, and heating rooms. You can also define an element that uses other elements as external references in its content. A generic building core element, for example, could contain references for bathroom elements or staircase elements. You can nest external references multiple levels deep.

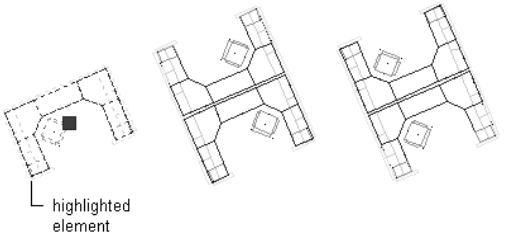
Keep these points in mind when creating elements:

- An element needs to be referenced into a construct before it can be used for views.
- An element is re-usable; if you do not need the element more than once in your drawing, create a construct instead.

Processing Elements in the Building Project

Once you have created and modified a number of elements in your project, you need to decide how to use them further downstream in the project. The following list describes typical uses for elements and where to find additional information:

Plan view of furniture layout with highlighted element



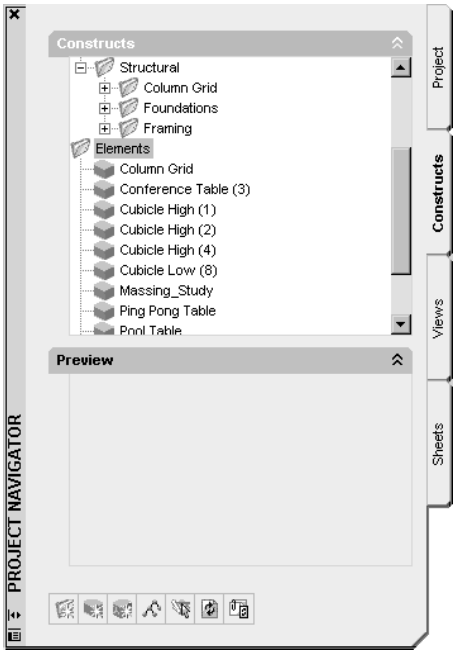
Use	Further Information
reference an element into a construct	This is the most frequent use case for an element. A generic element, like a bathroom layout, is referenced into a specific construct, like a floor plan. For more information, see "Referencing Elements into Constructs" on page 282, and "Referencing an Element into Multiple Constructs" on page 284.

Use	Further Information
reference an element into another element	For example, if you want to have different elements for single cubicles—a 4-cubicle group, and an 8-cubicle group—you could create an element for one cubicle, and reference that four times into the 4-cubicle group element. For more information, see "Referencing an Element into Another Element" on page 303. **NOTE** When you reference an element into another element, the host element still needs to be referenced into a construct before it can be used for views.
reference an element into a plotting sheet	You can directly reference an element into a plotting sheet. This can be useful for title block elements or the documentation of a detail.
convert an element to a construct	If you have created an element, and realize that it shows a unique portion of the building, for example a staircase, you have the option of converting the element into a construct. For more information, see "Converting an Element to a Construct" on page 305.

Creating a New Element

Use this procedure to create an element.

1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. In the tree, locate the Elements category or any subcategory of the Elements category.



4 Add the new element to the project in one of the following ways:

- Right-click the category in which to place the new element, and click New ➤ Element.
- In the toolbar at the bottom of the Constructs tab, click .

5 Define the element properties:

If you want to . . .	Then . . .
name the new element	enter a name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
add a description for the element	click the setting for Description, enter a description of the element, and click OK.
change the category of the element	select from the Category list. By default, the category you chose in step 3 is suggested.

If you want to . . .	Then . . .
select a different template file	click , and browse for a new template. By default, the default template for elements set in the project is used.

6 Click OK.

7 Open the element, as described in "Opening and Closing an Element" on page 299.

8 Edit the element as necessary:

- Add objects to the element.
- Reference other elements into the element.

  For more information, see "Referencing an Element into Another Element" on page 303.

9 To update the tree in the Project Navigator, click .

Converting a Legacy Drawing to an Element

You may have legacy drawing files in Autodesk® Architectural Desktop that you want to convert into elements.

When you convert a legacy drawing file into an element, the following process is performed by the software:

- The drawing file is either moved, copied, or connected via a link to the element category you specify.
- If necessary, a different name is given to the file and a description is added to it.
- An accompanying XML file with the necessary project information is automatically generated.

There are two ways to convert a legacy drawing file into an element: you can open the drawing file in Autodesk Architectural Desktop and save it as an element, or you can drag a drawing file from Internet Explorer to the Project Navigator.

Related Procedures

- Converting Drawing Files to Elements by Opening and Saving
- Converting Drawing Files to Elements by Dragging and Dropping from Internet Explorer

Converting Drawing Files to Elements by Opening and Saving

Use this procedure to convert a legacy drawing file to an element by opening it in Autodesk® Architectural Desktop and then saving it as an element.

1. On the File menu, click Open, and open the desired drawing file.
2. On the Window menu, click Project Navigator Palette.
3. Click the Constructs tab.
4. In the tree, locate the Elements category or any of its subcategories.
5. Right-click, and click Save Current Dwg as Element.
6. Define the element properties:

If you want to . . .	Then . . .
change the name of the drawing file	enter a new name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
enter a description for the element	click the setting for Description, enter a description of the element, and click OK.
change the category of the element	select one from the Category list. By default, the category you chose in step 4 is suggested.

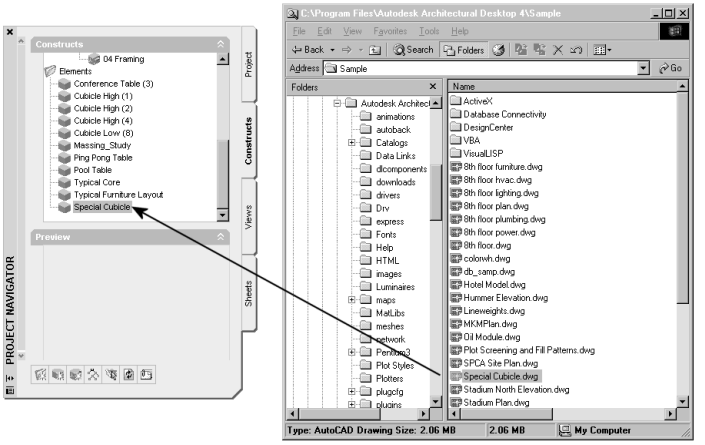
7. Click OK.
8. To close the element, click Close on the File menu.
9. To update the tree in the Project Navigator, click .

Converting Drawing Files to Elements by Dragging and Dropping from Internet Explorer

Use this procedure to convert legacy drawing files to elements by dragging and dropping them from Internet Explorer.

Internet Explorer offers three different modes of conversion:

- Converting a file to an element and moving it into a project folder
- Copying a file, and converting the copy to the element in a project folder
- Converting a file to an element and creating a link to its original location



1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. Start Internet Explorer, and position it next to the Project Navigator.
4. In Internet Explorer, open the folder that contains the legacy document.
5. Place the legacy drawing in the Elements category or one of its subcategories:

If you want to . . .	Then . . .
move the legacy drawing into the selected category, and convert it to an element	drag the drawing into the desired location in the Project Navigator.
move a copy of the legacy drawing into the selected category, and convert it to an element	CTRL-drag the drawing into the desired location in the Project Navigator.
create a link to the legacy drawing in its original location, and convert it to an element	ALT-drag the drawing into the desired location in the Project Navigator.

NOTE You can also drag an entire legacy folder into the project. The folder is converted into a category, and all drawings within are converted to elements. For instructions on converting legacy folders to categories, see "Creating a Category by Dragging a Folder from Internet Explorer to the Project Navigator" on page 264.

6 Define the element properties:

If you want to . . .	Then . . .
change the name of the drawing file	enter a new name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
enter a description for the element	click the setting for Description, enter a description of the element, and click OK.
change the category of the element	select one from the Category list. By default, the category you chose in step 5 is suggested.

7 Click OK.

8 To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.

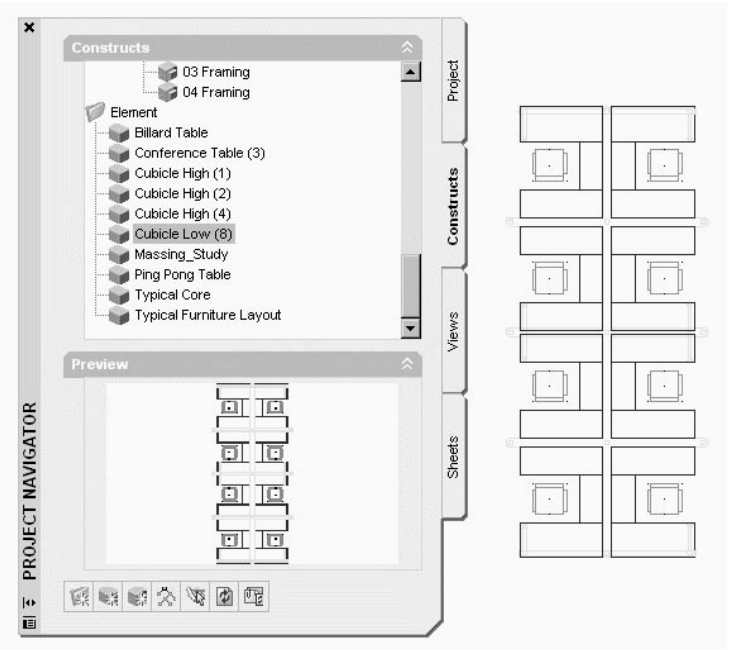
9 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

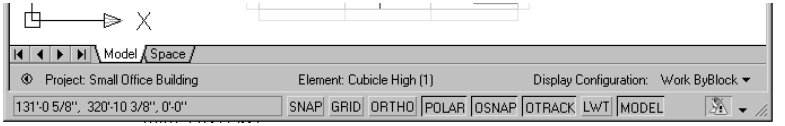
10 To update the tree in the Project Navigator, click .

Opening and Closing an Element

Use this procedure to open and close an element.



When you open an element, the status line in the Autodesk® Architectural Desktop drawing area displays the name of the associated project.



1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. In the tree, locate the Elements category or the subcategory that contains the element you want to open.
4. Open the element in one of these ways:

   - Select the element, right-click, and click Open.
   - Double-click the element.

   The element is opened in the drawing area of Autodesk Architectural Desktop. You can now edit it.

5. To close the element, click Close on the File menu, and save the changes if necessary.

6 To update the preview of the element in the Project Navigator, click .

Dragging Objects into an Element

Use this procedure to drag and drop objects into an element.

When you create a new element, you may choose to add content to it in several ways. You can draw objects within the element, you can reference external drawings into an element, or you can drag and drop objects from other drawing files into an element.

1 Open the drawing that contains the objects you want to drag and drop into an element.

NOTE The drawing containing the objects is not required to be a part of a project.

---

2 On the Window menu, click Project Navigator Palette.

3 Click the Constructs tab.

4 In the tree, locate the Elements category or the subcategory that contains the element to which you want to add objects from another drawing file.

5 In the open drawing file, select the objects you want to drag and drop into the element.

6 Move or copy the objects into the element.

If you want to . . .	Then . . .
move the objects from the open drawing to the element	drag the objects from the drawing onto the desired element in the Project Navigator.
copy the objects from the open drawing to the element	CTRL-drag the objects from the drawing onto the desired element in the Project Navigator.

Changing the Properties of an Element

Use this procedure to change the properties of an element.

1 On the Window menu, click Project Navigator Palette.

2 Click the Constructs tab.

3 In the tree, locate the Elements category or the subcategory that contains the element you want to change.

4 Select the element, right-click, and click Properties.

5 Change the element properties:

If you want to . . .	Then . . .
change the name of the element	enter a new name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
change the description of the element	click the setting for Description, change the description of the element, and click OK.
change the category of the element	select one from the Category list. Changing the category of an element means changing its location in the project.

6 Click OK.

7 To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.

8 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

Deleting an Element

Use this procedure to delete an element.

The element must be closed in order to delete it.

NOTE Do not delete an element from Internet Explorer. This might result in inconsistent project data.

1 On the Window menu, click Project Navigator Palette.

2 Click the Constructs tab.

3 In the tree, locate the Elements category or the subcategory that contains the element to delete.

4 Select the element, right-click, and click Delete.

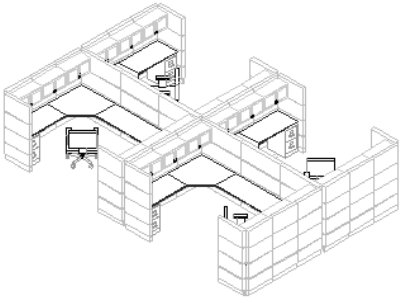
5 Click Yes in the subsequent message box.

Referencing an Element into Another Element

Use this procedure to reference an element into another element.

NOTE When you are working in a project environment, make sure that all files you are using belong to this project or another project. Drawing files that do not belong to a project have no accompanying XML file and, therefore, do not give access to the full functionality of Drawing Management. For example, a non-project drawing file referenced into a project file via the AutoCAD Xref Manager is not assigned a project category and does not turn up in the Project Navigator tree. So, while you could technically reference a non-project drawing file into an element with standard AutoCAD commands, it is not advisable. To reference a non-project drawing file into the project, convert the file into an element, and then reference it.

3D view of cubicle element referenced four times into cubicle group



1 On the Window menu, click Project Navigator Palette.

2 Click the Constructs tab.

3 In the tree, locate and open the element into which you want to reference another element.

4 In the Project Navigator, locate the element to reference into the open element.

5 Reference the element into the open element in one of these ways:

If you want to . . .	Then . . .
attach the element as an external reference to the open element	select the element in the Project Navigator, right-click, and click Xref Attach, or select the element in the Project Navigator, and drag it into the open element in the Autodesk® Architectural Desktop drawing area. When you attach an element as an external reference, you create a link from the referenced element to the current element; any changes to the referenced element are displayed in the current element when it is opened or refreshed.
overlay the element as an external reference on the open element	select the element in the Project Navigator, right-click, and click Xref Overlay. When you overlay an external reference, you also create a link from the referenced element to the current element. Unlike an attached reference, an overlaid reference is not included when the element is itself attached or overlaid as a reference to another element or construct.
insert the element as a block into the open element	select the element in the Project Navigator, right-click, and click Insert as Block. When you insert an element as a block reference into another element, the link between the referenced element and the current element is cut off. The inserted element is converted to a block and does not update when the reference element is changed. You can, however, edit the block in the current element.

6 If necessary, edit the external reference in the open element.

For more information on external references, see "Attach External References" in the *AutoCAD 2004 Online Users Guide*.

For more information on blocks, see "Create and Insert Symbols (Blocks)" in the *AutoCAD 2004 Online Users Guide*.

Displaying External References of an Element

Use this procedure to display the external references contained in an element.

1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. In the tree, locate the element for which to display external references.
4. Select the element.
5. Display the external references in one of these ways:

   - Right-click, and click Show External References.
   - Click .

   A worksheet with the external references contained in the element is displayed. You can expand or collapse the list by clicking individual items.

6. Click OK to close the worksheet.

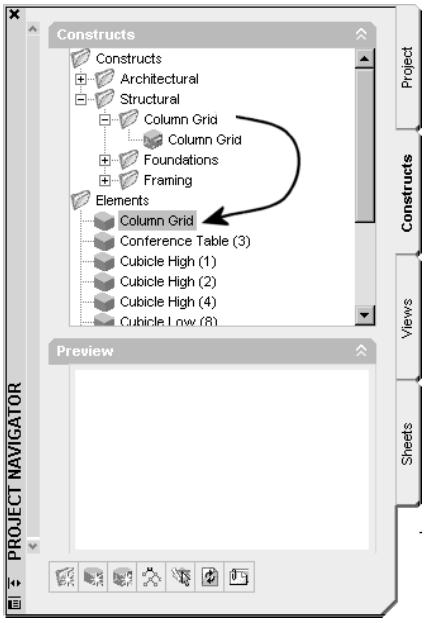
NOTE You can also display external references by opening the element in the Autodesk® Architectural Desktop drawing area and using the AutoCAD Xref Manager. For more information, see "Reference Other Drawing Files (Xrefs)" in the *AutoCAD 2004 Online Users Guide*.

Converting an Element to a Construct

Use this procedure to convert an element to a construct.

If you create an element and realize later that you do not need this drawing as a repeating element, you can convert it into a construct.

NOTE Do not drag an element to the Constructs folder within Internet Explorer. This will result in inconsistent project data.



1. On the Window menu, click Project Navigator Palette.
2. Click the Constructs tab.
3. In the tree, locate the element to convert into a construct.
4. Select the element, and drag it into the Constructs category or one of its subcategories.
5. Specify the construct properties, as described in"Creating a New Construct" on page 272.
6. To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.
7. In the Reference File Re-Path Queue worksheet, click Re-path.

   For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

NOTE If you want to convert the construct back to an element, drag it back to the Elements category.

Changing Elements: Interactions with the Project

Changes made to one part of a project frequently influence other parts of the project. The following information describes the changes you can make to an element, and the effects of the changes on other parts of the building project.

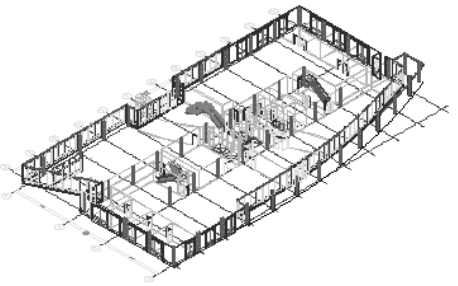
- **Adding new elements:** When you add new elements to a project, you must reference them into other elements, constructs, or plotting sheets.
- **Changing the element name and category (location):** Elements are used as external references in other files. When you change the name and the location of an element, its external reference path is no longer correct. To update the project, re-path it, as described in "Updating (Re-Pathing) the Project" on page 333.
- **Deleting an element:** When you delete an element that has been referenced into another element or into a construct or a plotting sheet, that drawing is now incomplete and has missing references. If a construct with deleted elements has been referenced into a view, and the view is updated, it also is incomplete. Therefore, before deleting an element, check to see if it is still used elsewhere.

  For detailed information on deleting elements, see "Deleting an Element" on page 302.

Views

Once the structure and the individual parts of the building are defined by constructs, you can begin creating reports of that data. A view is a drawing that references a number of constructs to present a specific aspect of the building project. You could, for example, create a first-floor reflected ceiling plan or second-floor framing plan. You could also create a composite view of all floors in the building. Views combine the appropriate constructs via external references according to their location within the building model. For example, to create a floor plan of the west wing of the second floor, you would create a view that references all constructs assigned to the second floor and the west wing. This would also include a curtain wall spanning the first through fifth floor. You can reference additional constructs that do not lie on that floor but that you still want to see in the view, such as a building outline or a grid.

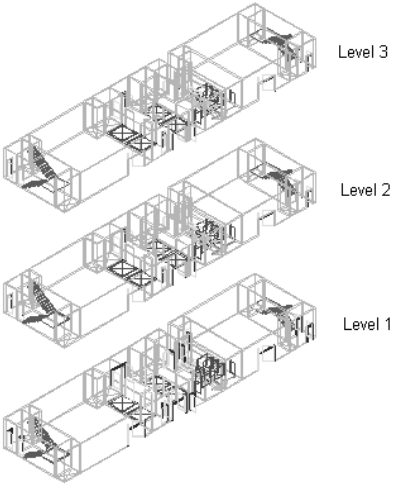
3D view of building first floor



Views and Constructs

You create a view by selecting constructs from your project and referencing them into the view. When creating multi-level views, each construct is referenced at its level height.

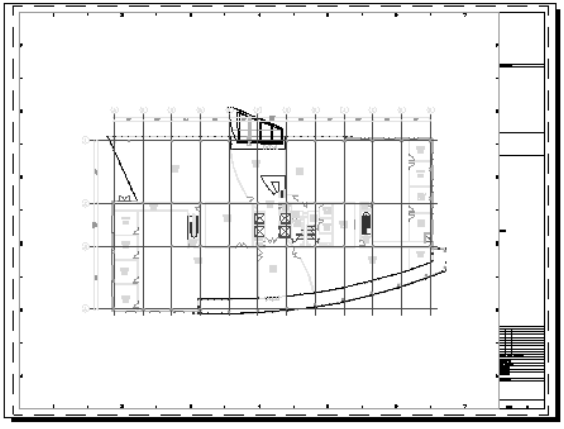
3D view of copied building core constructs at each building level



Views and Plotting Sheets

Views are used to create plotting sheets. You reference a view into a plotting sheet and supplement it with plot-sheet specific objects like title blocks and other annotation components.

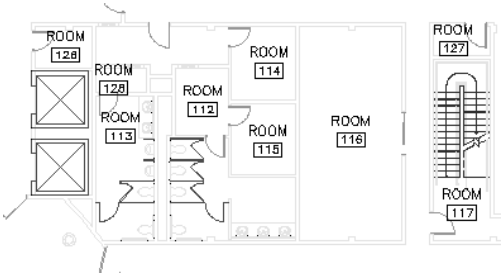
Plotting sheet with building plan



Views and Annotation

You can generate project-wide data like annotation, dimensions, and schedule tables in a view or a plotting sheet, depending on your specific workflow and needs. The Autodesk®Architectural Desktop Scheduling feature makes it easy to generate annotation in both views and plotting sheets. For more information on annotating a project, see "Annotating a Building Project" on page 341.

View drawing with annotation tags



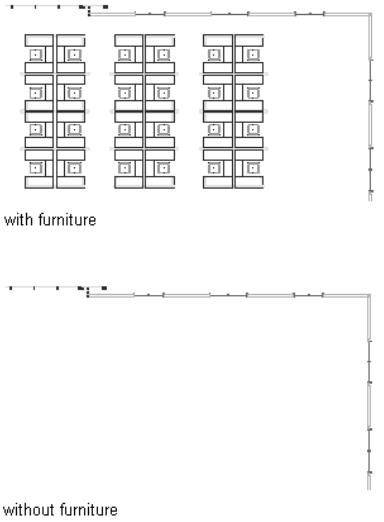
Views and Layer Snapshots

The default plotting sheet template can contain layer snapshots that you can select when creating a new view. The selected layer snapshot is used when the view is referenced into a plotting sheet that is based on the default sheet template.

Updating Views

A view can include either individual constructs or entire construct categories. For example, if you select the Architectural—First Floor construct category, all constructs within this category are included in the view. If you add constructs to that category later, the view is updated to include the new constructs. Therefore, it is recommended that you use categories in order to keep your views current throughout the project.

Plan view of view with and without furniture layout



View Files

A view is a drawing (DWG) file. As opposed to other non-project related drawing files, when you create a view an additional XML file with the same name is created. The accompanying XML file contains information to connect the drawing file into the project.

NOTE The XML file is created and updated automatically. You do not need to edit it, but be careful not to accidentally delete it in Internet Explorer.

NOTE Do not convert an existing drawing file into a view. Because views consist of referenced constructs in the drawing, it is better to create a new view within the project and then fill it with constructs.

View Templates

When you create a project, you set a default template for new views.

The view template should be saved so that it will create a drawing that opens to the model tab, or the model space of a layout tab. When you create a new view, all of the constructs assigned to the view will automatically be referenced into the view drawing. The view must open into the model tab, or a model space viewport in a different layout to avoid the building being referenced into paper space.

For more information about project templates, see "Creating a New Project" on page 229.

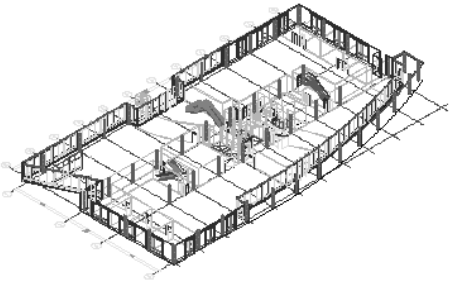
Related Topics

- When to Start with Views
- Process Overview: Creating a View
- Creating a New View
- Displaying External References of a View
- Opening and Closing a View
- Changing the Properties of a View
- Regenerating a View
- Deleting a View
- Changing Views: Interactions with the Project

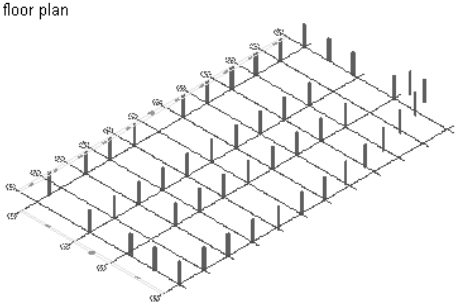
When to Start with Views

Typically, you create views after you have defined your basic constructs. There are different view types you can create. For example, you could create a series of views for individual floors: "First Floor," "Second Floor," "Basement," "Roof." You could also create a series of views based on plan type: "Plan View," "Model View," "Reflected View." Another schema could be by function: "Walls," "Framing," "Furniture."

3D view of first floor plan and framing plan



floor plan



framing plan

You can add tags, dimension the building objects, and create a schedule table in a view. Tags and schedule tables contain a number of new project properties, such as level and division assignments. For detailed information on annotating a project, see "Annotating a Building Project" on page 341.

Keep these points in mind when creating views:

- You can only reference constructs directly into a view. To see elements in a view, they must be referenced by a construct.
- You can add tags, dimensions, and schedule tables to a view.

Process Overview: Creating a View

Creating a view involves the following main steps:

Step 1: Select levels and divisions to include in the view.

For more information, see "Creating a View: Assigning Levels and Divisions" on page 315.

Step 2: Select the constructs to be contained in the view.

For more information, see “Creating a View: Selecting the Constructs” on page 316.

Step 3: Select the viewport settings to be used when the view is referenced into a plotting sheet.

For more information, see “Creating a View: Setting Viewport Defaults for the Plotting Sheet” on page 318.

Step 4: If necessary, annotate and dimension the new view.

For more information, see “Annotating a Building Project” on page 341.

Creating a New View

A wizard leads you through the steps for creating a view.

NOTE Views are containers for constructs. Typically, you start to create a view when you already have the necessary constructs in the drawing. However, you can also create an empty view first and add constructs to it later.

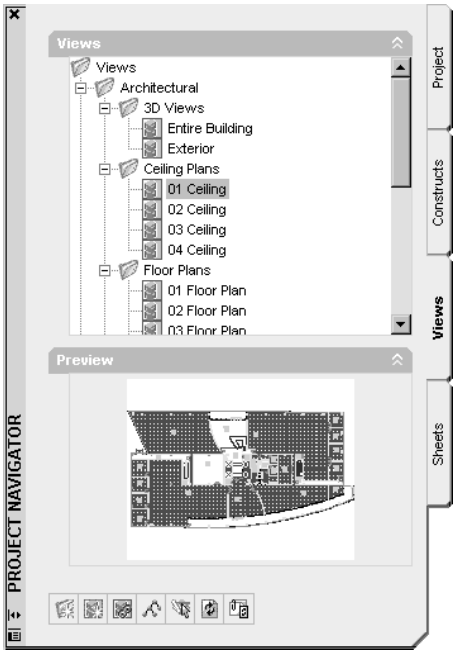
Related Procedures

- Creating a View: Defining General Properties
- Creating a View: Assigning Levels and Divisions
- Creating a View: Selecting the Constructs
- Creating a View: Setting Viewport Defaults for the Plotting Sheet

Creating a View: Defining General Properties

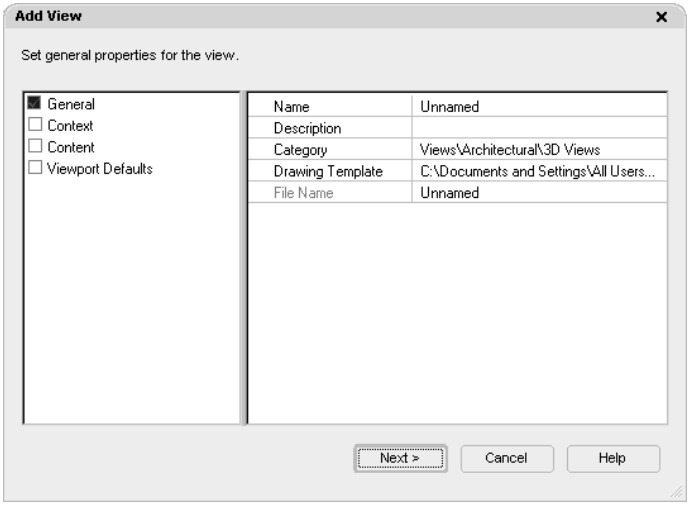
Use this procedure to set the name, description, category, and template file of a new view.

1. On the Window menu, click Project Navigator Palette.
2. Click the Views tab.
3. In the Views tree, locate the category in which to place the new view. If you have not defined any categories, the new view is placed in the basic Views category.



4 Add a new view to the project in one of these ways:

- Right-click the category in which to place the new view, and click New ➤ View.
- In the toolbar at the bottom of the Views tab, click .



5 Define the general view properties.

If you want to . . .	Then . . .
name the new view	enter a name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
enter a description for the view	click the setting for Description, enter a description of the view, and click OK.
change the category of the view	select from the Category list. By default, the category you chose in step 3 is suggested.
select a different template file	click , and browse for a new template. By default, the default template for views set in the project is used.

6 Click Next, and proceed to "Creating a View: Assigning Levels and Divisions" on page 315.

Creating a View: Assigning Levels and Divisions

Use this procedure to assign the levels and divisions included in the view.

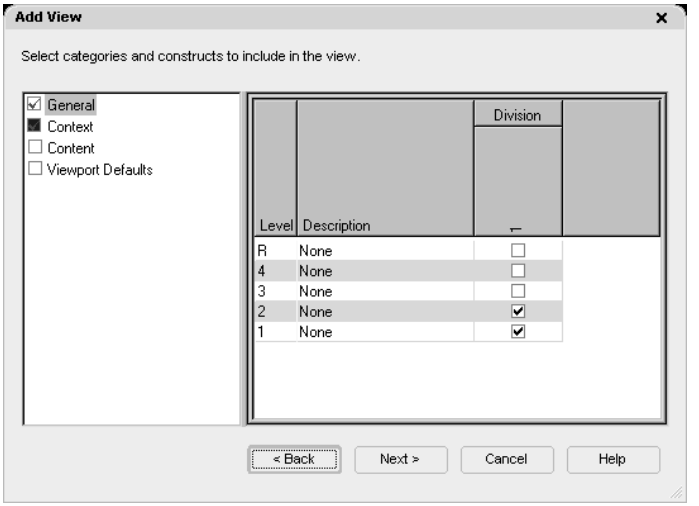
You can choose multiple levels and divisions for a view, for example, to create a view of the entire building.

When you select one or more levels as view context, all constructs that belong to those levels are referenced into the view at the elevation you set for the level in "Creating a New Level" on page 251. For example, the first-floor constructs might be referenced at zero elevation and second-floor constructs at 2.75 meters. A spanning element would be referenced at the elevation of the lowest level to which it is assigned.

The level and divisions you choose serve as preselection for the next step. For example, if you choose the first level and the south wing as view context, all constructs belonging to that level and wing are checked in the content selector. You can exclude constructs if you wish, but preselection saves time and effort.

1 Define the general properties of the view, as described in "Creating a View: Defining General Properties" on page 313.

2 Click Next.



3 Select the levels and divisions to be included in the view.

4 When you are finished setting the levels and divisions, click Next, and proceed to defining the view content as described in "Creating a View: Selecting the Constructs" on page 316.

Creating a View: Selecting the Constructs

Use this procedure to select constructs to be referenced in the view.

You can attach or overlay constructs into the view. By default, each construct is attached as an external reference. For detailed information on attaching and overlaying external references, see "Reference Other Drawing Files" in the *AutoCAD 2004 Online User's Guide*.

If more than one level is selected, the constructs are inserted at the elevation of the level to which they are assigned. For example, if you assign an apartment construct to the second level, which has an elevation of 2.75 meters, the apartment construct is referenced into the view at 2.75 meters.

Selecting constructs is the key to creating a view. The view consists mainly of referenced constructs.

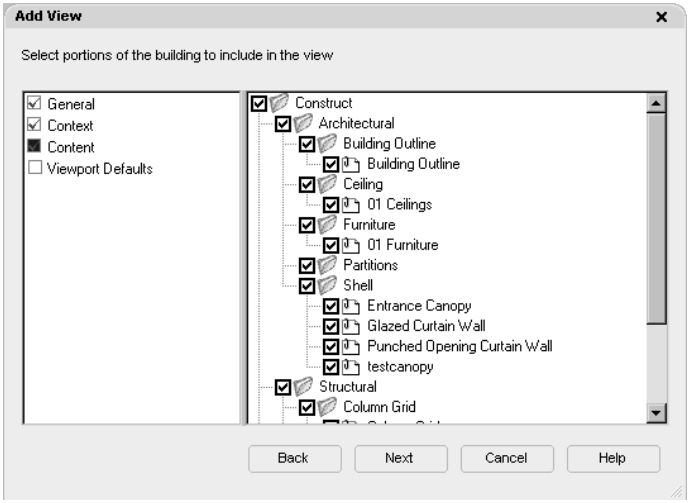
There are several ways to make the selection of constructs easier:

- **Preselect levels and divisions:** Depending on the level and division you selected in the Level/Divisions Assignments tab, all constructs at that level and division are already checked.

- **Work with categories:** When you select a category, all constructs within that category are selected. When you add constructs to the category later, they are included in the view.

1 Define the context of the view, as described in "Creating a View: Assigning Levels and Divisions" on page 315.

2 Click Next.



Based on the context you chose in the previous tab, a number of constructs and categories have been selected. You can use this preselected set, or make changes to it.

3 Create the selection set of constructs for the view:

If you want to . . .	Then . . .
select an entire category to include in the view	select the category. All constructs in the category are selected automatically. When you add constructs to the category later, they are included in the view.
select a construct to include in the view	select the construct.
exclude a category from the view	clear the category's box. All constructs in the category are cleared automatically.
exclude a construct from the view	clear the construct's box.

4 Determine the referencing mode of the constructs in the view:

If you want to . . .	Then . . .
attach the construct to the view	select the construct, right-click, and click Set to Attach. **NOTE** Attaching an external reference is the default insertion method for views. When the Set to Attach command is unavailable, the construct has already been set to be attached.
overlay the construct to the view	select the construct, right-click, and click Set to Overlay. **NOTE** When the Set to Overlay command is unavailable, the construct has already been set to be overlaid.

5 Click Next, and proceed to "Creating a View: Setting Viewport Defaults for the Plotting Sheet" on page 318.

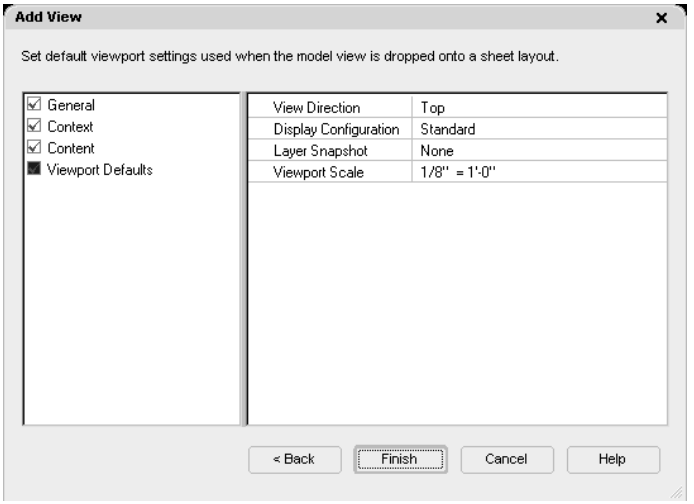
Creating a View: Setting Viewport Defaults for the Plotting Sheet

Use this procedure to define the view direction, display configuration, layer snapshot, and viewport scale to assign when referencing the view into a plotting sheet.

All the available settings come from the default sheet template. For example, if your default sheet template contains a layer snapshot named "Construction," you can select that layer snapshot when setting up a new view. If you reference a view into a sheet that is not based on the default sheet template, you cannot access the selected layer snapshot.

1 Define the content of the view, as described in "Creating a View: Selecting the Constructs" on page 316.

2 Click Next.



3 Select the view direction and display configuration.

NOTE The view direction and display configuration determine how the view is displayed when it is referenced into a plotting sheet layout. The view direction and display configuration for the view itself are determined from the view template selected in "Creating a View: Defining General Properties" on page 313.

4 Select a layer snapshot to use for referencing the view into a plotting sheet.

If the default sheet template does not contain any layer snapshots, this list is empty.

5 Select the viewport scale to use when referencing the view into a plotting sheet.

6 Click Finish.

Displaying External References of a View

Use this procedure to display the external references of a view.

1 On the Window menu, click Project Navigator Palette.

2 Click the Views tab.

3 In the tree, locate the view for which to display external references.

4 Select the view.

5 Display the external references in one of these ways:

- Right-click, and click Show External References.
- Click .

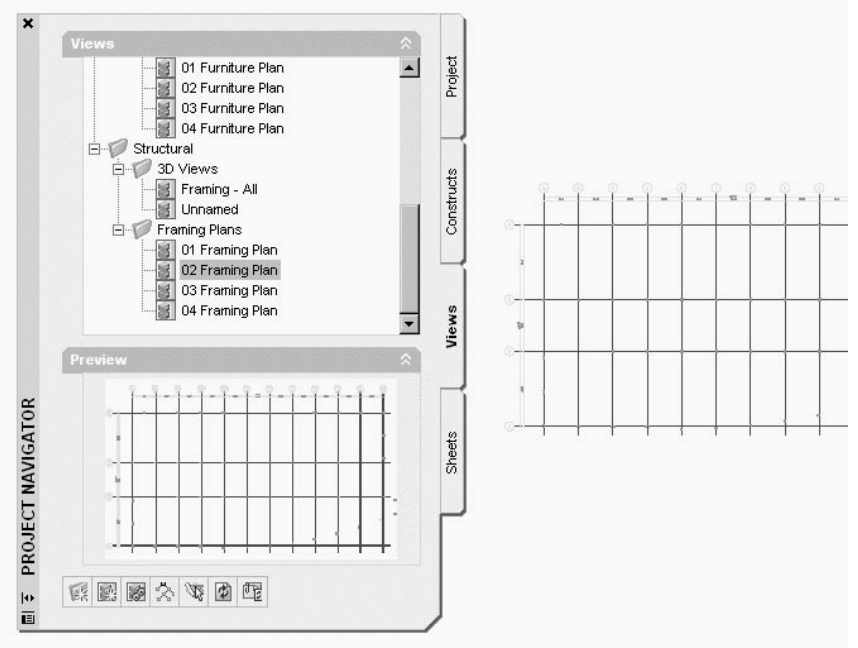
A worksheet with the external references of the view is displayed. You can expand or collapse the list by clicking individual items.

6 Click OK to close the worksheet.

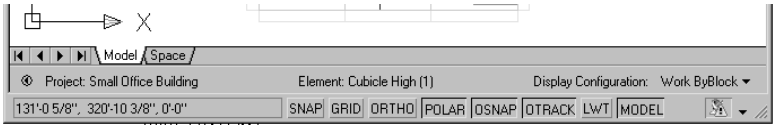
NOTE You can also display external references by opening the view, and using the AutoCAD Xref Manager. For more information, see "Reference Other Drawing Files (Xrefs)" in the *AutoCAD 2004 Online Users Guide*.

Opening and Closing a View

Use this procedure to open and close a view.



When you open a view, the status line in the Autodesk®Architectural Desktop drawing area displays the name of the associated project.



1. On the Window menu, click Project Navigator Palette.
2. Click the Views tab.
3. In the Views tree, locate the view you want to open.
4. Open the view in one of these ways:

   - Select the view, right-click, and click Open.
   - Double-click the view.

   The view is opened in the drawing area of Autodesk Architectural Desktop.

5. To close the view, click Close on the File menu, and save the changes, if necessary.
6. To update the preview of the view in the Project Navigator, click .

Changing the Properties of a View

Use this procedure to change the properties of a view.

If you have changed the name or the location of constructs included in the view, you need to repath the view.

If you have changed the level or division assignment of constructs included in the view, you need to reload the external references in the view. For information, see "Regenerating a View" on page 322.

1. On the Window menu, click Project Navigator Palette.
2. Click the Views tab.
3. In the Views tree, select the view, right-click, and click Properties.
4. Click the General category on the left, and change the general view properties:

If you want to . . .	Then . . .
change the name of the view	enter a new name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.

If you want to . . .	Then . . .
change the description of the view	click the setting for Description, change the description of the view, and click OK.
change the category of the view	select from the Category list.

5 Click the Context category on the left, and change the levels and divisions to include in the view.

6 Select the Content category on the left, and change the selected constructs for the view.

If you want to . . .	Then . . .
add a construct or category to the view	check the box for the construct or category.
remove a construct or category from the view	clear the box for the construct or category.
change the referencing mode of a construct	select the construct, right-click, and select one of these commands: ■ To attach a previously overlaid construct to a view, click Set to Attach. ■ To overlay a previously attached construct to a view, click Set to Overlay. **NOTE** If one of these commands is unavailable, its mode is already selected.

7 Click the Viewport Defaults category on the left, and change the settings of the view when referenced into a plotting sheet.

8 Click OK.

9 To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.

10 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

Regenerating a View

Use this procedure to regenerate all views in the project. You need to regenerate a view if its content has changed—for example, if you have changed the

constructs assigned to it. When you regenerate a view, you reload all of the external references used to generate the view.

1 In the Project Navigator, click the Views tab.

2 Click the button.

All views in the project are updated with the changed constructs.

Deleting a View

Use this procedure to delete a view.

For information on the consequences of deleting views, see "Changing Views: Interactions with the Project" on page 323.

The view must be closed in order to delete it.

NOTE Do not delete a view from Internet Explorer. This might result in inconsistent project data.

---

1 On the Window menu, click Project Navigator Palette.

2 Click the Views tab.

3 In the Views tree, select the view, right-click, and click Delete.

4 Click Yes in the subsequent message box.

Changing Views: Interactions with the Project

Changes made to one part of a project frequently influence other parts of the project. The following information describes the changes you can make to a view and the effects of the changes on other parts of the building project:

- **Adding a new view:** When you create a new view, all or most of the referenced constructs should be present. For quick and comfortable selection of the constructs, you should place them in categories.
- **Changing the view name and category (location):** A view has a number of constructs referenced into it, and the view itself is referenced into a plotting sheet. Therefore, any name and location changes to a view need to be updated throughout the project. To update the path, re-path the project, as described in "Updating (Re-Pathing) the Project" on page 333.
- **Changing the content of a view:** Any changes made to the content of a view are also made to the plotting sheets that reference that view.

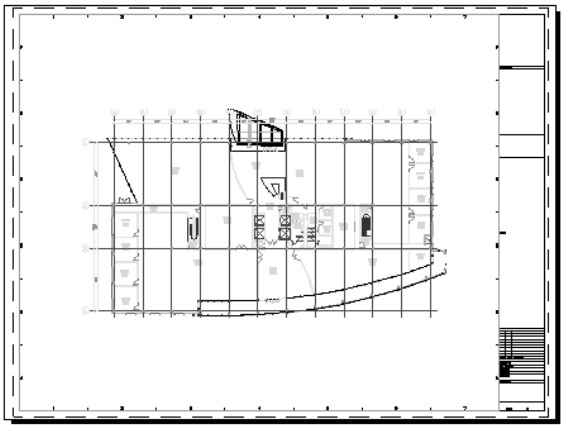
- **Deleting a view:** If you delete a view that has been referenced into a plotting sheet, that plotting sheet is now incomplete and has missing references. Check to see if the view is still used in a sheet before deleting it.

  For detailed information on deleting views, see "Deleting a View" on page 323.

Plotting Sheets

Plotting sheets are used to plot plans of your building project. The plotting sheet references views and can be used to add annotation data to the project. Typically, you create one plotting sheet for each view you want to plot. You might, however, also create a plotting sheet that references multiple views.

Plotting sheet with building plan view



Plotting Sheet Viewports

A view dragged onto a layout in a plotting sheet is referenced into model space. The viewport created on the layout is scaled to match the scale specified by the view, and has the display configuration and layer snapshot specified by the view.

For more information on setting display configurations and layer snapshots in a view, see "Creating a View: Setting Viewport Defaults for the Plotting Sheet" on page 318.

Plotting Sheets and Annotation

You can generate project-wide data like annotation, dimensions, and schedule tables in a view or a plotting sheet, depending on your specific workflow

and needs. The Autodesk®Architectural Desktop Scheduling feature makes it easy to generate annotation in both views and plotting sheets. For more information on annotating a project, see "Annotating a Building Project" on page 341.

Plotting Sheet Files

A plotting sheet is a drawing (DWG) file. As opposed to other non-project related drawing files, an additional XML file with the same name is created when you create a plotting sheet. The accompanying XML file contains information to connect the drawing file into the project.

NOTE The XML file is created and updated automatically. You do not need to edit it but be careful not to accidentally delete it in Internet Explorer.

NOTE Do not convert an existing drawing file into a plotting sheet. Because plotting sheets typically contain views and a view consists mainly of referenced constructs in the drawing, it is better to create a new plotting sheet within the project and then fill it with views.

Plotting Sheet Templates

When you create a project, you set a default template for new plotting sheets.

The plotting sheet template should be saved so that it will create a drawing that opens to a layout without a viewport. Because a view referenced into a plotting sheet will automatically create a viewport in the layout, the plotting sheet should have an empty layout ready to use the viewport set in the view.

For more information about project templates, see "Creating a New Project" on page 229.

Related Procedures

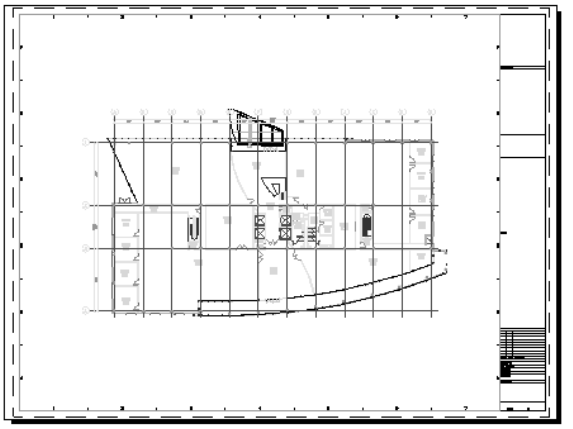
- When to Start with Plotting Sheets
- The Content of Plotting Sheets
- Creating a New Plotting Sheet
- Opening and Closing a Plotting Sheet
- Referencing a View into a Plotting Sheet
- Changing the Properties of a Plotting Sheet
- Displaying External References of a Plotting Sheet
- Deleting a Plotting Sheet
- Changing Plotting Sheets: Interactions with the Project

When to Start with Plotting Sheets

Plotting sheets are the final output of a building plan. You create plotting sheets after you have created elements and constructs for all parts of the building model along with the necessary views.

Designing a building is an iterative process. You often revisit planning stages and make changes to elements and constructs. These changes are reflected in the views and plotting sheets.

Plotting sheet with building plan



Keep these points in mind when creating plotting sheets:

- The content of a plotting sheet depends on the view that is referenced into it and the constructs and elements referenced into the view.
- The viewport settings of a plotting sheet are defined in the view that is referenced into it. For more information, see "Creating a View: Setting Viewport Defaults for the Plotting Sheet" on page 318.
- A plotting sheet contains all plotting-specific settings like title blocks and print annotation.

The Content of Plotting Sheets

Plotting sheets are predominantly used to reference views for printing purposes. However, plotting sheets can contain these other components as well:

- Annotation: You can add schedule tables, object tags, and dimensions to a plotting sheet.

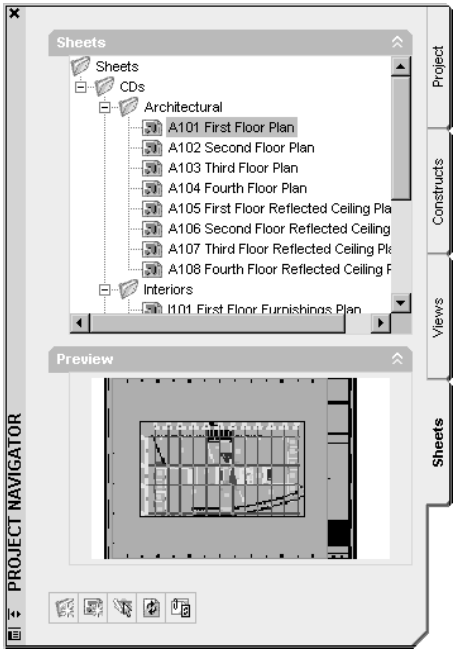
- Elements: You can use elements directly in plotting sheets. For example, you could use an element for a title block (although you could also add the title block to the plotting sheet template). You could also highlight a specific detail of the building object, like a chair/desk combination, and document that in the plotting sheet. Note that this might influence the scheduling in the plotting sheet, so make sure that this is really the desired effect.

Creating a New Plotting Sheet

Use this procedure to create a new plotting sheet.

1 On the Window menu, click Project Navigator Palette.

2 Click the Sheets tab.



3 Add a new plotting sheet to the project in one of these ways:

- Right-click the folder in which to place the new plotting sheet, and click New ➤ Sheet.
- In the toolbar at the bottom of the Sheets tab, click .

4 Define the sheet properties:

If you want to . . .	Then . . .
name the new sheet	enter a name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
enter a description for the plotting sheet	click the setting for Description, enter a description of the plotting sheet, and click OK.
change the category of the plotting sheet	select from the Category list. By default, the category you chose in step 3 is suggested.
select a different template file	click , and browse for a new template. By default, the default template for plotting sheets set in the project is used here.

5 Click OK.

6 Open the plotting sheet, as described in "Opening and Closing a Plotting Sheet" on page 328.

7 Edit the plotting sheet as necessary:

- Reference views into the plotting sheet.

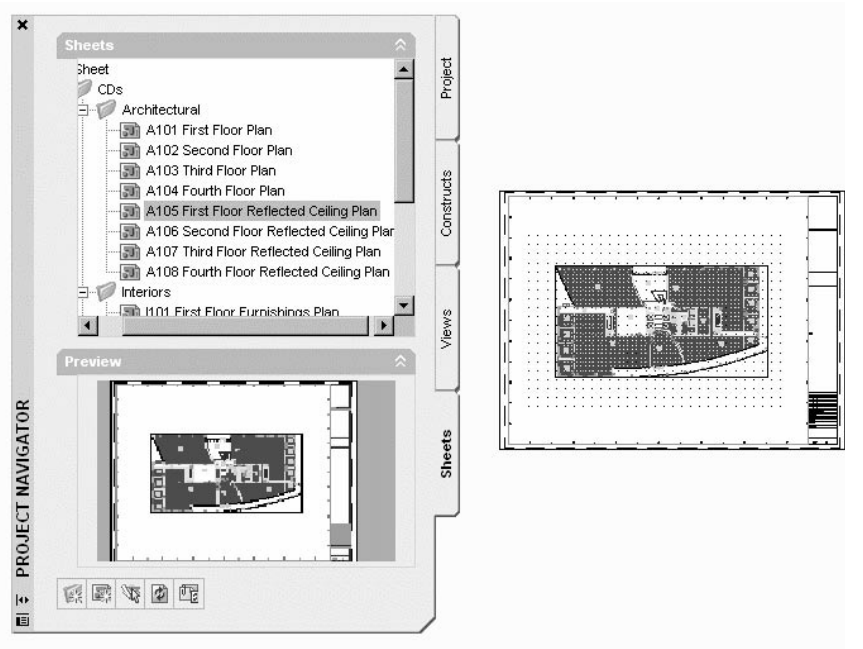
  For more information, see "Referencing a View into a Plotting Sheet" on page 330.
- Create or import title blocks, if these are not in the template.
- Add tags, property set data, and dimensions to the sheet.

  For more information, see "Annotating a Building Project" on page 341.

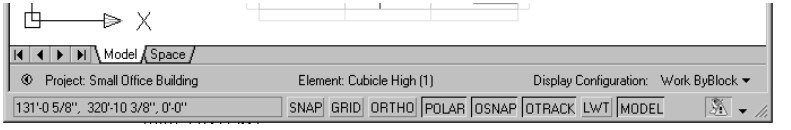
8 To update the tree in the Project Navigator, click .

Opening and Closing a Plotting Sheet

Use this procedure to open and close a plotting sheet.



When you have opened a plotting sheet, the status line in the Autodesk® Architectural Desktop drawing area displays the name of the associated project.



1. On the Window menu, click Project Navigator Palette.
2. Click the Sheets tab.
3. Locate the sheet you want to open.
4. Open the sheet in one of these ways:

   - Select the sheet, right-click, and click Open.
   - Double-click the sheet.

   The sheet is opened in the drawing area of Autodesk Architectural Desktop. You can now edit it.

5. To close the sheet, on the File menu, click Close, and save the changes, if necessary.

6 To update the preview of the sheet in the Project Navigator, click .

Referencing a View into a Plotting Sheet

Use this procedure to reference a view into a plotting sheet.

When you reference a view into a plotting sheet, the following information is taken from the view:

- **View Direction:** The view direction of the referenced view is determined by the setting you have made in the view. When you have set the view direction in the view to TOP, the referenced view is displayed in TOP view in the associated viewport of the plotting sheet.
- **Display configuration:** The display configuration set in the view is used to display the referenced view.
- **Layer Snapshot:** The layer snapshot set in the view is used to display the referenced view.
- **Viewport Scale:** The viewport scale defined in the view is used to display the referenced view.

For more information on how to set the display in a view, see "Creating a View: Setting Viewport Defaults for the Plotting Sheet" on page 318.

NOTE When you drag and drop a view into a sheet, the view is referenced into the sheet as an attachment.

TIP You can reference multiple views into a sheet. For each additional view you drag-and-drop into the sheet, an additional viewport will be generated.

---

1 On the Window menu, click Project Navigator Palette.

2 Click the Sheets tab.

3 Open the plotting sheet into which to reference a view.

4 In the Project Navigator, click the Views tab.

5 Reference the view into the open plotting sheet in one of these ways:

If you want to . . .	Then . . .
attach the view to the plotting sheet	select the view, right-click, and click Xref Attach, or select the view, and drag it into the open plotting sheet in the Autodesk® Architectural Desktop drawing area.
overlay the view on the plotting sheet	select the view, right-click, and click Xref Overlay.

Changing the Properties of a Plotting Sheet

Use this procedure to change the properties of a plotting sheet.

1 On the Window menu, click Project Navigator Palette.

2 Click the Sheets tab.

3 Select the sheet, right-click, and click Properties.

4 Change the sheet properties:

If you want to . . .	Then . . .
change the name of the sheet	enter a new name. If the project number is used as a prefix for project file names, you do not need to enter the prefix here. The complete name with prefix is displayed under File Name. For more information on prefixes, see "Creating a New Project" on page 229.
change the description of the sheet	click the setting for Description, change the description of the sheet, and click OK.
change the category of the sheet	select one from the Category list. Changing the category changes its location in the project.

5 Click OK.

6 To update your project with the new file information, select the file in the Project Navigator tree, right-click, and click Re-Path File.

7 In the Reference File Re-Path Queue worksheet, click Re-path.

For more information on updating files, see "Updating (Re-Pathing) the Project" on page 333.

Displaying External References of a Plotting Sheet

Use this procedure to display the external references of a plotting sheet.

1. On the Window menu, click Project Navigator Palette.
2. Click the Sheets tab.
3. In the tree, locate the plotting sheet for which to display external references.
4. Select the plotting sheet.
5. Display the external references in one of these ways:

   - Right-click, and click Show External References.
   - Click .

   A worksheet with the external references of the plotting sheet is displayed. You can expand or collapse the list by clicking individual items.

6. Click OK to close the worksheet.

NOTE You can also display external references by opening the view, and using the AutoCAD Xref Manager. For more information, see "Reference Other Drawing Files (Xrefs)" in the *AutoCAD 2004 Online Users Guide*.

Deleting a Plotting Sheet

Use this procedure to delete a plotting sheet.

The plotting sheet must be closed in order to delete it.

NOTE Do not delete a plotting sheet from Internet Explorer. This will result in inconsistent project data.

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1. On the Window menu, click Project Navigator Palette.
2. Click the Sheets tab.
3. Select the sheet, right-click, and click Delete.
4. Click Yes in the subsequent message box.

Changing Plotting Sheets: Interactions with the Project

Changes made to one part of a project frequently influence other parts of the project. The following information describes the changes you can make to a plotting sheet and the effects of the changes on other parts of the building project:

NOTE Because the sheet is the last stage of the project, it has fewer interactions with the project than the other components do. For example, deleting a plotting sheet has no influence on other drawings, like views or constructs.

- Adding a new plotting sheet: Normally, a plotting sheet is created to reference one specific view. For example, if you create a view called "First Floor Plan," you need to create a plotting sheet that contains this view.
- Changing the plotting sheet name and category (location): A plotting sheet has one or more views referenced into it. Therefore, any name and location changes to a plotting sheet need to be updated throughout the project. To update the path, re-path the project, as described in "Updating (Re-Pathing) the Project" on page 333.

  For detailed information on deleting views, see "Deleting a View" on page 323.

Updating (Re-Pathing) the Project

Use this procedure to update the paths within the project after making changes to the name or location of elements, constructs, views, or plotting sheets. For example, if you move a project file into another category, or rename it, you must update the file to reflect that change in the Project Navigator.

An update is always prompted for when you change the current project in the Project Browser. For more information, see "Selecting the Current Project" on page 229.

When you are zipping a project, and send it to another user who unpacks the project to a different location on his computer, the project will be updated in its new location when it is set current for the first time on the new machine. For example, if your project resides in C:\Project1\, and the user you are sending it to, unpacks it to D:\Project1, the path information is updated when the new user sets the project current in his version of Autodesk Archi-

tectural Desktop. This, however, will only work, if all project paths were correct and current when you zipped them. If, for example, you have moved the project to another location on your computer before zipping it, and not re-pathed it before zipping, the re-pathing on the new user's machine will not work correctly. Before you zip and send a project, you must make sure that all external reference paths in the project are valid at the time of zipping.

WARNING! If you close Autodesk Architectural Desktop without updating the file paths in your project, all changed path information is lost. The next time you open your project, it will not have current and correct file path information. Therefore, it is strongly recommended that you update your project frequently during the work session.

You have the choice between these updating options:

- Updating a single project file
- Updating all files in a category
- Updating all files in the project

1. On the Window menu, click Project Navigator Palette.
2. Change the name or the location of a project file or project folder in the Project Navigator.
3. Update your files:

If you want to . . .	Then . . .
update a single project file	select the project file, right-click, and click Re-path File.
update all files in a category	select the category folder, right-click, and click Re-Path Files.
update all files in the project	Click .

4. In the Reference File Re-Path Queue worksheet, click Re-path.

Refreshing the Project View

Use this procedure to refresh the project view in the Project Navigator.

When multiple users are working on the same project simultaneously, the situation can occur that one user's tree in the Project Navigator gets out of sync with the changes of another user.

For example, you might have one user who is adding/moving/deleting constructs of a project. At the same time, another user is annotating some plotting sheets. The user that is working on the plotting sheets is not automatically notified that his coworker has removed some constructs from the project; so if he tries to open a removed construct from his Project Navigator, he will get an error message.

To prevent this situation, it is necessary to frequently refresh the project tree. When you refresh the project tree, all tree items are updated to reflect the current file status.

1. On the Window menu, click Project Navigator Palette.
2. Click the tab for which you want to refresh the file tree.
3. Click .

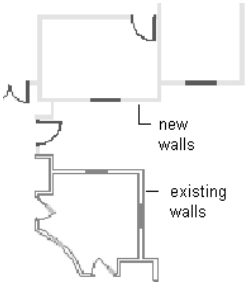
NOTE It is recommended that you do this frequently during the project session.

Object Display in External References

When you reference a project drawing into another project drawing—an element into a construct, a construct into a view, or a view into a plotting sheet—the referenced drawing has the display settings of the host drawing.

NOTE An exception to this is a situation where you insert the external reference as an overlay and have activated the setting for using the overlay's display settings. Typically, you would do this when using a file in the Object Enabler. For more information, see "Using the Display Configuration of an External Reference with the Object Enabler" on page 338.

Viewing new and existing walls in Xref detail



In some cases, you need to change the display of an external reference for a specific view. For example, you may want to display new walls with their regular settings, and existing walls as a light gray background image. Because the definition of "new walls" and "existing walls" changes from one project phase to the next, this information is not usually present in the referenced construct drawing.

Autodesk®Architectural Desktop offers the possibility to use the display configurations of the referenced drawing within the drawing that holds the external reference.

You could, for example, define in a construct a display configuration called "Existing Walls" and assign a light gray color to it. Because you do not know into which views or during which project phase the construct will be referenced, you do not assign this display configuration to the walls. When you reference the construct into a view during the first phase of the project, you use the regular display configuration for new walls. When you reference that construct into a view in a later phase, you can assign the "Existing Walls" display configuration. This change of display in the view has no influence on the source construct, which retains its original settings. In this way, you can reference a construct into a number of views with different displays, without changing the original construct.

Related Topics

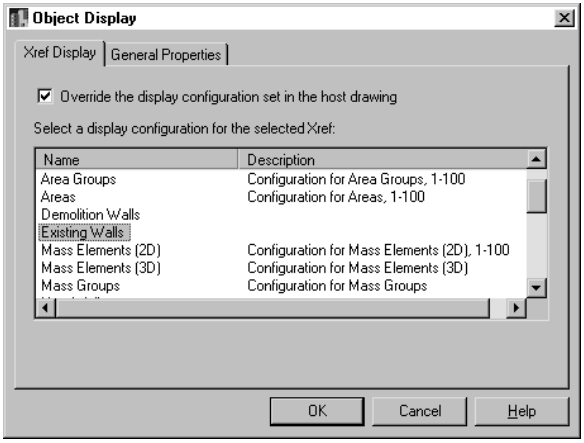
- Using the Display Configurations of an External Reference
- Using the Display Configuration of an External Reference with the Object Enabler
- Example: Displaying Part of the Model as Background

Using the Display Configurations of an External Reference

Use this procedure to use the display configurations of an external reference within the host drawing.

1. Create a project drawing that contains the display configurations you need for all phases of the project. For example, you could create display configurations named “New Walls,” “Existing Walls,” and “Demolition Walls.”

   Because you do not yet know in which phase of the project you will use the drawing, you do not assign any of these display configurations but rather assign a standard Plan or Model configuration.
2. Reference the drawing into another project drawing.
3. Select the reference in the host drawing, right-click, and click Edit Object Display.



4. Click the Xref Display tab.

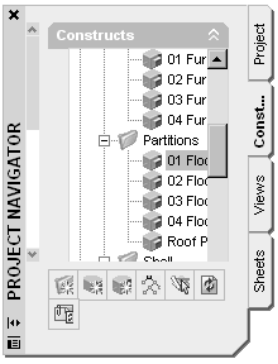
   The display configurations from the referenced drawing are listed.
5. Select Override the Display Configuration Set in the Host Drawing.
6. Select a display configuration, for example “Existing Walls.”
7. Click OK.

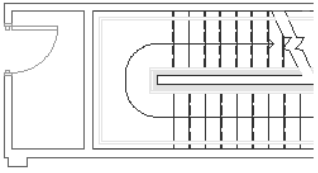
   The external reference is displayed with the selected display configuration.

Using the Display Configuration of an External Reference with the Object Enabler

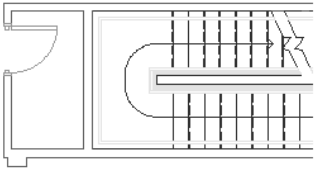
Use this procedure to apply the display configuration of an external reference when overlaying it in the Object Enabler.

Viewing drawing entities in Architectural Desktop and AutoCAD





Plan detail in
Architectural Desktop



Plan detail in
AutoCAD

During the life cycle of a large project, drawings might be transferred to a contractor who uses standard AutoCAD. Opening a drawing containing external references can then cause visual fidelity problems. To ensure that your external references are displayed with their original display configuration, perform the following steps:

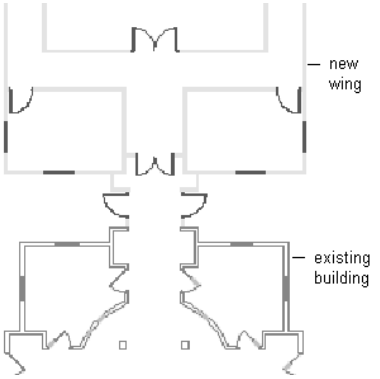
1. Open the external reference source drawing in Autodesk Architectural Desktop.
2. Assign to the Model tab the display configuration to appear when the drawing is opened in AutoCAD using the Object Enabler.
3. On the Format menu, click Drawing Setup.
4. Click the Display tab.
5. Select When Used as an Xref Overlay use Display Configurations from this Drawing only.
6. Click OK.
7. Save and close the drawing.
8. Open AutoCAD with the Object Enabler.
9. Overlay the source drawing into the current drawing.

   The display configuration you have assigned to the referenced drawing is used.

Example: Displaying Part of the Model as Background

You might want to include in a view one or more constructs for informational purposes that may be outside the selected categories. These constructs would be displayed differently than the other constructs in the view. For example, you could display the geometry of an adjacent floor as a "background" for reference when working on a floor. The part of the building displayed as "background" and as "foreground" depends on the view. For example, in a view of the west wing, the adjacent east wing would be the background. In a view of the east wing, the west wing would be the background. Because this information is context-dependent, you cannot apply the background and foreground display configurations to the constructs. You must be able to change the display configuration for each view the constructs are referenced in.

Plan view of existing and new construction detail



1. Create constructs for the foreground and background parts of the model. For example, create a construct for the first floor of the north wing and one for the first floor of the south wing.

   For more information, see "Creating a New Construct" on page 272.

2. Within the constructs, create a display configuration for background display. This configuration could display in light gray and with a thin lineweight.

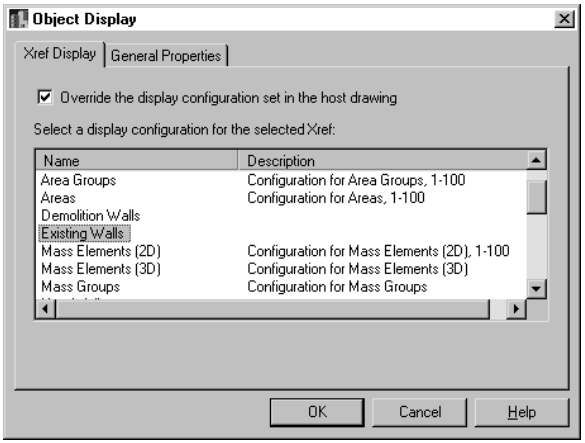
   TIP If you are using the templates provided with Autodesk® Architectural Desktop, you can use the Screened display configuration to achieve this effect.

   TIP For optimal reuse, create the display configurations in the construct template before creating the constructs.

3. Create a view.

   For more information, see "Creating a New View" on page 313.

4. Select the constructs created in step 1, and reference them into the views.
5. Open the view.
6. Select the external reference that you want to display as background, right-click, and click Edit Object Display.



7 Click the Xref Display tab.

All display configurations from the construct drawing are listed.

8 Select Override the Display Configuration set in the Host Drawing.

9 Select a display configuration, for example “Background” or “Screened.”

10 Click OK.

The external reference is displayed with the selected display configuration.

Annotating a Building Project

A building model can contain annotation for the objects contained in it. A number of annotation features of Autodesk®Architectural Desktop have been enhanced to work optimally with the Drawing Management feature.

The following sections summarize the enhancements of the Scheduling feature for annotating a building project.

Related Topics

- Preparing the Project for Annotating
- Tagging a Project
- Property Set Data and Schedule Tables in Projects
- Dimensioning a Project
- Creating a Title Block for a Project

Preparing the Project for Annotating

You typically annotate a project when you have finished the design phase. Before you start creating annotation for the building objects, you might need to perform some extra steps with the building objects:

- **Create areas from walls and other objects:** You may want to report information on the rooms of a building, such as room numbers, room finishes, or physical information like net and gross areas, perimeters, and calculation modifiers. An area object can schedule this information. You can easily create areas from walls and other building objects. For more information, see "Creating Areas from Linework and Object Outlines" on page 1994 and "Creating Areas from Closed Boundaries" on page 1995.
- **Create spaces from walls and other objects:** Spaces are similar to areas. You can also schedule room-specific information from spaces. For information on creating spaces from walls, see "Generating a Space from Walls" on page 667, and "Generating a Space from Walls, Lines, Arcs, Polylines, and Circles" on page 669.

  For detailed information on the differences between the two object types, see "Areas" on page 1986, and "Spaces" on page 656.

Tagging a Project

Use this procedure to tag objects in a project drawing.

One of the most frequent uses of annotation in a project is tagging the individual objects. Tags can be attached to objects in a drawing or to objects in an external reference. You can tag objects in source drawings like elements or constructs, or you can tag them in higher-level drawings like views or plotting sheets.

Property set definitions have property definitions for project information. You can use these to create project-specific tags that display, for example, level and division information.

For more information, see "Project Properties" on page 346, "Creating a Property Set Definition with Project Property Definitions" on page 348, and "Custom Tags" on page 2237.

1. Open the project drawing in which to add your tags.

   This may not be the drawing in which the object to be tagged is located. It can also be a drawing that references the drawing with the object.

2. On the Format menu, click DesignCenter™.

3 In DesignCenter, click the Custom view.

4 Expand Architectural Desktop, and expand Imperial or Metric.

5 Locate the tag to insert in the drawing.

6 Drag it into the drawing.

7 Select the object to which to attach the tag.

NOTE You can select an object within an external reference.

8 Specify the location of the tag in the drawing.

9 If necessary, edit the information in the property set of the tag, and click OK.

NOTE It is not necessary to tag objects in order to include those objects in a schedule table. Tags are a convenient mechanism for attaching property set data to objects.

Property Set Data and Schedule Tables in Projects

Schedules are tables that list specific information about selected components in your building model. You can create different types of schedules by attaching property set data to objects and object styles, and then extracting and displaying the data in a schedule table.

For detailed information on property sets and schedule tables, see "Schedules" on page 2197.

The existing scheduling features have been enhanced to work optimally in a Drawing Management environment.

You can schedule each instance of each external reference individually. For example, if you have an element that contains a typical door, you can reference that door element five times into a construct. When you create a door schedule in the construct, all five instances of the door element are scheduled independently.

When you work in a non-project environment, you attach property data to objects in the drawing. When you use the Drawing Management feature, you work extensively with external references and are able to perform the following tasks:

- **Attach property set data to objects in external references:** You can, for example, reference a construct into a view, and attach property sets in the view to the objects from the referenced construct. Attaching property sets to external references works for any nested levels—you can reference an element into a construct; a construct into a view; a view into a plotting sheet; and, in the plotting sheet, attach property sets to objects from all other project files.
- **Attach different property sets to individual instances of an external reference within a host drawing:** You can reference the same door multiple times into the same host drawing and attach different property sets to each instance of the door. That way, you can reference the same floor plan construct multiple times in a building and schedule each floor differently.
- **Combine property sets from the source element or construct drawing with property sets from higher-level views or plotting sheets:** You can create a property set with physical object properties in the element drawing and a finish and cost-estimating property set in the plotting sheet and schedule both in the plotting sheet.

Related Procedures

- Process Overview: Creating Property Sets and Schedule Tables in a Project
- Project Properties
- Creating a Property Set Definition with Project Property Definitions
- Attaching Property Sets to Objects from External References
- Creating a Schedule Table for a Project
- Example: Numbering a Door in a Project

Process Overview: Creating Property Sets and Schedule Tables in a Project

The main steps necessary to work with property set data and schedules in a project are as follows:

Step 1: Create property set definitions and schedule table styles that contain the necessary project information.

For more information, see "Project Properties" on page 346 and "Creating a Property Set Definition with Project Property Definitions" on page 348.

You can create property set definitions and schedule table styles at different locations in the project environment:

- In the Autodesk® Architectural Desktop *PropertySetDefs.dwg* file
- In your own, user-defined property set definitions drawing
- In the drawing template
- In the drawing

NOTE To attach a property set definition to an external reference, import it into the object drawing. This is done automatically when you drag a tag from DesignCenter into the drawing.

NOTE The drawing that contains your property set definitions does not need to be a part of your project. You can import and use property set definitions from any drawing file accessible to you.

There are a number of guidelines that can help you decide in which property set definition to put property definitions:

- Non-manual property definitions—i.e., Automatic, Formula, Classification, Material, and Project Property Definitions—can in many cases be defined in property set definitions that are applied to styles. If a property set definitions is to be applied to objects that do not have styles, it does not matter where these property definitions are defined.
- Manual property definitions containing data that does not change for each instance of a style should be defined in property set definitions that are applied to styles.
- Manual property definitions containing data that does change for each instance of a style should be defined in property set definitions that are applied to objects.

Step 2: Attach the property set definition to an object or style in a project drawing.

You can attach a property set to an object at various stages of the project. You can attach property set data to an external reference and also override existing property sets from the external reference in the host drawing. For example, you can attach a property set definition to a door in an element and then override that property set with an extended one when referencing that door into a construct. You could also create an element without property sets, reference it into a construct and a view, and attach a property set there.

NOTE Overriding property set definitions works only for those property sets attached to objects. Property sets attached to styles cannot be overridden when referenced into another drawing.

For more information, see "Attaching Property Set Data to Objects" on page 2205 and "Attaching Property Sets to Objects from External References" on page 349.

The following guidelines help you to select the correct location for attaching property sets to objects within a project:

- Property set definitions that are applied to styles must be attached to styles in the drawing containing the style.
- Property set definitions that are applied to objects and that contain data that *does not* change for each instance of the object that is externally referenced should be attached to the object itself in the externally referenced drawing.
- Property Set Definitions that are applied to objects and that contain data that *does* change for each instance of the object that is externally referenced should be overridden at the external reference, typically at the project construct level.

These guidelines are recommendations. The location of property data also depends on the processes and workflow you have established in your work environment.

Step 3: Open the project drawing in which to place the schedule table.

Step 4: If necessary, attach property sets to objects to be scheduled from external references, or override property sets for those objects on the external references that contain them.

For more information, see "Attaching Property Sets to Objects from External References" on page 349.

Step 5: Create schedule tables in the drawing.

For more information, see "Creating a Schedule Table for a Project" on page 351.

Project Properties

A project property definition can be defined in a property set definition so that an object has access to information about the project in which it is currently located.

These project properties are available:

Property	Description
Name	Name of the project
Description	Description of the project
Number	Number of the project

Property	Description
Location	File location of the project on the hard disk or network drive
Number of Levels	Total number of levels in your project
Level ID	ID of the level the object is on
Level Elevation	Elevation of the level the object is on
Level Height	Height of the level the object is on
Number of Divisions	Total number of divisions in your project
Division ID	ID of the division the object is in
Sheet Name	Name of the sheet drawing that contains the object
Sheet Description	Description of the sheet drawing that contains the object
Details	Properties for all project details created in "Adding Project Details" on page 231

In addition to project properties, these properties might also be useful for annotating a project:

- **Location property definition:** Can be used to retrieve property data from areas, spaces, and AEC polygons associated with an object. A data location grip on the object is used to define the area, space, or AEC polygon associated with it. For example, this can be used to get the room number for the space in which a door opens.

  For detailed information, see "Adding a Location Property Definition to a Property Set Definition" on page 2258.

- **Formula property definition:** Allows you to create formulas from other property definitions you have defined. For example, to subtract a finish quantity from a wall volume, you could set up a formula in which a defined finish amount is deducted from a wall volume.

  For detailed information, see "Adding a Formula Property Definition to a Property Set Definition" on page 2254.

- **Classification property definition:** Can be used to get the current classification of an object's style, or to get other property data defined for that classification. For more information, see "Classification Definitions" on page 2289

- **Material property definition:** Can be used to get the current material of an object, or to get other property data defined for that material.

  For detailed information, see "Materials" on page 491.

Creating a Property Set Definition with Project Property Definitions

Use this procedure to create a property set definition containing project property definitions.

For a list of available project properties, see "Project Properties" on page 346.

For general information on creating property set definitions, see "Creating a Property Set Definition" on page 2247.

NOTE A property set definition can contain different types of property definitions such as automatic properties, project properties, formulas, and classifications.

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1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and click Property Set Definitions.
3. Right-click, and click New.
4. Enter a name for the new property set definition, right-click, and click Edit.
5. Click the Applies to tab, and define if the property set definition should be applied to objects or to object styles.
6. Select the entities or styles to which the property set definition should apply.

   Typically, you would attach project information to objects such as areas and spaces, walls, doors, windows, and curtain walls.
7. Click the Definition tab.
8. Click .

   The general project properties are listed. If you have created project details, as described in "Adding Project Details" on page 231, they are listed too and can be selected for the property set definition.
9. Select a project property.
10. Enter a name, and click OK.

11 Repeat steps 8-10 for each project property you want to add to the property set definition.

12 If necessary, add other properties to the definition.

13 Click OK twice.

Attaching Property Sets to Objects from External References

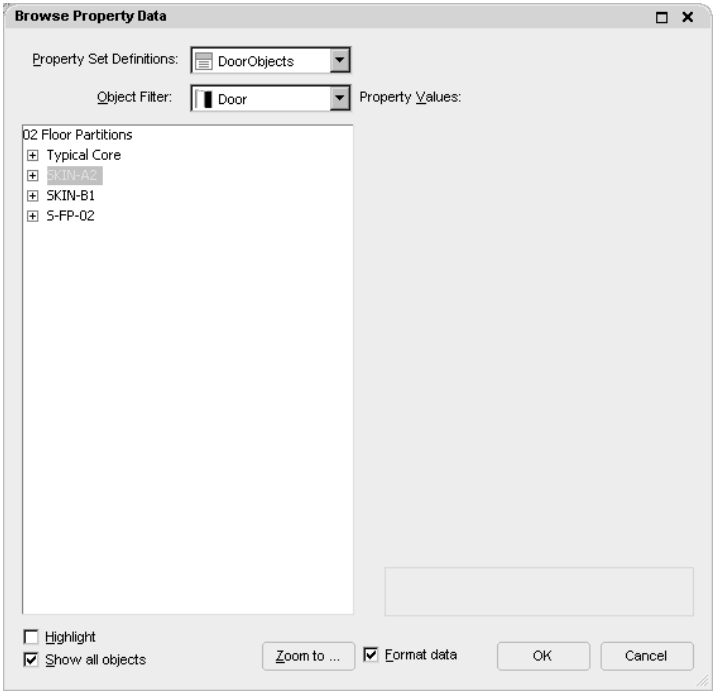
Use this procedure to attach property sets to objects in external references.

This topic explains the following procedures:

- Attaching property sets to objects from external references.
- Attaching different property sets to different instances of the same external reference. For example, you can reference the same floor plans onto multiple levels and schedule each level differently.

1 Reference a project drawing, such as an element or a construct, into another project drawing, such as a view or a plotting sheet.

2 Open the Documentation tool palette, and select the Browse Property Data tool.



3. Under Property Set Definition, select the property set definition from the host drawing with which you want to work.
4. Expand the desired external reference in the tree, until you can see the desired object.
5. Attach property set data to objects:

If you want to . . .	Then . . .
attach a property set from the host drawing to an object in an external reference	If no property set definition with the same name has been attached to the object, the row of boxes immediately next to it is empty. Select the box to check it. A property set is attached directly to the object. It is displayed on the right side, and can be edited.
override a property set from an external reference with a property set from the host drawing	If a property set with the same name has been attached at a lower level to the external reference, a read-only box is displayed at the appropriate level. Select the box at that level next to the object. The property set is attached to the external reference at the selected level as an override for the object. If a property set definition with the same name as that selected above exists in the external reference, it uses it, otherwise the property set definition in the host drawing is copied to the external reference. The property set is displayed on the right and is editable.
attach different property sets to different instances of an external reference	Expand the desired instance of the external reference in the tree. Select the box next to the object instance. To attach a different property set to another instance, select a different property set definition, expand a different instance of the external reference, and attach the property set to it.
remove a property set from the host drawing for an external reference	clear the box at the appropriate level next to the desired object.

6. If necessary, decrease the number of objects displayed in the tree:

If you want to . . .	Then . . .
show only one type of object in the tree	select the appropriate object under Object Filter.

If you want to . . .	Then . . .
show only those objects that already have the selected property set attached on some level	clear Hide Objects without Property Set Definitions.

7 If you are not sure whether you selected the correct object from the external reference, click Highlight to mark the object in the drawing area.

8 To display the correct object in the drawing area, click Zoom to.

9 If necessary, edit the property set data on the right.

10 To display properties with the correct data format style from the property set definition, select Format Data.

11 Click OK.

Creating a Schedule Table for a Project

Use this procedure to create a schedule table that contains property data from an external drawing such as a project drawing.

Schedule tables can contain information from external references and block references, which typically must exist in the same drawing as the schedule table. Schedule tables now optionally specify an external drawing, which is scheduled as if it were an external reference in the same drawing as the table. The advantage to this is that the graphics of the external drawing do not need to be generated in order to fill out the data in the table.

For general information on adding schedule tables, see "Adding a Schedule Table" on page 2216.

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1 Open the plotting sheet that will contain the schedule table.

2 Open the tool palette that you want to use, and select a Schedule Table tool.

If necessary, scroll to display the tool that you want to use.

3 On the Properties palette, expand Basic, and expand General.

4 Select a style.

5 Instead of selecting objects in the drawing, press ENTER.

6 Specify the insertion point of the schedule table.

7 Specify the size of the schedule table.

An empty schedule table is inserted into the drawing.

8. Select the empty table, right-click, and click Properties.
9. On the Properties palette, expand Advanced, and expand External Source.
10. For Schedule External Drawing, select Yes.

    The External Drawing setting are displayed, with a list containing all drawings in the Views directory of the current project. Each drawing should correspond to a view defined in the project. If no project is active, the list contains all drawings in the last directory browsed.
11. Select the view you want to schedule.

NOTE The setting for External Drawing Name is displayed only if you have selected Yes for Schedule External Drawing.

If the desired external view drawing is not displayed in the list, select Browse and find it.

Example: Numbering a Door in a Project

The following example shows how you can define property data that combines object properties with project properties. The example uses door numbers and room information to show how you could use project, location, formula, and manual property definitions. Typically a door is numbered based on the room in which it opens, with an alphabetic suffix for rooms with multiple doors. The following diagram shows how a door number can be built up from other information in the drawing and the project.

Value	Property Set Definition	Property Definition	Description
2	Space	LevelNumber	A project property definition, getting the Level ID for the object for the current project
01	Space	BaseNumber	A manual auto-incrementing property definition
201	Space	RoomNumber	A formula property definition, with the formula [LevelNumber][BaseNumber]

Value	Property Set Definition	Property Definition	Description
201	Door	RoomNumber	A location property definition, getting the Space: RoomNumber property value for the space under the door's data location grip
___A	Door	DoorNumber Suffix	A manual text property definition
201A	Door	DoorNumber	A formula property definition, with the formula [RoomNumber][Suffix]

1. Create a drawing in a project that contains a number of spaces and a number of doors.
2. Create a property set definition for spaces.
3. Define the following properties in the definition:

Property	Instruction
LevelNumber	Click , enter LevelNumber for Name, and select Level ID in the list. Then, click OK.
SpaceNumber	Click , enter SpaceNumber for Name, and click OK. Then, select Auto Increment - Integer for Type.
RoomNumber	Click , enter RoomNumber for Name, and enter the formula **[LevelNumber][SpaceNumber]**. The easiest way to create the formula is by clicking the properties in the list.

4. Create a property set definition for doors.
5. Define the following properties in the definition:

Property	Instruction
RoomNumber	Click , enter RoomNumber for Name, and select the RoomNumber formula property from the Space property set definition created above. Then, click OK.

Property	Instruction
DoorNumberSuffix	Click , enter DoorNumberSuffix for Name, and click OK. Then, select Text for Type.
DoorNumber	Click , enter DoorNumber for Name, and enter the formula **[RoomNumber] [DoorNumberSuffix]** by clicking the properties in the list.

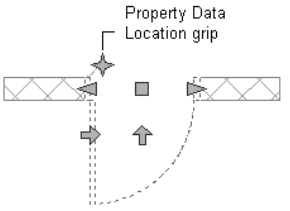
6 Attach these property set definitions to the doors and spaces in the drawing, and fill in the manual properties.

TIP The quickest way to attach property sets to multiple objects is to use the Browse Property Data tool on the Documentation tool palette.

7 Select a door in the drawing.

Notice a new star-shaped grip near the hinge jamb.

Viewing the Property Data Location grip of a door



This data location grip is displayed on an object when it has any property set attached to it that contains a location property definition. An object with a data location grip can retrieve property data from a space, area, or AEC polygon under the position of the grip.

8 Select the Data Location grip, and move it over a space in the drawing.

A curved dashed line will be drawn between the grip and the object.

9 In the Properties palette, click the Extended Data tab. If your rooms are on the second floor, the resulting value reads "201A." If you attach these property sets to the same space and door on the third floor, it reads "301A."

This is just one of many examples of how to use the new Scheduling features within a project. For a complete description, see "Schedules" on page 2197.

Dimensioning a Project

Use this procedure to dimension objects in a project drawing.

In the documentation phase of a project, you create detailed dimensions of objects. AEC dimensions can be attached to objects in a drawing or to objects in an external reference. You can dimension objects in source drawings like elements or constructs, or you can dimension them in higher-level drawings like views or plotting sheets.

For detailed information, see "AEC Dimensions" on page 2357.

1. Open the project drawing in which to add a dimension.

   This may not be the drawing in which the object to be dimensioned is located. It may be a drawing that references the object.
2. Open the tool palette that you want to use, and select an AEC dimension tool.

   If necessary, scroll to display the tool that you want to use.
3. On the Properties palette, expand Basic, and expand General.
4. Select a style.
5. In the drawing area, select the objects to dimension.

   NOTE You can select objects from the drawing, objects from external references, or a combination of both.
6. Press ENTER.
7. Specify the position of the new dimension:

If you want to . . .	Then . . .
insert the dimension group parallel to or perpendicular to the dimensioned object	drag the cursor in the desired direction, and click in the drawing at the desired insertion point. **NOTE** If your selection set contains objects with different directions, the direction of the first selected object defines the parallel and perpendicular directions.

If you want to . . .	Then . . .
insert the dimension group at a specified rotation	enter **r** (Rotation) on the command line, and press ENTER.Then, enter a rotation angle either by clicking in the drawing or by entering one on the command line. Press ENTER, and click in the drawing at the desired insertion point. **NOTE** If your selection set contains objects with different directions, the rotation is calculated with reference to the first selected object.
insert the dimension group aligned parallel to an object other than the dimensioned object	enter **a** (Align) on the command line, and press Enter. Then, select the object to which to align the dimension group. Press ENTER, and click in the drawing at the desired insertion point. **NOTE** The direction of the dimension group is dependent on the rotation of the chosen object. The drawing direction of the object has no influence on the dimension group direction.

Creating a Title Block for a Project

You can create title blocks that display project-specific information. When the information changes, it is updated in the title block. A title block is a multi-view block, which can include these automatic project attributes:

- Project number
- Project name
- Project description
- Project location
- Project sheet name
- Project sheet description
- Project details

Project attributes are set when you create a new project. For more information, see "Creating a New Project" on page 229.

Project details are optional information you can enter for your project. For more information on creating project details, see "Adding Project Details" on page 231.

Related Procedures

- Process Overview: Creating a Title Block for a Project
- Adding Project Attributes

- Creating a Project Block
- Creating a Multi-View Block
- Creating a Tool for the Title Block
- Inserting the Title Block into a Drawing

Process Overview: Creating a Title Block for a Project

Creating a project title block consists of these basic steps:

Step 1: Open the project drawing in which to add a title block. Typically, this is a plotting sheet.

Step 2: Add project attributes to the drawing.

Step 3: Create a block from the attributes.

Step 4: Create a multi-view block from the block.

Step 5: Create a multi-view block tool.

Step 6: Insert the multi-view block as a title block in the plotting sheet.

Adding Project Attributes

Use this procedure to create project attributes for a title block in the drawing.

The following project attributes are available for a title block:

Project Attributes

Attribute	Description
PROJECT:NUMBER	Displays the project number.
PROJECT:NAME	Displays the name of the project.
PROJECT:DESCRIPTION	Displays the description of the project.
PROJECT:LOCATION	Displays the file location of the project file.
PROJECT:SHEET:NAME	Displays the sheet name for the drawing containing the title block, if it is part of the currently active project.
PROJECT:SHEET:DESCRIPTION	Displays the sheet description for the drawing containing the title block, if it is part of the currently active project.

Project Attributes

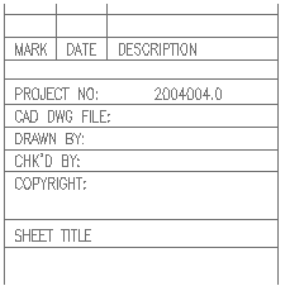
Attribute	Description
PROJECT:<DETAILCATEGORY>:<DETAIL>	Displays a user defined project detail. **NOTE** You must enter the detail category and detail name in the attribute without any spaces. For example, to create an attribute for the detail "Zoning" in the detail category "Proposed Improvements," you would enter it as PROJECT:PROPOSEDIMPROVEMENTS:ZONING

1. On the command line, enter **ddattdef**.
2. In the Tag field, enter one of the attributes described above. For example, to create an attribute for the name of the project, enter PROJECT:NAME.
3. Proceed to adding the attribute as described in "Working with Attributes" in the *AutoCAD 2004 User's Guide*.
4. Repeat steps 1–3 for each attribute to add to the project title block.
5. Complete the attribute block with lines, borders, and other desired components.

As a result, you have a number of attributes and graphic elements in your drawing. Your attribute block might look like this:

Viewing title block attributes and data

title block detail
with attributes
displayed



title block detail
with project
number data

Creating a Project Block

Use this procedure to create a block that contains the attributes you added in the previous step.

1. On the Format menu, click Blocks ➤ Block Definition.
2. Enter a name for the block.
3. Click Select Objects, and select the attributes and additional graphics to include in the title block.
4. From the Drag-and-drop units list, select Unitless.
5. Proceed to creating the block as described in "Defining Blocks" in the *AutoCAD 2004 User's Guide*.

Creating a Multi-View Block

Use this procedure to create a multi-view block from one or more blocks created in the previous procedure.

For detailed information about multi-view blocks, see "Multi-View Blocks" on page 2481.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects.
3. Right-click Multi-View Block Definitions, and click New.
4. Enter a name for the new multi-view block definition, and press ENTER.
5. Select the new multi-view block definition, right-click, and select Edit.
6. Click the View Blocks tab.
7. Select a display representation for the title block.

   Typically, you would display a title block in Plan views and Reflected views.
8. Click Add.
9. Select the block you defined in "Creating a Project Block" on page 359, and click OK.
10. Select the view directions for the block.
11. Repeat steps 6–9 for each display representation in which the title block is to appear.
12. Click OK twice.

Creating a Tool for the Title Block

Use this procedure to create a tool for the title block.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects, and expand Multi-View Block Definitions.
3. Locate the multi-view block definition you created in the previous procedure, and drag it to the tool palette.
4. Click OK to close the Style Manager.

Inserting the Title Block into a Drawing

Use this procedure to insert the multi-view block you created in the previous procedure into the drawing as a title block.

Viewing title block attributes and data

title block detail
with attributes
displayed

title block detail
with project
number data

1. In the project drawing, click the layout tab on which to place the title block.
2. Open the tool palette that you want to use, and select the multi-view block tool you created in "Creating a Tool for the Title Block" on page 360.
3. Specify the insertion point of the title block.

   You can move or hide the Properties palette to expose more of the drawing area.
4. If necessary, specify the scale and rotation of the title block.
5. Press ENTER.

Working with Cut Planes in a Project

You can set a global cut plane for each display configuration in a drawing, and individual cut planes for objects like walls, curtain walls, and wall openings.

The Global Cut Plane

You can set a global cut plane for a display configuration in a drawing. All objects included in that display configuration are cut at the height defined in the display configuration, unless they have an object-specific cut plane override. Each display configuration can have a different cut plane. For more information, see "Object-Specific Cut Planes" on page 373 and "Global Cut Planes" on page 364.

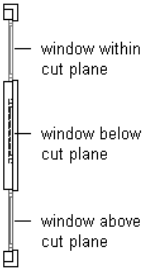
The Object-Specific Cut Plane

A number of objects can override the global cut plane settings and use their own cut planes: for example, walls, curtain walls, and stairs. For more information, see "Object-Specific Cut Planes" on page 373.

Cut Plane Display Range

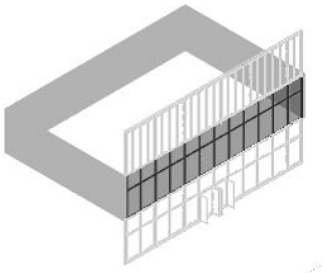
A cut plane is set to a specific height, for example, 1.4 meters. Objects above or below that level are by default not displayed in a Plan view. You can, however, define a display range above and below the cut plane. Object components inside that range are displayed too. This would be useful if you want to display a window that lies above or below the cut plane but that should be included in the display.

Viewing plan view window cut plane options



You also use a display range to define clipped views, such as the model view of a second floor. In that case, the display range defines which levels to display and which levels to hide.

Clipped 3D view of second floor



For more information, see "Using the Global Cut Plane: Creating a Clipped Model View" on page 370.

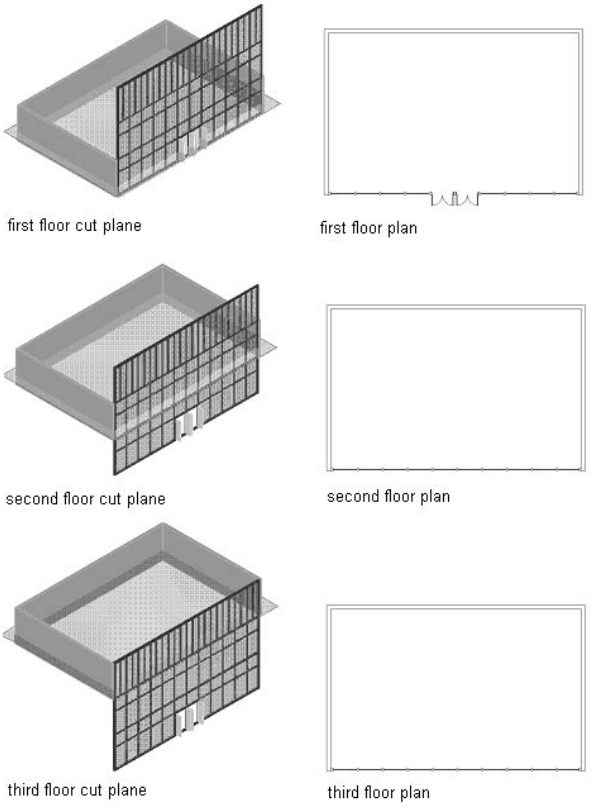
Cut Planes and Levels

Levels are represented separately by one or more files and are assembled in a view or plotting sheet to represent the entire building.

You set the cut plane individually for each level of a building. You create a drawing file—a construct or a view—that represents the level, and assign a cut plane to a display configuration within the drawing.

The following images illustrate a curtain wall that spans three levels. The images on the left indicate the cut plane for the associated level drawing. The plans to the right show how the curtain wall would be displayed in Plan view at each level. Notice the different appearance of the doors and mullions on the various floor plans.

Specifying three cut plane levels



Related Topics

- Global Cut Planes
- Object-Specific Cut Planes

Global Cut Planes

The global cut plane is set for a display configuration in a drawing. It cuts all objects in the display configuration at the same height. You can have different cut planes for different display configurations within a drawing: for example, one cut plane height for a regular Plan view, and another cut plane height for a Reflected view.

The global cut plane is used on all objects that do not have an object-specific cut plane override. For more information, see "Object-Specific Cut Planes" on page 373.

Related Topics

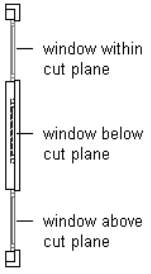
- Global Cut Plane Display Range
- Display Properties for the Cut Plane Display Range
- Setting the Global Cut Plane and the Display Range
- Using the Global Cut Plane: Displaying the Cut Plane of a Different Level
- Using the Global Cut Plane: Creating a Clipped Model View

Global Cut Plane Display Range

When you set a global cut plane for a display configuration, you also set a display range above and below the cut plane. This is the range in which objects, even when they do not intersect the cut plane, are displayed. For example, if you set the cut plane to 1.4 meters and define the visible range above the cut plane at 2 meters and the visible range below the cut plane at 1 meter, then your objects are cut at 1.4 meters. Objects that lie between 1.4 meters and 2 meters as well as objects that lie between 1.4 meters and 1 meter are also displayed, but with different display for above and below the cut plane. Objects that lie outside the range—for example, a window that is inserted at 0.8 meter—are not displayed at all.

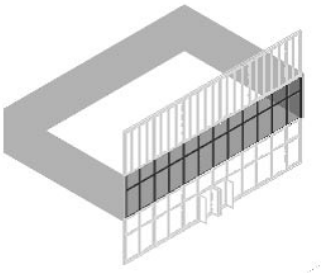
NOTE The values for the display range are calculated relative to the WCS, not relative to the global cut plane height.

Plan view of window cut planes



You also use a display range to define clipped views, such as the model view of a second floor. In that case, the display range defines which levels to display and which levels to hide.

Clipped 3D view of second level



For more information, see "Using the Global Cut Plane: Creating a Clipped Model View" on page 370.

Display Properties for the Cut Plane Display Range

Many objects have display components that you can set for display above and below the cut plane. For example, an object below the cut plane can be inserted with dashed lines and a different line color. If you want to work with the display range, you need to set the appropriate display components accordingly.

NOTE The Above and Below Cut Plane display components appear in all Plan-type display representations, such as Plan, Plan High Detail, Plan Low Detail, Plan Screened, Reflected, and Reflected Screened, as well as in user-defined display representations that are based on any of these display representations.

The following objects have display components for above and below the cut plane:

Object	Components that can be set for above and below cut plane
Curtain Walls/Curtain Wall Units	Curtain Wall/Curtain Wall Unit body
Doors	Frame Panel Stop Swing Threshold
Door/Window Assemblies	Door/Window Assembly body
Mass Elements	Mass Element body

Object	Components that can be set for above and below cut plane
Railings	Guard Rail Hand Rail Bottom Rail Post
Slabs/Roof Slabs	Slab Body Slab Outline
Stairs	Stringer Stringer Facets Riser Riser Numbers Nosing Path Outline
Structural Members	Beam/Brace/Column body
Walls	Wall Body
Windows	Glass Frame Sash Sill

For more information on setting display properties for individual objects, see the appropriate procedures for the objects.

Setting the Global Cut Plane and the Display Range

Use this procedure to set the global cut plane and the visible display range for a display configuration.

For information on the display system, see "Display Configurations" on page 445.

NOTE The values you enter for the Above and Below ranges are the absolute height values calculated from the WCS origin. They are not relative to the cut plane. For example, if you have set the global cut plane to 1.4 meters, you need to set the visible range above the cut plane to a value higher than 1.4 meters; otherwise, you get an invalid display range.

1. On the Format menu, click Display Manager.
2. Expand Configurations.

3 Select the display configuration for which to set the global cut plane.

4 Click the Cut Plane tab.

5 Define the cut plane and the visible ranges above and below the cut plane:

If you want to . . .	Then . . .
define the global cut plane height for the display configuration	enter the appropriate value for Cut Height.
define the visible range above the cut plane	enter the appropriate value for Display Above Range. **NOTE** The value you enter here is calculated from the WCS origin and is not relative to the cut height.
define the visible range below the cut plane	enter the appropriate value for Display Below Range. **NOTE** The value you enter here is calculated from the WCS origin, and is not relative to the cut height.

NOTE For information about displaying the cut plane of a different level, see "Using the Global Cut Plane: Displaying the Cut Plane of a Different Level" on page 368.

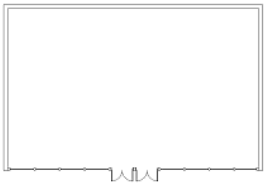
6 Click OK.

Using the Global Cut Plane: Displaying the Cut Plane of a Different Level

Use this procedure to display the cut plane of a different level.

Usually, you want to display the cut plane of the current level. However, in some cases, you might want to display a different level.

Specifying different cut planes results



result using first
floor cut plane

result using second
floor cut plane

1. Create a view containing the desired level.

   For more information, see "Creating a New View" on page 313.

2. If necessary, switch to a Plan view.
3. On the Format menu, click Display Manager.
4. Expand Display Configurations.
5. Select the current display configuration, which is displayed in bold text.
6. Click the Cut Plane tab.
7. Click Calculate.

   This button is only available when the drawing is part of a project. It uses the level information you entered in "Creating a New Level" on page 251.

8. In the Cut Plane Worksheet, select the level whose Plan view you want to display in the current drawing.

   For example, if you have created a view of the first floor but want to display the Plan view of the second floor, select 2.

9. Select the cut plane height of the selected level.

   For example, to display the second level at a cut height of 1.4 meters, enter 1.4 here.

10. Click OK.

The display range is adapted to display the height of the selected level.

For example, perhaps you have a three-story building with a floor height of 2.75 meters for each floor. You have created a view of the first floor but want to display the second floor in it at a cut height of 1.4 meters. In the Cut Plane dialog, you enter 2 for level, and 1.4 for Cut Plane Height Above Level. When you click OK, the display range of the view now spans the second level. The following values are entered into the Cut Plane Tab of the display configuration:

Field Name	Value	Comment
Display Below Range	2.75 meters	This is where the second level starts.
Cut Height	4.15 meters (2.75 meters + 1.4 meters)	To display a cut height of 1.4 meters, you need to add 1.4 meters to the start of the second level at 2.75 meters.
Display Above Range	5.5 meters	The second level starts at 2.75 meters, and has a base height of 2.75 meters. This results in an overall height of 5.5 meters.

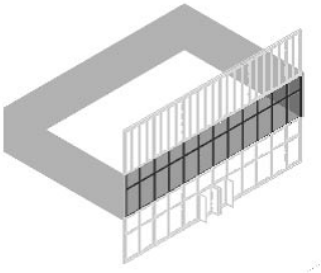
11 Click OK.

Using the Global Cut Plane: Creating a Clipped Model View

Use this procedure to create a clipped Model view of a building level.

If a level is crossed by a spanning element like a curtain wall or an elevator shaft, you want to display only those parts of the spanning element that actually lie on that level. You can create a clipped Model view that displays only those objects and object ranges within the user-defined display range.

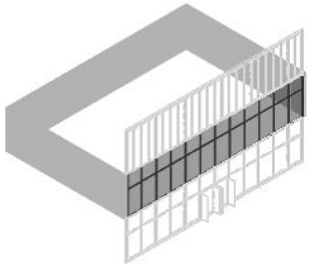
Clipped Model view



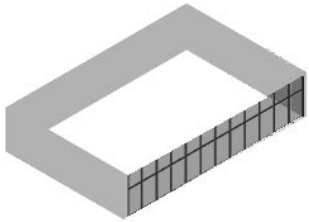
Some display settings for a clipped Model view are influenced by the materials assigned to the clipped objects:

- Display of object ranges outside the display range: You can display the parts of a spanning element that are outside the display range of the level. In some cases, you might want to display those parts of the object in a lighter color and thinner lineweight to imply the complete shape of the object.

  3D view of spanning element in and out of display range

  spanning element out of display range

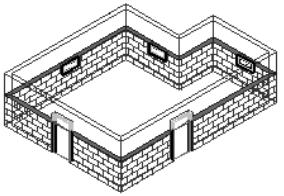
  

  spanning element in display range

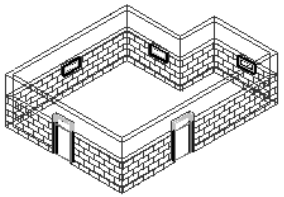
  How those parts are displayed is set in the Sectioned Body component of the objects's materials. For information on setting the display of the Sectioned Body component, see "Sectioned Body and Sectioned Boundary" on page 502 and "Defining the Layer, Color and Linetype of a Material" on page 520.

- Display of a section hatch and a section boundary where the display range cuts the spanning object: You might choose such a display to highlight the cut line.

Section hatch and cut line displayed where display range cuts object



with cut plane
section hatching



without cut plane
section hatching

How the section hatch and boundary are displayed is defined in the Section Hatch component of the materials for the object. For information on setting the display of these components, see "Section Hatch Material Component" on page 502, "Sectioned Body and Sectioned Boundary" on page 502, and "Defining the Layer, Color and Linetype of a Material" on page 520.

1. Create a view containing the desired level.

   For more information, see "Creating a New View" on page 313.

2. If necessary, switch to a Model view: for example, SW Isometric.
3. On the Format menu, click Display Manager.
4. Expand Configurations.
5. Select the current display configuration.

   It is displayed in bold text.

6. Click the Cut Plane tab.
7. Set the Above and Below display ranges to be identical to the level height.

   For example, if your level is 2.75 meters high, set Display Below Range to 0.0 meters and Display Above Range to 2.75 meters.

NOTE For a clipped model view, it is not important how you set the cut plane, as the cut plane is displayed only in Plan views. Either keep the original value, or enter any value within the display range: for example, 1.4 meters.

8 Expand Sets.

9 Select the current display set (displayed in bold text).

10 Click the Display Options tab.

11 Define the display of the clipped model view:

If you want to . . .	Then . . .
display the objects in the display range defined in step 7 with their regular display settings, and the objects outside of the display range as Sectioned Body	select Section AEC Objects by Display Range defined in Display Configuration.
show a section hatch and a section boundary where spanning objects are cut by the display range	select Show Materials where Display Range Intersects AEC Objects.
hide all parts of spanning objects outside of the display range	select Hide Sectioned Body Component.
suppress the surface hatch of objects within the display range	select Hide Surface Hatching.

12 Click OK.

Object-Specific Cut Planes

Many objects in Autodesk®Architectural Desktop have individual settings for cut planes that can override the global cut plane setting. Object-specific cut planes are useful when you have objects of different heights in your Plan view. This happens frequently when you are working with a split-level floor plan or a sunken room.

An object-specific cut plane takes precedence over the global cut plane in the display configuration.

For more information on the global cut plane, see "Global Cut Planes" on page 364.

Related Topics

- Object-Specific Cut Plane Overrides
- Example: Overriding the Cut Plane for a Wall
- Cut Planes from the Anchoring Object
- Example: Using the Cut Plane of the Anchoring Object
- Manual Cut Planes

Object-Specific Cut Plane Overrides

The following objects can have an object-specific cut plane:

- Curtain Walls
- Curtain Wall Units
- Door/Window Assembly
- Mass Elements
- Roof Slabs
- Slabs
- Stairs
- Walls

Example: Overriding the Cut Plane for a Wall

The object-specific cut plane is a part of the display properties of an object. You can set it for an individual object, an object style, or as the system default.

For detailed information on display properties, see "Display Representations" on page 437 and "Creating a Display Representation for an Object" on page 463.

TIP If you want to create a clipped model view, as described in "Using the Global Cut Plane: Creating a Clipped Model View" on page 370, or want to display the cut plane of a different level, as described in "Using the Global Cut Plane: Displaying the Cut Plane of a Different Level" on page 368, make sure to turn off the object specific-cut plane of the included objects. The object-specific cut plane overrides the global cut plane, and so you might get unexpected display results.

The following example demonstrates how to set an object-specific cut plane for a wall style. The detailed steps for other objects may vary slightly. For more information, see the individual object chapters.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and then expand Wall Styles.

3. Select the wall style for which you want to set an individual cut plane, right-click, and click Edit.
4. Click the Display Properties tab.
5. Select a Plan or Reflected display representation.
6. Click the Edit button.
7. Click the Cut Plane tab.
8. Select Override Display Configuration Cut Plane.
9. For Cut Plane Height, enter the desired cut plane.
10. Click OK three times.

Cut Planes from the Anchoring Object

Objects like windows or doors usually are anchored into walls, curtain walls, and window assemblies. Normally, you want those anchored objects to have the same cut plane height as the object into which they are anchored. However, because the cut plane of the anchoring object can be set by either the display configuration or by the object itself, you need to determine in the anchored object whether it should use the cut plane of the display configuration or of the object to which it is anchored.

The following objects can derive their own cut plane from the cut plane of the object to which they are anchored:

- Curtain Wall Units
- Doors
- Door/Window Assemblies
- Windows

Example: Using the Cut Plane of the Anchoring Object

Whether an anchored object uses the cut plane of its anchoring object or the cut plane of the display configuration is set in the display properties of the object. You can define this for an individual object, an object style, or as the system default.

For detailed information about display properties, see "Display Representations" on page 437, and "Creating a Display Representation for an Object" on page 463.

The following example demonstrates how to set an anchored window to use the cut plane of the wall to which it is anchored. The detailed steps for other objects may vary slightly. For more information, see the individual object chapters.

1. On the Format menu, click Style Manager.

2. Expand Architectural Objects, and then expand Window Styles.
3. Select the window style for which you want to set the cut plane when anchored, right-click, and click Edit.
4. Click the Display Properties tab.
5. Select a Plan or Reflected display representation.
6. Click the Edit button.
7. Click the Other tab.
8. Select Respect Cut Plane of Container Object When Anchored.

NOTE You should use this setting as the default. Even when the cut plane of the anchoring object does not differ from the global cut plane, this setting ensures a correct display of the anchored object in Plan views.

9. Click OK three times.

Manual Cut Planes

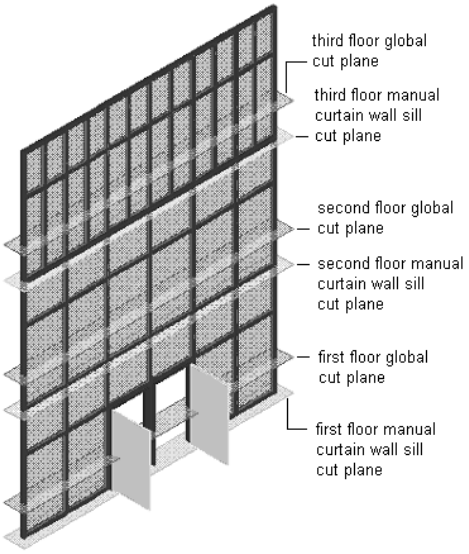
You can define any number of manual cut planes for a wall or a curtain wall.

The following illustration shows where manual cut planes might be defined in order to display a curtain wall sill at each level.

Manual cut planes are only displayed when they are inside the display range.

For information on setting the manual cut plane, see "Specifying the Cut Plane Display of a Wall" on page 1808 and "Creating Cut Planes for a Curtain Wall" on page 857.

3D view of curtain wall showing global and manual cut planes at each level



Running Drawing Management from the Command Line

You can run certain Drawing Management commands from the command line. These commands are also available as toolbar buttons or shortcut menu commands. In some cases, for example when creating LISP routines, you might want to initiate them via the command line.

Related Topics

- Command Line: Opening the Project Browser
- Command Line: Opening the Project Navigator
- Command Line: Refreshing the Project
- Command Line: Regenerating Views
- Command Line: Selecting a New Project Environment
- Command Line: Closing the Project Navigator

Command Line: Opening the Project Browser

Use this procedure to open the Project Browser from the command line.

- On the command line, enter **AecProjectBrowser**.
  The Project Browser is displayed.

NOTE Alternatively, you can click the button on each of the Project Navigator tabs.

Command Line: Opening the Project Navigator

Use this procedure to open the Project Navigator palette from the command line.

- On the command line, enter **AecProjectNavigator**.
  The Project Navigator palette is displayed.

NOTE Alternatively, you can click Project Navigator Palette on the Window menu.

Command Line: Refreshing the Project

Use this procedure to refresh the project in the Project Navigator from the command line.

- On the command line, enter **AecRefreshProject**.
  The Project Navigator Palette is displayed, and all tabs are refreshed to display the current project state.

NOTE Alternatively, you can click the button on each of the Project Navigator tabs.

Command Line: Regenerating Views

Use this procedure to regenerate all views in the current project from the command line. When you regenerate a view, you reload all of the external references used to generate the view.

■ On the command line, enter **AecRegenerateProjectViews**.
All views in the current project are regenerated.

NOTE Alternatively, you can click the button on the Views tab of the Project Navigator.

Command Line: Selecting a New Project Environment

Use this procedure to select a new project environment from the command line.

NOTE You can select only existing projects from the command line. To create a new project environment, go to the Project Browser and create a new project as described in "Selecting the Current Project" on page 229.

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1. On the command line, enter **AecSetCurrentProject**, and press ENTER.
2. Enter the project you want to set current on the command line.

NOTE Alternatively, you can click the button on each tab of the Project Navigator and set the new project in the Project Browser.

Command Line: Closing the Project Navigator

Use this procedure to close the Project Navigator from the command line.

■ On the command line, enter **AecCloseProjectNavigator**.
The Project Navigator Palette is closed.

NOTE Alternatively, you can click the button of the Project Navigator Palette.

Frequently Asked Questions about Drawing Management

This topic contains questions and answers that can help you to achieve the results you need when working with Drawing Management.

What do I have to consider when working with the XML files in the project?
The project data of a building model is contained in the APJ file, which contains information about the overall project, and in the XML files accompanying each DWG file. Both file types are well-formed XML. In most cases, you should not try to edit these files manually in an XML editor, as you might inadvertently corrupt the file. To make changes to your project, use the Project Browser and Project Navigator commands instead.

I have added a lot of project details in the Project Browser. Can I export these to another application?
Yes. The project details you enter in the Project Browser are stored in the project's APJ file, which is a well-formed XML file. If you want to export these details, create a copy of the APJ file, and export it to any XML application or database.

What should I do if my APJ file has been accidentally deleted or corrupted?
Deleting or corrupting the project's APJ files has no influence on the DWG files and XML files contained in the project. In the Project Browser, the project will not display anymore. To recreate the project with a new APJ file, go to the Project Browser, and create a new project of the same name in the same folder location as the previous APJ file. For instructions, see "Creating a New Project" on page 229. Then, go to the Project Navigator, and drag-and-drop the Elements, Constructs, Views, and Sheets folders of the project from Internet Explorer into the corresponding tabs of the Project Navigator. For instructions, see "Creating a Category by Dragging a Folder from Internet Explorer to the Project Navigator" on page 264. This re-inserts the files into the project.

What should I do if an XML file has been accidentally deleted or corrupted?
Each DWG file within a project has an accompanying XML file that contains the project specific information. If the accompanying XML file is accidentally deleted or corrupted, the DWG file is no longer recognized as part of the project and will not display in the Project Navigator. To insert it into the project again, you need to reconvert the DWG file into a project file. For

instructions, see "Converting a Legacy Drawing to a Construct" on page 276 and "Converting a Legacy Drawing to an Element" on page 296.

Can I limit other users access to the project files?
You can limit other users ability to edit and delete project files by using the network permissions. You can limit the Delete rights for the entire project, so that users are not able to delete files from the project or move files around within the project. You might also consider just limiting the delete rights to the top project folder (containing the APJ file) and allow deleting in the sub-folders.

How much additional file space will the project files need?
Working with a project does not require large additional amounts of file space on your computer or network folder. The XML files are less than 10K, most of them around 1-3K. The APJ file is slightly bigger, but in most cases won't exceed 10K either.

How can I best archive a project?
All of the project files are contained in a folder structure within the top project folder, which also contains the APJ file. To archive the project, just take the top project folder and move or copy it to the desired archive location on a folder, a CD, or streamer tape.

How would I best place Addenda, Alternates, or As-Builts within the project?
How you organize these items would largely depend on your internal processes and workflow. One solution would be to draw the alternates as regular constructs and then create special views for them.

If you want to present completely different plans/elevations to represent Alternates, you could use divisions to represent them; when generating the view, you just need to include the appropriate division into the view.

In some cases you might also consider copying the project and putting the Alternates into the copied project. For instructions, see "Copying a Project" on page 234. If you copy a project, however, you have two different file sets to maintain; the copied project does not retain any links to the original one.

How do I define the physical locations of elements and constructs in the building?
The location of a project file when referenced into another project file depends on the location in the original file. If you have drawn an element at 0,0,0, then it is referenced at 0,0,0. When placing a construct into a view, the horizontal location is determined by the level the construct is on; when you have assigned a construct to the second level, it is inserted at the base elevation of the second level, for example 2.75 meters.

When referencing a project file into another project file, are basepoints other than 0,0,0 respected?
Yes. When referencing elements into constructs, and constructs into views, they are inserted at 0,0,0. A base point (INSBASE) other than 0,0,0 within the elements and constructs is respected.

Can I override the basepoints of project files when referencing them in other project files?
No. This is standard AutoCAD behavior.

Can I lock elements and constructs in their position to avoid accidentally moving them?
Yes. If you want to lock an element or construct within the building model, lock the layer the element or construct has been inserted on.

Is there an easy way to copy an element to multiple constructs at once?
Yes. Select the element in the Project Navigator, right-click, and click Attach Elements to Constructs. For detailed instructions, see "Referencing an Element into Multiple Constructs" on page 284.

Is there an easy way to copy a construct to multiple levels at once?
Yes. There are two methods of achieving this, which are described in "Copying a Level with Assigned Constructs" on page 253 and "Copying Constructs to Levels" on page 275.

How do I move constructs from one level to another?
To move a construct to a different level, you need to change its level assignment. Select the construct, right-click, and click Properties in the shortcut menu. Then, choose a different level in the Assignments matrix. For detailed instructions, see "Changing the Properties of a Construct" on page 286.

Will wall cleanups work across walls from different divisions?
Yes. Walls do cleanup across external references, such as divisions. You just need to make sure that the wall baselines are at the same elevation.

Will AEC dimensions work with objects from external references?
Yes. AEC dimensions are capable of dimensioning objects from external references, even when they are nested. For detailed information, see "Dimensioning a Project" on page 355.

Will schedule tags and property sets work with objects from external references?
Yes. Schedule tags and property set definitions are capable of annotating objects from external references, even when they are nested. For detailed information, see "Tagging a Project" on page 342 and "Property Set Data and Schedule Tables in Projects" on page 343.

Is the Project Navigator MDI compliant?
No. During a session of Autodesk Architectural Desktop, only one project can be opened at a time. You can open files from different projects with the regular File ➤ Open command. You do not, however, see the associated project in the Project Navigator.

Layer Management

6

Autodesk® Architectural Desktop adds layer standards, layer keying, and a layer management interface—the Layer Manager—to the layering capabilities included in AutoCAD®. These additional features help you standardize, automate, and manage the use of layers in your office, in your projects, and in your drawings.

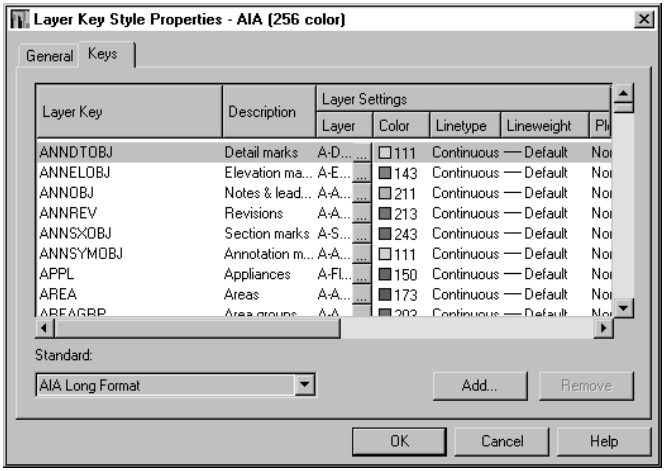
Layer Standards
Layer standards establish naming conventions for layers in your drawings. A layer standard contains a set of rules that determines the structure of the layer names in a drawing. When you install the software, you can select from a number of layer standards that you can use. You can change or edit each of the layer standards later, if needed.

Layer Keys and Layer Key Styles
Each layer standard has a corresponding layer key style. A layer key style contains a set of layer keys. The layer keys in the layer key style assign objects to predefined layers with names that conform to the layer standard. When you add an object, the object is automatically drawn on the layer assigned to it in the current layer key style. This process is called *layer keying*.

In this chapter

- Managing Drawing Layers
- Working with Layer Groups
- Working with Layer Snapshots
- Working with Layer Keys
- Creating and Editing Layer Standards

Viewing the layer keys and layers in a layer key style



You can change any part of the layer name structure using layer key overrides within the layer key style. You can override the layer names for all the layer keys in a layer key style, or you can override individual layer key styles.

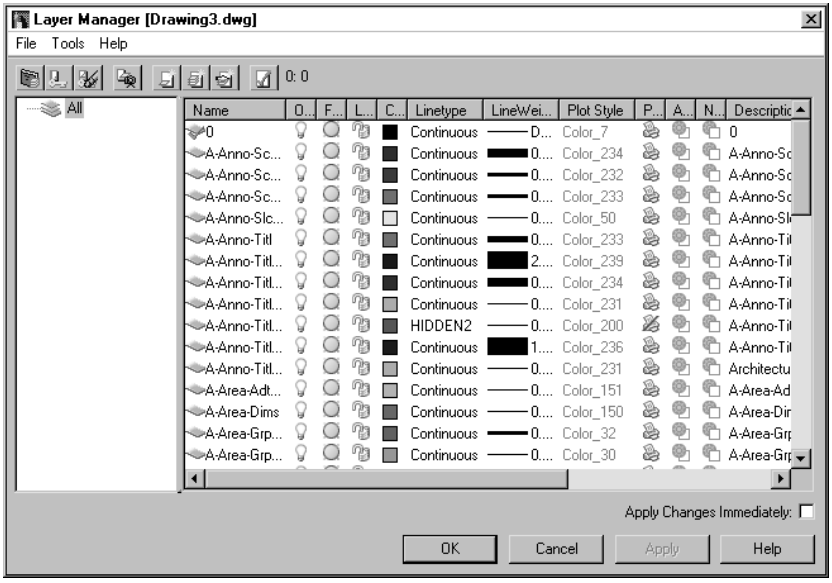
Layer Manager

You can access layer standards, layer key styles, and layer overrides, as well as other layering features, in the Layer Manager. The Layer Manager helps you organize, sort, and group layers, as well as save and coordinate layering schemes. In the Layer Manager you can:

- Change layer properties by clicking AutoCAD®layer property icons
- Make a layer the current layer
- Create, rename, and delete layers
- Work with layer standards and layer key styles
- Create layer groups and layer snapshots

When you display the Layer Manager, all the layers in the current drawing are displayed in the All layer group. If there are any external reference files linked to the drawing, the layers are listed in an XRef layer group.

Viewing layers in the Layer Manager



Layer Groups

You can create additional layer groups to manage large sets of layers. You can specify the visibility of all the layers in the layer group by changing the layer group properties. The Layer Manager allows you to create two types of layer groups: user layer groups and filter layer groups. User groups can contain any layers that you put in them, while filter groups contain only layers that meet criteria that you specify.

Layer Snapshots

In addition to layer groups, the Layer Manager allows you to save layers and their settings as layer snapshots, similar to taking a picture of a layer set that you can restore and view later. By saving layer and view information in a snapshot, you can quickly recall specific layer and view configurations from complex data sets. For example, a facilities manager might create snapshots of individual floor plans and furniture, cable, and HVAC layouts to separate this information from a complete building layout.

Related Procedures

- Managing Drawing Layers
- Working with Layer Groups
- Working with Layer Snapshots
- Working with Layer Keys

- Creating and Editing Layer Standards

Managing Drawing Layers

The Layer Manager helps you organize, sort, and group layers, as well as save and coordinate layering schemes. You can also use layer standards with the Layer Manager to better organize the layers in multiple drawings.

When you open the Layer Manager, all the layers in the current drawing are displayed in the right pane. You can work with individual layers to:

- Change layer properties
- Make a layer the current layer
- Create, rename, and delete layers

If you are working with drawings that contain large numbers of layers, you can improve the speed at which the Layer Manager loads layers when you open it by selecting Layer Manager/Optimize for Speed in the AEC Editor options. For more information, see "Changing the AEC Editor Settings" on page 388.

Related Procedures

- Changing the AEC Editor Settings
- Opening the Layer Manager
- Making a Layer Current
- Creating a Layer with a Layer Standard
- Creating a Nonstandard Layer
- Renaming a Layer
- Deleting a Layer
- Changing the Layer Standard of a Layer
- Editing the Description of a Layer

Changing the AEC Editor Settings

Use this procedure to optimize the speed of the Layer Manager. To speed drawing performance, you can improve the layer loading time of the Layer Manager.

NOTE When you optimize the speed for the Layer Manager, the layer icons that show if a layer is in use are turned off.

1 On the Format menu, click Options.
2 Click the AEC Editor tab.
3 Under Optimize for Speed, select Layer Manager.
4 Click OK.

Opening the Layer Manager

Use this procedure to open the Layer Manager. When you open the Layer Manager, all the layers in the current drawing are displayed in the right pane of the Layer Manager and the layer groups are displayed in the left pane.

1 On the Format menu, click Layer Management ➤ Layer Manager.
2 To close the Layer Manager, click .

Making a Layer Current

Use this procedure to make a specific layer the current layer in the drawing. You must select an individual layer to make current. You cannot make multiple layers or layer groups current.

1 On the Format menu, click Layer Management ➤ Layer Manager.
2 In the right pane, double-click the layer that you want to make current.

   You can also select the layer that you want to make current and click

   The selected layer is now the current layer and is marked with a green check in the Layer Manager. The layer name is displayed next to the Current Layer button near the top of the Layer Manager.
3 Click OK.

Creating a Layer with a Layer Standard

Use this procedure to create a layer that conforms to the layer standard.

Autodesk® Architectural Desktop creates layers as needed according to the current layer standard. For example, when you add a wall to a drawing, the software creates the necessary wall layers if they do not yet exist.

If you need to create layers for a specific purpose, use the fields and values of the layer standard.

1 On the Format menu, click Layer Management ➤ Layer Manager.
2 Click .

3 Select the layer standard that you want to use for Layer Standard.

4 Specify the layer standard information.

Depending on the layer standard you are using, different fields are available here. For example, if you are using the AIA 2nd Edition standard, you have fields for Discipline Designator, Major, Minor 1, Minor 2, and Status.

To select a value for one of the available fields, click [. . .], and select one of the values offered.

You can also enter a new value, provided you follow the parameters specified for the layer standard components.

When you are finished, the Layer Name and Description fields display the combination of values you have selected. If you have, for example, created a new layer for wall dimensions according to the AIA 2nd Edition layer standard, it is named *A-Anno-Dims*.

NOTE If the name of the new layer is the same as an existing layer in the current layer key style, the properties of the new layer are automatically updated with the properties of the existing layer.

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5 Select Make Current if you want to make the layer the current layer.

6 Select a color for the layer from the list.

If the desired color is not available on the list, select Select Color, and select a color from the Color Picker.

7 Select a linetype.

If the desired linetype is not available on the list, select Other, and select a linetype from the Select Linetype dialog box.

8 Select a lineweight.

9 Clear Plot if you do not want the new layer to be plotted.

10 Click OK twice.

Creating a Nonstandard Layer

Use this procedure to create a nonstandard layer. A nonstandard layer is a layer that does not need to conform to the naming and content standard of any layer standard. You might want to use nonstandard layers for elements like architect's comments or construction lines, blocks you do not want to insert on their original layer, or walls that you want to display partially.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select Non Standard for Layer Standard.

4 Enter a name for the new layer.

5 Select Make Current if you want to make the layer the current layer.

6 Enter a description for the new layer.

7 Select a color for the layer from the list.

   If the desired color is not available on the list, select Select Color, and select a color from the Color Picker.

8 Select a linetype.

   If the desired linetype is not available on the list, select Other, and select a linetype from the Select Linetype dialog box.

9 Select a lineweight.

10 Clear Plot if you do not want the new layer to be plotted.

11 When you finish specifying the properties of the layer, click OK twice.

Renaming a Layer

Use this procedure to specify a new name for a layer.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Right-click the layer that you want to rename, and click Rename Layer.

3 Enter a new name for the layer, and press ENTER.

4 Click OK.

Deleting a Layer

Use this procedure to delete a layer from a drawing.

Keep the following points in mind when you delete layers:

- If you try to delete a layer that still has objects on it, you receive an error message. To delete this layer, you must first erase all objects on it in the drawing.
- If the layer you try to delete is the current layer, Delete is unavailable on the shortcut menu. To delete this layer, make another layer current and then delete the layer.
- Some layers may be assigned to the components of another object, or even to other object styles. These layers cannot be deleted.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. Right-click the layer that you want to delete, and click Delete.

   The layer you have deleted is marked with a red "X." It is permanently deleted when you click Apply or OK.

   NOTE If Apply Changes Immediately is selected, the layer is automatically deleted.

3. Click OK.

Changing the Layer Standard of a Layer

Use this procedure to assign a specific layer to a different layer standard.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. Right-click the layer that you want to change, and click Change Layer Standard.
3. Select the layer standard that you want to use for Layer Standard.

   The layer you selected is now assigned to the specified layer standard.

   NOTE If a layer standard is unavailable on the shortcut menu, the layer that you selected is not valid for that standard.

4. Click OK.

Editing the Description of a Layer

Use this procedure to change the description of a layer.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. Right-click the layer that you want to change, and click Change Description.
3. Enter a new description for the layer, and press ENTER.
4. Click OK.

Working with Layer Groups

With the Layer Manager, you can create groups of layers to produce working views and backgrounds from large building data sets. Layer groups help you

work more efficiently in drawings that have many layers. You can change the settings of a layer group to apply the changes to all layers in the group at one time. For example, you can lock a layer group to lock all the layers in the group.

Types of Layer Groups

There are four types of layer groups:

Type	Description
All	Is always present and lists all the layers and other layer groups in the drawing.
Xref	Lists any layers in external reference files linked with the current drawing. This group is automatically created when you xref a drawing into the current drawing.
User groups	Contain layers that you have assigned to them.
Filter groups	Contain layers based on a filter that you specify for the group. You can base filters on layer names and other layer properties.

Rules for Layer Groups

The following group rules apply when you are creating and working with layer groups:

- You can list a layer in more than one layer group.
- Multiple listings of the same layer must always have identical property settings. For example, a layer that is a member of two groups cannot be a different color in each group.
- You cannot list a layer twice in a group.
- You can delete layer groups without affecting the layers in the group.
- Changing one of the properties of a layer group changes that property for all the layers in that group, except where the change would be invalid. For example, it is not possible to freeze the current layer.
- Layer group names need not be unique.
- There is no naming convention for layer groups. Group names can include spaces, nonalphanumeric characters, and both uppercase and lowercase letters.
- Xref layer groups cannot contain other filter groups.

Managing Layer Groups

You can add and subtract layers from layer groups. You can change the standard AutoCAD® properties for the layers in groups, rename layer groups, delete layer groups, and change the filters in filter groups.

Related Topics and Procedures

- User Groups and Filter Groups
- Creating a User Group
- Creating a Filter Group
- Adding Layers to Layer Groups
- Changing the Properties of a Layer Group
- Renaming and Deleting Layer Groups

User Groups and Filter Groups

With the Layer Manager, you can create two types of layer groups: user groups and filter groups.

User-defined groups can contain any layers in the current drawing. You can manually add layers to, and remove layers from, user groups by dragging layers within the Layer Manager into the user group or by selecting an object in the drawing on the layer that you want to add to the user group.

A filter group contains layers that meet filter criteria that you specify for the group. Filter criteria can select layers according to layer states (on/off, frozen/thawed, locked/unlocked), properties, or names. For example, you can create a filter group that includes all of the red layers in the current drawing.

Filter groups can be either dynamic or static:

- Dynamic filter groups are automatically updated when you change the properties of layers that are part of the group. Dynamic filter groups are also updated when you add or modify layers that meet the criteria specified in the filter. You cannot manually add layers to, or remove layers from dynamic filter groups.
- Static filter groups are not automatically updated; they include only the layers that met the filter criteria when the group was created. You can manually add layers to, and remove layers from, static filter groups.

The layer groups named Xrefs and All are created automatically.

Creating a User Group

Use this procedure to create a user group. User groups can contain any layers in the current drawing. You can manually add layers to, and remove layers from, user groups by dragging layers within the Layer Manager into the user group or by selecting an object in the drawing on the layer that you want to add to the user group.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 In the left pane of the Layer Manager, select a layer group that you want to create the new group under, right-click, and click New Group ➤ User, or click in the Layer Manager.

3 Enter a name for the new user group, and press ENTER.

4 Edit the new user group:

If you want to . . .	Then . . .
add layers to the user group	see "Adding Layers to Layer Groups" on page 402.
specify properties for the user group	see "Changing the Properties of a Layer Group" on page 403.

5 Click OK.

Creating a Filter Group

A filter group contains layers that meet filter criteria that you specify for the group. Filter criteria can select layers according to layer states (on/off, frozen/thawed, locked/unlocked), properties, or names. For example, you can create a filter group that includes all of the red layers in the current drawing.

You can create two types of filter layer groups:

- Dynamic filter groups automatically update when you change the properties of layers that are part of the group. You cannot manually add layers or remove layers.
- Static filter groups do not automatically update, and include only the layers that met the filter criteria when the group was created. You can manually add layers and remove layers.

Related Topics and Procedures

- Creating Filter Groups
- Specifying a Filter for Layer State
- Specifying a Filter for Layer Color
- Specifying a Filter for Layer Linetype
- Specifying a Filter for Layer Standard
- Specifying a Filter for Layer Name

Creating Filter Groups

Use this procedure to create filter groups, either dynamic or static. You can specify more than one filter for a group. For example, you can filter by layer name and status to group all frozen walls layers.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. In the left pane of the Layer Manager, select a layer group that you want to create the new group under, right-click, and click New Group ➤ Filter.
3. Enter a name for Filter Name.
4. Specify the type of filter group:

If you want to . . .	Then . . .
specify a filter group that updates when you change the properties of layers in the group	select Dynamic.
specify a filter group that does not automatically update	select Static.

5. Specify the filter criteria:

If you want to . . .	Then . . .
filter layers by visibility state	see "Specifying a Filter for Layer State" on page 396.
filter layers by layer color	see "Specifying a Filter for Layer Color" on page 398.
filter layers by layer linetype	see "Specifying a Filter for Layer Linetype" on page 399.
filter layers by layer standard	see "Specifying a Filter for Layer Standard" on page 400.
filter layers by wildcard characters	see "Specifying a Filter for Layer Name" on page 401.

6. Click OK twice.

Specifying a Filter for Layer State

Use this procedure to specify a filter that includes layers based on the following layer states:

- On/off
- Frozen/thawed
- Locked/unlocked
- New viewport frozen/thawed
- In use/unused

A layer must meet all the specified filter criteria to be included. For example, if you select Off and Frozen for the filter, a layer that is turned off but is not frozen will not be included in the group. The default setting for all options on the States tab is Both.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. In the left pane of the Layer Manager, select a layer group that you want to create the new group under, right-click, and click New Group ➤ Filter.
3. Enter a name for Filter Name.
4. Click the States tab.
5. Clear Ignore This Filter.
6. Specify the On/Off layer state criteria for the filter:

If you want to . . .	Then . . .
include all the layers in the drawing that are turned on	select On.
include all the layers in the drawing that are turned off	select Off.
select layers that are turned on and layers that are turned off	select Both.

7. Specify the Freeze/Thaw layer state criteria for the filter:

If you want to . . .	Then . . .
include all the layers in the drawing that are thawed	select Thawed.
include all the layers in the drawing that are frozen	select Frozen.
select layers that are thawed and layers that are frozen	select Both.

8 Specify the Locked/Unlocked layer state criteria for the filter:

If you want to . . .	Then . . .
include all the layers in the drawing that are unlocked	select Unlocked.
include all the layers in the drawing that are locked	select Locked.
select layers that are unlocked and layers that are locked	select Both.

9 Specify the Viewport Thawed/Frozen layer state criteria for the filter:

If you want to . . .	Then . . .
include all the layers in the drawing that are thawed in a new viewport	select New VP Thawed.
include all the layers in the drawing that are frozen in a new viewport	select New VP Frozen.
select layers that are thawed and layers that are frozen in a new viewport	select Both.

10 Specify the In use/Unused layer state criteria for the filter:

If you want to . . .	Then . . .
include all the layers in the drawing that are in use	select In Use.
include all the layers in the drawing that are unused	select Unused.
select layers that are used and layers that are unused	select Both.

11 Click OK.

Specifying a Filter for Layer Color

Use this procedure to specify a filter that includes layers based on layer colors.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 In the left pane of the Layer Manager, select a layer group that you want to create the new group under, right-click, and click New Group ➤ Filter.

3 Enter a name for Filter Name.

4 Click the Colors tab.

5 Clear Ignore This Filter.

6 Add or remove layer colors in the filter:

If you want to . . .	Then . . .
add an individual color to the filter	select the color for Available Color(s), and click Add. The color you selected is moved from Available Color(s) to Selected Color(s).
remove an individual color from the filter	select the color for Selected Color(s), and click Remove. The color that you selected is moved from Selected Color(s) to Available Color(s).
add all of the colors from the Autodesk®Architectural Desktop color palette to the color filter	click Add All. All of the colors available in the software are moved to Selected Color(s).
remove all of the layer colors in the color filter	click Remove All. The colors for Selected Color(s) are moved to Available Color(s).
add a new color to the filter from the full color palette	click Choose Color, select a color, and click OK.

7 Click OK.

Specifying a Filter for Layer Linetype

Use this procedure to specify a filter that includes layers based on linetype.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 In the left pane of the Layer Manager, select a layer group that you want to create the new group under, right-click, and click New Group ➤ Filter.

3 Enter a name for Filter Name.

4 Click the Linetypes tab.

5 Clear Ignore This Filter.

6 Add linetypes to the filter:

If you want to . . .	Then . . .
add an individual linetype to the filter	select the linetype for Available for Filtering, and click Add. The linetype you selected is moved from Available for Filtering to Already in Filter.
remove an individual linetype from the filter	select the linetype for Already in Filter, and click Remove. The linetype that you selected is moved from Already in Filter to Available for Filtering.
add all of the available linetypes to the filter	click Add All. All of the available linetypes are moved from Available for Filtering to Already in Filter.
remove all of the linetypes in the filter	click Remove All. The linetypes for Already in Filter are moved to Available for Filtering.

7 Click OK.

Specifying a Filter for Layer Standard

Use this procedure to specify a filter that includes layers based on layer standards and layer standard categories.

The categories available are the categories that are included in the layer standard. When you add categories to the Selected Categories list, the order in which you add them affects the hierarchical structure of the generated layer groups. For example, if you select the AIA 2nd Edition layer standard, you can add Discipline Designator followed by Major to create a two-tier hierarchy with architectural layers separated from facilities management layers.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 In the left pane of the Layer Manager, select a layer group that you want to create the new group under, right-click, and click New Group ➤ Filter.

3 Enter a name for Filter Name.

4 Click the Standards tab.

5 Clear Ignore This Filter.

6 Specify the layer standard filter criteria:

If you want to . . .	Then . . .
filter for layer categories that are not in a layer standard	select Non Standard for Layering Standard.
filter for layers that are in a layer standard	select the layer standard for Layering Standard.

7 If you selected a layer standard, use Add and Remove to transfer layer standard categories to and from Available Categories and Selected Categories.

8 Click OK.

Specifying a Filter for Layer Name

Use this procedure to specify a filter that includes layers based on wildcard strings in a layer name. The wildcard string is not case sensitive.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 In the left pane of the Layer Manager, select a layer group, right-click, and click New Group ➤ Filter.

3 Enter a name for Filter Name.

4 Click the Wildcards tab.

5 Clear Ignore This Filter.

6 Specify the wildcard filter criteria:

If you want to . . .	Then . . .
include in the filter all layers that contain a particular string	select Wildcard Layer Names Must Match, and enter a wildcard string and an asterisk (*).
exclude from the filter all layers that contain a particular string	click Wildcard Layer Names Must Not Match, and enter a wildcard string and an asterisk (*).

For more information about working with wildcards, see "Filter Selection Sets" in the online *AutoCAD 2004 User's Guide*.

7 Click OK.

Adding Layers to Layer Groups

Use this procedure to add layers to a layer group. You can manually add layers to a user group or to a static filter group. You can either drag them from the list of layers in the right pane of the Layer Manager to the group in the left pane or add the layer to the group by selecting an object in the current drawing that is on the layer that you want to add.

You can also replace all layers in an existing group by selecting objects in the current drawing that are on the layers that you want to use as replacements for the existing layers.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Add layers to a layer group:

If you want to . . .	Then . . .
add layers to a layer group by dragging	in the left pane of the Layer Manager, select the All layer group. In the right pane of the Layer Manager, drag a layer to the user layer group or static filter group in the left pane.
add layers to a layer group by selecting drawing objects	select the layer group, right-click, and click Select Layers ➤ Add. In the current drawing, select an object on each layer that you want to add to the group. Press ENTER to return to the Layer Manager.
replace layers from groups by selecting drawing objects	select the layer group whose layers you want to replace, right-click, and click Select Layers ➤ Replace. Select an object on each layer that you want to replace the layers in the group. Press ENTER to return to the Layer Manager.

3 Click OK.

Changing the Properties of a Layer Group

Use this procedure to change the properties of all layers in a layer group. If a layer is in more than one group, the changes apply to that layer in all groups in which it is included. For example, if you freeze a group that includes the layer A-Wall, that layer is frozen in any other group in which A-Wall appears.

NOTE Because you cannot freeze the current layer, you do not have the option to freeze a group in the active viewport if the current layer is included in the group. You also cannot freeze the active viewport on the Model layout tab.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. Click the layer group whose properties you want to change, and specify properties:

If you want to . . .	Then . . .
specify whether the group is locked	right-click, click Lock, and click Lock On or Lock Off.
specify whether the group is frozen	right-click, click Freeze/Thaw, and click Freeze or Thaw.
specify whether to freeze all the layers in the group only in the active viewport	right-click, click Viewport, and click Freeze or Thaw.
specify the visibility of the group	right-click, click Visibility, and click On or Off.
freeze all layers in the drawing except those in the selected layer group	right-click, click Isolate Group, and click All Viewports or Active Viewport Only.
specify the color for all layers in the group	select All in the left pane, and click the color value for the group in the right pane. Select a color, and click OK.
specify the linetype for all layers in the group	select All in the left pane, and click the linetype value for the group in the right pane. Select a linetype, and click OK.
specify the lineweight for all layers in the group	select All in the left pane, and click the lineweight value for the group in the right pane. Select a lineweight, and click OK.

3 Click OK.

Renaming and Deleting Layer Groups

Use this procedure to rename or delete layer groups. The layer group is deleted from the Layer Manager, but the layers listed in the group are not deleted.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Rename or delete a layer group:

If you want to . . .	Then . . .
rename the layer group	right-click the layer group, and click Rename Group. Enter a new name, and press ENTER.
delete the layer group	right-click the layer group, and click Delete Group.

3 Click OK.

Working with Layer Snapshots

A layer snapshot is a specific set of layers and view information that you can save, edit, and restore in your drawing. By saving layer and view information in a snapshot, you can quickly recall specific layer and view configurations from complex data sets. For example, a facilities manager might create snapshots of individual floor plans and furniture, cable, and HVAC layouts to separate this information from a complete building layout.

You can create and name any number of layer snapshots. You can add and delete individual layers in a snapshot. You can edit, delete, and import and export the snapshot. Import snapshots into new drawings to automatically specify a layering scheme in your drawing.

NOTE If you are sharing drawing files with other non-Architectural Desktop products that are using object enablers and want to create layer snapshots, create layer snapshots using the AutoCAD® Layer States Manager to create LAS files by entering **-layer**. For more information, see "Layer States Manager" in the online *AutoCAD 2004 Command Reference*.

Related Procedures

- Creating a Layer Snapshot
- Editing a Layer Snapshot
- Restoring a Layer Snapshot
- Deleting a Layer Snapshot
- Exporting a Layer Snapshot
- Importing a Layer Snapshot

Creating a Layer Snapshot

Use this procedure to create snapshots of all the layers in the current drawing or the layers in a particular layer group:

- Create a snapshot of all the layers in a drawing when you want to restore or export an entire layering scheme.
- Create a snapshot of a particular layer group to store specific layering information.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 In the left pane of the Layer Manager, click All.

3 Create a snapshot:

If you want to . . .	Then . . .
create a snapshot of all drawing layers	click , and click New. Enter a name for the snapshot, and click OK twice.
create a snapshot of a layer group	right-click the layer group, and click Save as Snapshot. Enter a name for the snapshot, and click OK.

4 Click OK.

Editing a Layer Snapshot

Use this procedure to edit a layer snapshot. You can edit a snapshot in several ways:

- adding layers
- removing layers
- modifying layer properties

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select the snapshot that you want to edit, and click Edit.

4 Edit the selected snapshot:

If you want to . . .	Then . . .
add layers from the drawing to the snapshot	click Add, select the layer that you want to add, and click OK.
delete a layer from a snapshot	select the layer that you want to delete, and click Delete.
edit the standard AutoCAD® layer properties of the individual layers in the snapshot	click the property icons or descriptions. This affects only the snapshot. The layers in the drawing are not affected until you restore the snapshot.

5 When you finish editing the layer snapshot, click OK twice.

Restoring a Layer Snapshot

Use this procedure to restore a layer snapshot. When you restore a snapshot, the layers in the drawing display with the settings as they are defined in the snapshot.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select the layer snapshot that you want to restore, and click Restore.

4 Click OK twice.

Deleting a Layer Snapshot

Use this procedure to delete a layer snapshot. When you delete a snapshot, you do not delete the layers from the drawing. You delete only the snapshot of the layers.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select the snapshot that you want to delete, and click Delete.

4 Click OK twice.

Exporting a Layer Snapshot

Use this procedure to export a layer snapshot so that the snapshot is available to import in other drawings. You can export snapshots with the following file extensions:

- **SSL:** Layer Manager Snapshot Format. Saves a layer properties, description, and linetype file.
- **LAY:** Bonus Layer Format. Compatible with the AutoCAD® Express Tools utility for saving layer snapshots. The layer description and linetype file are not saved with the snapshot.
- **CSV:** Comma-Delimited Format. An ASCII file that you can read or edit in a standard word processor.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. Click .
3. Select the snapshot that you want to export, and click Export.
4. Enter a name for the new snapshot file.
5. Navigate to the folder where you want to save the layer snapshot.
6. Select a file format for Save as type.
7. Click Save, and click OK twice.

Importing a Layer Snapshot

Use this procedure to import a layer snapshot into a drawing. A snapshot must first be exported from one drawing before it can be imported into another. For more information, see "Exporting a Layer Snapshot" on page 407.

You must be in the destination drawing when you open the Layer Manager to import from the source drawing.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. Click .
3. Click Import.
4. Select the snapshot that you want to import, and click Open.
5. Click Yes to restore the settings.

   This makes the snapshot settings active in the drawing.
6. Click OK twice.

Working with Layer Keys

A layer key maps an object that you draw to a defined layer. Layer keys also specify the default properties of each layer.

Layer Keys and Layer Keying

When you create an object, the layer key that is associated with the object automatically places that object on the layer to which it is mapped. Using layer keys to automatically place objects on predefined layers is called *layer keying*. Usually, you key objects to layers that conform to a layer standard. Each layer standard names layers according to a set of rules that you can modify. For more information, see "Creating and Editing Layer Standards" on page 421.

Layer Key Styles

You can create different sets of layer keys, called layer key styles, that you can use to place objects on defined layers in your drawings. Each layer key style contains a set of layer keys. Both the AIA and BS1192 layer key styles contain layer keys and layer properties, including layer name, description, color, linetype, lineweight, plot style, and plot settings for all of the AEC objects. You can import the AIA and BS1192 layer standards and layer key styles that are provided with Autodesk® Architectural Desktop from the *AecLayerStd.dwg* in the *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\Layers* folder. If you are running Windows NT®, the drawing file is located in the *\winnt\Profiles\All Users\Application Data\Autodesk Architectural Desktop 2004\R16.0\Layers* folder. You can modify these styles, if needed, or create new layer key styles. You can also create layer key styles from LY files.

Properties of Layer Key Styles

You can add and remove layer keys from layer key styles. Default layer keys cannot be removed. The properties of any layer in an existing layer key style can also be edited. You can change the layer name, description, color, linetype, lineweight, plot style, and plot settings for the layer that each layer key maps to. If the layer key style is based on a layer standard, you can use overrides on all or some of the layer keys within the layer key style. For more information about overrides, see "Layer Key Overrides" on page 418.

NOTE The default Standard layer key style is not based on a layer standard. It contains the default set of layer keys.

LY Files and Layer Key Styles

If you have LY files from S8 or Release 1 of Autodesk® Architectural Desktop that you want to use, you can create a new layer key style from an LY file. For more information see, "Creating a Layer Key Style from an LY File" on page 415.

Overrides to Layer Key Styles

Whether you create an original layer key style or one from an existing LY file, if you want to use overrides, you must base the layer key style on a layer standard in the current drawing. If you create a nonstandard layer key style, the Overrides On/Off command is unavailable. If you copy a layer key style, you can use layer key overrides only if the layer key style that you copied is based on a layer standard. For more information about using layer key overrides, see "Layer Key Overrides" on page 418.

Managing Layer Key Styles

To create, edit, copy, or purge layer key styles, you access the Style Manager.

The Style Manager provides a central location in Autodesk® Architectural Desktop, where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager".

Related Procedures

- Default Layer Keys
- Default Layer Key Values
- Creating a Layer Key Style
- Creating a Layer Key Style from an LY File
- Editing Layer Key Styles
- Attaching Notes and Files to a Layer Key Style
- Layer Key Overrides

Default Layer Keys

Autodesk® Architectural Desktop uses the following default layer keys when you create AEC objects.

Default layer keys for creating AEC objects

Layer Key	Description
ANNDTOBJ	Detail marks

Default layer keys for creating AEC objects	
ANNELOBJ	Elevation objects
ANNOBJ	Notes, leaders, etc.
ANNREV	Revisions
ANNSXKEY	Section marks
ANNSXOBJ	Section marks
ANNSYMOBJ	Annotation marks
APPL	Appliances
AREA	Areas
AREAGRP	Area Groups
AREAGRPNO	Area Group Numbers
AREANO	Area Numbers
CAMERA	Cameras
CASE	Casework
CASENO	Casework tags
CEILGRID	Ceiling grids
CEILOBJ	Ceiling objects
CHASE	Chases
COLUMN	Columns
COMMUN	Communication
CONTROL	Control systems
CWLAYOUT	Curtain walls
CWUNIT	Curtain wall units
DIMLINE	Dimensions
DIMMAN	Dimensions (AutoCAD points)

Default layer keys for creating AEC objects	
DOOR	Doors
DOORNO	Door tags
DRAINAGE	Drainage
ELEC	Electric
ELECNO	Electrical tags
ELEV	Elevations
ELEVAT	Elevators
ELEVHIDE	Elevations (2D)
EQUIP	Equipment
EQUIPNO	Equipment tags
FINCEIL	Ceiling tags
FINFLOOR	Finish tags
FIRE	Fire system equipment
FURN	Furniture
FURNNO	Furniture tags
GRIDBUB	Plan grid bubbles
GRIDLINE	Column grids
LAYGRID	Layout grids
LIGHTCLG	Ceiling lighting
LIGHTW	Wall lighting
MASSELEM	Massing elements
MASSGRPS	Massing groups
MASSSLCE	Massing slices
OPENING	Wall openings

Default layer keys for creating AEC objects	
PEOPLE	People
PFIXT	Plumbing fixtures
PLANTS	Plants - outdoor
PLANTSI	Plants - indoor
POLYGON	AEC Polygons
POWER	Electrical power
PRK-SYM	Parking symbols
ROOF	Rooflines
ROOFSLAB	Roof slabs
ROOMNO	Room tags
SCHEDOBJ	Schedule tables
SEATNO	Seating tags
SECT	Miscellaneous sections
SECTHIDE	Sections (2D)
SITE	Site
SLAB	Slabs
SPACEBDRY	Space boundaries
SPACEOBJ	Space objects
STAIR	Stairs
STAIRH	Stair handrails
STRUCTBEAM	Structural beams
STRUCTBEAMIDEN	Structural beam tags
STRUCTBRACE	Structural braces
STRUCTBRACEIDEN	Structural brace tags

Default layer keys for creating AEC objects	
STRUCTCOLS	Structural columns
STRUCTCOLSIDEN	Structural column tags
SWITCH	Electrical switches
TITTEXT	Border and title block
TOILACC	Architectural specialties
TOILNO	Toilet tags
UTIL	Site utilities
VEHICLES	Vehicles
WALL	Walls
WALLFIRE	Fire wall patterning
WALLNO	Wall tags
WIND	Windows
WINDASSEM	Window assemblies
WINDNO	Window tags

Default Layer Key Values

The following default values are assigned to new layer keys.

Default values for layer keys	
Layer name	Same as layer key name. Assigned to appropriate layer root name.
Description	Blank
Color	7 (white/black)
Linetype	Continuous
Lineweight	Default
Plot style	Normal

Default values for layer keys	
Plot	Yes

Creating a Layer Key Style

Use this procedure to create a layer key style. You can create a layer key style by using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

If you want to use layer key overrides, you must base the layer key style you create on a layer standard in the current drawing. If you create a nonstandard layer key style, you cannot attach layer key overrides to that layer key style.

1 On the Format menu, click Layer Management ➤ Layer Key Styles, or in the Layer Manager, click .

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Create a new layer key style:

If you want to . . .	Then . . .
create a style with default properties	right-click Layer Key Styles, and click New.
create a style from an existing style	right-click the layer key style you want to copy, and click Copy. Right-click, and click Paste.

3 Right-click the new layer key style and click Rename.

4 Enter a name for the new layer key style, and press ENTER.

5 To edit the new layer key style, right-click the style, and click Edit:

If you want to . . .	Then . . .
specify properties for layer keys	see "Editing Layer Key Styles" on page 415.
add notes and files to the style	see "Attaching Notes and Files to a Layer Key Style" on page 417.

6 When you finish specifying the properties of the layer key style, click OK twice.

Creating a Layer Key Style from an LY File

Use this procedure to create a new layer key style from an existing LY file from S8 or Release 1 of Autodesk® Architectural Desktop. If the LY file that you are using does not contain the default layer keys required by the software, they are added to the new layer key style by default and mapped to default layers based on the key name. For example, the layer key ANNOBJ maps to the layer ANNOBJ.

If you want to use layer key overrides, you must base the new layer key style on a layer standard. If you create a nonstandard layer key style, you cannot attach layer key overrides to that layer key style. When you create an original layer key style from an existing LY file, you can choose which sections of the LY file you want to include in your layer key style.

You must first import an existing LY file.

1 On the command line, enter **-AECLYImport**.
2 Enter the file name to import, or enter **?** and browse for a file.
3 Select a file, and click Open.
4 Enter the name for the new layer key style.
5 Select the sections of the LY file you want to include in the new layer key style.
6 Click OK.

A new layer key style is created. It is not associated with a layer standard until you assign the new layer key style to a layer standard. For more information about changing style properties, see "Editing Layer Key Styles" on page 415.

Editing Layer Key Styles

Use this procedure to edit a layer key style.

- You can change the layer standard that a layer key style is based on, or you can specify a layer standard for a nonstandard layer key style.
- You can add layer keys to the layer key style.
- You can remove any layer keys except the default layer keys.
- You can edit the layer properties of the layers to which the layer keys map.
- You can specify whether layer key overrides can be used with the layer key style.

1 On the Format menu, click Layer Management ➤ Layer Key Styles, or in the Layer Manager, click .

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Right-click the layer key style that you want to change, and click Edit.

3 Click the Keys tab.

4 Specify the layer standard:

If you want to . . .	Then . . .
specify a different layer standard on which to base the layer key style	select a new layer standard for Standard.
specify that the layer key style is not based on a layer standard	select Non Standard for Standard.

NOTE You can base more than one layer key style on the same layer standard so that each layer key style can be used with different color, linetype, and override settings.

5 To add a new layer key, click Add.

New keys are added with default values.

6 To delete a layer key, select a layer key, and click Remove.

You cannot delete the default layer keys.

TIP To change the properties of more than one layer key at a time, hold down CTRL and select the additional layer keys.

7 Select a layer key, and specify the layer key properties:

If you want to . . .	Then . . .
modify the description for a layer key	double-click the text that you want to change for Description, and enter new text.
modify the layer name	under Layer, click the [...] button. Specify the appropriate values for layer fields, and click OK.

If you want to . . .	Then . . .
modify the color for a layer key	under Color, click the current value. Select a new color, and click OK.
modify the linetype for a layer key	under Linetype, click the current value. Select a new linetype, and click OK.
modify the lineweight for a layer key	under Lineweight, click the current value. Select a new lineweight, and click OK.
specify whether a layer key will plot	under Plot, click the printer icon to turn plotting on or off.
specify whether to allow layer field overrides	under Allow Overrides, clear the options for which overrides are not allowed.

8 Click OK twice.

Attaching Notes and Files to a Layer Key Style

Use this procedure to enter notes and attach reference files to a layer key style. You can also edit notes and edit or detach reference files from a layer key style.

1 On the Format menu, click Layer Management ➤ Layer Key Styles, or in the Layer Manager, click .

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Right-click the layer key style that you want to change, and click Edit.

3 Click the General tab.

4 To add a description to the layer key style, enter it for Description.

5 Click Notes.

6 To add a note, click the Notes tab, and enter the note.

7 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.

If you want to . . .	Then . . .
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK three times.

Layer Key Overrides

A layer key override enables you to change the default layer names specified by one or more layer keys. The structure of layer names is determined by the descriptive fields in the layer standard definition. You can allow overrides on all the layer keys within a layer key style, or you can select individual layer keys that you want to override. You can override all descriptive fields that make up the layer name, or you can specify which descriptive fields to override. You can apply overrides to any layer keys in a layer key style that is based on a layer standard.

For example, in the AIA 2nd Edition layer standard definition, the Discipline Designator field assigns a description and the Major field assigns a name by default. By using layer key overrides, you can change the values specified in these fields and add values in the unused fields, Minor Code and Status.

The information that you enter to create layer key overrides must conform to the field width and value types specified by the layer standard definition. For example, you cannot specify a four-letter override in the Discipline Designator field in the AIA 2nd Edition Layer Standard, because the maximum width for the Discipline Designator field as specified in the AIA layer standard definition is 1. To modify the descriptive fields, you must edit the layer standard definition. For more information, see "Creating and Editing Layer Standards" on page 421.

After you add overrides to a layer key style, you can turn the overrides on and off in your current drawing. When the layer key overrides are on, objects that you create are placed on layers defined by the layer standard definitions and overridden with the values that you specify. When the layer key overrides are off, objects that you create are placed on the layers defined only by the layer keys. You can start using the layer key overrides immediately after you specify them, or you can use the Overrides On/Off command to switch them on later.

Layer key overrides do not change the layer assignments of existing objects. Only objects added after an override is enabled are affected by the override.

Related Topics and Procedures

- Specifying Layer Key Overrides
- Turning Layer Key Overrides On and Off
- Remapping Objects to Different Layers
- Restoring Objects to Default Layer Key Layers

Specifying Layer Key Overrides

Use this procedure to specify layer key overrides. The layer key overrides that you specify apply only to the layer keys that have any or all descriptive field overrides selected in the Layer Key Properties dialog box. For more information, see "Editing Layer Key Styles" on page 415.

To specify layer key overrides, you must have a layer key style that is based on a layer standard. If you base your layer key standard on a nonstandard style, you cannot specify layer key overrides.

If you do not have all overrides enabled in the Layer Key Overrides dialog box, objects that you draw after you exit the dialog box are placed on the layer defined by the layer standard. You can use the Overrides On/Off command to turn on the layer overrides later.

NOTE Individual layer keys that do not allow overrides as specified in the Layer Key Properties dialog box are not overridden when you select Enable All Overrides.

---

1. On the Format menu, click Layer Management ➤ Layer Key Overrides.
2. Under Current Layer Key Style, select the layer key style that you want to override.

   The layer standard that the layer key style is based on is displayed under Based on Standard and is not editable.

3. Enter values for Override or click the [...] button to specify values to override the information in the descriptive fields.

   The fields in this dialog box depend on the layer standard your layer key style is based on. For example, if you are using the AIA 2nd Edition layer standard, you can enter override values for the Discipline Designator, Major, Minor 1, Minor 2, and Status descriptive fields.

4. To begin using the layer overrides immediately, select Enable All Overrides.
5. Click OK.

   If you turned on the layer key overrides, any objects that you create now use the layer key overrides according to the override values that you have specified and whether you allowed overrides for the layer keys in the layer key style. If you did not turn on the layer key overrides, objects that you create are placed on layers defined by the layer standard.

Turning Layer Key Overrides On and Off

You can use the Overrides On/Off command to turn layer key overrides on and off for the current layer key style in your drawing. This command is available only if your current layer key style is based on a layer standard and if you have specified layer key overrides. If the layer key overrides are on in the current drawing, a check mark is displayed next to the command name on the menu.

- On the Format menu, click Layer Management ➤ Overrides On/Off.

If you turned the layer key overrides on, objects that you create are placed on layers defined by the layer standard definitions and are overridden with the values that you specified. If you turned the layer key overrides off, objects that you create are placed on layers defined by the layer standard.

Remapping Objects to Different Layers

Use this procedure to change the layer an object is drawn on by remapping it from the current layer key to a different layer key.

1. On the Format menu, click Layer Management ➤ Remap Object Layers, or in the Layer Manager toolbar, click .
2. Select the object or objects that you want to change, and press ENTER.
3. To view the list of available layer keys, enter **?**.
4. Press F2 to view the list of layer keys.
5. Select the layer key that you want to map the object to, right-click, and click Paste To CmdLine.
6. Press F2 to close the text window, and press ENTER.

The object is mapped to a different layer in your drawing, respecting any current layer key overrides.

Restoring Objects to Default Layer Key Layers

Use this procedure to restore the default layer key assignment to an object after you remap the object to a different layer by assigning it to a different layer key.

1. On the Format menu, click Layer Management ➤ Remap Object Layers.
2. Select the object or objects that you want to change, and press ENTER.
3. Enter **o** (byObject).

   This applies the layer assigned to the default layer key of each object in the selection set, respecting any current layer key overrides.
4. Press ENTER.

Creating and Editing Layer Standards

A layer standard contains predefined layer names and a set of rules that determines the names of new layers that you create using that layer standard. You can use layer standards to establish individual, project, or office layering conventions that provide consistent and informative layer names. Autodesk® Architectural Desktop provides a number of layer standards that you can use in drawings. You can also create your own layer standards by customizing an existing layer standard.

How Layer Standards Determine Layer Name

When you create a new layer using a layer standard, the layer name has a number of parts separated by delimiters (for example, hyphens). Each part of the layer name is determined by rules specified in a corresponding field of the layer standard.

For example, the AIA 2nd Edition layer standard includes four fields that form each new layer name: Discipline Designator, Major, Minor 1, Minor 2, and Status. Each field is separated by a hyphen (-) delimiter, as in the following example:

(Discipline Designator) - (Major) - (Minor 1) - (Minor 2) - (Status)

A layer in your drawing with a Discipline value of "A," a Major value of "Wall," a Minor 1 value of "Full," a Minor 2 value of "Abov" and a Status value of "D," to denote a demolition layer, would be named A-WALL-FULL-ABOV-D.

You can edit the layer standard definition to change these rules. For more information, see "Editing Component Fields" on page 429.

You can override the information in each field to change the way a layer standard creates a layer name by specifying layer key overrides. For more information, see "Layer Key Overrides" on page 418.

Layer Standards Included with the Layer Manager

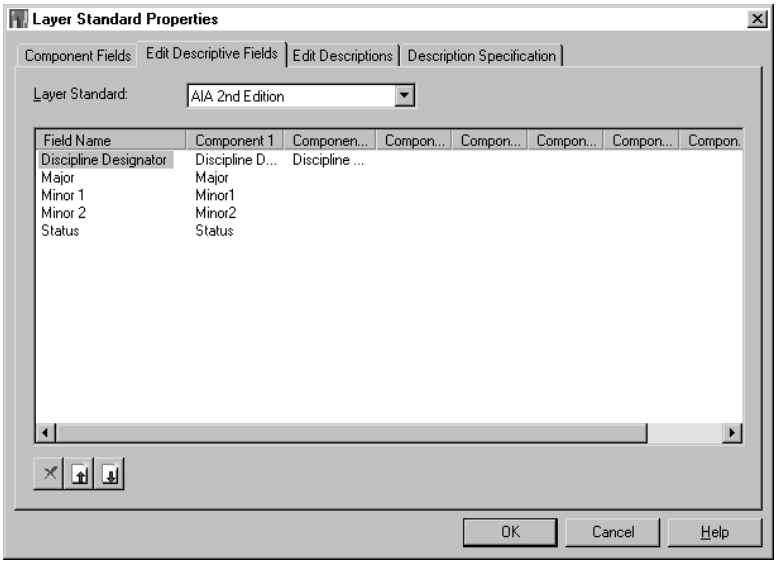
Autodesk® Architectural Desktop provides industry-standard layering conventions including: AIA 2nd Edition, BS1192 Descriptive, BS1192 - AUG Version 2, and NCS Version 2. Additional international layer conventions are also provided including: DIN 276, ISYBAU Long Format, ISYBAU Short Format, and STLB. Each layer standard contains specific information organized in fields. You can specify how the information appears in each field by changing the values in the layer standard fields. For more information, see "Editing Component Fields" on page 429.

Related Topics and Procedures

- Component Fields in Layer Standards
- Creating a Layer Standard
- Editing Component Fields
- Editing Descriptive Fields
- Editing Descriptions
- Editing Description Specifications
- Purging Layer Standards
- Importing Layer Standards
- Exporting Layer Standards

Component Fields in Layer Standards

Each layer standard defines the number of component fields that make up a layer name and specifies the rules for the content allowed in each field. If you create or edit a layer standard, you access the layer standard properties to edit the component fields.



Component Field Descriptions

Each layer standard contains the following component fields.

Value	Description
Field Name	Identifies the field. Field names should be as consistent as possible across layering systems to aid in translation.
Optional	When Yes, allows the field to be omitted from the end of the layer name. Optional layer fields cannot precede a required layer field unless the match option is Yes so that the fields can be identified according to a match against specific descriptions.
Max Width	Represents the maximum width in characters that can be used.
Fixed Width	When Yes, prevents a field from being shortened from the max width setting.
Wildcard	An AutoCAD® wildcard pattern that the field must match.

Value	Description
Match Description	When Yes, recognizes the field only if it exactly matches a description. You can omit fields from the middle of layer names. For example, an AIA layer may be made up of <discipline> <major> <minor>, or <discipline> <major> <status>, or <discipline> <major> <minor> <status>, as the <minor> field may not precede the <status> field and can be determined only by matching the field value against valid <minor> field descriptions. **NOTE** When omitting fields from layer names, verify that the omitted field Match Description property is No. This ensures that the layer name specified can be created.
Delimiter	Specifies the character used to separate fields with no fixed width. Delimiters are often also used in fixed-width fields for clarity.
Default	A predefined value for those field names that are not optional within the layer.

For more information about the content of specific layer standards, see "AIA Long Format Layer Standard" on page 424 and "BS1192 - Descriptive Layer Standard" on page 426.

AIA Long Format Layer Standard

The AIA Long Format Standard contains the following fields:

Field Name	Description
Discipline Designator	Shows divisions of manageable sections. For example, A for architectural, M for mechanical. This field is required.
Major	Designates assemblies or construction systems such as walls and doors. This field is required.
Minor 1	Further differentiates major groups into minor groups such as full-height walls and partial-height walls. This field is optional and user-defined.
Minor 2	Additional information, like title or unit information.
Status	Differentiates phases of work. For example, New indicates new, Demo indicates to be demolished. This field is optional.

The following table lists the rules for the AIA Long Format Layer Standard:

AIA Long Format							
Field	**Optional**	**Width**	**Fixed**	**Wildcard**	**Match**	**Delimiter**	**Default**
Discipline Designator	No	1	Yes	"@"	No	None	A
Major	No	4	Yes	"@@@@"	No	"-"	Wall
Minor	Yes	4	No	"*"	No	"-"	
Status	Yes	4	No	"*"	No	"-"	

BS1192 - AUG Version 2 Layer Standard

The BS1192 - AUG Version 2 layer standard contains the following fields:

Field	Description
Discipline	Identifies the author of the layer by using a single character. For example, A for architect, S for structural engineer. This field is required.
Category	Identifies the building element by using three digits and uses CISfB as a common referencing system. For example, 210 for wall, 315 for door. This field is required.
Graphics	Indicates information that is associated with the category by using a single character. For example, D for dimension, G for graphics, T for text. This field is required.
Grade	Expresses as a single digit the recommended line thickness, where 1 is the thinnest and 9 is the thickest. This field applies mostly when using text where ISO standard pen thicknesses correlate with ISO standard text heights. For example, text that is 2.5mm high that is drawn with a 0.25mm pen is given a pen grade of 2. This field is required.
Level	Differentiates viewing planes in plan, section, or elevation view by using a two-digit alphanumeric character. For example, 01 would be Level/Floor 1, EA the elevation, and SA Section A. This field is optional.
Status	Indicates the state of work by using a single character. For example, N indicates new, R indicates to be removed. This field is optional.
Scale	Indicates the level of detail to be shown by using a single character. For example, P indicates a planning level, D indicates a detail. This field is optional.

Field	Description
Phase/Time	Indicates phasing or alternatives by using a single character.
User	Specifies the user. It is not a fixed width field but is separated from the rest of the layer name with an underscore. For example, A210G701_WALL_L1. This field is optional.

The following table lists the rules for the BS1192 - AUG Version 2 Layer Standard:

BS1192 - AUG Version 2

Field		Optional	Width	Fixed	Wildcard	Match	Delimiter	Default
Discipline		No	1	Yes	[0A-Z]	No	None	A
CSIfB	CISfB-A	No	1	Yes	#	No	None	1
	CISfB-B	No	1	Yes	#	No	None	0
	CISfB-C	No	1	Yes	#	No	None	0
Graphics		No	1	Yes	[0ACDG HTZ]	No	None	G
Grade		No	1	Yes	#	No	None	7
Level		Yes	2	Yes	[0-9A-Z] [0-9A-Z]	No	None	00
Status		Yes	1	Yes	[0NXR]	No	None	0
Scale		Yes	1	Yes	[0ASPD]	No	None	0
Phase		Yes	1	Yes	[0-9A-Z]	No	None	0

BS1192 - Descriptive Layer Standard

The BS1192 - Descriptive layer standard contains the following fields:

Field Name	Description
Discipline	Identifies the author of the layer by using a single character. For example, A for architect, S for structural engineer. This field is required.

Field Name	Description
Element	Identifies the building element by using a descriptive name for it. For example, possible choices for this field are “Equipment” or “Room.” This field is required.
Graphics	Indicates information that is associated with the category by using a single character. For example, D for dimension, G for graphics, T for text. This field is required.
Level	Differentiates viewing planes in plan, section, or elevation view by using a two-digit alphanumeric character. For example, 01 would be Level/Floor 1, EA the elevation, and SA Section A. This field is optional.
Status	Indicates the state of work by using a single character. For example, N indicates new, R indicates to be removed. This field is optional.
Scale	Indicates the level of detail to be shown by using a single character. For example, P indicates a planning level, D indicates a detail. This field is optional.
Phase	Indicates phasing or alternatives by using a single character.
User	Specifies the user. It is not a fixed width field but is separated from the rest of the layer name with an underscore. For example, A210G701_WALL_L1. This field is optional.

The following table lists the rules for the BS1192 - Descriptive Layer Standard:

BS1192 - Descriptive

Field	Optional	Width	Fixed	Wildcard	Match	Delimiter	Default
Discipline	No	1	Yes	[0A-Z]	No	None	A
Element	No	15	No	*	No	-	Wall
Graphics	No	1	Yes	[0ACDG HTZ]	No	-	G
Level	Yes	2	Yes	[0-9A-Z] [0-9A-Z]	No	None	00
Status	Yes	1	Yes	[0NXR]	No	None	0
Scale	Yes	1	Yes	[0ASPD]	No	None	0

BS1192 - Descriptive

Field	Optional	Width	Fixed	Wildcard	Match	Delimiter	Default
Phase	Yes	1	Yes	[0-9A-Z]	No	None	0

Creating a Layer Standard

Use this procedure to create a layer standard, with default settings or based on an existing standard, that specifies naming conventions for layers in drawings.

If your drawing does not contain a layer standard, you can import a layer standard from another drawing or an Autodesk® Architectural Desktop template. For more information, see "Importing Layer Standards" on page 432.

1. On the Format menu, click Layer Management ➤ Layer Manager.
2. Click .
3. Click New.
4. To base the new layer standard on an existing standard, select Based On, and select a standard.
5. Enter a name for the new layer standard, and click OK.
6. To edit the new layer standard, right-click the standard, and click Edit:

If you want to . . .	Then . . .
specify component fields of the layer standard	see "Editing Component Fields" on page 429.
specify descriptive fields of the layer standard	see "Editing Descriptive Fields" on page 429.
specify the descriptions for the layer standard	see "Editing Descriptions" on page 430.
specify the descriptive specifications of the layer standard	see "Editing Description Specifications" on page 431.

7. Click OK twice.

Editing Component Fields

Use this procedure to specify how you want to set up the fields within the layer standard that determine the different parts of the layer names created with that standard. You can add and delete fields here.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select the layer standard that you want to edit, and click Edit.

4 Click the Component Fields tab.

5 Modify the component fields:

If you want to . . .	Then . . .
delete a component field	select the field, and click .
add a component field above an existing field	select the field, click , and enter a name for the new component field.
add a component field below an existing field	select the field, click , and enter a name for the new component field.
edit a field name	double-click the name of the field, and enter a new name over the existing name.
change the values of individual components of the fields	select the values that you want to change, and select a new value. For more information, see "Component Field Descriptions" on page 423.

6 Click OK three times.

Editing Descriptive Fields

Use this procedure to add a description that is applied to each component field in the layer name. You can add a single description to a group of layer name component fields.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select the layer standard that you want to edit, and click Edit.

4 Click the Edit Descriptive Fields tab.

5 Modify the descriptive fields:

If you want to . . .	Then . . .
delete a descriptive field	select the field, and click .
add a descriptive field above an existing field	select the field, click , and enter a name for the new descriptive field.
add a descriptive field below an existing field	select the field, click , and enter a name for the new descriptive field.
edit a field name	double-click the name of the field, and enter a new name over the existing name.
delete a component from a descriptive field	select the component, and click Delete.

6 Click OK three times.

Editing Descriptions

Use this procedure to map longer or different descriptions to the component fields of the layer name.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select the layer standard that you want to edit, and click Edit.

4 Click the Edit Descriptions tab.

5 Modify the descriptions:

If you want to . . .	Then . . .
delete a description	select the field description, and click .

If you want to . . .	Then . . .
edit a description	select the field description, click . Make changes to the description, and click OK.
add a field with a value and a description	click . Enter a value and a description for the field, and click OK. To add multiple fields, click Apply after each individual field, and click OK to finish.

6 Click OK three times.

Editing Description Specifications

Use this procedure to specify how all the fields in the layer standard determine the layer description that is displayed in the Layer Manager. You can change the field that is used in the description and the order of the fields, and you can add text to the beginning of the layer description.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select the layer standard that you want to edit, and click Edit.

4 Click the Description Specification tab.

5 Specify how the fields determine the layer description:

If you want to . . .	Then . . .
delete a layer standard field	select the field, and click .
add a field above an existing field	select the field, click , and enter a name for the new field.
add a field below an existing field	select the field, click , and enter a name for the new field.
edit text	double-click the text for Prior Text, and enter a new name.

If you want to . . .	Then . . .
change a field value	select the current value for Field, and click a new value.

6 Click OK three times.

Purging Layer Standards

Use this procedure to remove standards that are not in use.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Select the layer standards that you want to purge, and click Purge.

4 Click OK.

NOTE To purge all layer standards and layer key styles in a drawing, enter **AecPurgeLayerStyles**. This is beneficial to use when creating custom templates or when importing new layer standards and layer key styles.

Importing Layer Standards

Use this procedure to import layer standards from other drawings or from the *AecLayerStd.dwg* drawing in *Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\Layers* folder. If you are running Windows NT®, the drawing file is located in the *\winnt\Profiles\All Users\Application Data\Autodesk Architectural Desktop 2004\R16.0\Layers* folder.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Click Import/Export.

4 Click Open.

5 Select the drawing with the layer standards that you want to import, and click Open.

All the layer standards in the drawing are displayed in the External File list.

6 Under External File, select the layer standard that you want to import, and click Import.

You can select more than one layer standard in a list by holding down CTRL while you select the additional layer standards.

If you import a layer standard that already exists in the target drawing, a message is displayed asking if you wish to overwrite the existing layer standard. Click Yes to overwrite the existing layer standard, or click No to cancel.

7 Click OK.

The layer standards that you imported are displayed in the Layer Standards dialog box.

Exporting Layer Standards

Use this procedure to export layer standards from the current drawing to a new drawing or to an existing drawing.

1 On the Format menu, click Layer Management ➤ Layer Manager.

2 Click .

3 Click Import/Export.

4 Export the layer standards:

If you want to . . .	Then . . .
export layer standards to a new drawing	click New, enter a name for the new drawing, and click Save.
export layer standards to an existing drawing	click Open, select a drawing, and click Open.

5 Select the layer standards that you want to export, and click Export.

You can select more than one item in a list by holding down CTRL while you select the additional items. If you export a layer standard that already exists in the target drawing, a message is displayed asking if you wish to overwrite the existing layer standard. Click Yes to overwrite the existing layer standard, or click No to cancel.

6 Click OK three times.

Display System

7

In this chapter

- Display Representations
- Display Sets
- Display Configurations
- The Display Manager
- Creating and Editing Display Configurations
- Managing Display Configurations
- Troubleshooting the Display System

The display system in Autodesk® Architectural Desktop controls how AEC objects are displayed in a designated viewport. By specifying the display configuration in a viewport and the direction from which you want to view the objects shown in the viewport, you can produce different architectural displays. The display system lets you produce floor plans, reflected plans, elevations, 3D models, or schematic displays without redrawing any objects.

Elements of the Display System

The display system has three major elements:

- A display representation, which controls how an individual object, such as a door or a wall, is displayed
- A display set, which is a group of display representations of objects
- A display configuration, which is a collection of display sets assigned to particular view directions

These three elements are hierarchical: each display configuration contains a number of display sets, and each display set contains a number of display representations. To use a display configuration, you assign it to a viewport. The objects in the viewport then use the display properties specified in the display configuration.

Predefined Display Configurations in Templates

You use different display configurations for different tasks, such as sketching and plotting. You

also use different display configurations for different types of drawings, such as floor plans, 3D models, and elevations.

Autodesk® Architectural Desktop includes templates with predefined display configurations applied to viewports. These display configurations are created for typical architectural tasks and drawing types. You can use the display configurations and viewports supplied by the templates, or you can modify the display system settings to suit your office standards. If you want to create your own display configurations, you can start a drawing from scratch or from a template that does not contain predefined display configurations.

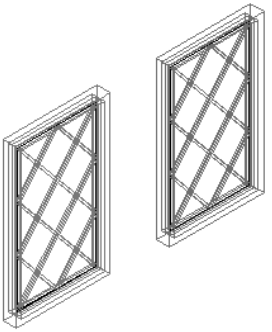
Materials and the Display System

A material definition is a group of settings for the display properties of a real-world material, such as glass, brick, or wood. The settings define how the components assigned to the material appear in every view.

The materials feature works with the display system to simplify the process of customizing the display of drawings. Rather than specifying individual display properties, you can control the display of objects according to the materials assigned to the physical components of the objects.

For example, you can assign an aluminum frame material to the frame, sash, and muntins of all windows whose components consist of this material. The display properties of the aluminum frame material are customized to look like typical aluminum frames for windows. By assigning the material to window components, you avoid the need to customize the display properties of the frame, sash, and muntins of every window that uses aluminum components. In addition, if the materials change during the project, you can quickly reassign components to the new material.

Window components assigned aluminum and wood materials



Sample styles in Autodesk® Architectural Desktop catalogs contain predefined materials assigned to their components. Use these materials in your drawings, customize them, or create your own materials. For more information, see "Creating and Editing Materials" on page 517.

Related Topics and Procedures

- Display Representations
- Display Sets
- Display Configurations
- The Display Manager
- Creating and Editing Display Configurations
- Managing Display Configurations
- Troubleshooting the Display System

Display Representations

A display representation defines how the components that make up an object are drawn. In traditional CAD and manual drafting, a single object, such as a door, is typically drawn multiple times in different drawings. In these drawings, each instance of a door is a separate collection of linework.

In Autodesk® Architectural Desktop, display representations let you create only one object that can change the way it draws itself depending on the display representation used to represent that object.

Display Components of AEC Objects

Most AEC objects are made up of individual components. For example, a door has the following components: door panel, frame, stop, swing, glass, and threshold. A door may also have muntins.

Each component of the object has both physical and graphical properties that help to determine the display representation of that object

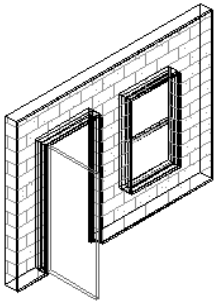
- The physical properties of an object control width, height, shape, and location of the object in the drawing.
- The graphical properties control visibility (on/off), layer, color, and linetype.

To represent an object in the drawing area, a display representation uses both the physical and graphical properties of the object. You typically decide the physical properties of the object when you create it. For example, you specify the size of a door and its location in a wall. You control the graphical properties of an object in its display representations. You can define multiple display representations for the same object.

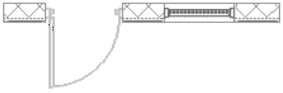
Display Representations and View Directions

A representation of an object is not dependent on view direction, although a display representation is usually designed with a specific view in mind.

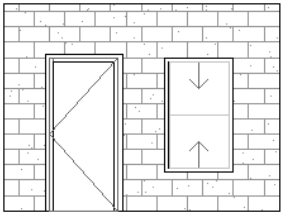
Objects displayed from different view directions that use different display representations



Model display representations for wall, door, and window shown in 3D from an isometric view direction



Plan display representations for wall, door, and window shown in 2D from a plan view direction



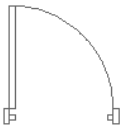
Elevation display representations for wall, door, and window shown in 2D from a front view direction

Why Most Objects Have Multiple Display Representations

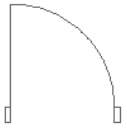
All objects have predefined display representations. Most objects have Plan, Model, and Reflected display representations, because these are the most common design situations that require a different view of an object. Some objects, such as cameras and reference AEC objects, have only a General representation, because the display of these objects does not change in different views.

A single object can be drawn in different ways, depending on the individual needs of different drawing types. For example, the Plan display representation draws the door panel, frame, stop, and swing components. The Nominal display representation draws the door panel, frame, and swing components. Although both representations draw the door panel, each representation draws it differently. The Plan display representation draws a door panel as a rectangle, while the Nominal display representation draws it as a single line.

Door shown in the Plan and Nominal display representations



door in Plan display representation showing frame, panel, swing, and stop



door in Nominal display representation showing frame, panel, and swing

The Plan display representation is appropriate for representing objects in two-dimensional (2D) views when components are to be displayed from a plan (Top) view. The Nominal display representation is appropriate for representing objects in 2D views when a limited amount of detail is needed in plan view. For example, display configurations intended for plotting at small scales, where details of objects might be obscured, often use the Nominal display representation.

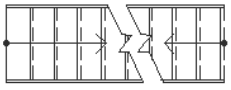
Default Display Representations

The display representations available for each object and the names of those display representations are based on the ways that you might need to view the object in your drawings. Different display representations can include different components of the object or additional display options.

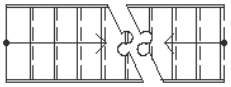
For example, the display properties of stairs in the Plan display representation include settings for controlling the display of break marks and other stair symbols. Break marks appear only in 2D Top view drawings, so other display representations, such as Model and Elevation, do not contain settings for break marks. Similarly, objects that never display break marks do not have

settings for them in their Plan display representations.

The Plan display representation for stairs includes options for break marks



zigzag break mark



curved break mark

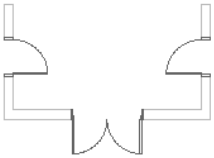
Customizing the Display of an Object

When you do not use materials to control display, you customize the appearance of an object by changing its display properties for the display representation that you want to use. For example, you can turn off the door swing in the Plan display representation, specify whether the swing is straight or an arc, specify the percent open, and change the layer, color, and linetype of the swing.

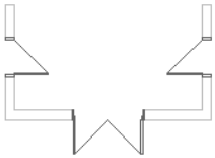
When you change the display of an object, you specify how these changes are applied to the instances of the object in the drawing. You do this by specifying the source of the display properties for the selected display representation

- To apply the changes to the default display properties of the object, you customize the drawing default. The changes affect all instances of the object in the drawing.

Drawing default display properties affect all instances of an object



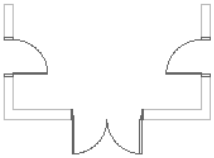
doors with
default display
properties



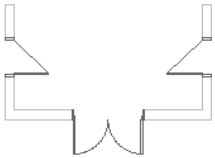
doors with
straight swing
specified in
drawing display
properties

- To apply the changes to all instances of the object that have the same style, you override the drawing default with the display properties of the object style.

  Changes to the display properties of a style affect all objects of that style



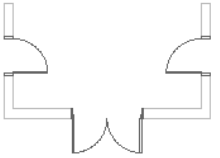
doors with
default display
properties



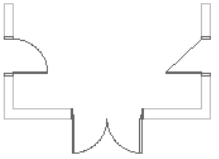
doors with
straight swing
specified in
door style display
properties

- To apply the changes only to the selected object, you override drawing default or style display properties with the display properties of the object.

The display properties of an object apply only to that object



doors with default display properties



door with straight swing specified in door display properties

Objects use the default display properties unless the properties are overridden by the display properties of an object style or an individual object. Generally, you customize the display properties of object styles so that the appearance of different types of the same object are consistent throughout a drawing. In specific circumstances, you may need to override the display properties of the style for an individual object to achieve certain results.

Display Sets

Display sets are collections of display representations of objects. A display set determines which objects are visible, and how the objects, such as a wall assembly that includes a door and a window, are displayed in different views.

Display Representations Included in a Display Set

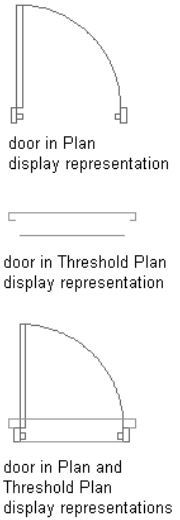
A display set usually contains a display representation for each object that is appropriate for a specific task or drawing type. For example, the Reflected display set contains display representations for objects typically included in a reflected ceiling plan. This display set uses the Reflected display representation for most of these objects. The display uses the Plan display representa-

tion for other objects, such as structural members, that appear the same in plan and reflected views.

A display set can contain more than one display representation for an object. For example, a display set for plotting a floor plan might include the Plan and Threshold Plan display representations for doors

- The Plan display representation contains components for the door panel, frame, stop, and swing.
- The Threshold Plan display representation contains components for the inner and outer thresholds of the door.

Plan and Threshold Plan display representations used alone and together to display a door



If a display set contains no display representations for an object, the object is not displayed when that display set is used. For example, a display set for a reflected ceiling plan does not need display representations for railings, which are not typically shown in these drawings.

Display Sets and View Direction

A display set is not dependent on view direction, although it is usually designed with a specific view in mind. For example, a Reflected display set is intended to be used to display objects from the Top view direction in a reflected ceiling plan.

Similarly, a Plan display set might contain the Plan display representations for a number of objects, which are intended for two-dimensional (2D), top

views. A three-dimensional (3D) model display set might contain the Model display representation for a number of objects. The specific display representations included in a display set depend on what display representations are available for each object. The display representations included in a display set also depend on whether the objects need to be drawn differently when displayed from different view directions.

Default Display Sets

Drawings based on templates provided with Autodesk®Architectural Desktop contain display sets for many purposes. However, all drawings, even those that are not created from templates, contain the following default display sets: Elevation, Model, Model High Detail, Model Low Detail, Plan, Plan High Detail, Plan Low Detail, and Reflected. These display sets contain display representations for each object based on the most common design situations.

Display Configurations

A display configuration is a collection of display sets assigned to view directions.

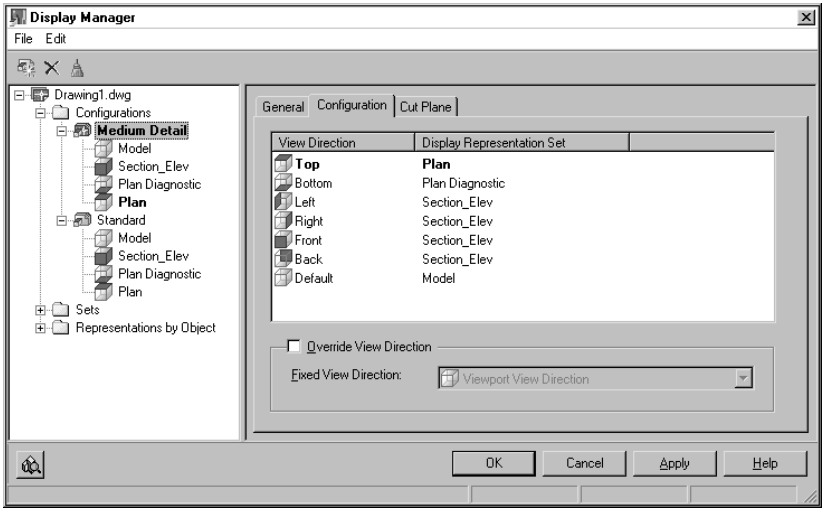
Display Configurations, Viewports, and Templates

A display configuration is typically created for a specific design task or drawing type. To use a display configuration, you assign it to a viewport. Drawings based on templates provided with Autodesk®Architectural Desktop contain layout tabs with viewports that are assigned appropriate display configurations for various tasks. You can use the display configuration assigned to a viewport, assign a different display configuration to the viewport, or customize the display configuration.

Display Sets Assigned to View Directions

You can identify the display set assigned to each view direction in a display configuration using the Display Manager. The Display Manager is a utility for managing elements of the display system. The following illustration shows a drawing with two display configurations, Medium Detail and Standard.

Sample display configurations in the Display Manager



In the Display Manager, the active viewport in the drawing (in bold type) is assigned the Medium Detail display configuration. In the left pane, the display sets used are listed below the configuration name. Icons next to each display set indicate the view directions to which the display set is applied. The Configuration tab in the right pane shows the display sets mapped to view directions. In this example, the current view direction in the drawing (in bold type) is Top, which uses the Plan display set. Objects in the active viewport are shown using the display representations in the Plan display set.

If the view direction in the active viewport is changed to Front, the objects are shown using the display representations in the Section_Elev display set. This is also true when the view direction in the active viewport is changed to Right, Left, or Back.

The display set assigned to the Default view direction is used when any view direction other than the six orthogonal views is selected or when a view direction is not assigned a display set. If the view direction of the active viewport is changed to Bottom, objects are shown using the display set assigned to the Default view direction—the Model display set.

For more information about the Display Manager, see "The Display Manager" on page 449.

Displaying Objects in a Viewport

A display configuration, the current viewport, and the object interact in the following manner to determine what is shown in a viewport:

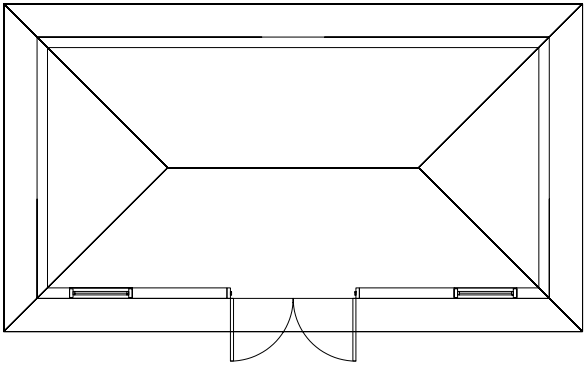
- The active viewport has a current view direction and a current display configuration. For example, the view direction is Top, and the display configuration is Medium Detail.
- The display configuration has one or more display sets and uses the display set that is assigned to the current view direction. For example, in the Medium Detail display configuration, the Plan display set is assigned to the Top view.
- The display set has associated display representations and it selects the representation(s) associated with an object that needs to be shown. For example, in the Plan display set, doors, windows, and walls use their Plan display representations.
- The object is shown in the active viewport using the appropriate display representation(s) and display properties.

Examples of View Directions that Use Different Display Sets

A display configuration assigns display sets to specific view directions. When a view direction is selected, the display representations in the display set determine how each object is displayed in the viewport.

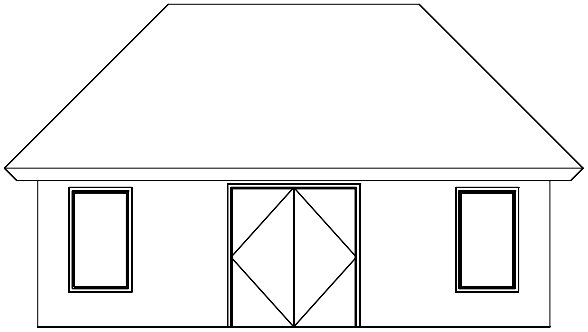
For example, the following illustration shows a viewport assigned the Plot display configuration and the Top view direction. In this illustration, the objects are shown with a Plan display representation.

Objects from Top view using a display set for plan views



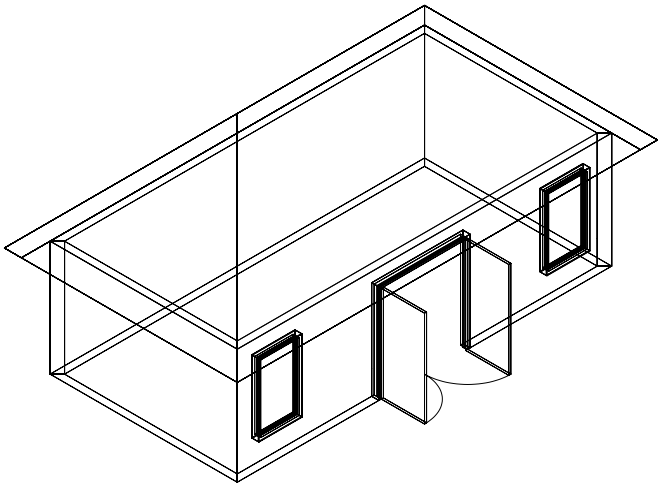
If the Front view direction is selected in this viewport, the same objects are displayed with an Elevation display representation.

Objects from Front view using a display set for elevation views



If the SW Isometric view direction is selected, the same objects are displayed with a three-dimensional (3D) representation.

Objects from SW isometric view using a display set for model views



Default Display Configuration

The display configurations in a drawing depend on the template used to create the drawing. If a drawing is not created from a template, the drawing contains the Standard display configuration, which includes the Plan and Model display sets.

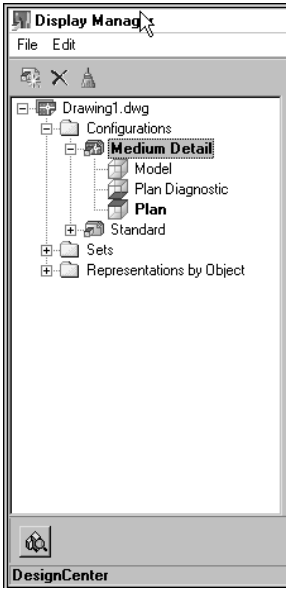
The Display Manager

The Display Manager is the central location of display system information for your drawing in Autodesk® Architectural Desktop. You use the Display Manager to create and modify display configurations, display sets, and display representations. In the Display Manager, you can also assign a display configuration to a viewport. In addition, you can view how objects display in different display representations. You can resize the Display Manager window and resize the left and right panes as needed to view display information.

Left Pane of the Display Manager

The left pane of the Display Manager organizes the display information in your drawings in a hierarchical tree view. You can add, purge, rename, copy, and send display system components in the tree view. As you select items in the left pane, the right pane is updated appropriately.

The left pane showing a tree view of display configurations and their components

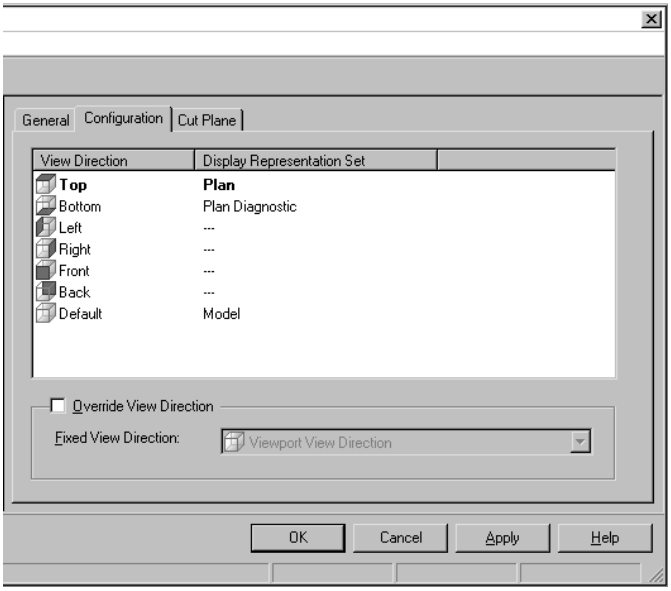


Right Pane of the Display Manager

The right pane of the Display Manager shows detailed display information, depending on what you select in the tree view in the left pane. You can view the display sets and mapped view directions associated with each display configuration. You can view the display representations of different objects, and access the default graphical display properties of objects in your draw-

ings. You can preview how an object is displayed with a display representation.

Right pane showing details of a selected display configuration

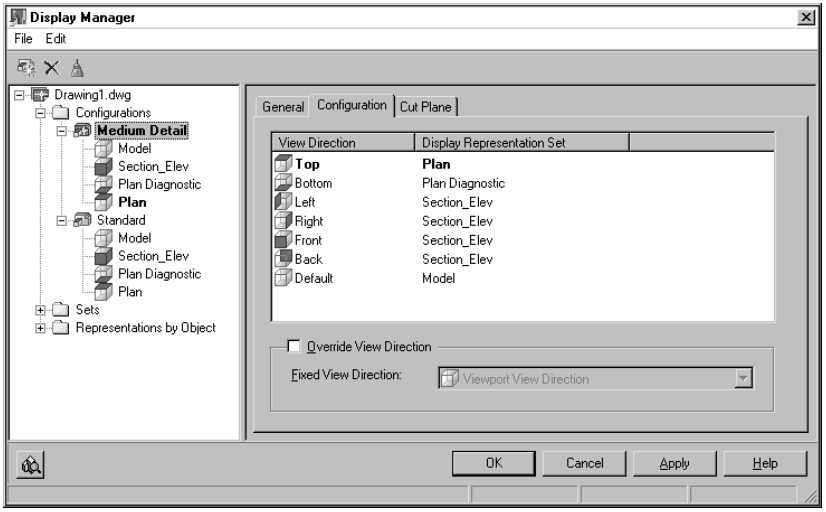


View Direction Icons in the Display Manager

The icons used with display sets and view directions provide a quick way to identify how a display set is used in a display configuration. When you expand a display configuration, the display sets used in the display configuration are shown. The icon next to each display set indicates the view directions to which it is applied in the display configuration.

In the following example, the Model display set is applied to the default view direction. The Section_Elev display set is applied to the front, back, left, and right view directions. The Plan display set is applied to the top view direction. In the right pane, icons correspond to the six orthogonal view directions and the default view direction.

Using icons to identify view directions to which display sets are applied



Related Procedures

- Opening the Display Manager
- Viewing Display Configurations
- Viewing Display Sets
- Viewing Display Representations
- Viewing an Object in a Display Representation
- Viewing the Display Representation of an Object in a Display Set
- Accessing the Default Display Properties of an Object

Opening the Display Manager

Use this procedure to open the Display Manager.

1. On the Format menu, click Display Manager.
2. Move and resize the Display Manager or resize the left and right panes as needed to view display information.

Viewing Display Configurations

Use this procedure to view the display configurations available in the current drawing. The display configurations in a drawing depend on the template used to create the drawing. If a drawing is not created from a template, the

drawing contains the Standard display configuration, which includes the Model and Plan display sets.

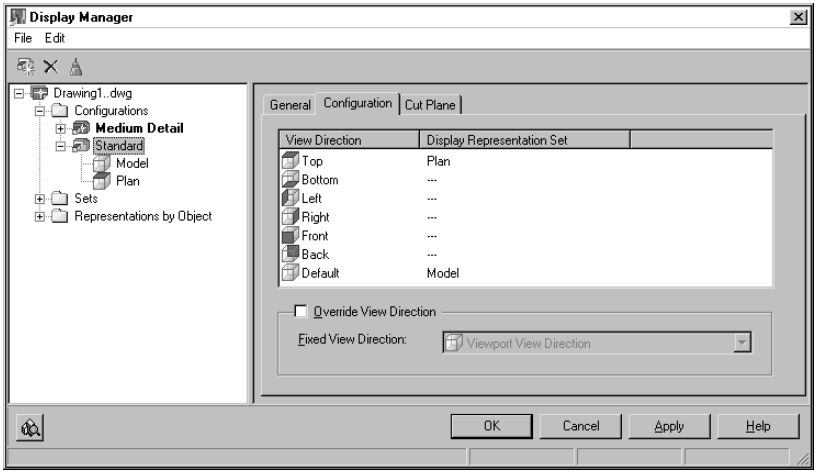
1 On the Format menu, click Display Manager.

2 Expand Configurations, and select a configuration.

3 Click the Configuration tab.

The left pane lists the display sets included in the configuration. The right pane lists the display sets assigned to each view direction. If a display set is not listed next to a view direction, the display set for the Default view direction is used when that view direction is selected. The Default view direction is also used for any view directions other than the six orthogonal views.

Display sets assigned to view directions in the Standard display configuration



4 Click the Cut Plane tab.

The Cut Plane tab contains settings for the height of the cut plane and the height above and below the cut plane that are included in views when you assign this display configuration.

5 Click OK.

Viewing Display Sets

Use this procedure to view the display sets in the current drawing.

1 On the Format menu, click Display Manager.

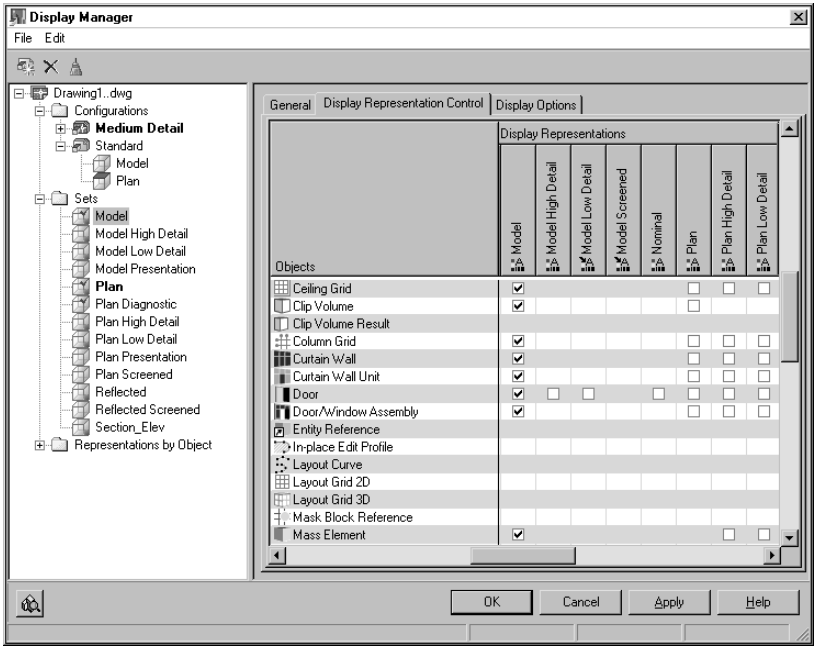
2 Expand Sets, and select a display set.

The icons next to the display set name in the left panel indicate whether a display set is used in a display configuration within the current drawing. The icon with the red check mark in it indicates that a display set is assigned. The icon with the green dot in it indicates that a display set is a standard set. Although standard sets can be renamed, they cannot be deleted.

3 Click the Display Representation Control tab.

The right pane contains a matrix that lists each object and display representation. A check mark under a display representation indicates that the display set uses that display representation to show the corresponding object. For example, in the Model display set, most objects use the Model display representations.

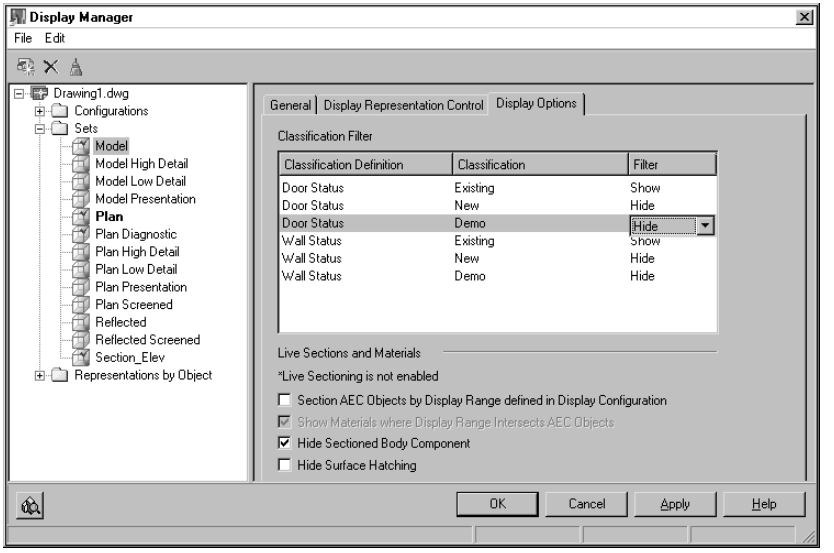
Display representations selected for each object in the Model display set



4 Click the Display Options tab.

Settings on this tab enable you to filter objects by their classification. In addition, you can specify settings that affect how materials are displayed when you generate a live section view of a building model.

Display options specified for a selected display set



5 Click OK.

Viewing Display Representations

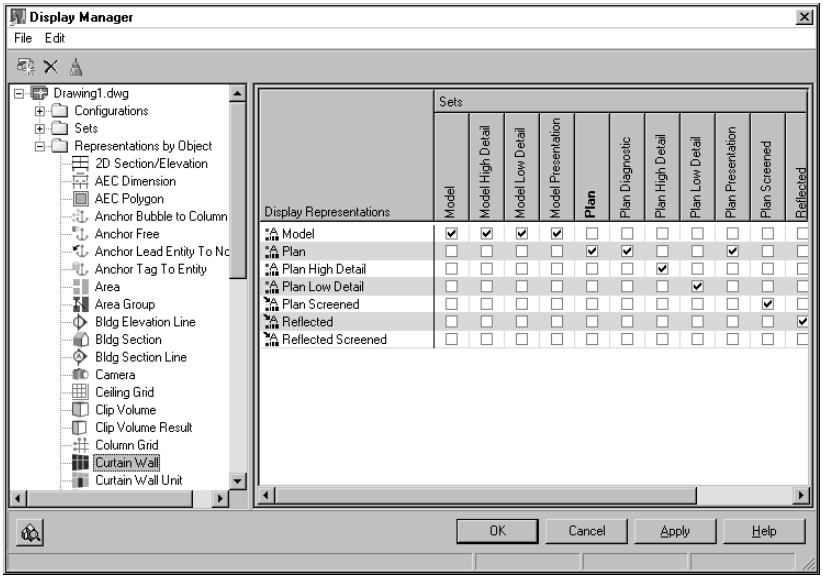
Use this procedure to view the display representations in the current drawing.

1 On the Format menu, click Display Manager.

2 Expand Representations by Object, and select an object.

In the right pane, rows list the display representations that exist for that object, and columns list display sets. A check mark under a display set indicates that the display representation is used in that display set. A display representation can be used in multiple display sets.

Curtain wall display representations used in display sets



The icons next to the display representation name indicate whether it is a predefined display representation or custom display representation. indicates a predefined display representation. indicates a custom display representation.

3 Click OK.

Viewing an Object in a Display Representation

Use this procedure to see how an object appears in different display representations and view directions.

1 On the Format menu, click Display Manager.

2 Click .

3 Reposition the Floating Viewer and the Display Manager so that both are visible.

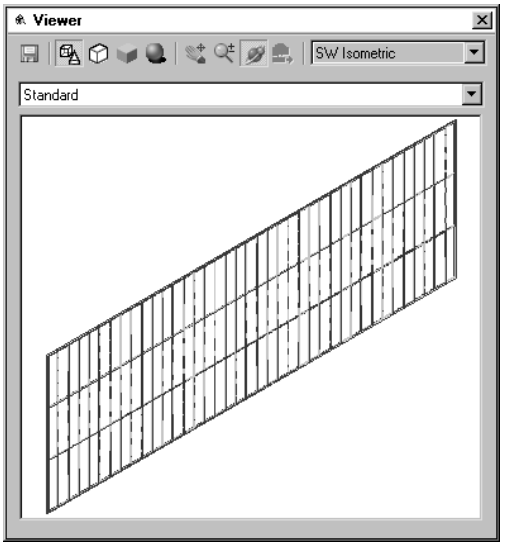
4 Expand Representations by Object, and select an object.

5 In the right pane, select a display representation.

NOTE Overrides to the default display representation, made in the display properties of an object style or an individual object, do not show in the Display Manager.

The Floating Viewer displays the object in the display representation.

Floating Viewer displaying a curtain wall



6 Use the controls in the Floating Viewer to view the object from different view directions and with hidden lines removed or with shading.

7 Repeat steps 4 and 5 to view objects in various display representations.

8 Click to close the viewer.

9 Click OK.

Viewing the Display Representation of an Object in a Display Set

Use this procedure to see how an object appears in the display representation used for the object in a selected display set.

1 On the Format menu, click Display Manager.

2 Click .

3 Reposition the Floating Viewer and the Display Manager so that both are visible.

4 Expand Sets, and select a display set.

5 Click the Display Representation Control tab.

6 Select an object.

NOTE Overrides to the default display representation, made in the display properties of an object style or an individual object, do not show in the Display Manager.

The Floating Viewer displays the object in the display representation selected for it in the display set.

7 Use the controls in the Floating Viewer to view the object from different view directions and with hidden lines and shading.

8 Repeat steps 6 and 7 to view other objects in the display representation used in the display set.

9 Select another display set, and repeat steps 6 and 7 to view objects as they appear in that display set.

10 Click to close the viewer.

11 Click OK.

Accessing the Default Display Properties of an Object

Use this procedure to access and view the default display properties of a display representation of an object. Default display properties apply to all instances of the object in the drawing unless the properties are overridden by the object style or an individual object.

1 On the Format menu, click Display Manager.

2 Expand Representations by Object.

3 Select an object.

NOTE Overrides to the default display representation, made in the display properties of an object style or an individual object, do not appear in the default display properties in the Display Manager.

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4 Double-click a display representation.

The Display Properties dialog box displays the default display properties of the object for the display representation you selected.

5 Click OK twice.

Creating and Editing Display Configurations

A display configuration is a collection of one or more display sets that control the representation of objects viewed from different directions in a drawing. You apply a display configuration to the viewport where you want the objects to appear. You can also select a display configuration to use as the default for model space and new viewports.

Drawings based on templates provided with Autodesk®Architectural Desktop contain display configurations for common tasks and drawing types. You can modify them and their display sets and display representations to meet your needs. You can also copy these elements of the display system to use as the basis for custom display configurations.

Related Topics and Procedures

- Process Overview: Creating a Display Configuration
- Tips for Working with Display Configurations, Sets, and Representations
- Creating a Display Configuration
- Creating a Display Set
- Creating a Display Representation for an Object
- Editing a Display Representation
- Assigning a Display Representation to a Display Set
- Assigning a Display Set to a View Direction
- Assigning a Display Configuration to a Viewport
- Specifying the Default Display Configuration
- Specifying the Display Configurations Used in Xref Overlays
- Changing the Display Configuration Used in Xref Drawings
- Displaying Objects by their Classification
- Specifying Settings for Live Sections and Materials

Process Overview: Creating a Display Configuration

Autodesk®Architectural Desktop templates provide display configurations for common design, drafting, and production tasks. You can also create custom display configurations.

The process of creating a display configuration has the following steps:

Step 1: Create a display configuration with default properties.

You can add display sets to the display configuration later, after you create display sets and display representations.

Step 2: Create display sets to associate with different view directions.

Although you can assign display sets to any view direction, you usually create them with specific view directions in mind. For example, you may want to create display sets for plan, elevation, and model views of a building model. You can add more display representations to the display sets later.

Step 3: Create or modify display representations for each object you want to display.

You create new display representations by duplicating an existing display representation for an object. Use a display representation that is similar to the one you want to create so that you have fewer settings to modify in the new representation. Although you can use display representations in any view direction, you usually create them with specific view directions in mind.

Step 4: Assign new, modified, or existing display representations to display sets.

A display set can include any display representations that you specify. Objects can use more than one display representation in a display set. Remember that you need to include at least one display representation for every object that is to appear in a viewport.

Step 5: Assign display sets to view directions in the display configuration.

You add display sets to a display configuration by assigning them to any of the six orthogonal view directions or to the Default view direction. The display system uses the display set assigned to the Default view direction for view directions that have no display set assigned to them in the display configuration.

Step 6: Assign the display configuration to a viewport.

The display configuration you created does not become active until you assign it to a viewport. You can assign a display configuration to multiple viewports. You can also export display configurations to other drawings.

Related Topics and Procedures

- Creating and Editing Display Configurations
- Creating a Display Set
- Creating a Display Representation for an Object
- Editing a Display Representation
- Assigning a Display Representation to a Display Set
- Assigning a Display Set to a View Direction
- Assigning a Display Configuration to a Viewport

Tips for Working with Display Configurations, Sets, and Representations

This topic provides suggestions for working effectively when you create and modify display configurations and their elements.

- Templates provided with Autodesk®Architectural Desktop and drawings based on the templates contain display configurations for common design, drafting, and production tasks and various drawing types. If your drawing does not contain these display configurations, you can import them into the drawing. For more information, see "Importing a Display Configuration" on page 478.
- Templates and drawings based on templates contain layout tabs with display configurations already assigned to viewports for specific tasks. Examine your building model in these different layouts to see if objects are displayed as you want them to appear.
- Before creating or modifying display configurations, review the predefined display configurations to see if they meet your needs or if you can readily adapt them for your project.
- When possible, use a predefined display configuration as the basis for the display configuration you create. Starting with a display configuration that is similar to what you need helps you work efficiently. You can modify only the settings that need to change, rather than creating everything from scratch.
- When you modify a display representation, the changes affect every display set and display configuration that use that display representation. To apply the changes more selectively, create a new display representation for

the object and assign it to the display sets in which the changes are to appear.

- Similarly, when you modify a display set, the changes appear in every display configuration that uses the display set. And if you modify a display configuration, the changes appear in every viewport in which the display configuration is assigned. Create custom display sets and configurations to apply the changes more selectively.
- Remember that changes you make to display representations through the Display Manager apply only to the default display properties of objects. Changes to the display properties of object styles and individual objects override the default display properties. In addition, if the default display properties of an object assign a material to the object components, the display properties of the material determine the appearance of the object.

Creating a Display Configuration

Use this procedure to create a display configuration. You can create a display configuration using standard default properties or by creating a duplicate of an existing display configuration.

1. On the Format menu, click Display Manager.
2. Expand Configurations.
3. Create a display configuration:

If you want to . . .	Then . . .
create a display configuration with default properties (contains no display sets)	right-click Configurations, and click New.
create a display configuration from an existing display configuration	right-click the display configuration you want to copy, and click New.

4. Enter the name for the new display configuration, and press ENTER.
5. Specify the display sets and display representations to use in this display configuration:

If you want to . . .	Then . . .
create a display set for this configuration	see "Creating a Display Set" on page 462.

If you want to . . .	Then . . .
create display representations to use in this display configuration	see "Creating a Display Representation for an Object" on page 463 and "Assigning a Display Representation to a Display Set" on page 465.
assign display sets to view directions	see "Assigning a Display Set to a View Direction" on page 467.

6 Click OK.

Creating a Display Set

Use this procedure to create a display set. You can create a display set using standard default properties or by creating a duplicate of an existing display set.

1 On the Format menu, click Display Manager.

2 Expand Sets.

3 Create a display set:

If you want to . . .	Then . . .
create a display set with default properties (contains no display representations)	right-click Sets, and click New.
create a display set from an existing display set	right-click the display set you want to copy, and click New.

4 Enter the name for the new display set, and press ENTER.

5 Specify the display representations to use in this display set:

If you want to . . .	Then . . .
create display representations to use in this display set	see "Creating a Display Representation for an Object" on page 463.
assign display representations to this display set	see "Assigning a Display Representation to a Display Set" on page 465.

If you want to . . .	Then . . .
add this display set to a display configuration	see "Assigning a Display Set to a View Direction" on page 467.

6 Click OK.

Creating a Display Representation for an Object

Use this procedure to create a display representation for a selected object. You create a display representation by duplicating an existing one for the object.

Each object has one or more display representations, depending on whether the object needs to change in different views. Select an existing display representation that is similar to the one you want to create. That way, the display properties are available for you to customize in the new display representation.

For example, if you want to create a display representation for stairs that uses a custom break mark, duplicate a plan display representation for stairs that contains the settings for the break mark.

1 On the Format menu, click Display Manager.

2 Expand Representation by Object.

3 Select the object for which to create a new display representation.

4 In the right pane of the Display Manager, right-click the display representation to duplicate, and click Duplicate.

5 Enter a new name for the display representation, and press ENTER.

The new display representation has the display properties of the display representation you duplicated.

6 Double-click the new display representation to edit its properties.

For more information about editing display properties, see "Editing a Display Representation" on page 464.

7 Assign the display representation to the display sets where you want the representation to be used.

For more information, see "Assigning a Display Representation to a Display Set" on page 465.

8 Click OK.

You can click Apply instead of OK to save the changes and continue working in the Display Manager.

Editing a Display Representation

Use this procedure to change the following default display properties of a display representation for an object:

- Visibility (on or off), and whether the display of a component is controlled by its material assignment
- Layer, color, linetype, and lineweight
- Display properties that are specific to the object and the display representation, such as the stair line and break mark in plan display representations of stairs

By default, the layer of object components is layer 0. The default color and linetype are ByBlock. With these defaults, the object components inherit the color and linetype properties of the "parent" object. For example, when the color and linetype of the door frame component are ByBlock, the door frame has the color and linetype of the door object. Object components cannot exist outside their parent object as typical AutoCAD®block objects can.

The changes you make to a display representation apply to every display set and display configuration that use the display representation. To apply changes more selectively, create a display representation based on the display representation you want to modify. You can then change the display properties of the new display representation and assign it to specific display sets. For more information about creating display representations, see "Creating a Display Representation for an Object" on page 463.

NOTE The changes you make to a display representation using this procedure apply only to the default display properties for the object. Changes to the display properties of object styles or of individual objects override the default display properties.

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1. On the Format menu, click Display Manager.
2. Expand Representations by Object.
3. Select the object for which you want to edit a display representation.
4. In the right pane of the Display Manager, double-click the display representation you want to edit.

   The display properties you can edit depend on the object and the display representation that you select. For example, a wall in a model display representation displays only the Layer/Color/Linetype tab; a wall in a plan display representation displays two additional tabs to specify display properties for hatching and cut plane components.

5 Click the Layer/Color/Linetype tab to change the AutoCAD properties, including visibility of the object components and whether their display is controlled by their material assignment.

6 If applicable, click tabs, such as Hatching or Other, to change object-specific display properties.

For more information about object-specific display properties, see the procedures for specifying the display properties of an object style in the Help topics for each object. For example, for more information about specifying the display properties of wall styles, see "Specifying the Display Properties of a Wall Style" on page 1879.

7 When you finish editing display properties, click OK twice.

Assigning a Display Representation to a Display Set

Use this procedure to add or remove display representations in a display set. Changes that you make to a display set affect every display configuration that uses the display set.

Keep the following points in mind when you add or remove display representations in a display set:

- A display set can use more than one display representation for an object. For example, some display sets for plan views include both Plan and Threshold Plan display representations for doors.
- If you want to use a display representation for an object other than the current one, be sure to clear the current display representation after selecting the new one. Otherwise, the display set uses the display properties of both display representations.
- If no display representation is selected for an object, the object does not appear when the display set is active in a viewport.
- If no check box appears under a display representation for an object, the object does not have the display representation. For example, some objects, such as layout curves and layout grids, have only one display representation.

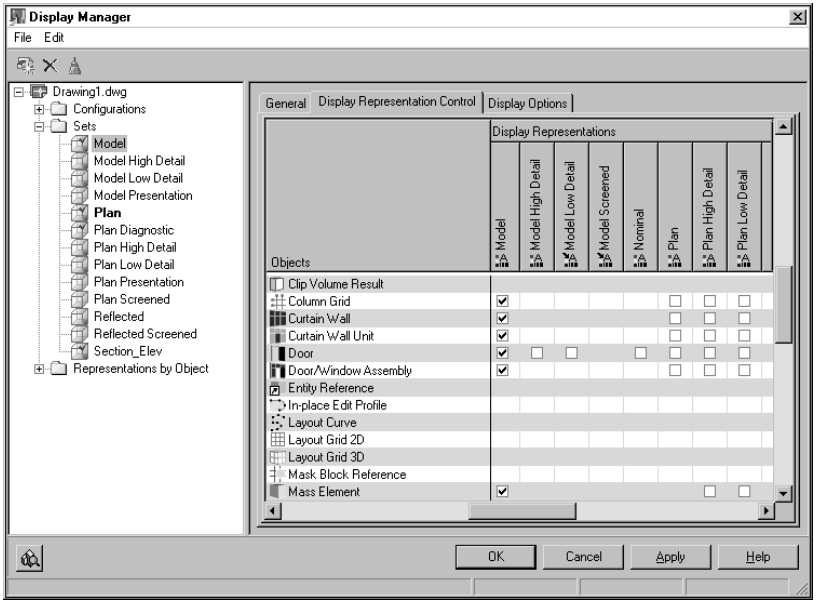
1 On the Format menu, click Display Manager.

2 Expand Sets.

3 Select the display set you want to edit.

4 Click the Display Representation Control tab.

Editing a display set



5 In the right pane, add and remove display representations:

If you want to . . .	Then . . .
add a display representation for an object to the display set	scroll to find the object in the list of objects. Select a display representation to use for the object. If no check box appears under a display representation, the object does not have the display representation.
remove a display representation for an object in the display set	scroll to find the object in the list of objects. Clear the display representation you want to remove.
use the same display representation for all objects in the display set	right-click the name of the display representation, and click Select All. Be sure to clear any other display representations for the objects in this display set.
remove an object entirely from a display set	scroll to find the object in the list of objects. Right-click the object name, and click Clear All.

6 Click OK.

Assigning a Display Set to a View Direction

Use this procedure to specify the display set assigned to each view direction in a display configuration.

1. On the Format menu, click Display Manager.
2. Expand Configurations.
3. Select the display configuration you want to edit.
4. Click the Configuration tab.
5. Under Display Representation Set, select the appropriate display set for each view direction.

   The display set you select becomes active when the view direction is selected in the viewport in which the display configuration is assigned. The display system uses the display set assigned to Default view direction for view directions for which you do not assign a display set and for the four isometric views.

6. Click OK.

   To see the results of the changes, you must assign the display configuration to a viewport. For more information, see "Assigning a Display Configuration to a Viewport" on page 467.

Assigning a Display Configuration to a Viewport

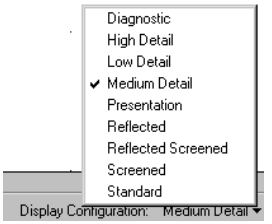
Use this procedure to assign a display configuration to a viewport. You can specify a display configuration for a viewport, model space, or tiled viewport at any time during your design process.

NOTE You can also assign a display configuration to the current viewport in the Display Manager. Right-click the display configuration, and click Set To Current Viewport.

---

1. Select the viewport for which you want to assign a display configuration.
2. In the drawing status area, select the setting for Display Configuration.

Displaying the display configurations you can assign to the current viewport



3 Select the display configuration that you want to use.

4 If necessary, enter **rea** (Regenerate All) to update the display to show the new display configuration.

Specifying the Default Display Configuration

Use this procedure to specify the default display configuration applied to new viewports, model space, or tiled viewports in the current drawing. Existing viewports with display configurations already assigned to them are not affected.

NOTE You can also assign the default display configuration in the Display Manager. Right-click the display configuration, and click Set as Drawing Default.

---

1 In the drawing status area, click .

2 Click Drawing Setup.

3 Click the Display tab.

4 Under Drawing Default Display Configuration, select the display configuration to apply to new viewports or when the TILEMODE system variable is set to 1.

5 Click OK.

6 If necessary, enter **rea** (Regenerate All) to update the display in model space to show the new display configuration.

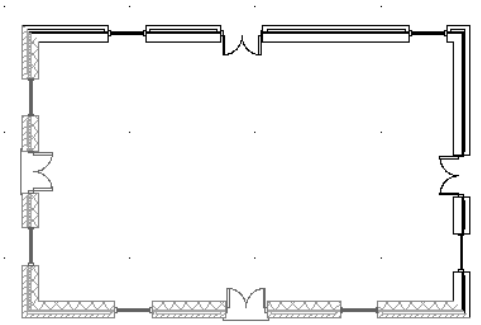
Specifying the Display Configurations Used in Xref Overlays

Use this procedure to specify whether the objects in an xref drawing are to use the display configurations in the xref when the drawing is referenced as an overlay by the host drawing.

By default, objects in both overlay and attached xref drawing use the display configurations assigned in the host drawing. This procedure describes how to specify that an xref overlay use only its own display configurations instead of those in the host drawing. If you do not turn on this option, objects in the xref drawing can use their own display configurations or those of the host drawing. Xref drawings that are referenced as an attachment can use either group of display configurations. For more information, see "Changing the Display Configuration Used in Xref Drawings" on page 470.

In the following example, the objects in the xref drawing inserted as an overlay use the Screened display configuration (North and East walls, doors, and windows). The host drawing uses the Medium Detail display configuration (South and West walls, doors, and windows).

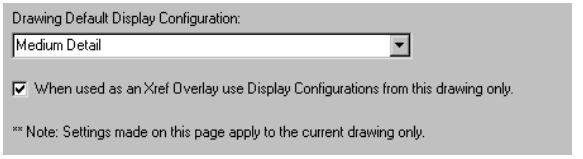
An xref overlay that does not use the active display configuration in the host drawing



1. Open the drawing that you want to reference in another drawing.
2. In the drawing status area, click .
3. Click Drawing Setup.
4. Click the Display tab.
5. Under Drawing Default Display Configuration, select When used as an Xref Overlay use Display Configurations from this drawing only.

   Clear this option if you want the xref drawing to use either its own display configurations or the display configurations in the host drawing.

   Specifying that objects use display configurations only from the current drawing



6 Click OK.

Changing the Display Configuration Used in Xref Drawings

Use this procedure to change the display configuration of an xref drawing that is referenced as either an attachment or an overlay in a host drawing.

NOTE If you specified that the drawing should always use its own display configurations when inserted as an xref overlay, you cannot change the display configuration used to display the xref objects in the host drawing. For more information, see "Specifying the Display Configurations Used in Xref Overlays" on page 468.

1 Open the host drawing that contains the xref drawing for which to specify a different display configuration.

2 Select the xref drawing you want to change, right-click, and click Edit Object Display.

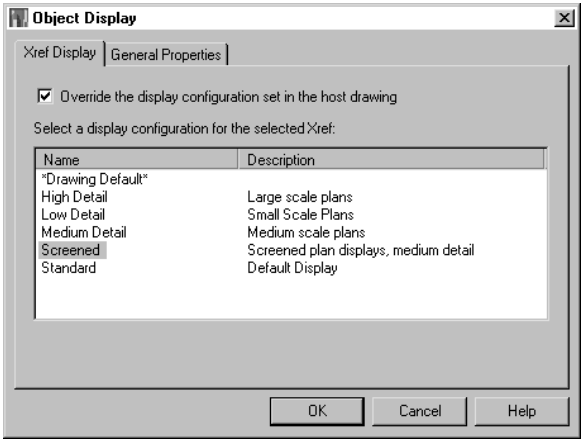
3 Click the Xref Display tab.

If the settings on the tab are unavailable, you cannot change the display configuration used for this xref overlay.

4 Select Override the display configuration set in the host drawing.

5 Select the display configuration that you want to use.

Selecting a display configuration from those in the xref drawing



The list of display configurations are those available in the xref drawing. Select Drawing Default if you want to use the default display configuration specified in the host drawing.

6 Click OK.

7 Enter **regenall** (Regenerate All) to see the changes to the display of objects in the xref drawing.

Displaying Objects by their Classification

Use this procedure to hide or show objects in a display set based on the classification of the objects. For example, if you classify objects by their construction status (new, existing, or demo), you can exclude objects with the demo classification from the display. When the display is used in the drawing, those objects do not appear.

Objects filtered from the display are not removed from the drawing. Their display is turned off only in viewports using the display set in which objects of that classification are filtered. You can change the filter to display them again. Because the objects still exist in the drawing, the display of other objects in the drawing does not change. For example, if you filter doors from a floor plan, the walls in which they are placed are still cut in the space occupied by the doors.

For more information about defining classifications and assigning them to object styles, see "Classification Definitions" on page 2289.

1 On the Format menu, click Display Manager.

2 Expand Sets.

3 Select the display set you want to edit.

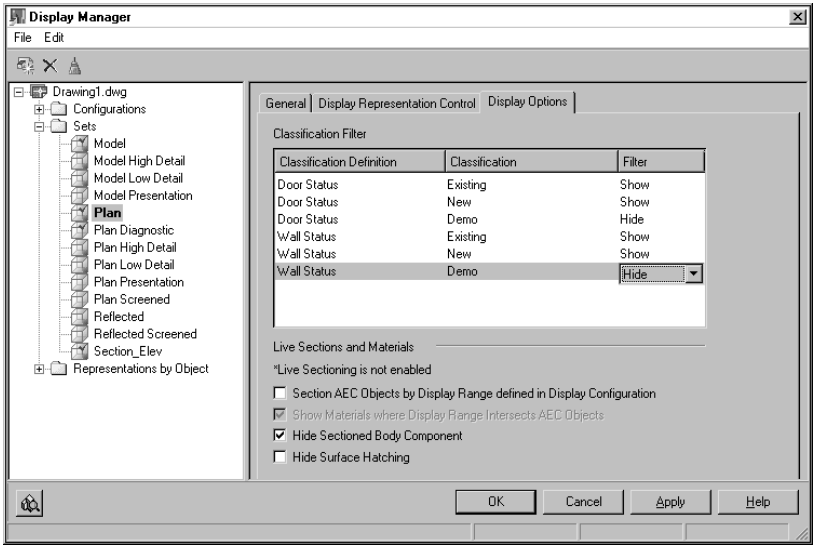
4 Click the Display Options tab.

The classification filter lists all classifications in the current drawing. The default setting is Show.

5 To hide objects of a specified classification, select Hide for Filter.

For example, to hide all doors and walls classified as Demo, select Hide for each Demo classification, as shown in the following figure.

Hiding objects based on their classification



To redisplay objects in a classification that were hidden, select Show for Filter.

6 Click OK.

Specifying Settings for Live Sections and Materials

Use this procedure to specify how live sections and materials are displayed when the selected display set is active in a viewport and a live section view of the building model is enabled. These settings let you refine the appearance of a section. For example, you can remove surface hatching that may obscure details that are important to show in the section.

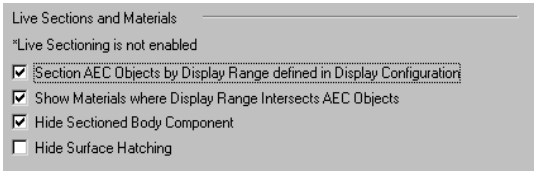
For more information about materials, see "Materials" on page 491. For more information about live sections, see "Creating and Editing a Live Section View" on page 2110.

1 On the Format menu, click Display Manager.

2 Expand Sets.

3 Select the display set you want to change, and click the Display Options tab.

Specifying display options for live sections and materials



4 Under Live Sections and Materials, specify display settings:

If you want to . . .	Then . . .
use the display range of the display configuration to determine the vertical extents of a live section view	select Section AEC objects by Display Range Defined in Display Configuration. If you want to graphically indicate where objects in the model extend below the display range, select Show Materials where Display Range intersects AEC Objects.
remove the display of the portion of sectioned objects that is beyond the bounding box of the live section	select Hide Sectioned Body Component.
remove surface hatching on sectioned objects	select Hide Surface Hatching.

5 Click OK.

Managing Display Configurations

The Display Manager is a utility that you use to manage display configurations, display sets, and display representations. You can rename them, delete them, copy them between drawings, e-mail them to other users, and purge unused elements from drawings.

Related Topics and Procedures

- Renaming a Display Configuration or a Display Set
- Renaming a Display Representation
- Deleting a Display Configuration or a Display Set
- Deleting a Display Representation

- Adding Notes and Reference Files to a Display Configuration or a Display Set
- Copying Display Configurations Between Drawings
- Purging a Display Configuration
- Purging a Display Set
- Purging a Display Representation

Renaming a Display Configuration or a Display Set

Use this procedure to rename a display configuration or a display set. You cannot rename the Standard display configuration.

1. On the Format menu, click Display Manager.
2. Select a display configuration or a display set:

If you want to . . .	Then . . .
rename a display configuration	expand Configurations, right-click the display configuration, and click Rename.
rename a display set	expand Sets, right-click the display set, and click Rename.

3. Enter the new name, and press ENTER.
4. Click OK.

Renaming a Display Representation

Use this procedure to rename a display representation. You can rename any display representation that you create as well as some that are provided in Autodesk® Architectural Desktop templates. You cannot rename predefined display representations.

1. On the Format menu, click Display Manager.
2. Expand Representations by Object.
3. Select the object for which to rename a display representation.
4. Right-click the display representation to rename, and click Rename.

   If Rename is unavailable on the shortcut menu, you cannot rename the display representation because it is predefined. Predefined display representations have this icon next to their names.

5 Enter the new name for the display representation, and press ENTER.

6 Click OK.

Deleting a Display Configuration or a Display Set

Use this procedure to delete a display configuration or a display set.

Keep the following points in mind when you delete display configurations or display sets:

- You cannot delete the display configuration that is assigned to the current viewport.
- You cannot delete predefined display configurations, which are indicated by a red check mark to the left of the configuration name.
- You cannot delete a display set that is used in a display configuration, nor can you delete the Standard display configuration.

NOTE Deleting a display configuration does not delete the display sets and display representations used in the display configuration. Deleting a display set does not delete the display representations used in the display set. For more information about deleting display representations, see "Deleting a Display Representation" on page 475.

1 On the Format menu, click Display Manager.

2 Select a display configuration or a display set:

If you want to . . .	Then . . .
delete a display configuration	expand Configurations, and right-click the display configuration, and click Delete.
delete a display set	expand Sets, and right-click the display set, and click Delete.

3 Click OK.

Deleting a Display Representation

Use this procedure to delete a display representation that is not assigned to a display set. You can delete any display representation that you create as well as some that are provided in Autodesk® Architectural Desktop templates. User-defined display representations have this icon next to their names.

You cannot delete predefined display representations. Predefined display representations have this icon next to their names.

1 On the Format menu, click Display Manager.
2 Expand Representations by Object.
3 Select the object for which to delete a display representation.
4 To remove the display representation from all display sets, right-click the display representation, and click Clear All.
5 Right-click the display representation to delete, and click Delete.

   You will receive an error message if you try to delete a predefined display representation or one that is assigned to a display set.

6 Click OK.

Adding Notes and Reference Files to a Display Configuration or a Display Set

Use this procedure to enter notes and attach reference files to a display configuration or a display set. You can also edit notes and edit or detach reference files from a display configuration or a display set.

1 On the Format menu, click Display Manager.
2 Select a display configuration or a display set:

If you want to . . .	Then . . .
add notes or files to a display configuration	expand Configurations, and select the display configuration.
add notes or files to a display set	expand Sets, and select the display set.

3 Click the General tab.
4 To add a description to the display configuration, enter it for Description.
5 Click Notes.
6 To add a note, click the Notes tab, and enter the note.
7 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.

If you want to . . .	Then . . .
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK twice.

Copying Display Configurations Between Drawings

You can use the display configurations, display sets, and display representations that you create or modify in multiple drawings.

Importing and Exporting Display Configurations and Display Sets
You can import display configurations and display sets from another drawing into the current drawing. You can export display configurations and display sets from the current drawing to new or existing drawings.

When you import or export a display configuration, the display system also copies any display sets and display representations included in the selected configuration that do not exist in the destination drawing. Similarly, if you import or export a display set, the display system copies any display representations that do not exist in the destination drawing.

If a display set or a display representation with the same name exists in the destination drawing, it is not overwritten with the new display information. To transfer the new information, rename the existing display set or representation in the destination drawing before importing or exporting display configurations or display sets.

For example, you want to import a display set named New Reflected that contains a display representation for doors named Reflected Screened, and the current drawing also contains a display representation for doors named Reflected Screened. To import the new display representation, rename the Reflected Screened display representation in the current drawing before importing the new display set and its display representations.

Importing and Exporting Display Representations
You can import and export display representations only as part of a display set. If you want to use a display representation in another drawing, assign the display representation to a display set, and copy the display set to the desti-

nation drawing. You can then use the display representation in display sets in the destination drawing.

E-mailing Display Configurations
If your system has e-mail, you can e-mail display configurations to other users from the Display Manager. You can send the entire display system in your drawing to another user of Autodesk® Architectural Desktop. The Display Manager copies the display system information to a new drawing, and attaches the drawing to a new e-mail message created using the e-mail program on your system. Users of Autodesk Architectural Desktop who receive your display system by e-mail can import it into their drawings, open the attached drawing file, and export your display system to their drawings; or they can use the attached drawing file as a template for new drawings. For further information about importing and exporting display systems, see "Copying Display Configurations Between Drawings" on page 477.

Related Procedures

- Importing a Display Configuration
- Importing a Display Set
- Exporting a Display Configuration
- Exporting a Display Set
- Sending Display Configurations to Other Users

Importing a Display Configuration

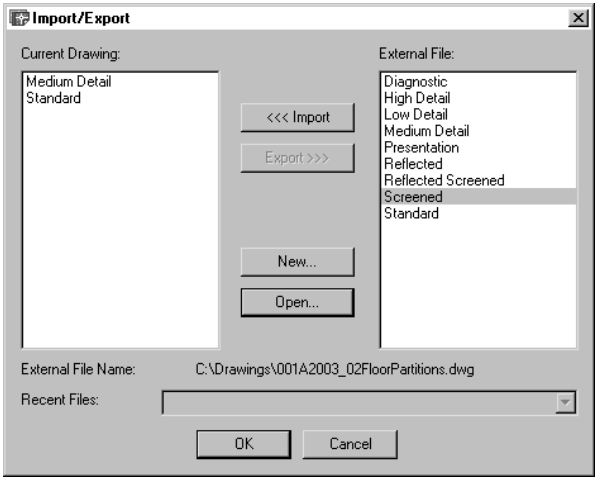
Use this procedure to import one or more display configurations from another drawing into the current drawing. Any display sets and display representations assigned to the display configurations that do not exist in the current drawing are copied into the current drawing with the display configurations. Display sets and display representations that have the same name as those in the current drawing are not imported.

1. Make sure that the drawing containing the display configuration you want to import is not open in the current session.
2. On the Format menu, click Display Manager.
3. Right-click Configurations, and click Import/Export.

4 Select the drawing from which to import display configurations:

If you want to . . .	Then . . .
select a drawing to which you previously imported or exported display information	select the drawing from the Recent Files list.
select a drawing that is not in the Recent Files list	click Open. Navigate to the drawing, and click Open.

Importing display configurations from another drawing



5 Under External File, select one or more display configurations to import, and click Import.

To select more than one display configuration, hold down CTRL while you select the display configurations.

If the current drawing contains a display configuration with the same name, the duplicate name is displayed in the Import/Export - Duplicate Names Found dialog box.

6 Resolve duplicate names, if prompted:

If you want to . . .	Then . . .
prevent the Display Manager from overwriting the existing display configuration with the new display configuration of the same name	select Leave Existing, and click OK.
replace the existing display configuration with the new display configuration	select Overwrite Existing, and click OK.
keep the existing display configuration and add the new display configuration with a different name	select Rename to Unique, and click OK. The Display Manager appends a number to the name of the new display configuration.

7 Click OK twice.

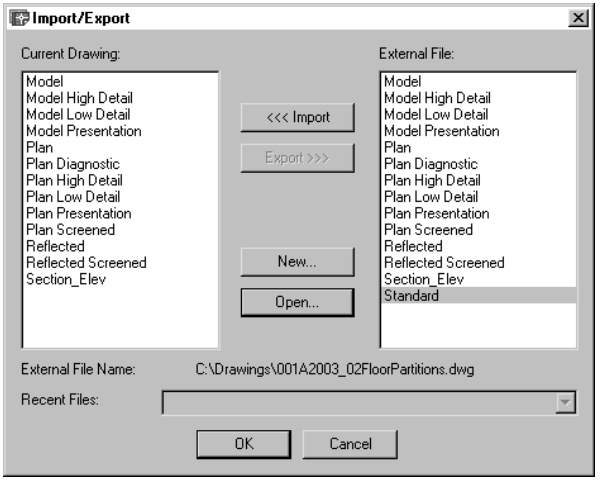
Importing a Display Set

Use this procedure to import one or more display sets from another drawing into the current drawing. Any display representations assigned to the display sets that do not exist in the current drawing are copied into the current drawing with the display sets. Display representations that have the same name as display representations in the current drawing are not imported.

1 Make sure that the drawing containing the display set you want to import is not open in the current session.
2 On the Format menu, click Display Manager.
3 Right-click Sets, and click Import/Export.
4 Select the drawing from which to import display sets:

If you want to . . .	Then . . .
select a drawing to which you previously imported or exported display information	select the drawing from the Recent Files list.
select a drawing that is not in the Recent Files list	click Open. Navigate to the drawing, and click Open.

Importing display sets from another drawing



5 Under External File, select one or more display sets to import, and click Import.

To select more than one display set, hold down CTRL while you select the display sets.

If the current drawing contains a display set with the same name, the duplicate name is displayed in the Import/Export - Duplicate Names Found dialog box.

6 Resolve duplicate names, if prompted:

If you want to . . .	Then . . .
prevent the Display Manager from overwriting the existing display set with the new display set of the same name	select Leave Existing, and click OK.
replace the existing display set with the new display set	select Overwrite Existing, and click OK.
keep the existing display set and add the new display set with a different name	select Rename to Unique, and click OK. The Display Manager appends a number to the name of the new display set.

7 Click OK twice.

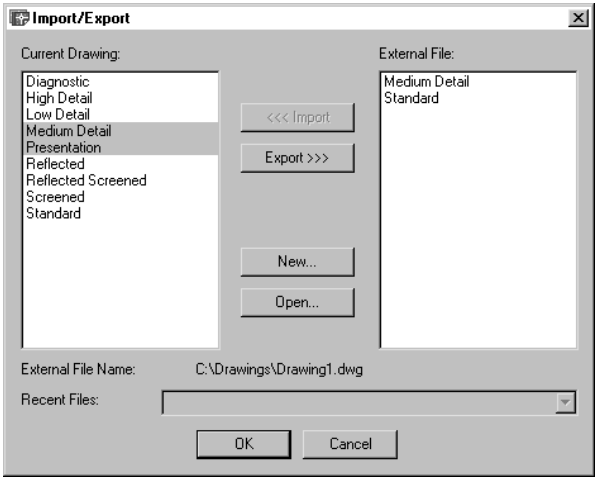
Exporting a Display Configuration

Use this procedure to export one or more display configurations from the current drawing into a new or existing drawing. Any display sets and display representations assigned to the display configurations that do not exist in the destination drawing are copied into the destination drawing with the display configurations. Display sets and display representations that have the same name as those in the destination drawing are not exported.

1 Make sure that the drawing into which you will export display configurations is not open in the current session.
2 On the Format menu, click Display Manager.
3 Right-click Configurations, and click Import/Export.
4 Select the drawing into which to export display configurations:

If you want to . . .	Then . . .
select a drawing for which you previously imported or exported display information	select the drawing from the Recent Files list.
select a drawing that is not in the Recent Files list	click Open. Navigate to the drawing, and click Open.
create a drawing	click New. Enter a name for the new drawing, and click Save.

Exporting display configurations to another drawing



5 Under Current Drawing, select one or more display configurations to export, and click Export.

To select more than one display configuration, hold down CTRL while you select the display configurations.

If the destination drawing (the external drawing) contains a display configuration with the same name, the duplicate name is displayed in the Import/Export - Duplicate Names Found dialog box.

6 Resolve duplicate style names, if prompted:

If you want to . . .	Then . . .
prevent the Display Manager from overwriting the existing display configuration with the new display configuration of the same name	select Leave Existing, and click OK.
replace the existing display configuration with the new display configuration	select Overwrite Existing, and click OK.
keep the existing display configuration and add the new display configuration with a different name	select Rename to Unique, and click OK. The Display Manager appends a number to the name of the new display configuration.

7 Click OK.

8 When prompted to save changes to the destination drawing (external drawing), click Yes.

9 Click OK.

Exporting a Display Set

Use this procedure to export one or more display sets from the current drawing into a new or existing drawing. Any display representations assigned to the display sets that do not exist in the destination drawing are copied into the destination drawing with the display sets. Display representations that have the same name as those in the destination drawing are not exported.

TIP To use a display representation in another drawing, assign the display representation to a display set, and copy the display set to the destination drawing. You can then use the display representation in display sets in the destination drawing.

---

1 Make sure that the drawing into which you will export display sets is not open in the current session.

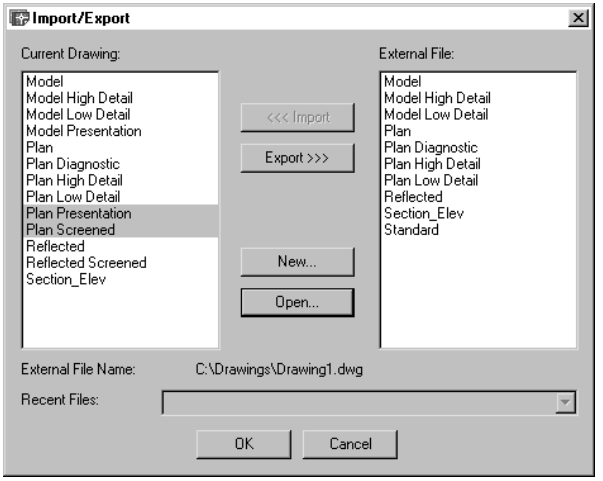
2 On the Format menu, click Display Manager.

3 Right-click Sets, and click Import/Export.

4 Select the drawing into which to export display sets:

If you want to . . .	Then . . .
select a drawing to which you previously imported or exported display information	select the drawing from the Recent Files list.
select a drawing that is not in the Recent Files list	click Open. Navigate to the drawing, and click Open.
create a new drawing	click New. Enter a name for the new drawing, and click Save.

Exporting display sets to another drawing



5 Under Current Drawing, select one or more display sets to export, and click Export.

To select more than one display set, hold down CTRL while you select the display sets.

If the destination drawing (the external drawing) contains a display set with the same name, the duplicate name is displayed in the Import/Export - Duplicate Names Found dialog box.

6 Resolve duplicate names, if prompted:

If you want to . . .	Then . . .
prevent the Display Manager from overwriting the existing display set with the new display set of the same name	select Leave Existing, and click OK.
replace the existing display set with the new display set	select Overwrite Existing, and click OK.
keep the existing display set and add the new display set with a different name	select Rename to Unique, and click OK. The Display Manager appends a number to the name of the new display set.

7 Click OK.

8 When prompted to save changes to the destination drawing (external drawing), click Yes.

Sending Display Configurations to Other Users

Use this procedure to e-mail all the display configurations and their elements in a drawing to other users of Autodesk® Architectural Desktop. The software creates a new drawing that contains only the display information from the current drawing and attaches the drawing to an e-mail message. Objects, layers, and other drawing content and settings are not included in the new drawing.

1 On the Format menu, click Display Manager.

2 Right-click the drawing name, and click Send.

An e-mail message with the subject "ADT Display System," is created using your e-mail program. A drawing file containing the display information is added to the message as a file attachment.

If e-mail is not available on your system, the Send option is not available.

3 Complete and send the message in your e-mail program.

4 Click OK.

Purging a Display Configuration

Use this procedure to purge unused display configurations from a drawing.

You cannot purge a display configuration assigned to a viewport or model space, or predefined display configurations, such as Standard.

1 On the Format menu, click Display Manager.

2 Right-click Configurations, and click Purge.

All display configurations that you can purge are selected in the Purge Display Configurations dialog box.

3 Clear any display configurations that you do not want to purge, and click OK twice.

Purging a Display Set

Use this procedure to purge unused display sets from a drawing.

You cannot purge a display set assigned to a display configuration, or predefined display sets such as Standard, Model, or Plan.

TIP To find out if a display set is assigned to any display configurations, select Configurations in the left pane. The right pane lists each display configuration and the display sets it uses.

1. On the Format menu, click Display Manager.
2. Right-click Sets, and click Purge.

   All display sets that you can purge are selected in the Purge Display Sets dialog box.
3. Clear any display sets that you do not want to purge, and click OK twice.

Purging a Display Representation

Use this procedure to purge unused display representations from a drawing. You cannot purge a display representation assigned to a display set, or predefined display representations such as Model or General.

1. On the Format menu, click Display Manager.
2. Expand Representations by Object.
3. Select the display representations to purge:

If you want to . . .	Then . . .
purge unused display representations for a specific object	right-click the object name, and click Purge.
purge all unused display representations in the drawing	right-click Representations by Object, and click Purge.

   All display representations that you can purge are selected in the Purge Display Representations dialog box.
4. Clear any display representations that you do not want to purge, and click OK twice.

Troubleshooting the Display System

If you have problems displaying objects in your drawing, use the following troubleshooting suggestions to resolve the problem.

- Why isn't my object displayed?
- Why isn't my viewport updating?
- I dragged objects to another drawing. Why do they look different now?
- Is there a quick way to verify that an object exists in a drawing but is not displayed?
- Why doesn't the linetype for my object display the way I expect?

Why isn't my object displayed?

When AEC objects in your model do not display correctly in a viewport, the following actions might help to solve the problem.

- In the drawing status area, verify the name of the selected display configuration. Select a different display configuration, and see if the problem is resolved.
- In the Display Manager, find out what display set is being used in the display configuration assigned to the viewport in question. The name of the current display configuration is highlighted. The names of the current display set is also highlighted.
- In the detailed view of the display sets in the Display Manager, make sure that a display representation for the object is selected in that display set.
- Is the object hidden because objects of its classification are filtered out in the current display set? On the Display Options tab, verify that objects are not hidden.
- If a display representation is selected in the current display set, look at the display properties of the display representation. Are the display components turned off? Are components on layers that are turned off?
- Is the display of components controlled by the material assigned (ByMaterial is selected in the display properties)? If so, look at the display properties of the material assigned to object components to determine the settings.
- Is the object drawn on a layer that is turned off?

Why isn't my viewport updating?

Under certain circumstances, such as when you switch view directions in shade modes other than 2D wireframe, the display is not restored correctly. In such cases, enter **objrelupdatedate** on the command line, and either select the problem AEC object or press ENTER to select all the AEC objects. This forces the display system to regenerate all the current display representations.

I dragged objects to another drawing. Why do they look different now?

Objects dragged or copied from one drawing to another use the display properties of the display configuration assigned to the viewport in the destination drawing. The display configuration in the original drawing is not copied with the objects.

Is there a quick way to verify that an object exists in a drawing but is not displayed?

Enter **DisplayDxfName** on the command line to label each object in the drawing with its name. Labels appear even for objects that are not displayed. For example, if you created a display set that did not include a display representation for doors, and you then assigned the display set to a display configuration used in the current viewport, doors would not be displayed in that viewport. An object can also exist in a drawing and not be displayed if the object was filtered out by its classification in the current display set. **DisplayDxfName** can help you determine whether the objects are simply not displayed or if they are not present.

1. At the command line, enter **displaydxfname**.
2. Enter **y** (Yes).
3. Enter **regenall** (Regenerate All).

Displaying the names of objects, including those that are not shown

4. To turn off object names, enter **displaydxfname**.
5. Enter **n** (No).

Why doesn't the linetype for my object display the way I expect?
The linetype scale for the components of AEC objects works with the AutoCAD® linetype scale specified in the LTSCALE variable to control the linetype of AEC objects. The default value for linetype scale of all components of AEC objects is 1.0. This value is multiplied by the current value for LTSCALE to produce the linetype scale of object components.

For example, if the LTSCALE value is 48.0, and the linetype scale in the display properties of an object is 1.0 for an object component, the linetype scale of the component is 48.0. If you change the linetype scale in the display properties to 2.0, the linetype scale of the component is effectively 96, or 2.0 x 48.

Materials

8

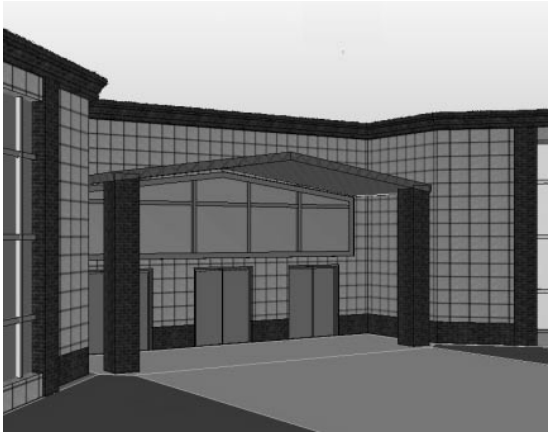
In Autodesk® Architectural Desktop, a material corresponds to a specific structural finish material in a building model, such as brick, concrete or glass. Materials are useful for creating sections, elevations, and renderings in the design process. Materials also provide a way to manage the display properties of object styles.

Building model showing materials in elevation view

In this Chapter

- Objects that Support Materials
- Process Overview: Creating and Assigning Materials
- Material Components and Display Properties
- Displaying Materials in a Drawing
- Working with Surface Hatches
- Overriding the Surface Hatch on Individual Objects
- Displaying a List of Materials
- Displaying a Material Query
- Creating and Editing Materials

Building model showing materials in rendered view



Simplifying the Design Process

Using materials makes defining the display of objects considerably easier. You define the display of a material, such as brick or glass, only once in the drawing or the drawing template, and then assign it to any object component you want to show that material. For example, you can define a material "Glass" and then assign it to any number of windows, glass door insets or cubicle walls. You typically assign materials to components in objects styles, you can also assign materials to the components of individual objects.

Using a common set of materials provides centralized control for the display of objects across the drawing or the whole project. When the particulars of a material change, you change them just once in the material definition and all objects are automatically updated.

Predefined Materials

Autodesk® Architectural Desktop provides a large number of predefined materials for all common design purposes, so that you get an easy start with new drawings. You can use these predefined materials or modify them to your special designs. You can also create your own materials. Styles that are provided with the software have materials already assigned to them.

You can also drag and drop render materials between Architectural Desktop and Autodesk®VIZ Render by accessing the Autodesk VIZ Render Material Catalog in Content Browser. If you are working in VIZ Render, Architectural Desktop imports any assigned materials.

NOTE If you open VIZ Render from the flyout Architectural Desktop automatically links the geometry from the open Architectural Desktop document into VIZ Render. However, if you open VIZ Render from the desktop icon, or from the Start menu, Architectural Desktop will only open VIZ Render, and any existing file will need to be re-opened and any existing geometry will need to be manually linked.

Surface Hatching

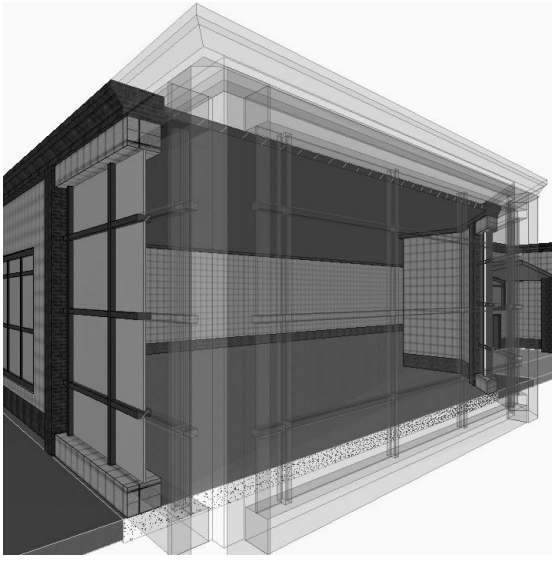
The ability to assign surface hatches to objects is provided by materials. Surface hatches can display in both model views and section/elevation views. You can precisely control placement and orientation of the hatch for each object face.

Section Hatching

Materials work seamlessly with sections and elevations. Section hatches can be specified independently of surface hatches. Special material components allow a realistic display of rendered live section views.

For information on live section views, see "Creating and Editing a Live Section View" on page 2110.

Rendered live section view with transparent outside material



Integration with Autodesk VIZ Rendering

Materials offer users of Autodesk® Architectural Desktop a seamless integration with VIZ Render. Material assignments prepare the drawing for editing and rendering in VIZ Render and AutoCAD. Furthermore, VIZ rendering materials can be imported into Autodesk Architectural Desktop drawings and applied to AEC objects.

Related Topics and Procedures

- Objects that Support Materials
- Process Overview: Creating and Assigning Materials
- Material Components and Display Properties
- Displaying Materials in a Drawing
- Working with Surface Hatches
- Overriding the Surface Hatch on Individual Objects
- Override Operations
- Displaying a List of Materials
- Creating and Editing Materials

Objects that Support Materials

Objects that you can assign materials are typically three-dimensional (3D) objects. Two-dimensional (2D) objects, such as areas, grids or AEC polygons, are more symbolic representations and drawing aids than actual building objects.

Not all object components can take on a material. For example, a door swing cannot have a material assignment. Since a door swing is simply a symbolic graphic, it is not made of a material and therefore does not support a material assignment. The appearance of door swing is specified in the display properties of a door style. The door frame, however, is a physical part of the door. It is made of a material and can be assigned a material in the door style or the door.

Object	Components that support materials
Curtain Walls/ Curtain Wall Units	infills frames mullions
Doors	frames panels stops insets muntins
Door/Window Assemblies	infills frames mullions
Mass Elements	mass element body
Mass Groups	mass group body
Railings	guardrails handrails bottom rails posts balusters
Roof	roof body
Slabs/Roof Slabs	slab body slab edge fascias slab edge soffits

Object	Components that support materials
Space Boundaries	interior boundary exterior boundary
Spaces	floor ceiling
Stairs	tread riser landing
Structural Members	beam brace column body
Walls	wall body wall shrinkwrap wall components
Windows	glass frames sashes muntins

Assigning Materials to Objects and Object Styles

Usually, you assign materials to object styles. All new objects based on the style have the same materials assigned to them.

You can also assign materials directly to an object. You may want to do this in these cases:

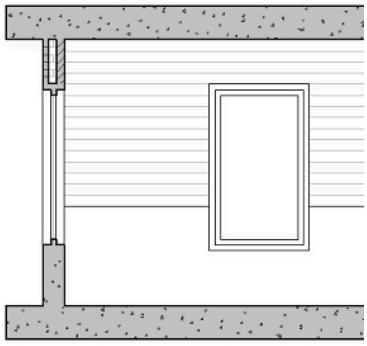
- The object in question does not support styles, but does support materials. This is the case for roofs.
- You want to override a material only for a specific object.

Examples of Material Assignments

You can assign materials to objects in plan views, model views, section views, and rendered views.

For example, if you want to draw a brick exterior wall, you can assign to it a material that displays a brick surface hatch in model view and a realistic brick display for a rendered view. If there are special insulation components in a wall, you can assign a light, half-transparent material to them. For sectioning the wall, you can assign a specific section hatch pattern that differs from the regular brick surface hatch.

Surface and section hatches assigned to walls



In another example, you can assign materials to the floor and ceiling component of a space. You could assign a floor tiling material to the floor component and a regular concrete material to the ceiling.

Process Overview: Creating and Assigning Materials

Autodesk®Architectural Desktop offers a large number of predefined building materials in the drawing templates. You can, however, also create your own custom materials.

The following steps describe how to create a material and assign it to an object or object style:

Step 1: Create a material definition for each material needed and specify the display properties of these materials.

For example, create a brick material that shows a dark red surface hatch, matching dark red linework components, an appropriate section hatch, and a brick rendering material. Or create a glass material that has light blue linework, a transparent surface, and a light blue rendering material.

For more information, see "Creating and Editing Materials" on page 517.

Step 2: In object styles, assign a material to represent each component.

For example, in a window style, assign the frame and the muntins a wood material and the window glass a glass material. Or, if you are working with

a wall style, assign a brick material to the wall body and an insulation material to insulation components.

Step 3: Make sure that the corresponding display properties of the object or object style are in all display representations specified as By Material.

Step 4: For object components that do not use materials, specify the display properties in each display representation.

For example, if you want the swing graphic of a door to match the dark brown door frame, open the display properties of the door style, and change the color of the door swing to a dark brown. Perform this step for each display representation in which the door swing appears.

When you create objects from these styles, their components are displayed as follows:

- If you have selected By Material in the Display Properties, then the object components that have materials assigned show the display properties you specified in the material definition.
- Object components that have no materials assigned show the display properties you specified in the object style.

Material Components and Display Properties

Each material has the following display components that determine the appearance of object components to which a material has been assigned:

- Linework
- Plan Hatch 3D Body
- Surface Hatch
- Section Hatch
- Sectioned Body and Boundary

When you specify a material, the software determines which object component to apply the material to. After you have specified display components of an object to be By Material, then you can no longer change the display component properties of that object.

The material components correspond to groups of object display properties or to display property types. For example, the material Linework component determines the appearance of linework components in 2D plan views, such as wall shrinkwraps, mass element boundaries or door frames. Surface Hatch determines the appearance of all surface hatching on objects in model and elevation views.

When you specify that an object component is displayed by material, the component uses the display properties of the associated material component, instead of the display properties of the object.

Only object components that correspond to a physical component of the object can be assigned materials. For example, a door swing cannot have a material assignment because it is a symbolic graphic. The appearance of the door swing will always be set in the door display properties. The door frame, however, is a physical part of the door. It is made of a material and can be assigned a material in the door style or the door display properties.

Custom display blocks cannot have materials assigned. Objects that are within custom display blocks may have materials assigned.

For a detailed list of object components mapped to material components, see the Help topics for the objects.

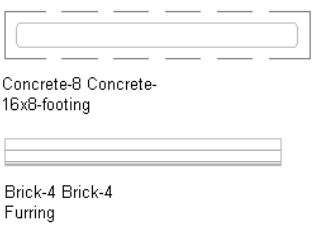
Related Topics

- Linework Material Component
- Plan Hatch Material Component
- 3D Body Material Component
- Surface Hatch Material Component
- Section Hatch Material Component
- Sectioned Body and Sectioned Boundary

Linework Material Component

The Linework component is used for object components representing linework in 2D plan and elevation views, such as wall boundaries, door frames, or mass element boundaries.

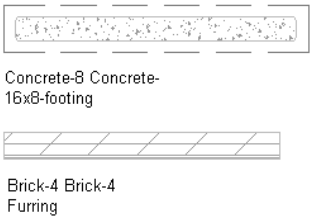
Viewing walls plan view linework material components



Plan Hatch Material Component

The Plan Hatch component is used for hatching display components in plan views, such as wall component hatches, mass element hatches, and slab hatches.

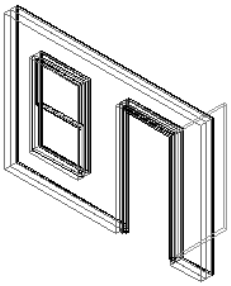
Viewing walls plan view hatching material components



3D Body Material Component

The Body component is used for object components representing linework in 3D model views, such as wall bodies, mass element boundaries, door frames, and window frames.

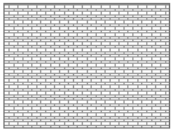
Viewing walls 3D body material components



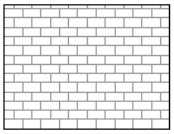
Surface Hatch Material Component

The Surface Hatch component is used for hatching display components in 3D model views, sections, and elevations. In a section, the surface hatch component is used for components not cut by the section line. Components cut by a section line are displayed with a section hatch.

Viewing walls elevation view surface hatching material components



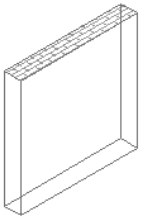
brick surface hatching



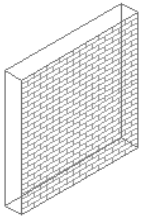
CMU surface hatching

You can specify the faces of an object that display the surface hatch within the material definition. For example, you can specify that the hatch be only on the front and left side of the object.

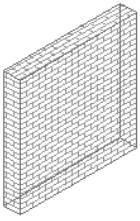
Specifying wall face surface hatching assignments



top face



front face



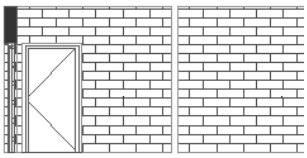
all faces

For more information about determining the surface hatch faces, see "Specifying the Surface Hatch Pattern of a Material" on page 523.

2D Section/Elevation Linework

The 2D Section/Elevation Linework component is used specifically for 2D building sections or building elevations. All linework in a 2D section/elevation can be controlled by this component. For more information about using materials in sections, see "Surface Hatch Linework" on page 2137.

Wall displaying a 2D elevation linework component

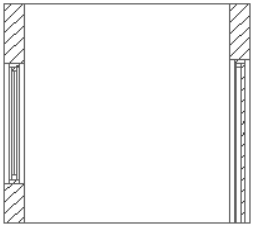


2D section
linework (green)

Section Hatch Material Component

The Section Hatch component is used specifically for building sections. It is used for hatches on object faces cut by a section line. Section hatches can be applied to 2D sections, 3D sections, and live section views. For more information on using materials on sections, see "Section Hatch Linework" on page 2137.

Wall displaying 2D section with section hatch



2D section
with section
hatch (red)

Sectioned Body and Sectioned Boundary

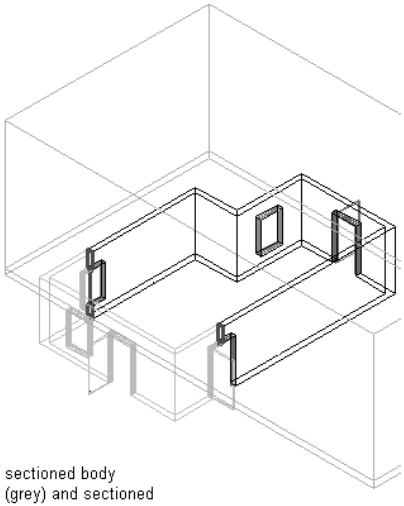
The Sectioned Body and Sectioned Boundary components display only in live section views. Live section views are a special section view of a 3D building model. The building objects are not converted into a section object but are retained as individual objects in the section. They keep all of their prop-

erties and display components and may be edited in the section. The part of the objects that lies outside of the section line can be displayed or hidden. When the parts outside of the section line are displayed, they get special display components named Sectioned Body that control their appearance.

Material Component	Description
Sectioned Body	the objects or object parts outside of the section
Sectioned Boundary	the outline of the cut line created by the section

For detailed information on live section views, see "Creating and Editing a Live Section View" on page 2110.

Live section view with sectioned body (grey) and sectioned boundary (red)



sectioned body (grey) and sectioned boundary (red)

Displaying Materials in a Drawing

Use this procedure to turn on materials in a display representation if they are assigned to objects but are not displayed in the drawing.

1. On the Format menu, click Display Manager.
2. Expand Configurations.

The current display configuration is marked in bold.

3. Expand the current display configuration.
4. Select a display set in the current display configuration.
5. Click the Display Representation Control tab.
6. Scroll to Material Definition and select a display representation.

   As a default, material definitions have only a General display representation. If this is the only available display representation listed, select it. If you created another display representation for materials, you can select that representation instead.

NOTE Make sure that you select only one display representation for materials in each display set. You should also verify that the component's object layer is turned on.

---

7. Repeat steps 4 - 6 to select a display representation for materials in the other display sets in the current configuration.
8. Click OK.

   The materials assignments you made now display in the drawing.

Working with Surface Hatches

Surface hatches are hatch patterns on three-dimensional (3D) objects that display in 3D model views and elevation views.

Each 3D object has a number of faces: Top, Bottom, Left, Right, Front, and Back. You can decide if it should carry a surface hatch or not. For example, if you view a wall in 3D view, you might want to hatch only the side facing you to avoid cluttering the drawing.

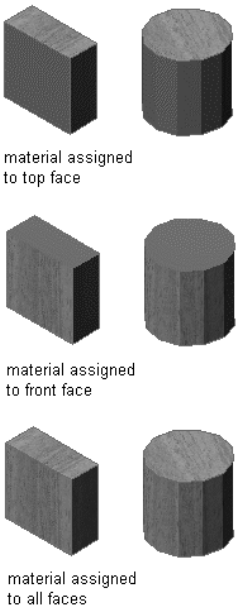
Which faces of an object carry the surface hatch is specified in the material definition. All objects that have that material assigned show the same surface hatch assignments, unless you create an individual surface hatch override.

Defining the faces on a regular object such as a wall, slab or box-shaped mass element is intuitive. Front, Back, Left, Right, Top and Bottom are clearly defined faces that can easily be assigned materials. However, defining which direction each face lies in can be more complex for different, irregularly shaped objects such as curved objects, extrusion objects, or free form objects resulting from boolean operations.

For information on changing the surface hatch assignments of a material definition, see “Specifying the Surface Hatch Pattern of a Material” on page 523.

For information on surface hatch overrides, see “Overriding the Surface Hatch on Individual Objects” on page 510.

Specifying object face material assignments



Related Topics

- Surface Hatches on Curved Surfaces
- Surface Hatches on Multiple Faces
- Surface Hatch Material Component
- Surface Hatches on Free Form Mass Elements

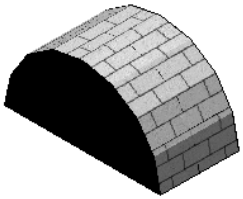
Surface Hatches on Curved Surfaces

Curved surfaces do not have all of the view directions you can specify in the material definition. It is important to know the faces are designated on curved surfaces to understand how surface hatching is applied when these objects are assigned materials.

An object with a vertically curved surface, such as a Barrel Vault mass element, has no front and back faces, as there is nothing that could delineate

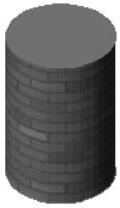
them. The curved surface of the Barrel Vault mass element is considered the top face of the object.

Barrel vault mass element with material assigned to top face



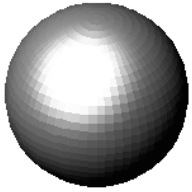
An object with a horizontally curved surface, such as a Cylinder mass element, has no left and right sides, as there is nothing to delineate them. The curved surface is considered the front face.

Cylinder mass element with material assigned to front face



An object that has only one curved surface, such as a Sphere mass element, has only a front face.

Sphere mass element with material assigned to front face



Surface Hatches on Multiple Faces

Irregular and complex objects can have multiple faces in one view direction. If necessary, you can override the surface hatch on all faces with the same view direction or on individual faces. For information on overriding individual faces, see "Overriding the Surface Hatch on Individual Objects" on page 510.

Stair with material assigned to treads

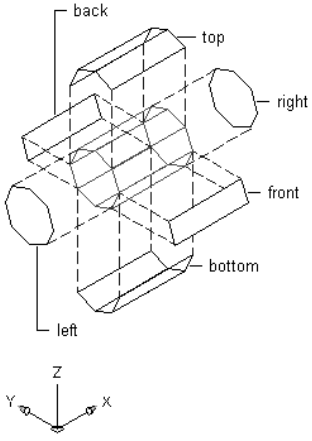
Surface Hatches on Extrusions

The surface hatch placement on objects created from an extruded profile depends on two factors:

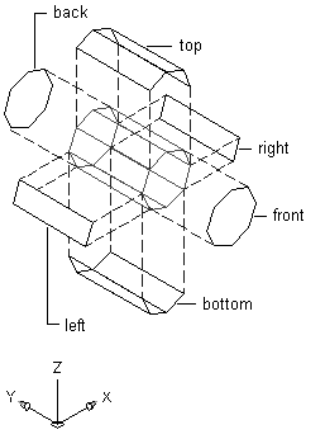
- the view directions assigned to the individual edges of the profile
- the direction of the extrusion

  The desired extrusion direction depends on the object you want to extrude from the profile. A rail, for example, is extruded in the *X* direction. A railing post is extruded in the *Z* direction. Custom door and window shapes are extruded in the *Y* direction.

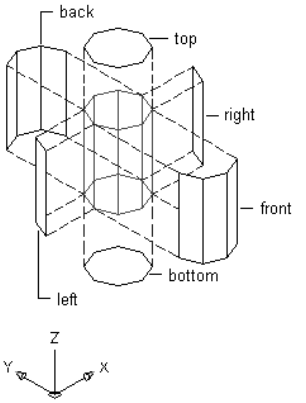
Face assignments from edges extruded in the X direction



Face assignments from edges extruded in the Y direction



Face assignments from edges extruded in the Z direction



Specifying Faces on Extrusions

Use this procedure to specify the faces on object components created from extruding a profile. These objects and components include extruded mass elements, wall body modifiers, custom railing components, and other components extruded from a profile.

When you create a profile, all the edges are marked for extrusion in the Z direction. These edge positions are calculated based upon the quadrant in which the midpoint of the edge lies. You can change the view direction of edges and the extrusion direction in the profile definition.

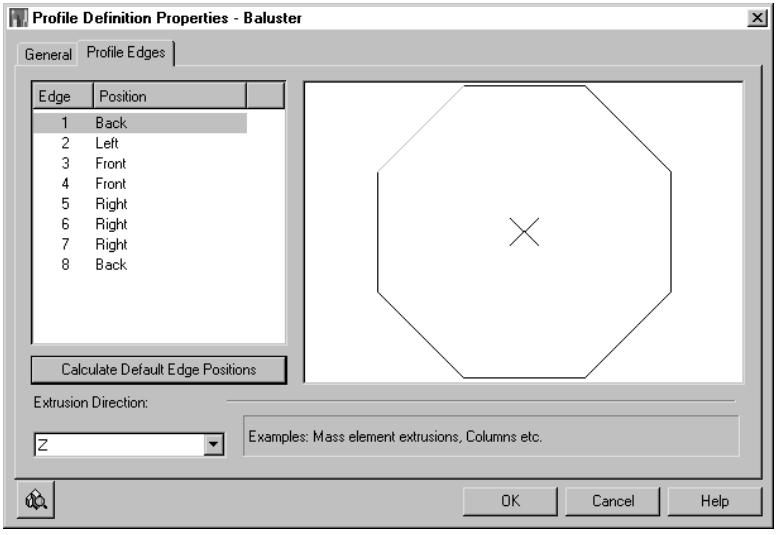
Determine the direction of the profile edges before creating objects from the profile. For example, if you have created a profile for a custom railing baluster and specified the direction of the individual edges, any baluster added to the railing based on that profile has those assignments. If you later change the edge view directions in the profile, existing balusters do not change accordingly.

1 On the Format menu, click Style Manager.

2 Expand Multi-Purpose Objects, and expand Profiles.

3 Right-click the profile for the extrusion, and click Edit.

4 Click the Profile Edges tab.



5 Select an extrusion direction.

6 For each edge, select a position that corresponds to the view direction you want to assign to the face created from that edge.

The edge positions that are available depend on the extrusion direction you selected.

7 Click OK twice.

Surface Hatches on Free Form Mass Elements

Free Form mass elements are created when you perform a boolen operation on a regular mass element, adding, subtracting or intersecting another mass element from it. The resulting mass element can be irregularly shaped.

When a mass element is converted into a Free Form mass element, all previous material assignments of the source mass elements are lost. The new mass element reverts to the Standard material. You can assign another material to the new mass element.

Overriding the Surface Hatch on Individual Objects

The surface hatch specified for a material determines the display of objects assigned the material in elevation and model views, as well as the appearance in rendered views. The material definition specifies which faces of objects—Top, Bottom, Left, Right, Front, Back—display a surface hatch.

However, in some instances, you may want to override the surface hatch for a selected face of an object. For example, you may want to turn off the surface hatch where it could obscure small details of an object when the drawing is plotted.

Override Operations

You can edit the surface hatches for an individual object face:

- hide the surface hatch
- change the rotation of the surface hatch
- change the vertical and horizontal offsets of the surface hatch

You can also specify whether the changes are applied only to the selected face or to all faces of the object with the same direction—for example, to all front faces.

Multiple Surface Hatch Overrides

You don't need to create separate overrides for individual changes; you can create one surface hatch override that is both rotated and offset. In most cases, this is the preferred method of working. However, in some cases, you need to assign more than one override. For example, suppose you want to rotate the surface hatch of all front faces of a column, and you want to offset one individual front face. You first add an override for the rotation and select All Front Faces. Then you add an override for the offset in which you select Only Selected Front Face.

Related Procedures

- Hiding a Surface Hatch

- Specifying the Rotation of a Surface Hatch
- Specifying the Horizontal and Vertical Offset of a Surface Hatch
- Editing Surface Hatch Overrides

Hiding a Surface Hatch

Use this procedure to hide the surface hatch on an object face.

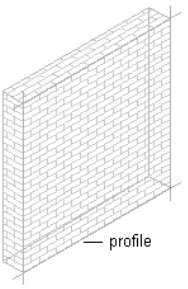
To add an override to a surface hatch, an object needs to have a surface hatch material assigned to it. A surface hatch on an object can come from an assigned material or from the display properties of the object or object style.

If a surface hatch comes from the display properties of the object instead of the material assignment, you cannot override it on individual faces. You receive an error message upon selecting the object face.

1. Select the object for which you want to hide an individual surface hatch, right-click, and click Materials ➤ Add Surface Hatch Override.
2. Select the object face where you want to hide the surface hatch.

   A profile surrounds the selected face.

   Profile defining a face of a wall

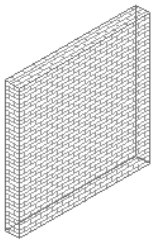


3. Specify where the override applies:

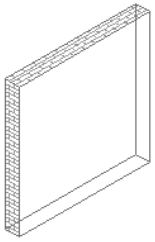
If you want to . . .	Then . . .
override only the selected face of the object	select Only Selected <Direction> Face for Faces. For example, to apply a surface hatch override only to the selected Front face of a wall, select Only Selected Front Face.
override all faces of the object in the same view direction	select All <Direction> Faces for Faces. For example, to apply a surface hatch override to all Top faces of a selected column, select All Top Faces.

4 Select Hide Surface Hatching.

Surface hatch hidden on the front face of a wall



before



after

5 Click OK.

Displaying a Hidden Surface Hatch

Use this procedure to display a previously hidden surface hatch.

An object must have a surface hatch material assigned to it in order to add an override to a surface hatch. A surface hatch on an object can come from an assigned material or from the display properties of the object or object style.

If a surface hatch comes from the display properties of the object instead of the material assignment, you cannot override it on individual faces. You receive an error message upon selecting the object face.

1 Select the object for which you want to re-display a hidden individual surface hatch, right-click, and click Materials ➤ Edit Surface Hatch Override.
2 Select the profile around the hidden the surface hatch.
3 Right-click, and click Edit Hatch Override.
4 Clear Hide Surface Hatching.
5 Click OK.

6 Select the profile, right-click, and click Save Changes.

Specifying the Rotation of a Surface Hatch

Use this procedure to specify the rotation of a surface hatch.

1 Select the object for which you want to rotate an individual surface hatch, right-click, and click Materials ➤ Add Surface Hatch Override.

2 Select the object face where you want to change the rotation.

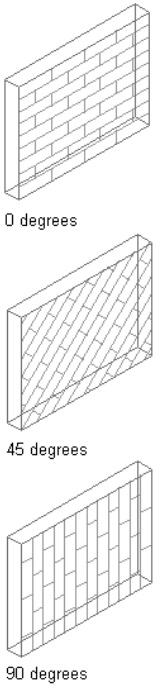
A profile surrounds the selected face.

3 Specify where the override applies:

If you want to . . .	Then . . .
override only the selected face of the object	select Only Selected <Direction> Face for Faces. For example, to apply a surface hatch override only to the selected Front face of a wall, select Only Selected Front Face.
override all faces of the object in the same view direction	select All <Direction> Faces for Faces. For example, to apply a surface hatch override to all Top faces of a selected column, select All Top Faces.

4 Specify the rotation of the surface hatch.

Specifying surface hatch rotation angles



5 Click OK.

Specifying the Horizontal and Vertical Offset of a Surface Hatch

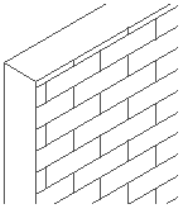
Use this procedure to specify the vertical and horizontal offset of a surface hatch.

An object must have a surface hatch material assigned to it in order to add an override to a surface hatch. A surface hatch on an object can come from an assigned material or from the display properties of the object or object style.

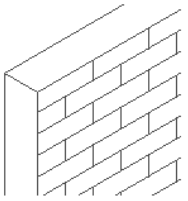
If a surface hatch comes from the display properties of the object instead of the material assignment, you cannot override it on individual faces. You receive an error message upon selecting the object face.

Changing the offsets of a surface hatch lets you adjust the hatch pattern on individual faces to align with the face edges or to improve the appearance of the hatch.

Specifying surface hatching offset and alignment



standard wall
surface hatch



wall surface
hatch offset
to align with
wall edge

1 Select the object for which you want to change the hatch pattern offset, right-click, and click Materials ➤ Add Surface Hatch Override.

2 Select the object face where you want to change the hatch pattern offset.

A profile surrounds the selected face.

3 Specify where the overrides applies:

If you want to . . .	Then . . .
override only the selected face of the object	select Only Selected <Direction> Face for Faces. For example, to apply a surface hatch override only to the selected Front face of a wall, select Only Selected Front Face.
override all faces of the object in the same view direction	select All <Direction> Faces for Faces. For example, to apply a surface hatch override to all Top faces of a selected column, select All Top Faces.

4 Specify the horizontal and vertical offsets of the surface hatch.

5 Click OK.

Editing Surface Hatch Overrides

Use this procedure to edit a surface hatch override that you applied to an object.

1. Select the object that has a surface override you want to change, right-click, and click Materials ➤ Edit Surface Hatch Overrides.
2. Select the profile of the face you want to edit.

   If you have multiple surface hatch overrides on one object face, ensure that you select the override you want to change.

3. Right-click, and click Edit Hatch Override.
4. Edit the surface hatch override:

If you want to . . .	Then . . .
hide a surface hatch	select Hide Surface Hatching.
re-display a hidden surface hatch	clear Hide Surface Hatching.
change the rotation of the surface hatch	enter a value for Rotation, or click and specify the rotation on the drawing screen.
change the offset of the surface hatch	enter a value for X Offset or Y Offset, or click and specify the offset on screen.

5. Click OK.
6. Select the profile, right-click, and select Save.

Displaying a List of Materials

Use this procedure to create a list of materials and their volumes for the objects that you select.

The list includes all materials used in the selected objects as well as the total volume of each material. You can use that information for preliminary cost estimates.

1. On the command line, enter **MaterialList**.
2. Select the objects you want to include in the list, and press ENTER.

3 Press F2.

The materials list is displayed in the AutoCAD® text window.

NOTE You can also select the list of materials, press CNTRL + C to copy it, and then press CNTRL + V to paste the materials list into Microsoft® Word.

Displaying a Material Query

Use this procedure to obtain volume information for a selected material.

The query results includes the total volume for all objects with a selected material. For example, if you have two brick walls within your selection set that each have a volume of 8.85 m3, the overall volume of brick objects is listed as 17.7 m3. You can use that information for preliminary cost estimates.

1 On the command line, enter **MaterialQuery**.

2 Select the objects you want to include in the query, and press ENTER.

3 Select the material you want to query.

For example, if you want to query for bricks, select Brick from the list.

4 Click OK.

All objects assigned the selected material are highlighted in the drawing.

5 Press F2.

6 The volume for the selected material is displayed in the AutoCAD® text window.

Creating and Editing Materials

Autodesk® Architectural Desktop provides a large number of predefined materials for all common design purposes so that you get an easy start with new drawings. You can use these predefined materials or modify them to your special designs. You can also create materials.

Each material has a set of display components that determine the appearance of objects to which a material has been assigned.

Material components correspond to groups of object display properties or to display property types. For example, the Linework component determines the appearance of linework components in 2D plan views. Surface Hatch determines the appearance of all hatching on objects in model views.

When you specify that an object display component is displayed by material, the component uses the display properties of the associated material component instead of the display properties of the object or object style.

Only object components that correspond to a physical component of the object can be assigned materials. For example, a door swing cannot have a material assignment because the swing is a symbolic graphic. The display properties of a door or door style determine the appearance of the door swing. The door frame, however, is a physical part of the door. It can be assigned a material in the door style or in individual doors.

How Materials are Used

A material can be assigned to multiple object components and multiple objects. For example, one glazing material might be used in door styles, window styles, door/window assembly styles, and curtain wall styles. The appearance of the component with the same material is the same, regardless of where it is used. If you edit a material definition, such as the color of the glazing, the change applies everywhere the material is assigned in the drawing.

Where you want a different appearance, you create a material definition for it and then assign the material where you want it used. For example, you might create one material for clear glass used in interior windows in an office building and another material for tinted glass used in exterior windows.

Naming Materials

When you select a material from the list, the materials are listed in alphabetical order. You may want to devise a naming convention for your materials that lets you locate them quickly when you assign materials to components. For example, you might create glazing materials named “glass.interior.clear,” “glass.exterior.tinted,” and “glass.exterior.clear.” These would appear in the following order in the materials list:

- glass.exterior.clear
- glass.exterior.tinted
- glass.interior.clear

Managing Material Styles

To create, edit, copy, or purge material styles, you access the Style Manager.

The Style Manager provides a central location in Autodesk® Architectural Desktop where you can work with styles from multiple drawings and

templates. For more information about using the Style Manager, see "Style Manager."

Related Topics and Procedures

- Creating a Material Definition
- Defining the Layer, Color and Linetype of a Material
- Specifying the Plan and Section Hatch Patterns of a Material
- Specifying the Surface Hatch Pattern of a Material
- Assigning Materials for Rendering
- Excluding a Material from 2D Section Shrinkwrap
- Attaching Notes and Files to a Material Definition

Creating a Material Definition

Use this procedure to create a material definition.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Multi-Purpose Objects, and expand Material Definitions.

3 Create a material definition:

If you want to . . .	Then . . .
create a new definition with default properties	right-click Material Definitions, and click New.
create a new definition from an existing definition	right-click the material definition you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new material definition, and press ENTER.

5 To edit the properties of your new definition right-click the definition, and click Edit:

If you want to . . .	Then . . .
enter a description of the material	click General. Enter a description of the material.
change the layer/color/ linetype properties	see "Defining the Layer, Color and Linetype of a Material" on page 520.

If you want to . . .	Then . . .
change the hatching patterns	see "Specifying the Plan and Section Hatch Patterns of a Material" on page 521.
assign surface hatching to individual object faces	see "Specifying the Surface Hatch Pattern of a Material" on page 523
assign surface and live section rendering materials	see "Assigning Materials for Rendering" on page 526.
exclude components from 2D shrinkwrap	see "Excluding a Material from 2D Section Shrinkwrap" on page 528
add notes, files, or documents to the definition	see "Attaching Notes and Files to a Material Definition" on page 530.

6 When you finish changing the material properties, click OK twice.

Defining the Layer, Color and Linetype of a Material

Use this procedure to define the layer, color, and linetype of the material components. For a detailed description of the individual material components, see "Material Components and Display Properties" on page 498.

NOTE If you turn off a display component in the material definition, all object components in the drawing that have that material assigned do not display in the drawing. For example, if you turn off the Linework component in a material, and assign that material to a door frame component, the door frame does not display in plan views.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Multi-Purpose Objects, and expand Material Definitions.

3 Select the material definition you want to change, right-click, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Object Override.

The display representation in bold is the current display representation.

6 If necessary, click

7 Click the Layer/Color/Linetype tab.

8 Select the component to change, and select a different setting for the property.

9 Click OK twice.

Specifying the Plan and Section Hatch Patterns of a Material

Use this procedure to change the patterns for the Plan, Hatch, and Section Hatch components of a material. For a detailed description of the individual hatch components, see "Material Components and Display Properties" on page 498.

For specifying a surface hatch pattern, see "Specifying the Surface Hatch Pattern of a Material" on page 523.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Multi-Purpose Objects, and expand Material Definitions.

3 Select the material definition you want to change, right-click, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Object Override.

The display representation in bold is the current display representation.

6 If necessary, click .

7 Click the Hatching tab.

8 Select Plan Hatch or Section Hatch, and click the setting for Pattern.

9 Select the hatching for the component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.

If you want to . . .	Then . . .
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

10 Click OK.

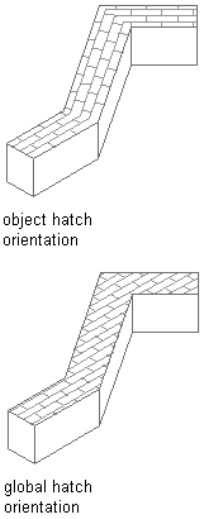
11 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

12 Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

Specifying surface hatching orientation

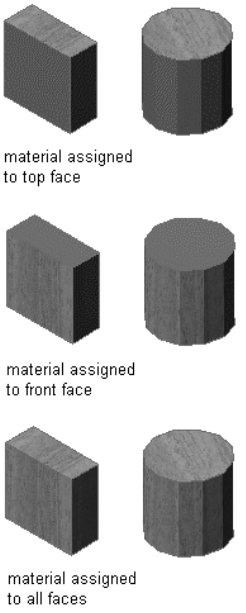


14 Click OK twice.

Specifying the Surface Hatch Pattern of a Material

Use this procedure to specify the pattern used for the surface hatch.

Specifying material assignment by object face



NOTE After you assign a material to an object, you can edit the surface hatches for the individual faces of the object. For information on editing surface hatches, see "Overriding the Surface Hatch on Individual Objects" on page 510.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Multi-Purpose Objects, and expand Material Definitions.
3. Select the material definition you want to change, right-click, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

6. If necessary, click .
7. Click the Hatching tab.

8 Select Surface Hatch, and click the setting for Pattern.

9 Select the hatching for the component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

10 Click OK.

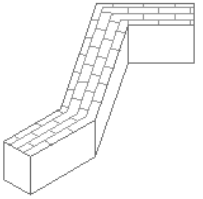
11 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

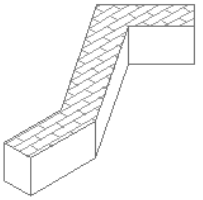
12 Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

Specifying surface hatch orientation





14 Click the Other tab.

15 For Surface Hatch Placement, select the object faces on which the surface hatching is displayed.

16 Click OK twice.

Assigning Materials for Rendering

Use this procedure to assign materials for rendering object surfaces.

In shaded view, rendered views, and when linking a drawing file to VIZ Render, objects may display rendering materials instead of the hatch patterns that are displayed in 2D wireframe and hidden line views. The following types of rendering materials are available:

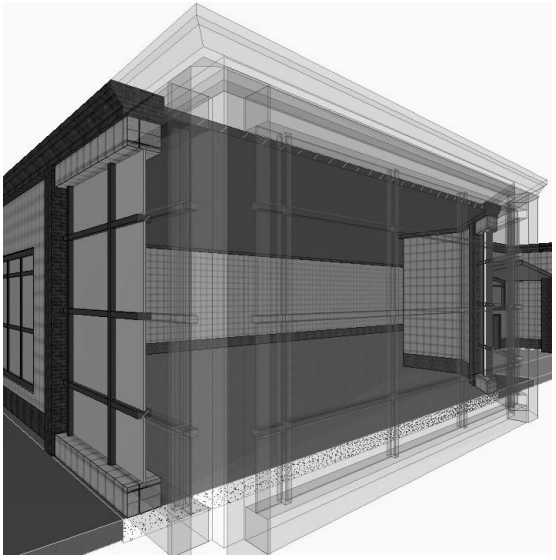
Render Material Type	Description
Surface Rendering Material	Any object face that has surface hatching applied displays the hatching in the AutoCAD® renderer or in VIZ Render
Live Section Rendering Material	All faces cut by a live section line display the live section rendering material when rendered with the AutoCAD® renderer or in VIZ Render

Render Material Type	Description
Live Section Sectioned Boundary Rendering Material	All objects and object parts outside of the live section line display the sectioned boundary material when rendered with the AutoCAD® renderer or in VIZ Render

You can assign rendering materials to two different component types:

- Object surfaces: All object surfaces that have a surface hatch applied to them can also have rendering materials assigned. If you want to assign rendering materials to an object surface, make sure that the Surface Hatch component in the material definition is turned on.
- Live section views: The Sectioned Body component of a live section view as well as the live section cut plane can have special rendering materials assigned. If you want to assign rendering materials to a live section view, make sure that the Sectioned Body component in the material definition is turned on.

Rendered live section view with transparent outside component



1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Multi-Purpose Objects, and expand Material Definitions.

3 Select the material definition you want to change, right-click, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Object Override.

The display representation in bold is the current display representation.

6 If necessary, click .

7 Click the Other tab.

8 Select rendering materials for the individual material components:

If you want to . . .	Then . . .
assign a rendering material to object surfaces	select a material for Render Material. Then, select a mapping type for Mapping: ■ If you select Same as Surface Hatch, only those surfaces which have been selected under Surface Hatch Placement are rendered. ■ If you select Face Mapping, all surfaces are rendered and any hatch alignment overrides are ignored.
assign a rendering material to the cut plane of a live section view	select a material for Cut Surface Render Material.
assign a rendering material to the body component outside the live section line	select a material for Sectioned Body Render Material.

If you don't find the right rendering material or want to see a preview of the material, click the Browse button and browse for the desired material.

9 Select a new rendering material, if necessary.

10 Click OK twice.

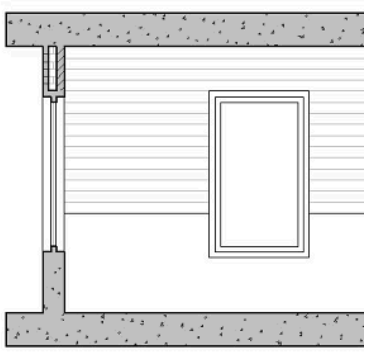
Excluding a Material from 2D Section Shrinkwrap

Use this procedure to exclude object components with a specific material assigned from the shrinkwrap of a 2D section.

When you create a 2D section, you can display a section component named Shrinkwrap. The shrinkwrap is the union of all object faces cut by the section line, merged into one component with one hatch pattern. This is a frequently used view of a 2D section.

By default, all components that are assigned materials are included in the shrinkwrap. However, you may want to exclude certain materials, such as glass, from the shrinkwrap.

2D Section Shrinkwrap with glass excluded from shrinkwrap (left)



1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Multi-Purpose Objects, and expand Material Definitions.
3. Select the material definition you want to change, right-click, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.

   The display representation in bold is the current display representation.

6. If necessary, click .
7. Click the Other tab.
8. Select Exclude from 2D Section Shrinkwrap.
9. Click OK twice.

Attaching Notes and Files to a Material Definition

Use this procedure to enter notes and attach reference files to a material definition. You can also edit notes and edit or detach reference files from a material definition.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Multi-Purpose Objects, and expand Material Definitions.
3. Select the material definition you want to change, right-click, and click Edit.
4. Click the General tab.
5. To add a description to the material definition enter it for Description.
6. Click Notes.
7. To add a note, click the Text Notes tab, and enter the note.
8. Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9. Click OK twice.

Style Manager

9

The Style Manager is a utility that provides a central location in Autodesk® Architectural Desktop where you can view and work with styles in drawings or from intranet sites.

Styles

Styles are sets of parameters that you can assign to objects in Autodesk Architectural Desktop to determine their appearance or function. For example, a door style determines what door type, such as single or double, bi-fold or hinged, a door in a drawing represents. The door style also determines the shape of the door, such as rectangular or arched, default frame dimensions, standard sizes, and display properties.

You assign a style to all instances of an object that you want to have the same characteristics. For example, you can assign one door style to all office doors in an office building and another door style to all fire doors in the building.

Objects in the software that use styles include two-dimensional (2D) sections and elevations, AEC Polygons, curtain walls, curtain wall units, doors, endcaps, mass elements, openings, railings, roof slab edges, roof slabs, schedule tables, slab edges, slabs, spaces, stairs, structural members, wall modifiers, walls, window assemblies, and windows.

Using the Style Manager, you can also manage layer key styles, schedule data formats, and cleanup group, mask block, multi-view block, profile, and property set definitions.

In this chapter

- Getting Started with the Style Manager
- Creating a Style
- Creating a Tool from a Style
- Renaming a Style
- Copying Styles between Drawings
- Sending Styles to Other Users
- Purging Styles

NOTE To view layer key styles in the Style Manager, run a Layer Management command (Layer Manager, Layer Key Styles, or Layer Key Overrides) before you display the Style Manager.

Using the Style Manager

The Style Manager allows you to readily create, customize, and share styles with other users. In the Style Manager, you can perform the following tasks:

- Access styles from open drawings and intranet sites
- Drag styles onto a palette to create tools
- Quickly set up new drawings and templates by copying styles from other drawings or templates
- Sort and view the styles in your drawings and templates by drawing or by style type
- Preview an object with a selected style
- Create and edit styles
- Delete unused styles from drawings and templates
- Send styles to other Autodesk Architectural Desktop users by email

Standard and Predefined Styles

Most of the objects in Autodesk Architectural Desktop have a default Standard style. Catalogs provided with the software contain additional predefined styles that you can copy to tool palettes to use in your drawings.

You can also access the styles for bar joists, curtain walls, doors, members, railings, roof slabs, slabs, spaces, stairs, walls, and windows, and property set definitions and schedule tables from drawings located in the *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial or Metric* folder. If you are running Windows NT®, these drawings are located in the *\winnt\Profiles\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\Styles\Imperial or Metric* folder.

Creating Tools from Styles

You can create object tools by dragging a style from the Style Manager to a tool palette. When you drag a style onto a tool palette to create a tool, a reference is created that associates the tool to the style. The reference location can be the current drawing, another drawing, or a remote location. If you edit the style in the Style Manager the tool automatically uses the updated style.

If an existing tool references a style from another drawing, the style is not added to the current drawing until you add an object of that style to the

drawing. The reference location is only used if the current drawing has been saved.

Upgrading from a Previous Release
If you are upgrading from Release 1 or Release 2 of Autodesk Architectural Desktop, the Style Manager replaces the Style dialog box used for creating, copying, editing, purging, importing, and exporting styles.

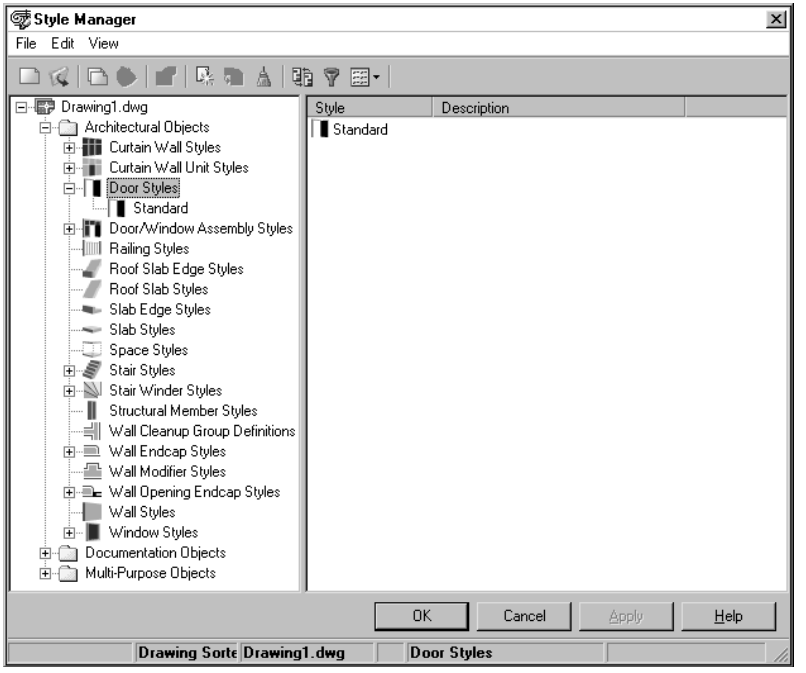
Related Procedures

- Getting Started with the Style Manager
- Creating a Style
- Creating a Tool from a Style
- Renaming a Style
- Copying Styles between Drawings
- Sending Styles to Other Users
- Purging Styles

Getting Started with the Style Manager

When you open the Style Manager, all the style information from all open drawings and templates is displayed. The Style Manager is split into two resizable panes and has a menu bar, a toolbar, and a status bar.

The Style Manager



Left Pane of the Style Manager

The left pane of the Style Manager organizes the styles in all open drawings and templates in a hierarchical tree view that you can navigate by expanding and collapsing the different levels in the tree. You can sort styles in the tree view by the drawing that contains them or by style type. The tree view is always displayed in the left pane, regardless of how you sort the styles.

Styles are organized into three categories: Architectural Objects, such as Door Styles; Documentation Objects, such as Schedule Table Styles; and Multi-Purpose Objects, such as Layer Key Styles. Within each category, styles are listed alphabetically.

Right Pane of the Style Manager

The right pane of the Style Manager displays different style information depending on what you select in the tree view in the left pane. You can preview how an object is displayed with a style, view style descriptions, view drawing information, and view the distribution of styles of a selected type across multiple drawings and templates.

Style Manager Menu Bar and Toolbar
The top of the Style Manager includes a menu bar and a toolbar that enable you to quickly access the menu commands. If you position your mouse over a toolbar icon, a tooltip identifies the icon.

Status bar
The status bar at the bottom of the Style Manager indicates how the styles are sorted in the tree view. The status bar also lists the drawing and style type or style currently selected.

Related Procedures

- Opening the Style Manager
- Sorting Styles in the Style Manager
- Viewing Styles in the Style Manager
- Viewing Styles Across Multiple Drawings
- Working with Drawings and Templates in the Style Manager

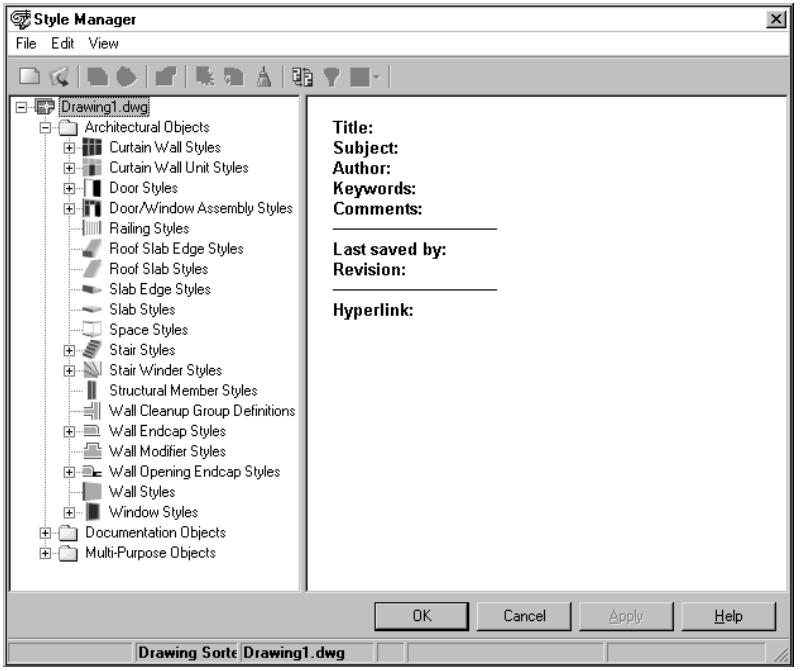
Opening the Style Manager

Use this procedure to open the Style Manager. You also access the Style Manager when you right-click object tools on the tool palettes.

When you open the Style Manager, all drawings and templates that are open in the current session are displayed in the tree view of the Style Manager.

1 On the Format menu, click Style Manager.

Opening the Style Manager



NOTE If drawings or templates are read-only, their read-only status is indicated by a lock on the folder next to the drawing in the tree view and also by a lock icon on the status bar.

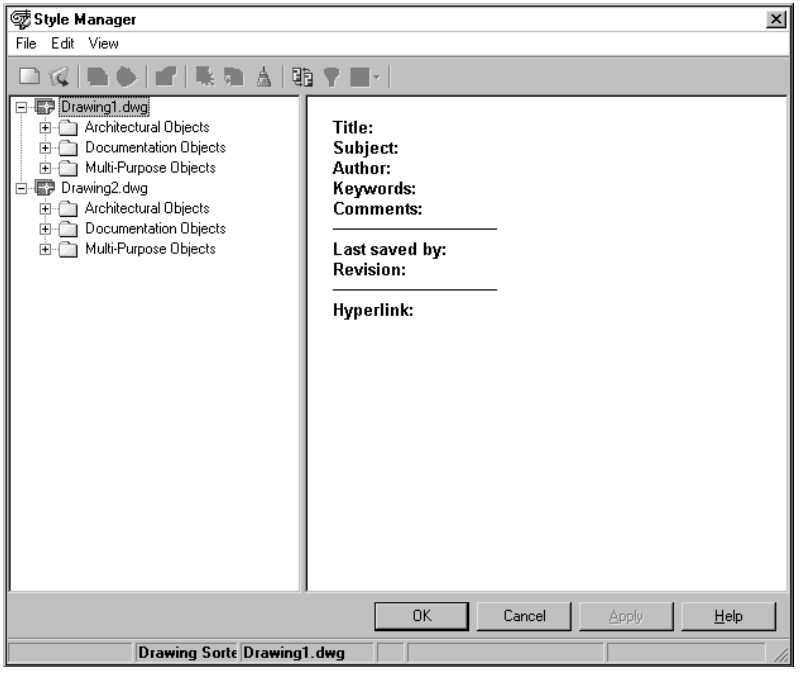
2 Move and resize the Style Manager, or resize the left and right panes as needed to view style information.

Sorting Styles in the Style Manager

Use this procedure to sort information in the Style Manager by drawing and by style. When you open the Style Manager, the names of open drawings and templates are displayed in the tree view in the left pane.

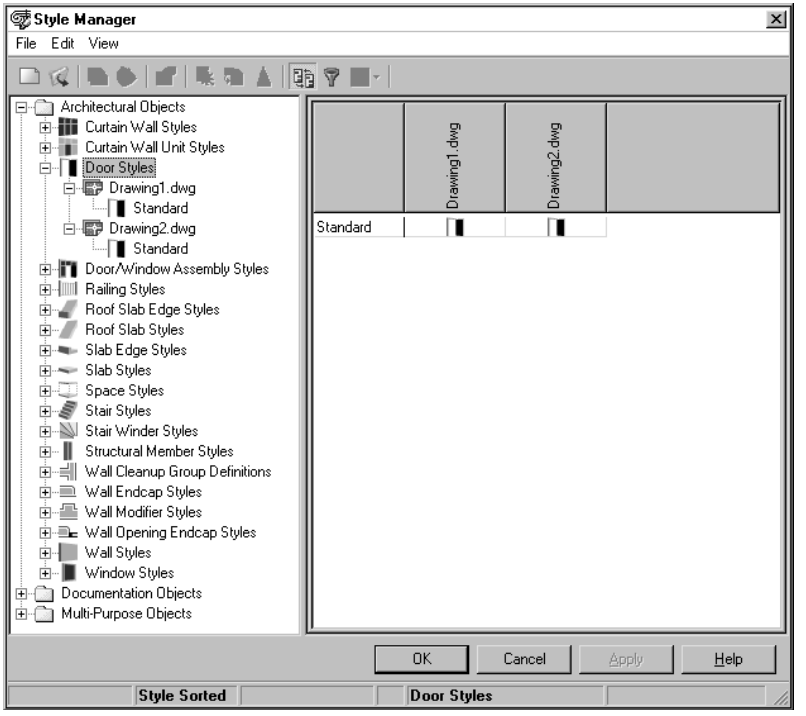
When you expand a drawing in the tree view, the individual styles within the drawing are grouped into three categories: Architectural Objects, Documentation Objects, and Multi-Purpose Objects. If you expand a category, the individual styles are listed alphabetically by style type.

Sorting styles by drawing in the Style Manager



To readily see the styles that are available in each drawing for a particular style type, such as door styles, you can sort the styles by style type. In style sorted view, styles are grouped by category, and organized by style type and then by drawing.

Sorting styles by style type



The status bar at the bottom of the Style Manager indicates whether the styles are sorted by drawing or by style type.

1. On the Format menu, click Style Manager.

   By default, styles are sorted by drawing.

2. On the View menu, click Explore ➤ By Style.
3. Expand a category, a style type, and then a drawing to view the styles available in each drawing.
4. In the toolbar, click to restore the by-drawing sort order.
5. Click again to sort the styles by style type.

Viewing Styles in the Style Manager

Use this procedure to preview how objects appear in selected styles and to view style descriptions. You can also filter styles to view only the styles of a selected type, such as wall styles.

NOTE Certain structural member styles do not display properly in the Style Manager Viewer or the Floating Viewer. This is because the "sample" member that displays in the viewer is a single segment that is relatively short. If a structural member style uses large start and end offsets (such as some of the Bar Joist sample styles) or requires multiple segments (such as a bent member), the viewer displays a defect marker. If properly defined, the member displays correctly when added to the drawing.

1. In the Style Manager, expand the category and the style type that you want to view.
2. Select a style.
3. In the right pane, click the Viewer tab.

   The object is displayed in the viewer with the characteristics of the selected style. Use the viewer control to see the object from different view directions and in wireframe, hidden, and shaded views.
4. Click the List tab to view information about the style.

   The style description is generated by the AutoCAD® LIST command.
5. To view only the styles of one style type, select a style type, and in the toolbar, click .

   Only the styles of the selected type, such as wall styles, are displayed in the Style Manager.
6. Click again to display all styles.

Viewing Styles Across Multiple Drawings

Use this procedure to display a chart view of the styles of a single style type distributed across the drawings open in the Style Manager. In the chart, you can see the styles used in more than one drawing and the styles used only in a single drawing.

1. In the Style Manager, sort the styles by style type.

2. In the tree view, click the style type with the styles that you want to view across the drawings.

   In the right pane, a matrix lists the styles of the selected style type that are available in each drawing.

3. In the left pane, select a style.
4. In the right pane, click the Viewer tab.

   The object is displayed in the viewer with the characteristics of the selected style. Use the viewer control to see the object from different view directions, and in wireframe, hidden, and shaded views.

5. Click the List tab to view information about the style.

   The style description is generated by the AutoCAD® LIST command.

6. To view only the styles of one style type, select a style type, and in the toolbar, click .

   Only the styles of the selected type, such as wall styles, are displayed in the Style Manager.

7. Click again to display all styles.

Working with Drawings and Templates in the Style Manager

When you first open the Style Manager, any drawings or templates that are open in Autodesk® Architectural Desktop are displayed in the tree view. You can open other drawings or templates and create new drawings or templates within the Style Manager.

Opening drawings in the Style Manager

When you create a new drawing or template, or open an existing drawing or template within the Style Manager, the drawing or template is open for use within the Style Manager only, not in your drawing session. You can open the drawing in the software after you exit the Style Manager.

Determining the status of a drawing

You can identify whether a drawing or template is open in the software or open only within the Style Manager. The icon next to the drawing or template in the tree view indicates its status in the Style Manager:

Drawing icon	Drawing status
	Drawing is open in the software and in the Style Manager
	Drawing is open only in the Style Manager
	Drawing is locked

A drawing may be locked in the Style Manager for the following reasons:

- The drawing is read-only.
- The drawing was created in a previous version of the software.
- The drawing is xrefed into a drawing that is currently open.
- The drawing is open in another application (for example, Volo View).
- The drawing file is locked on a network.

Hold the cursor over Lock in the status bar to view the reason for the lock in a tooltip.

TIP You can save your styles in a read-only source drawing and copy them to other drawings as necessary.

Closing drawings in the Style Manager

Any drawings and templates that you create or open in the Style Manager are displayed every time you open the Style Manager until you close them from within the Style Manager.

Related Procedures

- Starting a New Drawing or Template in the Style Manager
- Opening a Drawing or Template in the Style Manager
- Dragging a Drawing into the Style Manager
- Closing Drawings and Templates in the Style Manager

Starting a New Drawing or Template in the Style Manager

Use this procedure to start a new drawing or template in the Style Manager. The new drawing or template does not contain any styles and is open for use in the Style Manager only. It is not open in the Autodesk Architectural Desktop session. You can open the drawing in the software after you exit the Style Manager.

1. On the Format menu, click Style Manager.
2. In the Style Manager, click File ➤ New Drawing, or in the Style Manager toolbar, click .
3. Under File Name, enter the new drawing name.
4. Under Save as Type, select Drawing (*.dwg)* to create a drawing, or select Drawing Template File (*.dwt*) to create a template.
5. Click Save.
6. Click OK.

Opening a Drawing or Template in the Style Manager

Use this procedure to open a drawing or template in the Style Manager. The drawing or template is open within the Style Manager only. It is not open in the Autodesk Architectural Desktop session. You can open the drawing in the software after you exit the Style Manager.

If you open an Autodesk Architectural Desktop Release 1 or 2 drawing in the Style Manager, the drawing is opened as a read-only drawing.

1. On the Format menu, click Style Manager.
2. In the Style Manager, click File ➤ Open Drawing, or in the Style Manager toolbar, click .
3. Select one or more files, and click Open.
4. Click OK.

Dragging a Drawing into the Style Manager

Use this procedure to open a drawing or template in the Style Manager by dragging it from Microsoft®Windows®Explorer. The drawing or template is open within the Style Manager only. It is not open in the Autodesk Architectural Desktop session. You can open the drawing in the software after you exit the Style Manager.

1. In the Style Manager, sort the styles by drawing.
2. Start Microsoft Windows Explorer.

3 In Windows Explorer, select the drawing or template that you want to open in the Style Manager.

4 Drag the drawing into the tree view in the Style Manager.

5 Click OK.

Closing Drawings and Templates in the Style Manager

Use this procedure to close the drawings and templates open only in the Style Manager. You cannot close drawings in the Style Manager that are open in the Autodesk Architectural Desktop session.

1 In the Style Manager, sort the styles by drawing.

2 Select the drawing or template that you want to close.

3 In the Style Manager, click File ➤ Close.

4 Click OK.

Creating a Style

Use this procedure to create a style. You can create a style using default style properties or by copying a style. After you create the style, you can edit the style properties to customize the characteristics of the style.

A style is not stored in the drawing until you exit the Style Manager. A style is saved in a drawing when you save the drawing.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand a category and then expand the style type for which you want to create a style.

3 Create a style:

If you want to . . .	Then . . .
create a style with default properties	right-click the style type, and click New.
create a style from an existing style	right-click the style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new style, and press ENTER.

5 To edit the new style, right-click the style, and click Edit.

   For more information about creating a specific objects style or definition, see the style or definition topics associated with the object.

6 When you finish specifying the properties of the style, click OK twice.

After you have created a style, you can drag the style onto a tool palette to create a tool. For more information, see "Creating a Tool from a Style" on page 544.

Creating a Tool from a Style

Use this procedure to create a tool from a style. You can create tools from the following styles and definitions: AEC Polygon, area group, area, curtain wall, curtain wall unit, door, door/window assembly, mask block, mass elements, multi-view block, railing, room object, roof slab, schedule table, slab, space, stair, structural member, wall, and window.

For detailed information about creating and customizing tools, see the appropriate topic in the Help for each object.

1 Open the tool palette where you want to create a tool.
2 On the Format menu, click Style Manager.
3 Locate the style you want to copy, and drag it to the tool palette.

   The default tool name is the name of the referenced style.

   The image that identifies the new tool uses the view direction last used in the property palette for the selected object type.

4 Click OK.

Renaming a Style

Use this procedure to rename a style.

1 In the Style Manager, right-click the style you want to rename, and click Rename.
2 Enter a new name for the style, and press ENTER.
3 Click OK.

Copying Styles between Drawings

Use this procedure to copy styles or definitions from the current drawing to another drawing. You can copy styles and definitions between existing drawings. You can also copy them from an existing drawing to a new drawing.

If a style references other styles, those other styles are also copied to the other drawing. For example, if you copy a wall style into a new drawing, the wall endcap style used in the wall style is also copied to the new drawing.

NOTE You can also drag and drop styles and style types to copy them between drawings.

1 On the Format menu, click Style Manager.

The Style Manager is displayed, with the current drawing expanded in the tree view. Any drawings open in the current session are also shown in the tree view.

2 In the Style Manager, open the drawing where you want to copy the style, if necessary:

If you want to . . .	Then . . .
copy the style to a drawing that is not open in the Style Manager	in the Style Manager, click File ➤ Open, select the drawing you want, and click Open.
copy the style to a new drawing	in the Style Manager, click File ➤ New drawing, enter a name for the drawing, and click Save.

3 Expand a category, and expand a style type.

4 Select the styles or definitions that you want to copy:

If you want to . . .	Then . . .
copy an individual style or definition	right-click the style or definition, and click Copy.
copy all styles or definitions of a selected type, such as all wall styles	right-click the style or definition type, and click Copy. If your styles are sorted by style type, right-click the drawing name under the selected style or definition type, and click Copy.

5 Right-click the drawing where you want to copy the style(s), and click Paste.

The styles or definitions are copied into the selected drawing. If the drawing already contains a style with the same name, the duplicate name is displayed in the Import/Export - Duplicate Names Found dialog box.

6 Resolve duplicate style names, if prompted:

If you want to . . .	Then . . .
prevent the Style Manager from overwriting the existing style with the new style of the same name	select Leave Existing, and click OK.
replace the existing style with the new style	select Overwrite Existing, and click OK.
keep the existing style and add the new style with a different name	select Rename to Unique, and click OK. The Style Manager appends a number to the name of the new style. Right-click a style, and click Rename to change a style name.

7 Click OK.

Sending Styles to Other Users

Use this procedure to e-mail styles or definitions to other users of Autodesk® Architectural Desktop. The software creates a new drawing that contains only the style information from the current drawing and attaches the drawing to an e-mail message. If e-mail is not available on your system, the Send option is not available.

1 On the Format menu, click Style Manager.

2 Expand a category.

3 Select the styles or definitions you want to send:

If you want to . . .	Then . . .
send an individual style or definition	right-click the style or definition, and click Send.

If you want to . . .	Then . . .
send all styles or definitions of a selected type, such as all wall styles	right-click the style or definition type, and click Send. If your styles are sorted by style type, right-click the drawing name under the selected style or definition type, and click Send.
send all styles or definitions in the drawing (styles must be sorted by drawing)	right-click the drawing name, and click Send.

A new e-mail message with the subject "ADT Styles" is created using your e-mail program. A drawing file containing the styles and definitions you selected is added to the message as a file attachment.

4 Complete and send the message in your e-mail program.

5 Click OK.

Purging Styles

Use this procedure to remove unused styles and definitions from a drawing. You can purge any styles that are not applied to an object in the drawing and that are not used in another style. You can purge a single unused style or definition. You can also purge all unused styles or definitions of a selected type. For example, you can purge all unused wall styles.

If a style references other styles or definitions, these are not purged when you purge the style that uses them. For example, if you purge a wall style, the wall endcap style and cleanup group definition used in the wall style are not purged.

1 On the Format menu, click Style Manager.

The Style Manager is displayed, with the current drawing expanded in the tree view.

NOTE You can also purge a selected style or style type by pressing DELETE.

2 Expand a category, and expand a style type.

3 Purge styles or definitions:

If you want to . . .	Then . . .
purge one unused style or definition	right-click the style or definition you want to remove, and click Purge.
purge all unused styles or definitions of a selected type	right-click the style or definition type, and click Purge. When prompted, verify that the styles you want to purge are selected, and click OK.

If a style or definition you selected to purge remains in the list after purging, the style or definition is currently applied to an object or is used in another style. For example, you cannot purge a wall endcap style that is used in a wall style or that is applied to an individual wall.

4 Click OK.

Creating and Saving Drawings

10

Whether or not you work in a project environment, new Autodesk ®Architectural Desktop drawings have some common properties that you can specify when you create a drawing:

You can specify the template on which to base the drawing, or create a drawing that is not based on any template.

You can specify units, scale, layer standard and layer key style, and default display properties.

You can specify options that control drawing performance and behavior.

You also have a number of options for saving files for use with other applications, including AutoCAD®(without Autodesk Architectural Desktop). These options are useful if you work with vendors and consultants who do not use Autodesk Architectural Desktop.

Related Topics and Procedures

- About Templates
- Creating a Drawing from a Template
- Creating a Drawing from Scratch
- Opening Legacy Drawings
- Setting up a Drawing
- Specifying AEC Options
- Sharing Drawings with Other Users
- Publishing Drawings to Architectural Studio

In this chapter

- Publishing Drawings to Architectural Studio
- About Templates
- Creating a Drawing from a Template
- Creating a Drawing from Scratch
- Opening Legacy Drawings
- Setting up a Drawing
- Specifying AEC Options
- Sharing Drawings with Other Users

About Templates

The templates included in Autodesk®Architectural Desktop are drawing files with predefined settings that you use to create new drawings with the same settings. Templates have drawing units, drawing scales, and annotation plot sizes, that you would use in a typical project. Templates also contain a basic set of display configurations specific to working with architectural objects. You can get started on a project immediately by using one of the templates that are installed with Autodesk Architectural Desktop.

NOTE Tool catalogs and tool palettes provided with the software contain tools with sample object styles that you can add to drawings. Earlier version of the software stored this information in templates.

Architectural Desktop templates are installed by default in the folder, *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop\R16.0\enu\Template*.

Templates contain layout tabs with predefined display configurations applied to viewports. You can use display configurations and viewports in the templates, or you can modify the display settings to suit your own office standards. The display system in Autodesk Architectural Desktop controls how objects are displayed. By specifying objects you want to display in a viewport and a view direction, you can produce different architectural displays, such as floor plans, reflected plans, elevations, 3D models, or schematic displays. For more information, see "Display System" on page 435.

If you are a new user of Autodesk Architectural Desktop, it is recommended that you use a template to create your drawings until you are more familiar with the program.

You can also create templates by importing settings from a template into the current drawing, and then saving the current drawing as a template. For example, you can import the display configurations from the Autodesk Architectural Desktop template into another drawing. For more information about creating your own template, see "Use a Template File to Start a Drawing" in the *AutoCAD 2004 User's Guide*. For more information about importing display settings to a custom template, see "Importing a Display Set" on page 480 and "Importing a Display Configuration" on page 478.

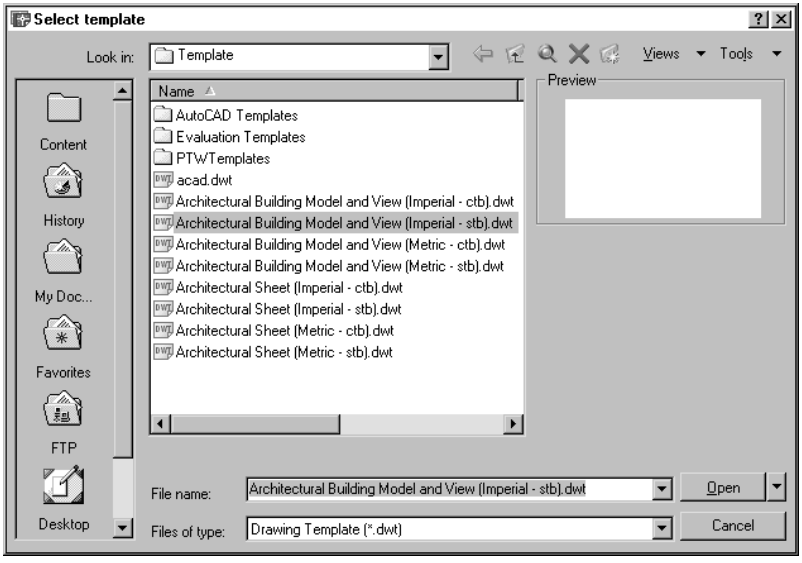
Creating a Drawing from a Template

Use this procedure to create a drawing from an Autodesk Architectural Desktop®template. The default drawing templates provided with the software are located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop\R16.0\enu\Template*. Template files use the .dwt extension.

NOTE To create a drawing that you want to include in a project, see "Process Overview: Working in a Project Environment" on page 221.

1. On the File menu, click New.
2. Select the template you want to use, or click Tools ➤ Find, and navigate to the template you want to use.

   Selecting a template in the Select template dialog box



3. Click Open.

   To view or change the default drawing settings for units, scale, layers, and display, see "Setting up a Drawing" on page 553.

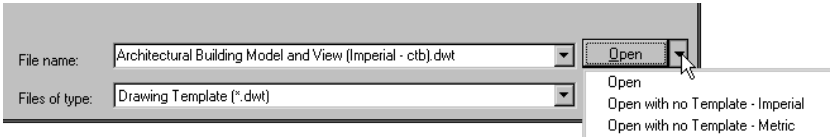
Creating a Drawing from Scratch

Use this procedure to create a drawing that is not based on a template. Drawings that are not based on templates contain no customized or predefined settings, such as display configurations and layout tabs with viewports. Drawings from scratch use the default settings specified in the Drawing Setup dialog box.

If you are a new user of Autodesk Architectural Desktop, use a template when you want to create drawings until you are comfortable working with layout tabs and display configurations. After you are more familiar with the program, you can create templates and customize your drawing settings by starting from scratch. For more information, see "Creating a Drawing from a Template" on page 551.

NOTE To create a drawing that you want to include in a project, see "Process Overview: Working in a Project Environment" on page 221.

1. On the File menu, click New.
2. Click the arrow next to Open.



3. Select Open with no Template–Imperial to begin a drawing in imperial units, or select Open with no Template–Metric to begin a drawing in metric units.

   For more information, see "Setting up a Drawing" on page 553.

Opening Legacy Drawings

Keep the following points in mind when you open drawings from earlier releases of Autodesk® Architectural Desktop:

- To upgrade a drawing from an earlier release to the current release, open the legacy drawing and then save the drawing. If the drawing references other legacy drawings, open and save these xref drawings to upgrade them to the current release.

- Release 2 drawings are always fully opened; the partial open option is not available.
- If you try to refedit a legacy drawing, a message is displayed stating that you need to update your previous drawings to the current release. It is recommended that you use the same version for your xref and host drawings.
- If you open a legacy drawing in the Style Manager, that drawing is marked as read-only, and you can to copy styles from that drawing to other drawings but you cannot copy styles to the legacy drawing.
- Open and save a legacy drawing in the current version if you want to be able to edit them in DesignCenter.

Setting up a Drawing

When you create a drawing from an Autodesk®Architectural Desktop template, the drawing setup options are predefined. You can use the predefined settings or customize them as needed. For example, you may want to use different drawing scales in individual drawings.

When you create a drawing from scratch (that is, without an Autodesk Architectural Desktop template), you specify settings for the drawing, such as layer standards and layer key styles to import to the drawing. For more information, see "Creating a Drawing from Scratch" on page 552

You can save the drawing units, drawing scale, and layer options as the default settings for any drawing that you start from scratch or from a template.

If you are unfamiliar with the display system and layer management in Autodesk Architectural Desktop, review "Display System" on page 435 and "Managing Drawing Layers" on page 388before specifying the layering and display options.

In Autodesk Architectural Desktop, the LAYER and UNITS commands are as follows:

- Entering LAYER at the command line displays the Layer Manager for Autodesk Architectural Desktop.
- Entering UNITS at the command line displays the Units tab of the Drawing Setup dialog box.

Related Procedures

- Specifying the Drawing Units
- Specifying the Drawing Scale

- Specifying a Layer Standard and a Layer Key Style
- Specifying the Default Display Representations of AEC Objects

Specifying the Drawing Units

Use this procedure to specify the drawing units in a new or existing drawing. If you change the drawing units, you can specify whether existing objects in the drawing are scaled to the new units or retain their original scale. You can also specify whether you want to scale objects inserted from a drawing with different units to the units in the current drawing or at their original scale.

You can also specify the unit type and precision for linear, angular, area, and volume units. The precision values specify only the number of decimal places displayed in Autodesk®Architectural Desktop. They do not determine the number of decimal places used to make calculations.

When you change the drawing units, the default options under Area and Volume change to reflect the new drawing units. The drawing scale options on the Scale tab also change to reflect the new drawing units.

1. In the drawing status area, click .
2. Click Drawing Setup.
3. Click the Units tab.
4. Specify the drawing units.

   The units that you select determine the unit of measurement that each unit in your drawing represents. For example, if you select Inches, each drawing unit equals one inch.
5. To scale objects that you insert into the current drawing from other drawings with different drawing scales, select Scale Objects Inserted from Other Drawings.

   Clear this option to insert objects at their original scale.
6. Under Length, select a unit type and precision.
7. Under Angle, select an angle type and precision.

   If you want to measure angles clockwise instead of counterclockwise, select Clockwise.
8. Under Area, select an area type and precision.

   If you do not want to use the default suffix that is displayed for the drawing units that you specify, enter a new suffix.
9. Under Volume, select a volume type and precision.

If you do not want to use the default suffix that is displayed for the drawing units that you specify, enter a new suffix.

10 Save the units settings:

If you want to . . .	Then . . .
save the units settings as the default settings for new drawings that you start from scratch or from templates that do not contain drawing setup information	select Save as Default. Settings on the Scale and Layering tabs are also saved as default settings.
save the units settings only for the current drawing	clear Save as Default.

NOTE You can save both default imperial and metric drawing unit and scale settings with the Save As Default option. When you start a drawing from scratch, specify English or Metric default settings in the Create a New Drawing dialog box to use either the imperial or metric settings that you saved as the default settings.

11 Click OK.

You are prompted to specify whether existing objects in the current drawing should be scaled for the new units.

12 Specify scaling of existing objects for Model Space and Paper Space:

If you want to . . .	Then . . .
scale existing objects in Model Space	select Scale Model-Space Objects in Current Drawing to Reflect New Units.
leave objects in Model Space at their current size	clear Scale Model-Space Objects in Current Drawing to Reflect New Units.
scale existing objects in Paper Space	select Scale Paper-Space Objects in Current Drawing to Reflect New Units.
leave objects in Paper Space at their current scale	clear Scale Paper-Space Objects in Current Drawing to Reflect New Units.

13 Click OK.

Specifying the Drawing Scale

Use this procedure to specify the drawing scale and the plot size of annotations model space. Annotation plot size, multiplied by the drawing scale factor, determines the height of plotted annotation text. Scale-dependent objects in an Autodesk® Architectural Desktop drawing are automatically scaled to reflect the units that are specified in a drawing. Any styles that you create in metric or imperial units are scaled appropriately.

1 In the drawing status area, click .

2 Click Drawing Setup.

3 Click the Scale tab.

4 Under Drawing Scale, select the drawing scale that you want to use.

If you do not see the scale that you want to use, select Other and enter a drawing scale factor for Custom Scales.

NOTE The scale values in the Drawing Scale list reflect the current drawing units. To change the drawing units, see "Specifying the Drawing Units" on page 554.

5 Enter a value for Annotation Plot Size.

6 Save the scale settings:

If you want to . . .	Then . . .
save the scale settings as the default settings for new drawings that you start from scratch or from templates that do not contain drawing setup information	select Save as Default. Settings on the Units and Layering tabs are also saved as default settings.
save the scale settings only for the current drawing	clear Save as Default.

7 Click OK.

If you also changed the drawing units, you are prompted to specify whether existing objects in the current drawing should be scaled for the

new units. For more information, see "Specifying the Drawing Units" on page 554.

Specifying a Layer Standard and a Layer Key Style

Use this procedure to specify the layer standard and layer key style to determine the layers that objects are placed on in a drawing. You can specify the layer key style to use in the current drawing. You can also specify a layer standard and a layer key style to be imported when you set up a new drawing.

Autodesk® Architectural Desktop includes the a number of layer standards and layer key styles in *AecLayerStd.dwg* located in *Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop\R16.0\enu\Layers*.

If your drawing is based on an Autodesk Architectural Desktop template, *AecLayerStd.dwg* (located in the Layers folder mentioned above) is loaded. This file contains layer standards and layer key styles.

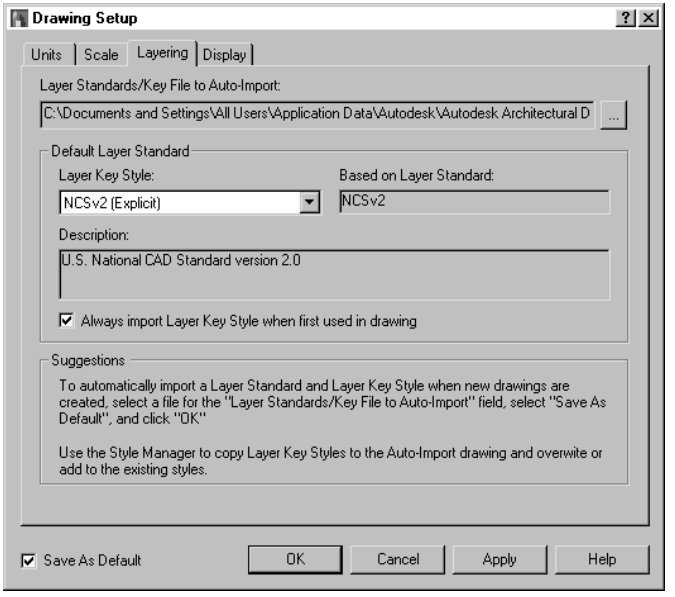
NOTE If you are unfamiliar with layer keying in Autodesk Architectural Desktop, review the overview of layer keying before specifying layering options. See "Working with Layer Keys" on page 408 .

If you want to use LY files from AutoCAD® Architectural Desktop Release 1, you can create a layer key style from an LY file. For more information, see "Creating a Layer Key Style from an LY File" on page 415.

1. In the drawing status area, click .
2. Click Drawing Setup.
3. Click the Layering tab.
4. Under Layer Standards/Key File to Auto-Import, click the [...] button.
5. Navigate to a drawing that contains the layer standard and layer key styles you want to import, and click Open.
6. Under Default Layer Standard, select the layer key style that you want to use in your drawing.
7. To import the layer key style from the layer standard you specified, select Always import Layer Key Style when first used in drawing.

   Selecting this option has the affect of checking the current drawing to see if the selected layer key style exists. If it does exist, the date and time stored on it is checked and compared with the external file. If the external layer key style drawing is newer, then it re-imports the layer key style and standard.

Specifying layering options for the current drawing and new drawings



IMPORTANT If you select Save as Default, the layer key style you select is the default layer key style for all new drawings, even if the drawings are based on templates that have a different default layer key standard.

8 Save the layer settings:

If you want to . . .	Then . . .
save the layers settings as the default settings for all new drawings	select Save as Default. Settings on the Units and Scale tabs are also saved as default settings.
save the layer settings only for the current drawing	clear Save as Default.

9 Click OK.

If you also changed the drawing units, you are prompted to specify whether existing objects in the current drawing should be scaled for the new units. For more information, see “Specifying the Drawing Units” on page 554.

Specifying the Default Display Representations of AEC Objects

Use this procedure to specify the default display representations of AEC objects. You can also specify the default display configuration for the Model tab and new viewports. In addition, you can specify whether the drawing uses its own display configurations or those of a host drawing when the drawing is referenced as an overlay xref in a host drawing.

You may find it easier to select and modify display representations using the Display Manager. The Display Manager is a utility that lets you manage default display information in your drawings. For more information about the display system, see "Display System" on page 435. For more information about usingt the Display Manager, see "The Display Manager" on page 449.

NOTE Changes you make on the Display tab apply only to the current drawing. New drawings are not affected.

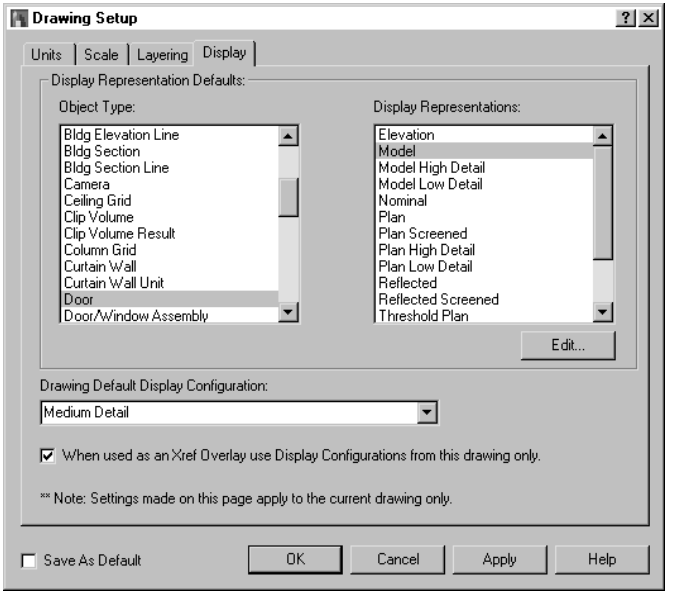
---

1. In the drawing status area, click .
2. Click Drawing Setup.
3. Click the Display tab.
4. To change the display representation for an object, select the object, and then select the display representation you want to use.
5. Select a display configuration for Default Display Configuration.

   The display configuration is applied to the Model tab and new viewports.
6. To use the display configurations in the current drawing when the drawing is referenced as an overlay xref in a host drawing, select When used as an Xref Overlay use Display Configurations from this drawing only.

   Clear this option if you want objects in the current drawing to use the display configurations of the host drawing when the current drawing is an overlay xref.

Specifying default display options for the current drawing



7 Click OK.

If you also changed the drawing units, you are prompted to specify whether existing objects in the current drawing should be scaled for the new units. For more information, see "Specifying the Drawing Units" on page 554.

Specifying AEC Options

Autodesk®Architectural Desktop adds several tabs to the AutoCAD®Options dialog box. You can use the AEC options to specify the default values for some architectural objects, to specify the location and type of content files, and to control performance while you are working with Autodesk Architectural Desktop.

Related Procedures

- Changing the AEC Editor Settings
- Specifying AEC Object Settings
- Specifying the Display Resolution of Objects with Facets
- Changing the AEC Content Settings

Changing the AEC Editor Settings

Use this procedure to specify settings to control the following aspects of the software:

- the display of diagnostic essages
- the placement of dialog boxes and viewers on the screen
- whether objects retain their layer, color, and linetype when you explode them or export them to an AutoCAD® or DXF file

To speed drawing performance, you can limit the snap points provided by certain display representations, and improve the layer loading time of the Layer Manager.

You can also specify settings for grip colors, and specify whether dynamic dimensions appear when you select and move grips to change the geometry of an object.

The AEC Editor settings that you specify are saved in the Windows® registry.

1. On the Format menu, click Options.

   You can also display the Options dialog box by right-clicking in the command line area, and clicking Options.

2. Click the AEC Editor tab.
3. Under Diagnostic Messages, select options for displaying diagnostic messages on the command line:

If you want to . . .	Then . . .
display data about the relationship between objects in the drawing	select Object Relationship Graph.
display Display System errors	select Display Management System.
display object geometry-specific data	select Geometry.

All diagnostic messages are off by default.

4 Under Similar-Purpose Dialogs, select options for the default position of dialog boxes and viewers:

If you want to . . .	Then . . .
use a common position on the screen for similar dialog boxes	select Use Common Position. Some dialog boxes, such as those containing style properties, are always displayed in the center of the screen, regardless of this setting.
use a common position for similar-purpose viewers	select Use Common Viewer Position and Sizes. Some viewers are not controlled by this setting.

5 Under Optimize for Speed, select Object Snap to limit certain display representations to respond only to the Node and Insert object snaps.

This setting affects stair, railing, space boundary, multi-view block, masking block, slice, and clip volume result (building section) objects.

6 Under Optimize for Speed, select Layer Manager to load layers into the Layer Manager faster.

If this option is cleared, each time you open the Layer Manager, the Layer Manager scans your current drawing to determine which layers are in use and which layers are not in use. After the layers are scanned and loaded into the Layer Manager, the status (in use/not in use) of each layer is indicated by the icon to the left of the layer name in the Layer Manager.

When you select this option, the Layer Manager does not scan the drawing to determine the status of the layers, speeding up the loading time. The icons that are displayed next to the layer name in the Layer Manager do not indicate whether or not the layer is in use.

7 Under Block Properties of Exploded Object, select Maintain Resolved Layer, Color, Linetype to maintain the layer, color, and linetype of AEC objects when you explode them.

When you explode an AEC object, you create several primitive objects grouped in a block definition. If this option is selected any objects whose component layer, color, and linetype properties are set to ByBlock take the layer, color, and linetype of the parent object. If this option is cleared, when you explode an object, properties that are ByBlock remain ByBlock. Clear this option if you want to explode the block definition even further.

8 To specify the units of measure for AutoCAD® drawings when they are opened in Autodesk Architectural Desktop, select Metric or Imperial for Units for Legacy Drawings.

This option enables the software to ignore the value for the AutoCAD MEASUREMENT variable to ensure that Autodesk Architectural Desktop respects the correct units when an AutoCAD drawing is opened in the software. Select Automatic if you want AutoCAD drawings to use the units that are current in Autodesk Architectural Desktop.

9. Under Export to AutoCAD, select Use Insert Method when binding Xrefs if you want all objects from an xref drawing referenced in the file you export to be incorporated into the host drawing.

   If you select this option, the drawing names of the xref drawings are discarded when the exported drawing is created. In addition, their layers and styles are incorporated into the host drawing. For example, all exploded walls, regardless of their source (host or xref) are located on the same layer.

   Clear Use Insert Method when binding Xrefs if you want to retain the xref identities, such as layer names, when you export a file to AutoCAD or to a DXF file. For example, the blocks that define walls in the host drawng are located on A-Wall in the exploded drawing. Walls in an attached xref drawing are located on a layer whose name is created from the drawing name and the layer name, such as Drawing1|Wall-A.

10. Enter a prefix or a suffix to be added to the drawing filename when the drawing is exported to an AutoCAD drawing or a DXF file.
11. Under Unselected Grip Colors, select the colors you want to use for each type of grip.
12. Under Dynamic Editing, select Use Dynamic Editing if you want dimensions to be displayed when you select and move grips.

    The dimensions identify the current value of the dimension being edited, such as the length of a wall, the difference between the current value and the new dimension based on the position of the grip, and the total value. For example, when you select and move a Lengthen grip on a wall, the dimensions shown are the current length, the difference between the current length and the length based on where you moved the grip, and the total new length of the wall.

    Clear this option if you do not want to see dimensions when you edit objects using grips.

13. Under Dynamic Editing, select a size for Dimension Text Size, and select the text color for the dimension value that you can edit for Focus Text Color.
14. Click OK.

Specifying AEC Object Settings

Refer to the following topics to specify AEC options for walls, stairs, and the display of curved objects:

- "Specifying Drawing Defaults for Walls" on page 1758
- "Specifying AEC Options for Stairs" on page 1412
- "Specifying the Display Resolution of Objects with Facets" on page 564

Specifying the Display Resolution of Objects with Facets

Use this procedure to specify the facet deviation and the maximum number of facets that can be used to display a curved object, such as a Cylinder mass element, or a curved wall. The values you specify apply to the current drawing.

The number you specify for facet deviation defines the maximum distance from the chord to the arc, the chord being an edge that is created from faceting the curve, to the true mathematical arc. The facet deviation must be greater than zero (0) and has no upper limit.

1. On the Format menu, click Options.

   You can also display the Options dialog box by right-clicking in the command line area, and clicking Options.

2. Click the AEC Object Settings tab.
3. Under AEC Display Resolution, enter a value for Facet Deviation.

   The default value is 1/2" for drawings created from imperial templates and is 12.7 mm for drawings created from metric templates. The value you enter is stored in the AecFacetDev variable.

4. Enter the maximum number of facets that can be used to draw curved objects.

   You can enter a value between 100 and 10,000. The value you enter is stored in the AecFacetMax variable.

   The default value is 500 for new drawings. Drawings created with earlier versions of Autodesk® Architectural Desktop have a default value of 128 for this setting.

5. Click OK.

Changing the AEC Content Settings

Use this procedure to specify the location of the content files accessed by the Custom View in AutoCAD® DesignCenter, choose between imperial and metric content, and specify whether the Edit Property Data dialog box is displayed when you insert schedule tags.

The AEC Content settings that you specify are saved in the Windows® registry.

1. On the Format menu, click Options.

   You can also display the Options dialog box by right-clicking in the command line area, and clicking Options.

2. Click the AEC Content tab.
3. Under Content Path, edit the path and location of your content files, or click Browse to locate for content files.
4. To display the Edit Property Data dialog box when you insert a schedule tag in the drawing, select Display Edit Property Data Dialog During Tag Insertion.
5. Click OK.

Changing the AEC Project Defaults

Use this procedure to specify the folders in which Autodesk® Architectural Desktop searches for projects, palettes, templates, and other project files.

1. On the Format menu, click Options.

   You can also display the Options dialog box by right-clicking in the command line area, and clicking Options.

2. Click the AEC Project Defaults tab.
3. Expand a category, and select a path.
4. Change, add, or remove a path:

If you want to . . .	Then . . .
change the current path	select the path, and click Browse. Navigate to the new path, and click OK.
add a path to the list of paths	select the category, such as Default Project Template Files, and click Add. Specify the new path, and click OK. If Add is unavailable, you can specify only one path for this category.

If you want to . . .	Then . . .
remove a path	select the path, and click Remove. If Remove is unavailable, you can edit the path but you cannot delete it.

5 Select Show Project Browser at startup if you want to the Project Browser to open when you open Autodesk Architectural Desktop.

6 Click OK.

Sharing Drawings with Other Users

Autodesk Architectural Desktop provides a number of methods for making drawings available to users who do not have the software. The method you choose depends on the software others are using, how exactly the drawing must match the original drawing, and the views the user requires of the drawing content.

Turning on Proxy Graphics

When you turn on proxy graphics in a drawing, users who do not have Autodesk Architectural Desktop but have another AutoCAD 2004-based product, such as Autodesk Land Desktop 2004, Mechanical Desktop 2004, or Autodesk Map 2004, can view and plot AEC objects and design data.

Using the Object Enabler

The Object Enabler is a free application that users can install that lets them view, plot, manipulate, and copy AEC objects and design data in AutoCAD 2004-based products.

Using AEC Object Explode

The AEC Object Explode feature lets you explode AEC objects in a drawing with some control over how the objects are exploded into primitive AutoCAD objects.

Exporting to AutoCAD Drawings and DXF Files

You can export Autodesk® Architectural Desktop drawings to AutoCAD® drawings for the following versions:

- AutoCAD 2004
- AutoCAD 2000 (including 2000i and 2002)

You can also export a drawing created in Autodesk® Architectural Desktop to a drawing interchange format (DXF) file. A DXF file is a text or binary file that contains drawing information that can be read by other CAD systems. For

more information about DXF files, see DXF Files in the *AutoCAD 2004 User's Guide*.

You can export drawings to the following DXF formats:

- AutoCAD 2004 DXF
- AutoCAD 2000 DXF (including 2000i and 2002)
- AutoCAD Release 12 DXF

Exporting drawings to an AutoCAD drawing or to a DXF file creates a separate drawing in which all AEC objects, such as walls, doors, windows, and roofs, are exploded to AutoCAD primitive objects, such as lines, arcs, and 3D faces. The resulting AutoCAD objects cannot be converted back to Autodesk Architectural Desktop objects.

NOTE You can open DXF files generated in earlier versions of Autodesk Architectural Desktop in the software if the files do not contain any AEC objects. DXF files that contain AEC objects cannot be imported into Autodesk Architectural Desktop 2004.

Related Topics and Procedures

- Comparing Methods of Sharing Drawings
- Generating Proxy Graphics
- Using the Object Enabler
- Exploding AEC Objects
- Viewport Layer Mapping
- Managing Xrefs
- Exporting a Drawing to AutoCAD
- Exporting a Drawing to a DXF File

Comparing Methods of Sharing Drawings

The following table lists the features of the various methods of sharing Autodesk® Architectural Desktop drawings with other users who do not have the software.

	Proxy Graphics	Object Enabler	AEC Object Explode, Export to AutoCAD (DWG or DXF)
Use of AEC objects in other AutoCAD-based applications	View/plot AEC objects and design data; no manipulation of objects	View, plot, copy, manipulate AEC objects and design data	View, plot, manipulate AEC objects and design data
Status of AEC objects in other applications	AEC objects are displayed as proxy graphics with no intelligence	AEC objects are maintained as intelligent objects	No AEC objects
Multiple representations of objects in different viewports	No	Yes	Yes
AEC objects still exist when reopened in Autodesk Architectural Desktop	Yes	Yes	No

Generating Proxy Graphics

Use this procedure to create proxy graphics in an Autodesk Architectural Desktop drawing you want to make available to users who do not have the software.

Proxy graphics store the last viewed image of AEC objects, which lets users view your drawing without modifying the original objects. Proxy graphics store only the display representation for the current active viewport.

NOTE Depending on the complexity and density of the drawing, a drawing saved with proxy graphics turned on can become extremely large and slow drawing performance. It is recommended that you make a copy of the drawing

without proxy graphics before turning them on in the drawing you want to share with other users.

1. Arrange the view for which you want to create proxy graphics.
2. At the command line, enter **Proxygraphics**.
3. Enter **1**.
4. Save the drawing.
5. To turn off proxy graphics, enter **Proxygraphics**, and then enter **0**.

Using the Object Enabler

Users who do not have Autodesk® Architectural Desktop but who have an AutoCAD® 2004-based product can install the Object Enabler to view your drawing exactly as you created it. The Object Enabler is available on the Autodesk Architectural Desktop installation CD and on the Autodesk web site. There is no charge for its distribution.

After a user installs the Object Enabler, the user can open the drawing and view, plot, manipulate, and copy AEC objects using standard AutoCAD commands. AEC objects are maintained as intelligent objects, and the drawing be re-used in Autodesk Architectural Desktop.

Exploding AEC Objects

Use this procedure to explode AEC objects in a drawing that you want to share with users who do not have Autodesk® Architectural Desktop. The exploded AEC objects become AutoCAD primitive objects, such as block definitions, lines, arcs, and 3D faces, and lose their intelligence as architectural objects. The exploded objects cannot be restored to AEC objects.

Using this method of sharing drawing information is appropriate for users who do not have AutoCAD-based applications, but who can open an AutoCAD format drawing that contains primitive objects.

WARNING! Before you explode AEC objects, save a copy of the original drawing. After AEC objects are exploded into AutoCAD primitive objects, they cannot be restored to AEC objects.

1. If the CAD Manager menu is not displayed, on the Window menu, click Pulldowns ➤ CAD Manager Pulldown.
2. On the CAD Manager menu, click Explode AEC Objects.

3 Specify whether to explode AEC objects:

If you want to . . .	Then . . .
explode all AEC objects to AutoCAD primitive objects	select Explode AEC Objects To Primitive Graphics. Proceed to step 4.
remove AEC objects without creating AutoCAD objects from them	clear Explode AEC Objects to Primitive Graphics. Proceed to step 5. Use this option if you have exploded individual AEC objects needed by other users, and now want to remove any other AEC object data from the drawing.

4 Specify the views in which to explode AEC objects:

If you want to . . .	Then . . .
explode objects as they appear in the current view on the Model tab, the active Model space viewport on a layout tab, or an entire layout tab if Paper space is active	select Current View.
explode objects on all layout tabs, creating block definitions for each viewport on each layout tab	select All Layouts. Select Model Tab as Additional Block if, in addition to the layout tabs, you want to create a block definition for the objects as they currently appear on the Model tab. For more information, see "Viewport Layer Mapping" on page 572.

5 Select Re-use Existing Layer and Block Names if you are converting all layouts.

Selecting this option minimizes the number of layers and block definitions produced when a drawing is exploded more than once. Clear this option if you want to preserve the exact appearance of the AEC objects in the viewports.

6 If the drawing contains xref drawings, specify how they are bound to the host drawing when exploded:

If you want to . . .	Then . . .
maintain the xref drawing name as part of the layer names for its objects when exploded	select Bind Xref, and select Bind.
incorporate objects from the xref drawing onto the layers created for the host drawing	select Bind Xref, and select Insert.

For more information, see "Managing Xrefs" on page 573.

NOTE Do not select *both* Explode to Anonymous Blocks and Maintain Resolved Layer, Color, Linetype, or clear *both* options. Select one option and clear the other as described in the following steps.

7 Select Explode to Anonymous Blocks if you want AEC objects to be exploded to blocks that contain the primitive objects for each AEC object.

If you select this option, it is recommended that you clear Maintain Resolved Layer, Color, Linetype. If you clear Explode to Anonymous Blocks, the primitive objects created from an exploded AEC object are not maintained in a single block.

8 Clear Maintain Resolved Layer, color, Linetype if you selected Explode to Anonymous Blocks.

Select Maintain Resolved Layer, Color, Linetype if you cleared Exploded to Anonymous Blocks. Selecting this option ensures that objects with ByBlock properties inherit the layer, color, and linetype of their parent AEC object.

9 Select Erase AEC Objects if you want to remove the original objects from the drawing after they are exploded to primitive objects.

10 Select Shorten Symbol Names, and enter a maximum length if the exploded drawing will be referenced into another drawing.

The range is 20-31. For example, if the maximum length were set to 20, the block "I_CASE_CORNER_WALL 30IN HIGH_F" would be renamed "I_CASE_CORNER_WALL~1". If you require more control over the final names, use the RENAME command.

TIP You can also use Shorten Symbol Names to create shorter symbol names without doing anything to AEC objects. If you select this option, but Explode AEC Objects To Primitive Graphics and Erase AEC Objects are not selected, the AEC objects remain unchanged, and all existing symbol names are shortened to the selected length.

11. Select Display Status Messages if you want to display messages at the command line that show the progress of the conversion to primitive graphics.

    The messages list the objects that are exploded and erased.

12. Click OK.
13. When the conversion to primitive objects is complete, save the drawing. Be sure to change the drawing name so that the original drawing still has intact AEC objects.

Viewport Layer Mapping

AEC objects have the ability to display themselves differently in each viewport. When AEC objects are exploded into AutoCAD primitive entities, each display representation must create a different set of primitives. For each viewport, a new layer and a new block definition are created to hold all exploded entities. A block reference (INSERT) to this definition is also created and placed on the given layer. For the given viewport, all layers created for other viewports are then frozen so that only the graphics for the display representation that was originally visible remain visible.

For a given layout tab, the following block definitions are created:

AecObjExplode_LayoutName_PspaceBlock containing AEC objects in paper space
AecObjExplode_LayoutName_Vport_VportHandle1Block containing AEC objects from MVIEW 1
AecObjExplode_LayoutName_Vport_VportHandle2Block containing AEC objects from MVIEW 2
…
AecObjExplode_LayoutName_Vport_VportHandleN
LayoutName is the name of the specific layout tab, and *VportHandle#* is the unique AutoCAD entity handle for that specific viewport.

NOTE To determine the handle for a viewport, enter **LIST** at the command line and select the viewport boundary. The handle is a hexadecimal number, such as 4D2A.

A layer is also created with the same names so that the blocks that do not apply to that viewport can be on a frozen layer, and thus not visible.

The "template" used to generate the block and layer names is stored in the Windows Registry under the key (note that the language code, shown as 409, will vary depending on your locale):

//HKEY_CURRENT_USER/Software/Autodesk/AutoCAD/R16.0/ACAD-204:409/AEC/4.0/AecObjExplode40/Preferences
/AecObjExplode/Preferences
You can change these templates to be another character string, but it must contain the "%1!s!" and similar format specifiers that are currently present. The format specifiers are replaced by the layout name and the viewport handle number in the final block and layer names.

NOTE When in the Model tab (TILEMODE=1), all representations are visible at the same time. This is because there is no way to freeze a layer in a tiled viewport without freezing it in all PaperSpace viewports. However, you can freeze all but one of the viewport layers to get the desired representation.

Managing Xrefs

Exploding AEC objects into primitive AutoCAD®objects is more complex when you do not use the "Automatically Bind Xrefs" option. This is because objects in xrefs actually belong to a different drawing file than the one that they are currently being viewed in. There are two methods you can use to convert the xref files.

- Use the Bind Xrefs option. This performs an Xref Bind on all xrefs before beginning the conversion process. This option ensures that the visual appearance of the converted drawing remains the same as the original. However, this also results in the xref drawing becoming part of the converted drawing.
- Run the Explode AEC Objects command on each of the xref drawings first, before running it on the host file. This also requires you to re-identify all converted xrefs when you have changed their name by specifying a different output file.

NOTE First copy all the parent and all xref drawing files. Then open the parent drawing, and use the Xref Manager to change the Saved Path for each Xref. Select them one at a time, and change each file name in the Xref Found At edit box. Finally, open, explode and save each of the drawings.

You should choose this method only when keeping the drawing as separate xrefs is mandatory. Also, in some cases you may not get the exact same graphics. This is because objects in the xref drawings display themselves based on the display configuration in effect for a given viewport in the host drawing. However, when the xref drawing is converted, the objects only know about viewports from their own drawing. If the same display configuration is not used in both drawings, the graphic output when converted to AutoCAD primitives may be different.

For example, if the xref drawing only has a single viewport that shows the plan representation, but both plan and model representations are used in the host file, exploding the files separately gives you only the plan representation in the final file. If the xref drawings have multiple representations, you need to clear one or more xref viewport layers in the host drawing to get the appropriate representations in each viewport.

Exporting a Drawing to AutoCAD

Use this procedure to export a drawing created in Autodesk® Architectural Desktop to AutoCAD®. This process creates a new AutoCAD 2004 or 2000 drawing with all AEC objects exploded. The original drawing is not affected.

Depending on the size and complexity of the original drawing, the resulting AutoCAD drawing may contain very large numbers of primitive objects, which can affect drawing performance.

NOTE When you export a drawing to an AutoCAD drawing, all AEC objects are exploded to AutoCAD primitive objects. Reopening the file in Autodesk Architectural Desktop does not restore these primitive objects to AEC objects.

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1. Choose whether to export a single representation of the AEC objects, or all visible representations.

   If the Model tab is displayed, only the representations in the current active view will be generated. If any layout tab is displayed, the representations for ALL layouts will be generated. This will usually result in duplicate graphics on the model tab, which makes the drawing less useful for some purposes.

   For example, when creating a drawing for a consultant to use as an xref attached background, you should have a top view displayed in the active Model tab viewport. When creating a drawing to be used to produce a rendering, you should have an isometric view displayed in the active Model tab viewport.

To create a drawing that includes the exact graphics used in all layout tab viewports, have any layout tab active. These drawings can be sent to a printing service, for example, to make plots without the need for Autodesk Architectural Desktop or the object enabler.

2 Enter the command UCS ➤ World.

It is important that the active Model viewport has the UCS set to World. Otherwise the resulting objects will be rotated from the current orientation.

3 On the File menu, click Export to AutoCAD, and click the version you want to use.

4 Enter a filename, and specify a path, if necessary.

The default filename includes any prefix or suffix that you specified on the AEC Editor tab of the Options dialog box. For more information, see "Changing the AEC Editor Settings" on page 561.

5 Click Save.

Exporting a Drawing to a DXF File

Use this procedure to export a drawing created in Autodesk® Architectural Desktop to a drawing interchange format (DXF) file. A DXF file is a text file that contains drawing information that can be read by other CAD systems. For more information about DXF files, see DXF Files in the *AutoCAD®2004 User's Guide*.

You can export drawings to the following DXF formats:

- AutoCAD 2004 DXF
- AutoCAD 2000 DXF (including 2000i and 2002)
- AutoCAD Release 12 DXF

This process creates a new DXF file with all AEC objects exploded. The original drawing is not affected.

Depending on the size and complexity of the original drawing, the resulting AutoCAD drawing may contain very large numbers of primitive objects, which can affect drawing performance.

NOTE When you export a drawing to a DXF file, all AEC objects are exploded to AutoCAD primitive objects. Reopening the file in Autodesk Architectural Desktop does not restore these primitive objects to AEC objects.

1. On the File menu, click Export to AutoCAD, and click the DXF format you want to use.
2. Enter a filename, and specify a path, if necessary.

   The .dxf extension for the file name is specified by default. The default file name also includes any prefix or suffix that you specified on the AEC Editor tab of the Options dialog box. For more information, see "Changing the AEC Editor Settings" on page 561.

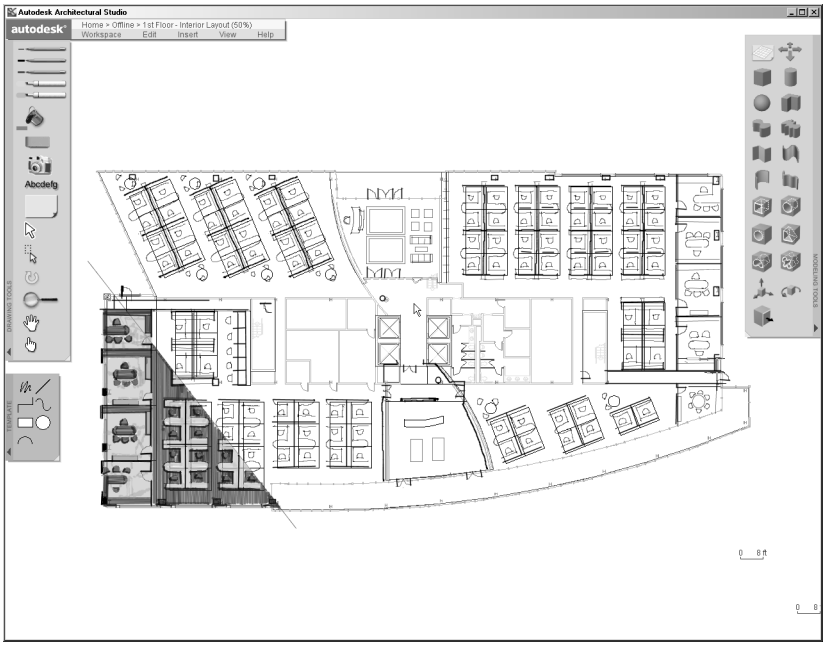
3. Click Save.

Publishing Drawings to Architectural Studio

You can "publish" or electronically plot floor plans, sections, elevations, and other building model views to Autodesk® Architectural Studio, an Internet-based conceptual design and collaboration environment designed to replicate a designer's desktop.

Any view on a layout tab of an Autodesk® Architectural Desktop drawing can be published to Autodesk Architectural Studio, where you can use pen-based input devices with the Autodesk Architectural Studio conceptual design, sketching, modeling, and presentation tools to work with your published designs. For example, a designer could publish an Autodesk Architectural Desktop floor plan to Autodesk Architectural Studio, where a project architect could sketch on top of it in Autodesk Architectural Studio.

A conceptual design sketched on top of a floor plan in Autodesk Architectural Studio



Exporting Autodesk Architectural Studio files to Autodesk Architectural Desktop

You can also export Autodesk Architectural Studio files to Autodesk Architectural Desktop. Three-dimensional conceptual models from Autodesk Architectural Studio can be imported into Autodesk Architectural Desktop, where

building models can take shape. 3D solids in your Autodesk Architectural Studio drawings are imported to Autodesk Architectural Desktop as Free Form mass elements. For more information, see the Autodesk Architectural Studio Help system.

Publishing a Drawing to Autodesk Architectural Studio

Use this procedure to publish any view on a layout tab in Autodesk Architectural Desktop to Autodesk Architectural Studio. When you publish a view of an Autodesk Architectural Desktop building model to Autodesk Architectural Studio, you use a plotter configuration file (PC3) to electronically plot your designs to Autodesk Architectural Studio in Drawing to Web Format (DWF).

NOTE Because DWF files are 2D vector files, 3D views are published to Autodesk Architectural Studio as 2D line drawings. Any views that are currently using AutoCAD SHADE or RENDER will not display as shaded or rendered in Autodesk Architectural Studio.

For more information about DWF, see DWF Files in the online *AutoCAD 2004 User's Guide*.

1. Start Autodesk Architectural Studio.

   Architectural Studio must be running to publish an Autodesk Architectural Desktop layout.

2. In Autodesk Architectural Desktop, select the layout tab in the drawing with the view that you want to publish.
3. On the File menu, click Page Setup.
4. Click the Plot Device tab.
5. Under Plot configuration, from the Name list, select a DWF plotter configuration.
6. Click the Layout Settings tab.
7. Specify the size, orientation, plot scale, plot area, and plot options for the layout.

   For more information, see Overview of Layout Setup in the online *AutoCAD 2004 User's Guide*.

8. Click OK.
9. In Autodesk Architectural Desktop, in the drawing status area, click .
10. Click Publish to Architectural Studio.

A meter displays the plot progress to Autodesk Architectural Studio. The published Autodesk Architectural Desktop layout displays in Autodesk Architectural Studio as a DWF drawing on a sheet of trace, a yellow overlay designed to look like a sheet of tracing paper.

Creating Conceptual Models

III

Topics in Part 3

- Creating Conceptual Models

Creating Conceptual Models

11

A conceptual model, which represents the idea for a building design, is comprised of a variety of building blocks. In Autodesk® Architectural Desktop, the building blocks include mass elements, mass groups, spaces, and slices. Combined, they produce a three-dimensional (3D) model.

In this Chapter

- Mass Elements and Mass Groups
- Using Massing Tools to Create Mass Elements
- Editing Mass Elements
- Mass Element Styles
- Using Massing Tools to Create Mass Groups
- Using Materials for Mass Elements and Mass Groups
- Using the Model Explorer to Create Mass Models
- Spaces
- Space Boundaries
- Creating Slice Floorplates from a Conceptual Model

Mass Elements and Mass Groups

Mass elements are primitive parametric objects that have specific shapes, such as arch, box, cylinder, and gable. They function as the building blocks of conceptual design (also schematic design) in Autodesk Architectural Desktop. You can create preliminary studies, or mass models, by grouping mass elements together in mass groups.

Mass Groups and Mass Models

When you create a mass group, you can combine the shapes of mass elements in the mass group by adding, subtracting, and intersecting them in a specific order. The resulting complex shape of the mass group forms your conceptual building design, or mass model. The mass model defines the basic structure and proportion of a building model.

Developing Mass Models

As you continue developing your mass model, you can combine mass elements into mass groups and create complex building shapes by adding, subtracting, and intersecting the mass elements.

After you create a mass group, you can change mass elements in the mass group as necessary to reflect the building design. You can edit individual mass elements that are attached to a mass group to further refine the building model. You can also nest mass groups within other mass groups. For more information, see "Creating a Mass Group" on page 628.

Using the Model Explorer

You can use the Model Explorer to create your entire mass model, or you can create your mass model in the current drawing. You can also modify your mass model or change the relationships of mass elements in the mass model in the Model Explorer. In addition to a graphics area that displays the mass model, the Model Explorer has a tree view in which you can drag and drop mass elements and mass groups to arrange and view the building blocks of your model in a hierarchical structure. For more information, see "Using the Model Explorer to Create Mass Models."

When creating massing studies, you can create mass groups with any AutoCAD 3D object, including AutoCAD ACIS solids. These can be combined with mass elements in the Model Explorer to allow more complex studies of potential designs. However, only objects that have volume affect the appearance of the mass group. For example, a polyline, even with thickness, does not contribute to the mass group.

Continuing Building Design from a Mass Model

The mass model that you create with mass elements and mass groups is a refinement of your original idea that you carry forward into the next phase of the project, where you can slice floorplates from the mass model. You can convert the floorplates to space boundaries to start space planning, or you can convert them to polylines and then to walls to begin your building design.

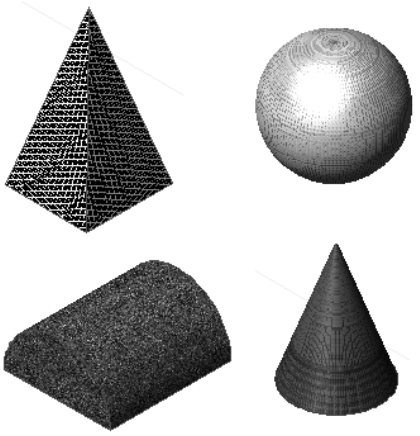
Display Configurations and Layouts for Mass Modeling

Drawings created from templates provided with Autodesk®Architectural Desktop contain display configurations and layouts that enable you to work effectively with mass elements and mass groups. For example, one layout has two viewports: one is assigned a display configuration that displays only mass groups and another display configuration that displays only mass elements.

Materials in Mass Elements

In Autodesk Architectural Desktop, you can assign materials to a mass element. These materials are displayed in wireframe and working shade views, or when linked into VIZ Render. Materials have specific settings for individual components of a mass element, such as linework or surface hatches.

Mass elements with assigned materials in rendered view



Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes, which contain settings for roof slabs. You can use these predefined materials, or modify them to your special designs. You can also create your own materials from scratch.

For more information, see “Using Materials for Mass Elements and Mass Groups” on page 641.

Other Uses of Mass Elements and Mass Groups
You can also use mass elements and mass groups to create three-dimensional body pieces of the building model. For example, you can apply them to walls as 3D body modifiers.

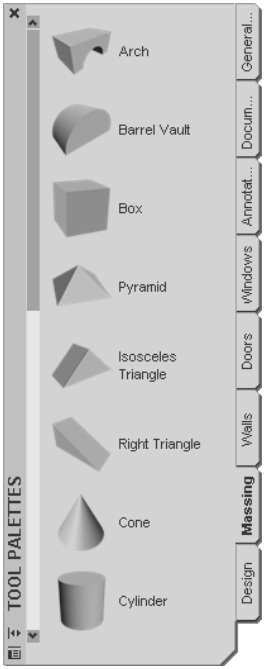
Related Procedures

- Using Massing Tools to Create Mass Elements
- Editing Mass Elements
- Mass Element Styles
- Creating a Mass Group
- Using Materials for Mass Elements and Mass Groups
- Using the Model Explorer to Create Mass Models

Using Massing Tools to Create Mass Elements

Tools provided with Autodesk®Architectural Desktop let you quickly place mass elements by selecting a tool from the Massing tool palette. Each massing tool has a specific mass element style and other predefined properties. When you place mass elements using massing tools, you can use the default settings of the tool, or you can change settings for the mass element properties. You can also use massing tools to apply the settings of a massing tool to existing mass elements.

Tool palettes containing massing tools



The default tool palettes in the workspace contain sample massing tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain massing tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- My Tool catalog

Custom palettes created by your CAD manager or other users may also contain massing tools with mass element styles and properties that are customized for your projects or office standards.

Related Procedures

- Creating a Mass Element
- Creating a Mass Element with User-Specified Settings
- Creating an Arch Mass Element
- Creating a Barrel Vault Mass Element
- Creating a Box Mass Element

- Creating a Pyramid Mass Element
- Creating an Isosceles Triangle Mass Element
- Creating a Right Triangle Mass Element
- Creating a Cone Mass Element
- Creating a Cylinder Mass Element
- Creating a Dome Mass Element
- Creating a Sphere Mass Element
- Creating a Gable Mass Element
- Creating a Drape Mass Element
- Creating a Doric Column Mass Element
- Creating Profiles for Extrusion and Revolution Mass Elements
- Creating a Mass Element by Extruding a Profile
- Creating a Mass Element by Revolving a Profile
- Converting 3D Objects to Mass Elements
- Creating a Mass Element Tool

Creating a Mass Element

Use this procedure to add a new mass element that has the properties specified in the massing tool that you select. To specify settings when you add a mass element, see "Creating a Mass Element with User-Specified Settings" on page 589.

Shapes of Mass Elements

To create mass elements, you start with basic shapes and then manipulate them for the desired result. The twelve basic mass element shapes are Arch, Barrel Vault, Box, Pyramid, Isosceles Triangle, Right Triangle, Cone, Cylinder, Dome, Sphere, Gable, and Drape. You can also create custom mass elements by extruding and revolving profiles and by creating free form mass elements.

You can modify a mass element based on its shape. For example, you can specify the width, depth, and height of a box mass element, and the radius and height of a cylinder mass element. For more information, see "Editing Mass Elements" on page 601.

Specifying the Size of Mass Elements

When you create a mass element, you can graphically specify some size parameters:

- A rectangular mass element is any element that has four lines at its base such as an Arch, Barrel Vault, Box, Gable, Pyramid, Isosceles Triangle, or Right Triangle. You can graphically specify the width, depth, and height of rectangular mass elements.

- When you create a circular mass element, you graphically specify all the valid size parameters. Circular mass elements are Cone, Cylinder, Dome, and Sphere.

Some parameters are fixed during input; for example, the radius of an arch is automatically one quarter of the width, and the rise of a gable is automatically half of the height. These parameters can be edited after the mass elements are placed in the drawing.

1. Open the tool palette that you want to use, and select a massing tool.

   If necessary, scroll to display the tool that you want to use.

2. Specify the insertion point of the mass element.

   You can move or hide the Properties palette to expose more of the drawing area.

3. Specify the next point.

   This point can be the second corner (for a rectangular mass element) or the radius (for a circular mass element).

4. Specify the height, if prompted.
5. Specify the rotation of the mass element.
6. Continue adding mass elements, and press ENTER.

Creating a Mass Element with User-Specified Settings

Use this procedure to add a mass element with settings that you specify.

1. Open the tool palette that you want to use, and select a massing tool.

   If necessary, scroll to display the tool that you want to use.

2. On the Properties palette, expand Basic, and expand General.
3. Select a style.
4. Select a shape.
5. Specify the mass group to which to attach the mass element.
6. Expand Dimensions.

   The options that display under Dimensions depend on the shape you selected for the mass element.

7 Specify the dimensions of the mass element:

If you want to . . .	Then . . .
specify the width of the mass element in its relative X direction	enter a value for Width.
specify the depth of the mass element in its relative Y direction	enter a value for Depth.
specify the height of the mass element in its relative Z direction	enter a value for Height.
specify the radius of the mass element	enter a value for Radius.
specify the rise of the mass element	enter a value for Rise.

8 In the drawing area, specify the insertion point of the mass element.

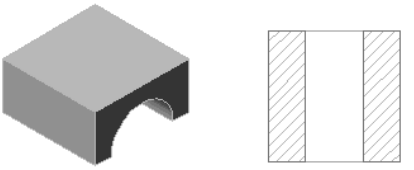
You can move or hide the Properties palette to expose more of the drawing area.

9 Continue adding mass elements, and press ENTER.

Creating an Arch Mass Element

Use this procedure to dynamically create an Arch mass element. The insertion point of an Arch mass element is at the centroid of its bottom face.

Arch mass element in 3D and plan views

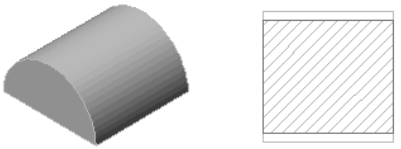


1 On the Massing tool palette, select the Arch tool.
2 Specify the first corner of the Arch.
3 Drag the cursor and specify the second corner of the Arch.
4 Drag the cursor and specify the height of the Arch.
5 Enter a rotation angle, or press ENTER to accept the default angle of 0.
6 Continue adding Arch mass elements, and press ENTER.

Creating a Barrel Vault Mass Element

Use this procedure to create a Barrel Vault mass element. The insertion point of the Barrel Vault mass element is at the centroid of its bottom face.

Barrel Vault mass element in 3D and plan views

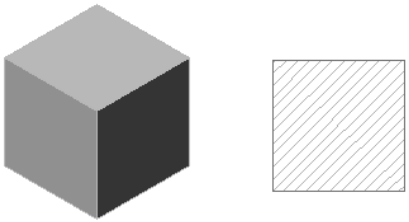


1. On the Massing tool palette, select the Barrel Vault tool.
2. Specify the first corner of the Barrel Vault.
3. Drag the cursor and specify the second corner of the Barrel Vault.
4. Enter a rotation angle, or press ENTER to accept the default angle of 0.
5. Continue adding Barrel Vault mass elements, and press ENTER.

Creating a Box Mass Element

Use this procedure to create a Box mass element. The insertion point of the Box mass element is at the centroid of its bottom face.

Box mass element in 3D and plan views

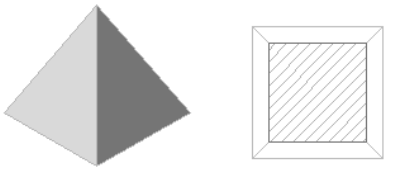


1. On the Massing tool palette, select the Box tool.
2. Specify the first corner of the Box.
3. Drag the cursor and specify the second corner of the Box.
4. Drag the cursor and specify the height of the Box.
5. Enter a rotation angle, or press ENTER to accept the default angle of 0.
6. Continue adding Box mass elements, and press ENTER.

Creating a Pyramid Mass Element

Use this procedure to create a Pyramid mass element. The insertion point of a Pyramid mass element is at the centroid of its bottom face.

Pyramid mass element in 3D and plan views

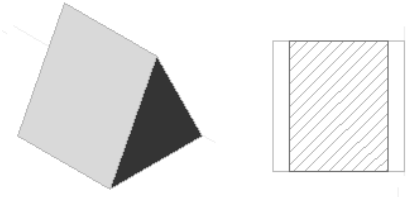


1. On the Massing tool palette, select the Pyramid tool.
2. Specify the first corner of the Pyramid.
3. Drag the cursor and specify the second corner of the Pyramid.
4. Drag the cursor and specify the height of the Pyramid.
5. Enter a rotation angle, or press ENTER to accept the default angle of 0.
6. Continue adding Pyramid mass elements, and press ENTER.

Creating an Isosceles Triangle Mass Element

Use this procedure to create an Isosceles Triangle mass element. The insertion point of an Isosceles Triangle mass element is at the centroid of its bottom face.

Isosceles Triangle mass element in 3D and plan views

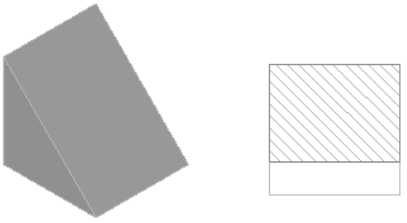


1. On the Massing tool palette, select the Isosceles Triangle tool.
2. Specify the first corner of the Isosceles Triangle.
3. Drag the cursor and specify the second corner of the Isosceles Triangle.
4. Drag the cursor and specify the height of the Isosceles Triangle.
5. Enter a rotation angle, or press ENTER to accept the default angle of 0.
6. Continue adding Isosceles Triangle mass elements, and press ENTER.

Creating a Right Triangle Mass Element

Use this procedure to create a Right Triangle mass element. The insertion point of a Right Triangle mass element is at the centroid of its bottom face.

Right Triangle mass element in 3D and plan views

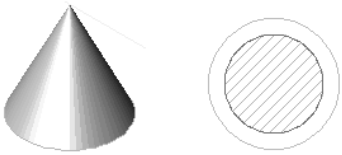


1. On the Massing tool palette, select the Right Triangle tool.
2. Specify the first corner of the Right Triangle.
3. Drag the cursor and specify the second corner of the Right Triangle.
4. Drag the cursor and specify the height of the Right Triangle.
5. Enter a rotation angle, or press ENTER to accept the default angle of 0.
6. Continue adding Right Triangle mass elements, and press ENTER.

Creating a Cone Mass Element

Use this procedure to create a Cone mass element. The insertion point of the Cone mass element is at the centroid of its bottom face.

Cone mass element in 3D and plan views

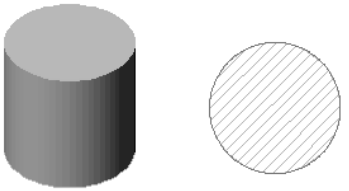


1. On the Massing tool palette, select the Cone tool.
2. Specify the insertion point of the Cone.
3. Drag the cursor and specify the radius of the Cone.
4. Drag the cursor and specify the height of the Cone.
5. Enter a rotation angle, or press ENTER to accept the default angle of 0.
6. Continue adding Cone mass elements, and press ENTER.

Creating a Cylinder Mass Element

Use this procedure to create a Cylinder mass element. The insertion point of the Cylinder mass element is at the centroid of its bottom face.

Cylinder mass element in 3D and plan views

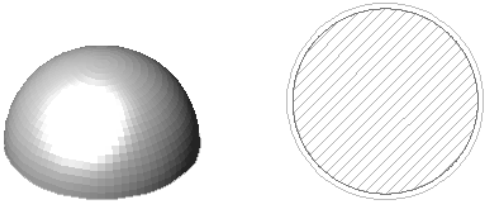


1. On the Massing tool palette, select the Cylinder tool.
2. Specify the insertion point of the Cylinder.
3. Drag the cursor and specify the radius of the Cylinder.
4. Drag the cursor and specify the height of the Cylinder.
5. Enter a rotation angle, or press ENTER to accept the default angle of 0.
6. Continue adding Cylinder mass elements, and press ENTER.

Creating a Dome Mass Element

Use this procedure to create a Dome mass element. The insertion point of the Dome mass element is at the centroid of its bottom face.

Dome mass element in 3D and plan views

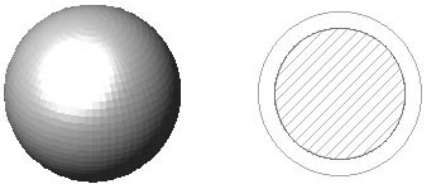


1. On the Massing tool palette, select the Dome tool.
2. Specify the insertion point of the Dome.
3. Drag the cursor and specify the radius of the Dome.
4. Enter a rotation angle, or press ENTER to accept the default angle of 0.
5. Continue adding Dome mass elements, and press ENTER.

Creating a Sphere Mass Element

Use this procedure to create a Sphere mass element. The insertion point of a Sphere mass element is at its centroid.

Sphere mass element in 3D and plan views

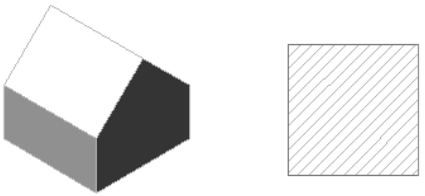


1. On the Massing tool palette, select the Sphere tool.
2. Specify the insertion point of the Sphere.
3. Drag the cursor and specify the radius of the Sphere.
4. Enter a rotation angle, or press ENTER to accept the default angle of 0.
5. Continue adding Sphere mass elements, and press ENTER.

Creating a Gable Mass Element

Use this procedure to create a Gable mass element. The insertion point of a Gable mass element is at the centroid of its bottom face.

Gable mass element in 3D and plan views

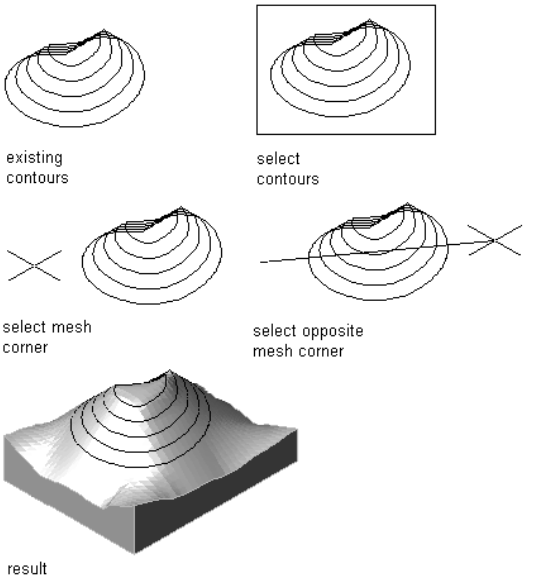


1. On the Massing tool palette, select the Gable tool.
2. Specify the first corner of the Gable.
3. Drag the cursor and specify the second corner of the Gable.
4. Drag the cursor and specify the height of the Gable.
5. Enter a rotation angle, or press ENTER to accept the default angle of 0.
6. Continue adding Gable mass elements, and press ENTER.

Creating a Drape Mass Element

Use this procedure to create a Drape mass element. A drape is useful when working with a conceptual model of a building site because you can create polylines at different elevations that represent topographic lines, and then drape a mass element over the polylines to show the contours of the site.

Creating a Drape mass element

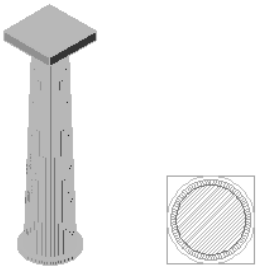


1. On the Massing tool palette, select the Drape tool.
2. Select the polylines to represent contours, and press ENTER.
3. Select the mesh corner, and then select the opposite mesh corner.
4. Enter the mesh size, and press ENTER.
5. Enter the base thickness, and press ENTER.

Creating a Doric Column Mass Element

Use this procedure to create a Doric Column mass element. The insertion point of a Doric column mass element is at the centroid of its bottom face.

Doric Column mass element in 3D and plan views



1. On the Massing tool palette, select a massing tool.
2. In the Properties palette, select Doric for Shape.
3. Specify the insertion point of the Doric column.
4. Drag the cursor and specify the radius of the Doric column.
5. Drag the cursor and specify the height of the Doric column.
6. Enter a rotation angle, or press ENTER to accept the default angle of 0.
7. Continue adding Doric column mass elements, and press ENTER.

Creating Profiles for Extrusion and Revolution Mass Elements

Use this procedure to define a profile from a polyline to create either of the following mass elements:

- Extrusion mass element, in which the shape of the two-dimensional (2D) profile is projected to create a three-dimensional (3D) mass element
- Revolution mass element, in which the 2D profile is revolved around its *X* axis to create a 3D mass element

You can draw more than one polyline within the outermost polyline to create voids in the resulting mass element. Polylines cannot intersect or overlap.

1. Draw one or more closed polylines in the shape you want to extrude or revolve.
2. Select the polyline, right-click, and click Convert To ➤ Profile Definition.
3. Enter **c** (Centroid) for the insertion point of the profile.

   The insertion point of the profile is aligned with the centroid of the mass element.
4. Press ENTER to specify a New profile definition.

5 Enter a name for the profile, and click OK.

You can now use the profile as an Extrusion or Revolution mass element. For more information, see "Creating a Mass Element by Extruding a Profile" on page 598 or "Creating a Mass Element by Revolving a Profile" on page 599.

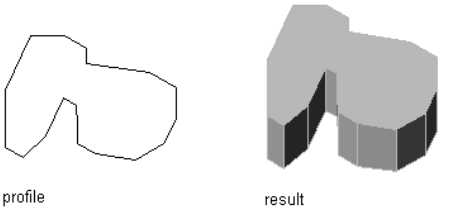
Creating a Mass Element by Extruding a Profile

Use this procedure to create a custom-shaped mass element by using a profile as the basis of its shape. The extrusion projects the shape of the profile to create the mass element.

The width and depth of the Extrusion mass element are based on the original width and depth of the profile. You can specify different width and depth values if necessary.

The insertion point is at the centroid of the bottom face of the Extrusion mass element.

Creating an Extrusion mass element from a profile



1 Create the profile to use as the basis of the mass element.

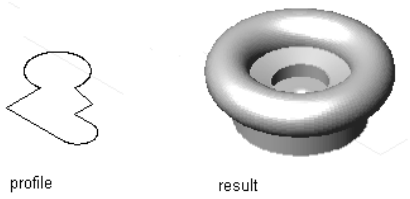
For more information, see "Creating Profiles for Extrusion and Revolution Mass Elements" on page 597.

2 On the Massing tool palette, select the Extrusion tool.
3 On the Properties palette, expand Basic and expand General.
4 Select the profile you created in step 1 for Profile.
5 Specify the insertion point in the drawing.
6 Specify the height of the Extrusion mass element.
7 Specify a rotation angle, or press ENTER for a rotation angle of zero degrees.
8 Press ENTER.

Creating a Mass Element by Revolving a Profile

Use this procedure to create a mass element by defining a profile as the basis of its shape and then revolving the profile about an axis. The axis of revolution is along the *X* axis of the profile as it is drawn. The insertion point is at the centroid of the bottom face of the Revolution mass element.

Creating a Revolution mass element from a profile



1. Create a profile to use as the basis of the mass element.

   For more information, see "Creating Profiles for Extrusion and Revolution Mass Elements" on page 597.

2. On the Massing tool palette, select the Revolution tool.
3. On the Properties palette, expand Basic and expand General.
4. Select the profile you created in step 1 for Profile.
5. Specify the insertion point in the drawing.
6. Specify a rotation angle, or press ENTER for a rotation angle of zero degrees.
7. Press ENTER.

Converting 3D Objects to Mass Elements

Use this procedure to convert AEC objects and other AutoCAD®ACIS solids to Free Form mass elements. When you convert an object to a Free Form mass element, the object is split into a collection of faces that compose the original shape.

NOTE When you convert objects to Free Form mass elements, your drawing size increases, potentially slowing drawing performance.

---

1. On the command line, enter **masselement**.
2. Enter **c** (Convert), and press ENTER.
3. Select the AEC object(s) or AutoCAD ACIS solid(s) that you want to convert to a Free Form mass element, and press ENTER.

4 Enter **y** (Yes) to erase the layout geometry, and press ENTER.

5 Enter **n** (Name) to name the mass element, and press ENTER.

6 Enter a name, and press ENTER three times.

Creating a Mass Element Tool

Use this procedure to create a mass element tool and add it to a tool palette. You may want to create your own mass element tools if you are placing multiple mass elements of specific styles with additional mass element properties that you want to be the same each time you add a mass element of that type.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a mass element in the drawing	select the object, and drag it to the tool palette.
create a tool from a mass element style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	right-click the tool and click Copy; open the other palette, and click Paste.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 Expand Basic, and expand General.

7 Click the setting for Description, enter a description of the mass element created from this tool, and click OK.

8 Specify a layer key and any layer overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.

9 Select a mass element style.

10 Select the drawing file containing the style used for this mass element.

11 Select a shape.

12 Expand Dimensions.

The options that display under Dimensions depend on the mass element tool you copied to create the new tool.

13 Specify the dimensions of the mass element:

If you want to . . .	Then . . .
specify the width of the mass element in its relative X direction	enter a value for Width.
specify the depth of the mass element in its relative Y direction	enter a value for Depth.
specify the height of the mass element in its relative Z direction	enter a value for Height.
specify the radius of the mass element	enter a value for Radius.
specify the rise of the mass element	enter a value for Rise.

14 Click OK.

Editing Mass Elements

After you create mass elements, you can edit and reposition them to generate the general form of your building mass model.

You can use grips to manipulate mass elements after you create them. The grip editing features available depend upon the shape of the selected mass element. Because mass elements are parametric, each mass element shape has specific behavior when you modify it. For example, if you select and drag the corner grip point of a Box mass element, the width and depth of the mass element are modified.

Autodesk® Architectural Desktop offers several methods for editing mass elements:

- You can directly edit mass elements using grips for dimensions and other physical characteristics.

- You can change mass element settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected mass element.

Related Procedures

- Using Grips to Edit Mass Elements
- Changing the Area of a Rectangular Mass Element
- Changing the Height of a Mass Element
- Moving a Mass Element
- Changing the Arch Radius of an Arch Mass Element
- Changing the Roof Height of a Gable Mass Element
- Changing the Rise of a Gable Mass Element
- Changing the Radius of a Circular Mass Element
- Changing the Shape, Size, and Mass Group of a Mass Element
- Editing the Faces of a Mass Element
- Assigning Materials to a Mass Element
- Specifying the Display Properties of a Mass Element
- Specifying the Hatching of a Mass Element
- Changing the Location of a Mass Element
- Attaching Hyperlinks, Notes, or Files to a Mass Element

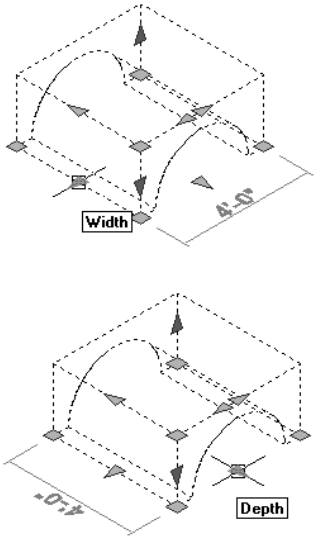
Using Grips to Edit Mass Elements

Refer to the illustrations and steps in this topic to use mass element grips to edit mass elements.

Editing Mass Element Dimensions

1. Select the mass element.
2. Select the grip for the dimension you want to change.

Viewing mass element grips and dimensions



3 Move the grip until the dimension value you want is displayed and click once, or enter a value.

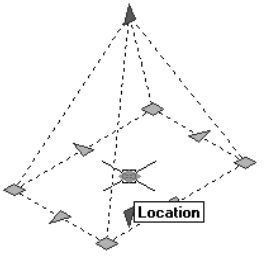
Changing the Location or Position of a Mass Element

1 Select the mass element.

2 Select the Location grip.

3 Move the mass element to the desired location, and click once.

Viewing a mass element Location grip



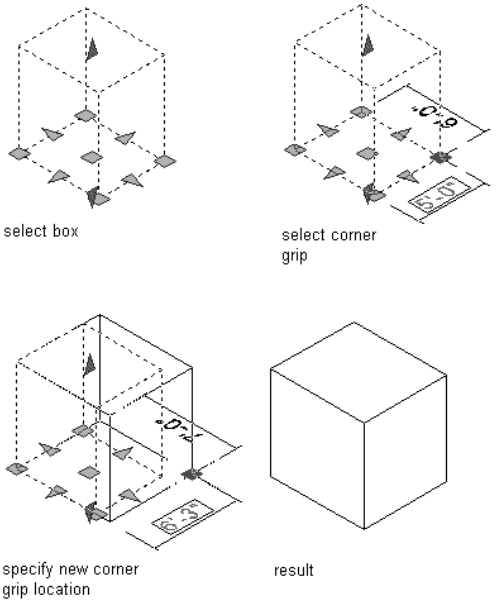
Changing the Area of a Rectangular Mass Element

Use this procedure to change the area of a rectangular mass element using grips. A rectangular mass element is any element that has four lines at its base, such as an Arch, Barrel Vault, Box, Gable, Pyramid, Isosceles Triangle, Right Triangle, or Extrusion.

For more information about mass element grips, see "Using Grips to Edit Mass Elements" on page 602.

You can also change the mass element area dimensions on the Properties palette.

Editing a Box mass element with its corner grip



1. Select the rectangular mass element to display its grips.
2. Click a corner grip, and move it to the new location.

   The location of the opposite corner remains fixed while you are moving the mass element corner.

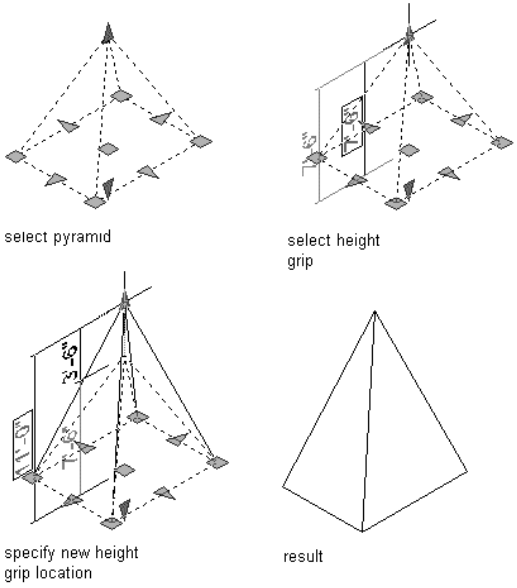
Changing the Height of a Mass Element

Use this procedure to change the height of a mass element using grips.

For more information about mass element grips, see "Using Grips to Edit Mass Elements" on page 602.

You can also change the mass element height on the Properties palette.

Editing a Pyramid mass element with its Height grip



1. Switch to a 3D view.
2. Select the mass element to display its grips.
3. Click the Height grip at the top of the mass element, and move it to the new location.

   The height of the mass element changes as you move the grip.

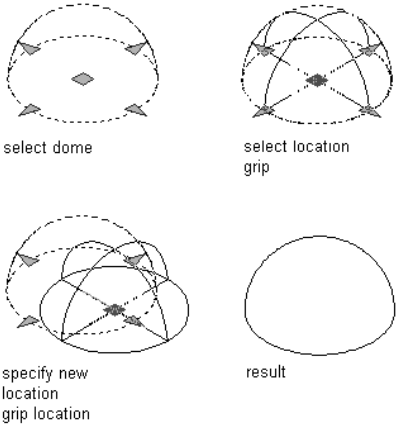
Moving a Mass Element

Use this procedure to move a mass element using grips.

For more information about mass element grips, see "Using Grips to Edit Mass Elements" on page 602.

You can also change the mass element location on the Properties palette.

Moving a Dome mass element with its Location grip



1 Select the mass element to display its grips.
2 Click the Location grip, and move it to the new location.

The entire mass element moves as you move the grip.

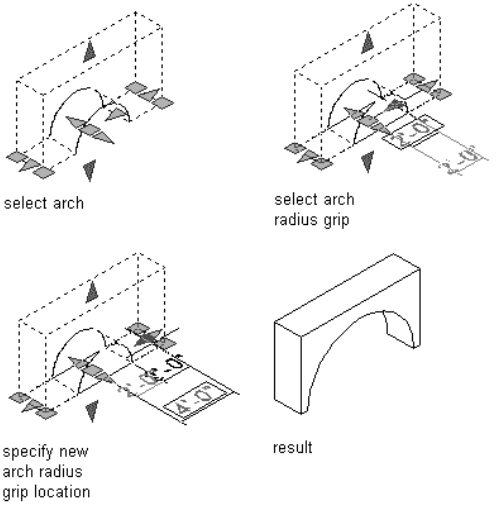
Changing the Arch Radius of an Arch Mass Element

Use this procedure to change the radius of the arch within an Arch mass element using grips.

For more information about mass element grips, see "Using Grips to Edit Mass Elements" on page 602.

You can also change the arch radius on the Properties palette.

Editing an Arch mass element with its Radius grip



1 Select the Arch mass element to display its grips.

2 Click the Arch Radius grip, and move it to the new location.

The radius of the arch changes as you move the grip.

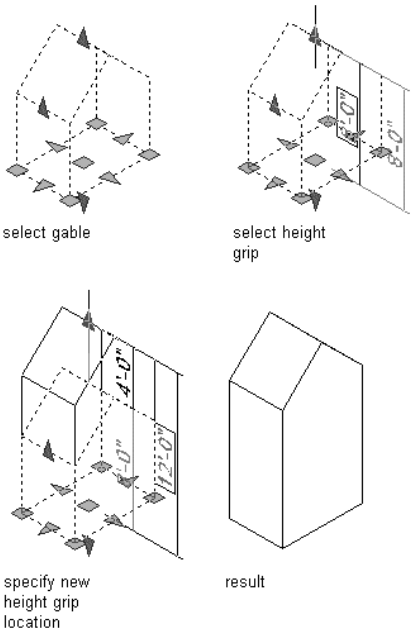
Changing the Roof Height of a Gable Mass Element

Use this procedure to change the roof height of a Gable mass element using grips.

For more information about mass element grips, see "Using Grips to Edit Mass Elements" on page 602.

You can also change the Gable roof height on the Properties palette.

Editing a Gable mass element with its Height grip



1. Switch to a 3D view.
2. Select the Gable mass element to display its grips.
3. Click the Height grip at the midpoint of the roof ridgeline.
4. Move the grip to change the height of the roof.

   The height of the roof ridgeline and the walls changes as you move the grip, leaving the roof slope and gable configuration unchanged.

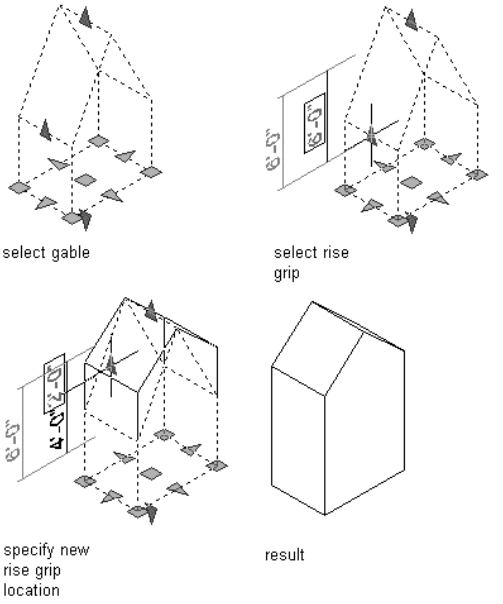
Changing the Rise of a Gable Mass Element

Use this procedure to change the wall height of a Gable mass element using grips.

For more information about mass element grips, see "Using Grips to Edit Mass Elements" on page 602.

You can also change the gable rise on the Properties palette.

Editing a Gable mass element with its Rise grip



1. Switch to a 3D view.
2. Select the Gable mass element to display its grips.
3. Click the Rise grip at the top of the wall.
4. Move the grip to change the height of the wall.

   The height of the wall changes as you move the grip, while the roof ridgeline position remains fixed. This changes the roof slope and gable configuration.

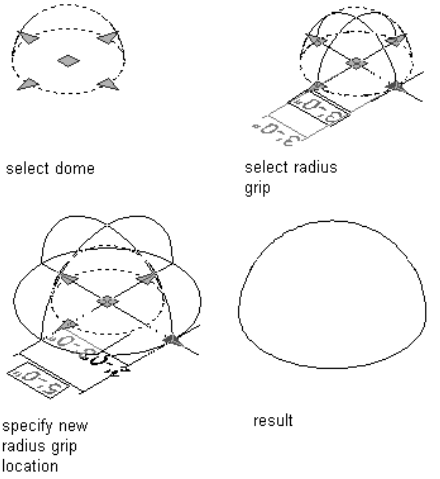
Changing the Radius of a Circular Mass Element

Use this procedure to change the radius of a circular mass element using grips. Circular mass elements include Cones, Cylinders, Domes, Doric Columns, Spheres, and Revolutions.

For more information about mass element grips, see "Using Grips to Edit Mass Elements" on page 602.

You can also change the mass element radius on the Properties palette.

Editing a Dome mass element with its Radius grip



1 Select the circular mass element to display its grips.

2 Click the Radius grip on the mass element.

You can select any one of the radius grips on the same circle to change the size.

3 Move the grip in or out.

The mass element becomes larger or smaller depending on the direction you move the grip.

Changing the Shape, Size, and Mass Group of a Mass Element

Use this procedure to change a mass element into another mass element shape, add it to a mass group, and change its size.

1 Double-click a mass element.

2 Expand Basic, and expand General.

3 Select a new basic shape for Shape.

4 To attach the mass element to a mass group, select a mass group for Attached to.

5 Expand Dimensions.

6 Enter new dimension values for the mass element.

NOTE When you change the size of a mass element, the center point remains constant and the change is applied to both sides of the element.

Combining Mass Elements Using Boolean Operations

Use this procedure to combine mass elements using Boolean operations.

1. Select the mass element to which you want to join another mass element.
2. Selected the desired Boolean operation:

If you want to . . .	Then . . .
combine the total volume of two or more mass elements into a composite object	right-click, and click Boolean ➤ Union.
remove the common area of one mass element from another	right-click, and click Boolean ➤ Subtract.
remove non-overlapping portions and create a composite solid from the common volume	right-click, and click Boolean ➤ Intersect.

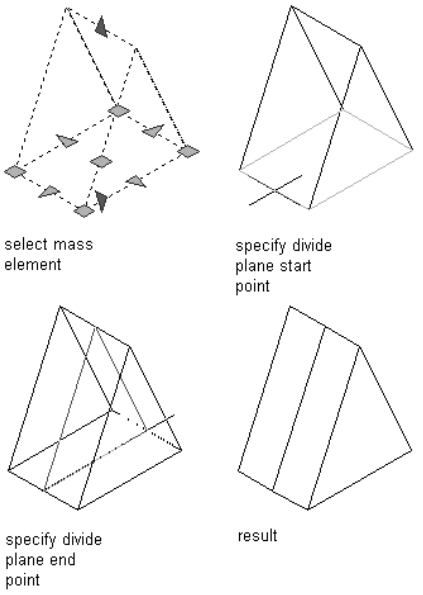
3. Select the objects you want to combine, and press ENTER.
4. Enter **y** (Yes) to erase the original geometry, or enter **n** (No) to keep the original geometry in the drawing.

Dividing a Mass Element

Use this procedure to divide a mass element. The divide plane you specify splits the original mass element into two separate mass elements.

1. Select the mass element you want to divide, right-click, and click Split.
2. Specify the divide plane start point.
3. Specify the divide plane end point.

Dividing a mass element



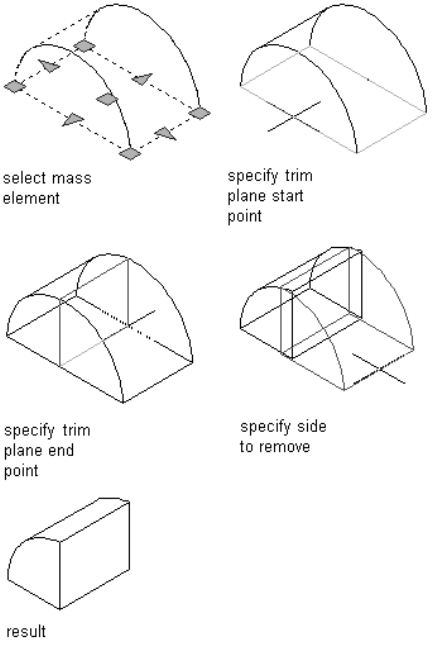
The original mass element is split along the divide plane, creating two mass elements.

Trimming a Mass Element

Use this procedure to trim a mass element. The divide plane you specify acts as the trim line, and you specify which side of the mass element to remove.

1. Select the mass element you want to divide, right-click, and click Trim.
2. Specify the divide plane start point.
3. Specify the divide plane end point.
4. Select the side of the mass element to remove.

Trimming a mass element



Dividing the Face of a Mass Element

Use this procedure to divide the face of a mass element. In order for the face to split, the mass element is automatically converted to a free form mass element.

1. Select the mass element whose face you want to divide, right-click, and click Split Face.
2. Select the first point on the face.
3. Select the second point on the same face, and press ENTER.

   The original mass element is converted to a free form mass element, and the selected face is divided along the line you specified.

Joining the Faces of a Mass Element

Use this procedure to join previously split faces of a mass element. After the faces are joined, the mass element is automatically converted back to the shape it was before being split.

1. Select the mass element whose faces you want to join, right-click, and click Join Faces.
2. Select the edge of the coplanar faces, and press ENTER.

   The mass element is converted to its original shape, and the selected faces are joined into a single face.

Editing the Faces of a Mass Element

Use this procedure to edit individual faces of a mass element. You must first convert the mass element to a Free Form mass element in order to edit its faces.

1. Double-click the mass element you want to edit.
2. On the Properties palette, expand Basic and expand General.
3. Select Free Form for Shape.

   The mass element is in edit in-place mode. Each face of the Free Form mass element is available to edit in this mode.

4. Select the Face grip for the face of the mass element that you want to edit.

   Depending on the original shape of the mass element, Edge and Vertex grips are displayed.

5. Click and hold on the Face grip to edit the selected face of the mass element:

If you want to . . .	Then . . .
move the face orthogonally, while stretching adjacent faces	click and drag the Face grip.
move the face freely, while stretching adjacent faces	click and hold the Face grip, press CTRL once, and drag the grip.
move the face on a plane, while maintaining the plane of adjacent faces	click and hold the Face grip, press CTRL twice, and drag the grip.
pull the face orthogonally, while adding adjacent faces	click and hold the Face grip, press CTRL three times, and drag the grip.
pull the face freely, while adding adjacent faces	click and hold the Face grip, press CTRL four times, and drag the grip.
push the face orthogonally, while adding adjacent faces and possibly creating a hole	click and hold the Face grip, press CTRL five times, and drag the grip.

Use CTRL to cycle through the choices available for editing the face.

6 Press ESC or right-click and click Deselect All to exit the editing session.

Assigning Materials to a Mass Element

Use this procedure to assign materials to the individual components of a mass element.

1 Select the mass element you want to assign materials to, right-click and click Edit Object Display.

2 To verify that the material assignment determines the display properties of the component, click the Display Properties tab, select the display representation where you want the changes to appear, and click .

3 Click the Layer/Color/Linetype tab, verify that By Material is selected for the component, and click OK.

4 Click the Materials tab.

The Component column displays all components of the mass element that can be assigned a material. Components that are only symbolical graphics, like the bounding box, are not listed because they cannot have a material assignment.

The Material Definition column displays the currently assigned materials. If no previous material assignments have been made, the default material is Standard.

5 Select the component you want to change, and select a different material definition.

You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

---

6 Click OK twice.

Specifying the Display Properties of a Mass Element

Use this procedure to change the following display properties of the components of a mass element:

- Visibility (component is on or off)
- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE If a material assignment determines the properties of a mass element display component, you can change the properties of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Assigning Materials to a Mass Element" on page 615.

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1. Select the mass element you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Specifying the Hatching of a Mass Element

Use this procedure to specify the hatching of the components of an individual mass element. Hatching is displayed only in display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

NOTE If a material assignment determines the hatching properties of a mass element display component, you can change the hatching of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Assigning Materials to a Mass Element" on page 615.

1. Select the mass element you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Hatching tab.
6. Select a display component, and click the setting for Pattern.
7. Select the hatching for the display component:

If you want to select . . .	Then . . .
a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
single hatching	select User-defined for Type, and clear Double Hatch.
double hatching	select User-defined for Type, and select Double Hatch.
solid fill	select Solid Fill for Type.

8. Click OK.
9. Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.
10. Click Angle, and enter the angle for the selected pattern.

11 Click Orientation, and specify how the hatching is oriented:

If you want to orient . . .	Then . . .
the hatching to the object, regardless of the object rotation	select Object.
the hatching to the World Coordinate System	select Global.

12 Click OK twice.

Changing the Location of a Mass Element

Use this procedure to relocate a mass element by changing the coordinate values of its insertion point. The mass element also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the mass element are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the mass element by aligning its normal with another axis. You can also rotate the mass element on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1 Double-click the mass element you want to change.

2 In the Properties palette, expand Basic, and expand Location.

3 Select Additional information.

4 Specify the location of the mass element:

If you want to . . .	Then . . .
relocate the mass element	enter new coordinate values under Insertion Point.
locate the mass element on the *XY* plane	make the normal of the mass element parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the mass element on the *YZ* plane	make the normal of the mass element parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.

If you want to . . .	Then . . .
locate the mass element on the *XZ* plane	make the normal of the mass element parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the mass element	enter a new value for Rotation Angle.

5 Click OK twice.

Attaching Hyperlinks, Notes, or Files to a Mass Element

Use this procedure to attach hyperlinks, notes, or files to a mass element. You can also edit hyperlinks and notes, and edit or detach reference files from a mass element.

1 Double-click the mass element you want to attach information to.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD®2004 Command Reference*.

4 Click OK.

5 To add a note, click the setting for Notes, and enter the note.

6 Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, and select a file. click open, and OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK twice.

Mass Element Styles

A mass element style is a collection of settings for variables associated with a mass element. Depending on the scope of the drawing, you could create different mass element styles to represent a wide range of different types of mass elements.

Properties that Mass Element Styles Control

The mass element style you select determines the properties of mass elements you create in the drawing. When you edit the display properties of a mass element style, those changes are applied to existing mass elements of that style throughout the current drawing.

Creating Mass Element Styles

Typically, you create mass element styles that represent the basic building blocks of the drawing. When you name a mass element style, mass elements are automatically grouped and can generate reports based on the first part of the mass element style name.

Editing Mass Element Styles

The changes you make to an existing mass element style take effect the next time you use it to create a mass element. Mass elements already created with the mass element style are not updated unless you change the display properties of the mass element style.

Managing Mass Element Styles

When you create, import, export, or edit styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Creating a Mass Element Style
- Assigning Materials to a Mass Element Style
- Specifying the Display Properties of a Mass Element Style
- Specifying the Hatching for Components of a Mass Element Style
- Attaching Notes and Files to a Mass Element Style

Creating a Mass Element Style

Use this procedure to create a mass element style. You can create a style using default style properties or by copying an existing style. After you create the

style, you edit the style properties to customize the characteristics of the style.

1 On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Multi-Purpose Objects, and expand Mass Element Styles.

3 Create a mass element style:

If you want to . . .	Then . . .
create a style with default properties	right-click Mass Element Styles, and click New.
create a style from an existing style	right-click the mass element style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new mass element style, and press ENTER.

5 To edit the new mass element style, right-click the style, and click Edit:

If you want to . . .	Then . . .
specify materials for mass element components	see "Assigning Materials to a Mass Element Style" on page 623.
specify the display properties of the style	see "Specifying the Display Properties of a Mass Element Style" on page 624.
specify hatching for components of the style	see "Specifying the Hatching for Components of a Mass Element Style" on page 625.
add notes and files to the style	see "Attaching Notes and Files to a Mass Element Style" on page 626.

6 When you finish specifying the properties of the mass element style, click OK twice.

Specifying the Materials of a Mass Element Style

A mass element consists of a number of components whose display properties can be determined by the materials assigned to each component.

When you assign materials to a mass element style, you assign one material to each physical component of the mass element. You assign materials to

components in each display representation where you want the materials to be used.

If you want to use the display properties of the mass element style, instead of using material display properties, you can turn off the material assignments in the display properties of the mass element style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in three-dimensional (3D) model views and in elevations.

Related Topics and Procedure

- Mass Element Materials and Display Components
- Assigning Materials to a Mass Element Style

Mass Element Materials and Display Components

The following table lists all mass element components plus information about which material components determine them in specific views.

Mass Element Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Plan Presentation, Plan Screened	
Above Cut Plane	Plan Linework
Below Cut Plane	Plan Linework
Hatch	Plan Hatch
Cut Plane	No Material
Model	
Entity	3D Body
Bounding Box	No Material
Reflected, Reflected Screened	
Entity	3D Body
Bounding Box	No Material
Hatch	Plan Hatch

Assigning Materials to a Mass Element Style

Use this procedure to assign materials to the individual components of a mass element style. When you assign a material to a mass element component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the mass element. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, the hatch is a physical component. The cut plane is a symbolic component.

NOTE If a material assignment does not determine the display properties of a mass element component, you can change the display properties of the mass element style as described in "Specifying the Display Properties of a Mass Element Style" on page 624.

---

1. Open a tool palette that has a mass element tool.
2. Right-click a mass element tool, and click Mass Element Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Select the component you want to change, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

    ---

11 Click OK twice.

Specifying the Display Properties of a Mass Element Style

Use this procedure to change the following display properties of the display components of a mass element style:

- Visibility (component is on or off)
- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

To change these display properties for an individual mass element, see "Specifying the Display Properties of a Mass Element" on page 616.

NOTE If a material assignment determines the display properties of components in the mass element style, you can change the properties of the display component by clearing By Material. You can also override the material assignment with a different material. For more information, see "Assigning Materials to a Mass Element Style" on page 623.

---

1. Open a tool palette that has a mass element tool.
2. Right-click a mass element tool, and click Mass Element Styles.
3. Right-click the mass element style you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. Click the Layer/Color/Linetype tab.
7. Select the component to change, and select a different setting for the property.
8. Click OK twice.

Specifying the Hatching for Components of a Mass Element Style

Use this procedure to specify the hatching of the components of a mass element style. Mass element hatching is displayed only in display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

1. Open a tool palette that has a mass element tool.
2. Right-click a mass element tool, and click Mass Element Styles.
3. Right-click the mass element style that you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and click Style Override.

   The display representation in bold is the current display representation.
6. Click the Hatching tab.
7. Select a display component, and click the setting for Pattern.
8. Select the hatching for the display component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

9. Click OK.
10. Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.
11. Click Angle, and enter the angle for the selected pattern.

12 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

13 Click OK twice.

Attaching Notes and Files to a Mass Element Style

Use this procedure to enter notes and attach reference files to a mass element style. You can also edit notes and edit or detach reference files from a mass element style.

1 Open a tool palette that has a mass element tool.
2 Right-click a mass element tool, and click Mass Element Styles.
3 Right-click the mass element style you want to change, and click Edit.
4 Click the General tab.
5 To add a description to the mass element style, enter it for Description.
6 Click Notes.
7 To add a note, click the Notes tab, and enter the note.
8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

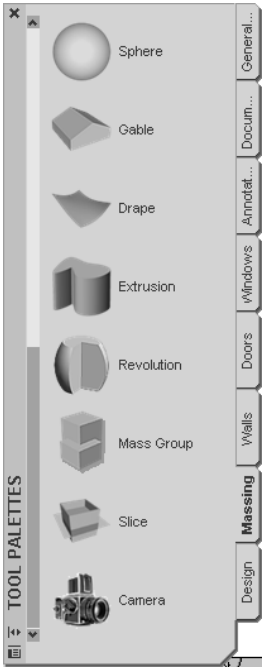
If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK three times.

Using Massing Tools to Create Mass Groups

Tools provided with Autodesk®Architectural Desktop let you quickly place mass groups by selecting a tool from the Massing tool palette. The mass group tool has predefined properties. When you place mass groups using mass group tools, you can use the default settings of the tool, or you can change settings for the mass group properties.

Tool palettes containing mass group tools



The default tool palettes in the workspace contain sample mass group tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain mass group tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog

Custom palettes created by your CAD manager or other users may also contain mass group tools with mass group properties that are customized for your projects or office standards.

Related Procedures

- Creating a Mass Group
- Adding a Mass Group Marker
- Assigning Materials to a Mass Group
- Changing the Size of the Mass Group Marker
- Adding a New Mass Element to a Mass Group
- Attaching an Existing Mass Element to a Group
- Detaching a Mass Element from a Group
- Making a Mass Element Additive
- Making a Mass Element Subtractive
- Creating an Intersection from Mass Elements
- Creating a Nested Mass Group
- Removing a Nested Mass Group from a Mass Group
- Changing the Location of a Mass Group
- Attaching Hyperlinks, Notes, or Files to a Mass Group
- Creating a Mass Group Tool

Creating a Mass Group

Use this procedure to add a new mass group that has the properties specified in the mass group tool that you select.

A mass group is a display object that allows you to visualize and manipulate combinations of mass elements. After you create mass elements, you can combine their shapes through Boolean operations (addition, subtraction, and intersection) in a mass group. The resulting complex shape of the mass group represents your mass model.

Mass Groups and Mass Group Markers
To create a mass group, you attach mass elements, other AEC objects, or AutoCAD® objects to a mass group marker that you place in a convenient area of your drawing. The mass elements and other objects that you attach to the mass group marker form the body of the mass group. The mass group marker becomes the "handle" that allows you to select and move the mass group. The mass group is created on a different layer than the mass elements that form it.

Using Boolean Operations to Create a Mass Group
You can combine the shapes of mass elements in the mass group, adding, subtracting, and intersecting them in a specific order:

- An additive operation combines the total volume of two or more solids or two or more regions into a composite object.
- A subtractive operation removes the common area of one set of solids from another.
- An intersection removes non-overlapping portions and creates a composite solid from the common volume.

You can attach anything to a mass group marker, but the mass group combines only closed, solid shapes. For example, a line has no solid properties and does not contribute anything to the shape of the mass group. However; an AutoCAD 3D solid does contribute to the final shape.

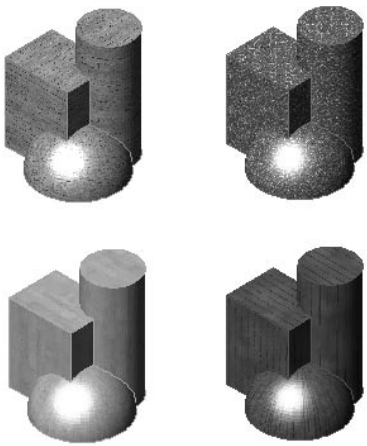
You can also create and work with mass groups in the Model Explorer. For more information, see "Using the Model Explorer to Create Mass Models" on page 646.

To further refine the building model, you can still edit individual mass elements attached to a mass group.

Materials in Mass Groups

In Autodesk Architectural Desktop, you can assign materials to a mass group. These materials then are displayed in wireframe or rendered views. Materials have specific settings for individual components of a mass group.

Mass groups with assigned materials in rendered view



Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes, which contain settings for mass groups. You can use these predefined materials, or modify them to your special designs. You can also create your own materials from scratch entirely.

For more information, see "Using Materials for Mass Elements and Mass Groups" on page 641.

1. Open the tool palette that you want to use, and select a mass group tool.

   If necessary, scroll to display the tool that you want to use.

2. Specify the insertion point of the mass group.

   You can move or hide the Properties palette to expose more of the drawing area.

3. Specify the rotation angle.

Adding a Mass Group Marker

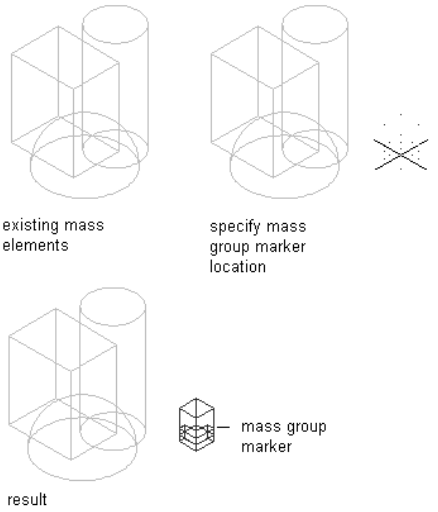
Use this procedure to add a mass group marker. The mass group is controlled by a mass group marker that you place in the drawing. The mass group marker is view dependent and changes size as you zoom within the drawing. Attach mass elements to the marker to create a mass group.

1. On the Massing tool palette, select the Mass Group tool.
2. Select a location for the mass group marker in the drawing.

   The location does not represent the location of the mass elements that you attach to the marker, so locate the marker in any convenient area in the drawing.

3. Specify a rotation angle for the mass marker.

Adding a mass group marker to a group of mass elements



Assigning Materials to a Mass Group

Use this procedure to assign materials to the individual components of a mass group.

1. Select the mass group you want to assign materials to, right-click and click Edit Object Display.
2. To verify that the material assignment determines the display properties of the component, click the Display Properties tab, select the display representation where you want the changes to appear, and click .
3. Click the Layer/Color/Linetype tab, verify that By Material is selected for the component, and click OK.
4. Click the Materials tab.

   The Component column displays all components of the mass group that can be assigned a material. Components that are only symbolical graphics, like the bounding box, are not listed because they cannot have a material assignment.

   The Material Definition column displays the currently assigned materials. If no previous material assignments have been made, the default material is Standard.

5 Select the component you want to change, and select a different material definition.

You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

6 Click OK twice.

Changing the Size of the Mass Group Marker

Use this procedure to change the size of the mass group marker by editing its display properties.

1 Select the mass group marker, right-click and click Edit Object Display.
2 Click the Display Properties tab.
3 Select the display representation where you want the changes to appear, and click Object Override.
4 Click the Other tab, and change the size of the mass group marker.
5 Click OK twice.

Adding a New Mass Element to a Mass Group

Use this procedure to add a new mass element to create a mass group after you have placed a mass group marker in the drawing.

1 Select an existing mass group marker, right-click and click Add New Element.
2 In the Properties palette, select a shape for the mass element.
3 Select Add, Subtract, or Intersect for Operation.
4 Specify an insertion point in the drawing.
5 Specify additional parameters for the mass element.

Depending on the shape of the mass element, you need to specify a second corner, the radius, or the height.

6 Specify a rotation angle.
7 Press ENTER.

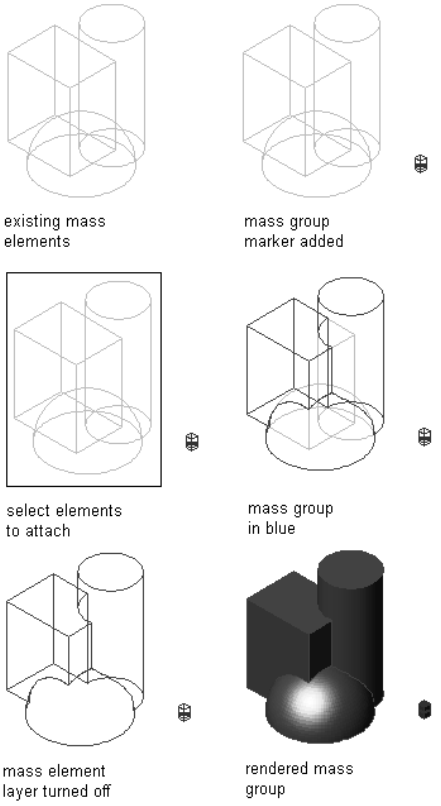
The newly created mass element is now part of the selected mass group.

Attaching an Existing Mass Element to a Group

Use this procedure to add existing mass elements to a mass group.

While it is possible to attach any number of objects to a single mass group, performance will be improved if this single group is subdivided into a series of nested groups. Your design will also be more manageable if a group is broken into logical divisions. In addition, if one of the subgroups fails to display as expected, it will be easier to track down the problem. In most cases, you can adjust the order of the objects in the group to get the correct appearance.

Attaching mass elements to a mass group



1. Select the mass group marker, right-click and click Attach Elements.
2. Select one or more mass elements to attach to the mass group.

3 Press ENTER.

Detaching a Mass Element from a Group

Use this procedure to detach a mass element from a mass group. After you have defined a mass group and added mass elements to it, you may decide that one or more elements do not fit your model. You can detach these from the mass group and use them elsewhere or delete them.

1 Select the mass group marker, right-click and click Detach Elements.
2 Select one or more mass elements to detach from the mass group.
3 Press ENTER.

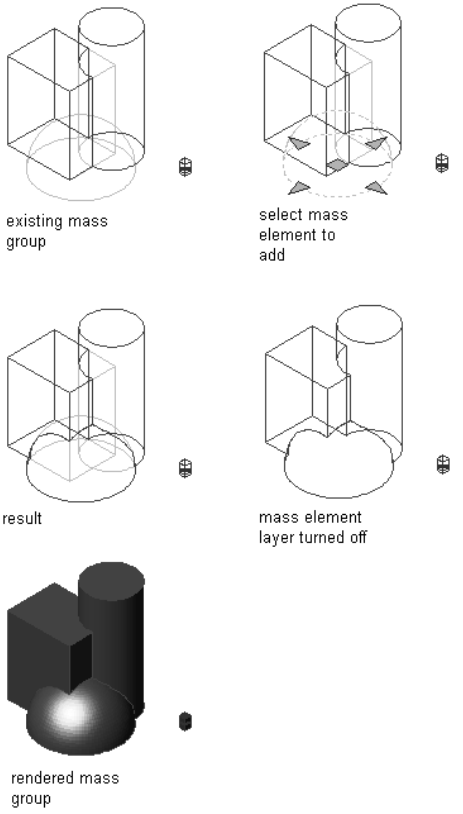
Making a Mass Element Additive

Use this procedure to change the operation of a mass element. All objects are additive by default when they are created. When two mass elements are grouped together, they form one mass containing both objects.

NOTE When you select the mass element, make sure you select the mass element, not the view of the mass group. When a mass element becomes part of a mass group, it gets placed in that display set, which is usually displayed with a different layer and color. To select a single element, you need to turn off the mass group layer.

- Select the mass element you want to make additive, right-click, and click Mass Group Operation ➤ Additive.

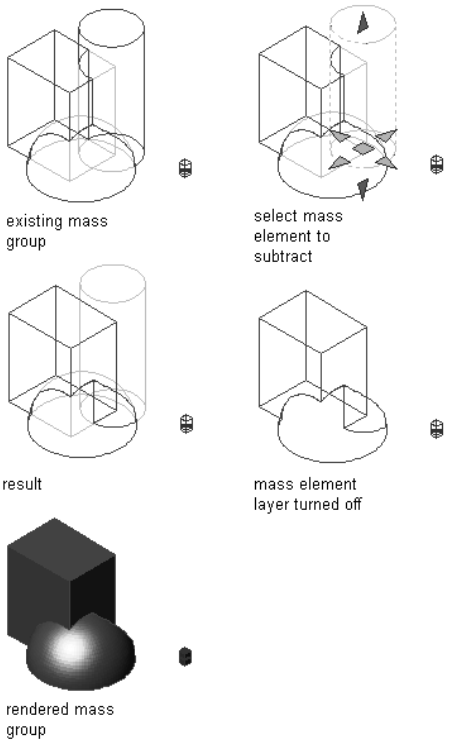
Adding a mass element to a mass group



Making a Mass Element Subtractive

Use this procedure to change the operation of a mass element. When a mass element in a group operates by subtraction, the mass element subtracts its mass where it overlaps another object.

Subtracting a mass element from a mass group



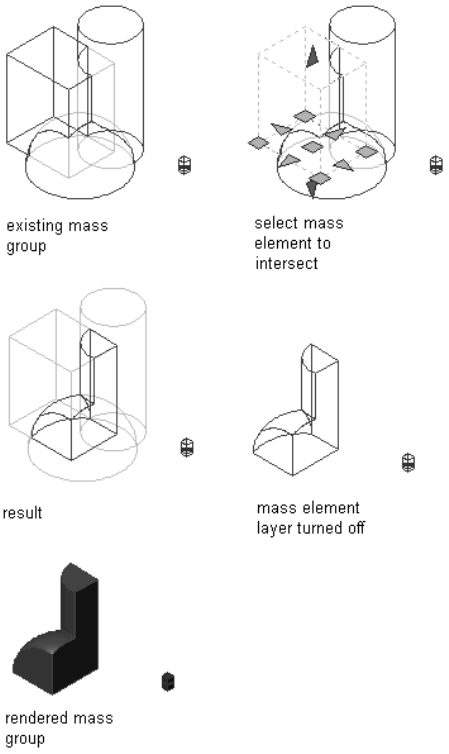
NOTE When you select the mass element, make sure you select the mass element, not the view of the mass group. When a mass element becomes part of a mass group, it gets placed in that display set, which is usually displayed with a different layer and color. To select a single element, you need to turn off the mass group layer.

1. Select the mass element you want to make subtractive.
2. On the Properties palette, expand Basic, and expand General.
3. Select Subtract for Operation.
4. Press ENTER.

Creating an Intersection from Mass Elements

Use this procedure to create a new mass shape using the intersection of two mass elements.

Generating an intersection mass group from mass elements



NOTE When you select the mass element, make sure you select the mass element, not the view of the mass group. When a mass element becomes part of a mass group, it gets placed in that display set, which is usually displayed with a different layer and color. To select a single element, you need to turn off the mass group layer.

1. Select the mass element you want to make intersecting.
2. On the Properties palette, expand Basic, and expand General.
3. Select Intersect for Operation.
4. Press ENTER.

Creating a Nested Mass Group

Use this procedure to attach a mass group to another mass group. This action nests the current mass group within the mass group that you select.

You may find it easier to nest mass groups using the Model Explorer. For more information, see "Moving a Mass Element or Group from One Mass Group to Another" on page 656.

1. Select the mass group that you want to nest within another mass group.
2. On the Properties palette, expand Basic, and expand General.
3. Click the mass group where you want to nest the current mass group for Attached to.
4. Specify Add, Subtract, or Intersect for Operation.

   This option determines how the mass group is nested within the mass group you selected.
5. Press ENTER.

Removing a Nested Mass Group from a Mass Group

Use this procedure to remove a mass group from another mass group in which the first mass group is nested. The mass group you remove remains in the drawing.

1. Select the mass group you want to remove.
2. On the Properties palette, expand Basic, and expand General.
3. Select None for Group.

Changing the Location of a Mass Group

Use this procedure to relocate a mass group by changing the coordinate values of its insertion point. The mass group also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the mass group are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the mass group by aligning its normal with another axis. You can also rotate the mass group on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1 Double-click the mass group you want to change.
2 In the Properties palette, expand Basic, and expand Location.
3 Select Additional information.
4 Specify the location of the mass group:

If you want to . . .	Then . . .
relocate the mass group	enter new coordinate values under Insertion Point.
locate the mass group on the *XY* plane	make the normal of the mass group parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the mass group on the *YZ* plane	make the normal of the mass group parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the mass group on the *XZ* plane	make the normal of the mass group parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the mass group	enter a new value for Rotation Angle.

5 Click OK twice.

Attaching Hyperlinks, Notes, or Files to a Mass Group

Use this procedure to attach hyperlinks, notes, or files to a mass group. You can also edit hyperlinks and notes, and edit or detach reference files from a mass group.

1 Double-click the mass group you want to attach information to.
2 On the Properties palette, click the Extended Data tab.
3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD®2004 Command Reference*.

4 To add a note, click next to Notes, enter text, and click OK.

5 To attach, detach, or edit a reference file, click next to Reference documents, and then do any of the following:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6 Click OK twice.

Creating a Mass Group Tool

Use this procedure to create a mass group tool and add it to a tool palette. You may want to create your own mass group tools if you are placing multiple mass groups with mass group properties that you want to be the same each time you add a mass group of that type.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 To add keywords to the tool, click More Info.

7 Enter the keywords, and click OK twice.

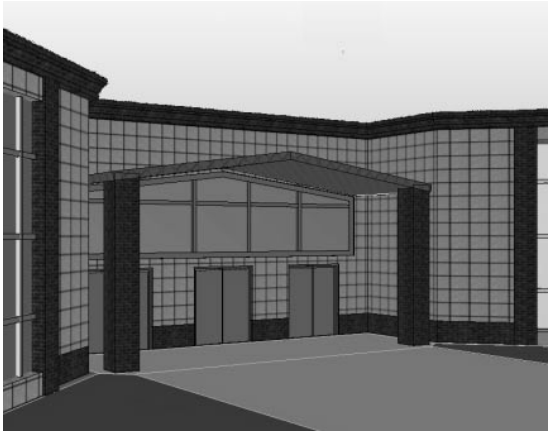
Using Materials for Mass Elements and Mass Groups

Using materials simplifies defining the display of objects. You define the display of a material, such as brick or glass, only once in the drawing or the drawing template, and then assign it to any object component or object style. For example, you can define a material "Glass" and assign it to any number of windows, glass door insets, or cubicle walls.

Using a common set of materials provides centralized control across the display of objects in a drawing or throughout the whole project. When the particulars of a material change, you change them just once in the material definition, and all objects are automatically updated.

For more information, see "Materials" on page 491.

Rendered building with different materials



Predefined Materials

Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes. You can use these predefined materials,

or modify them to your special designs. You can also create your own materials.

Surface Hatching

The ability to assign surface hatches to objects has greatly been improved by materials. Surface hatches can display in both model views and section/elevation views. Placement and orientation of the hatch can be precisely controlled and specified for each object face individually.

For detailed information about surface hatches, see "Working with Surface Hatches" on page 504.

Related Topics

- Mass Element and Mass Group Display Components and Materials
- Process Overview: Creating and Applying a Material for a Mass Element or Mass Group

Mass Element and Mass Group Display Components and Materials

A mass element or a mass group consists of a number of display components that can be determined by materials.

Workflow

When you assign materials to a mass element or a mass group, you assign one material to each display component of the mass element or mass group. For example, you assign a dark wood material to the mass element body and a light brown material to the mass element hatch. When you assign a material to a mass group, the display properties of the attached mass elements are overridden with the mass group settings.

If you want to use the display properties of the mass element instead of the material display properties, you can deactivate the material assignments in the display properties of the mass element.

Display Representations

The display properties of an object are specified for each display representation individually. Mass elements and mass groups have, by default, display representations for plan, model, reflected, and sketch views. You can create new display representations for mass elements and mass groups by copying an existing display representation. For example, you can create a new display representation "Plan 1:25" to create a plan view optimized for display in a view scaled to 1:25. This new display representation has the same display components as the original one from which it was copied. The copied com-

ponents will be influenced by the same material components as the original components.

Material Component Assignments
Material definitions consist of display components which correspond to component types of objects. For example, the Linework component of a material is used for all linework in Plan view. The Surface Hatch component of a material is used to hatch all object surfaces in 3D model views and elevations.

For a complete list of material components and their description, see "Material Components and Display Properties" on page 498.

The following table lists all mass element components plus information about which material components determine them.

Mass Element Component	Material Component
Plan High Detail, Plan Low Detail, Plan Presentation, Plan Screened	
Hatch	Plan Hatch
Cut Plane	No Material
Model	
Entity	3D Body
Bounding Box	No Material
Reflected, Reflected Screened, Sketch	
Entity	Plan Linework
Bounding Box	No Material
Hatch	Plan Hatch

The following table lists all mass group components plus information about which material components determine them.

Mass Group Component	Material Component
Plan High Detail, Plan Low Detail	
Marker	No Material

Mass Group Component	Material Component
Cut Plane	No Material
Hatch	No Material
Plan, Plan Presentation, Plan Screened	
Entity	Plan Linework
Marker	No Material
Model	
Entity	3D Body
Marker	No Material
Reflected, Reflected Screened	
Entity	Plan Linework
Marker	No Material

Process Overview: Creating and Applying a Material for a Mass Element or Mass Group

If you create a material, you can then apply it to all types of objects that support materials. For example, a concrete material could be used for a wall and for a structural element. Mass elements and mass groups are often used for columns, elevator shafts, or chimneys. If you want to create a material to use only for mass elements or mass groups, it is recommended that you name it accordingly. For example, if the materials have specific names such as Mass Element - Concrete Column or Mass Group - Cable Shaft, you can simplify the organization of your material definitions.

Step 1: Create a new material definition or edit an existing material definition.

For information on creating and editing materials, see "Creating and Editing Materials" on page 517.

Step 2: In the material definition, define the settings that affect the display of materials in mass elements and mass groups:

If you want to . . .	Then . . .
display a surface hatch for a mass element or a mass group in 3D model views	turn on the Surface Hatch component and specify its display properties. For more information, see "Defining the Layer, Color and Linetype of a Material" on page 520 and "Specifying the Surface Hatch Pattern of a Material" on page 523.
display a section hatch for a mass element or mass group in a 2D section, 3D section, or live section	turn on the Section Hatch component and specify its display properties. For more information, see "Defining the Layer, Color and Linetype of a Material" on page 520 and and "Specifying the Plan and Section Hatch Patterns of a Material" on page 521.
display the sectioned boundary and sectioned body of a mass element or mass group in a live section	turn on the Sectioned Boundary and Sectioned Body components and specify their display properties. For more information, see "Defining the Layer, Color and Linetype of a Material" on page 520.
add special rendering materials for mass elements or mass groups in live sections	select rendering materials. For more information, see "Assigning Materials for Rendering" on page 526.
exclude mass element or mass group components from a 2D section shrinkwrap hatch	specify this setting in the material definition. For information, see "Excluding a Material from 2D Section Shrinkwrap" on page 528.

Step 3: Turn on the assigned materials in the individual display representations, and then assign the materials to the mass elements and mass groups in your building model.

For information on assigning materials to mass elements, see "Assigning Materials to a Mass Element" on page 615.

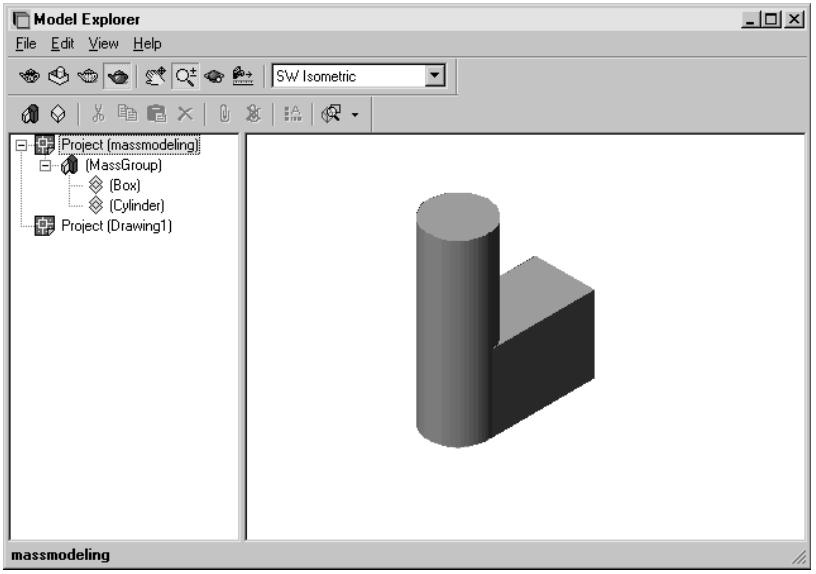
For information on assigning materials to mass groups, see "Assigning Materials to a Mass Group" on page 631.

Using the Model Explorer to Create Mass Models

The Model Explorer is a window in which you can create, view, and manipulate mass elements and mass groups. You can create your entire conceptual model by using Model Explorer. The main viewing window display is similar to the 3D orbit view. You can attach objects and mass elements to mass groups and view them in the Model Explorer. In the Model Explorer, you can simultaneously view the conceptual and the hierarchical structure of mass groups and mass elements that make up the model.

The Model Explorer is divided into three areas: the tree view in the left pane, the graphics area in the right pane, and the menu bar and toolbar across the top.

The Model Explorer



Left Pane of the Model Explorer
The tree view lists all open drawings as Projects. Any mass groups are displayed under their associated drawing in the tree view. If you expand a mass group in the tree view, the mass elements attached to the mass group display. One of the following icons displays next to each mass element in the mass

group, indicating which Boolean operation they use to combine with each other in the mass group:

Icon	
	Both squares yellow = additive
	Top portion of the two squares yellow = subtractive
	Middle of squares yellow = intersection

An additive operation in the Model Explorer combines the total volume of two or more solids or two or more regions into a composite object. A subtractive operation removes the common area of one set of solids from another. An intersection removes non-overlapping portions and creates a composite solid from the common volume.

The order of the objects and mass elements in the tree view dictates the outcome of the group when mass elements are combined. You can drag and drop the mass elements within the mass group to change the order in which they are combined.

You can also drag and drop mass groups to nest them within other mass groups to build your model. For example, if you are modeling a building with multiple wings, each wing can be a mass group containing multiple mass elements. You can then add these mass groups to a mass group of the entire building.

Right Pane of the Model Explorer

The right pane of the Model Explorer displays a graphical view of the mass elements or mass groups that you select in the left pane.

Model Explorer Menu Bar and Toolbar

The top of the Model Explorer includes a menu bar and toolbar that allow you to access the menu commands. If you position your pointing device over a toolbar icon, a tooltip displays with an explanation of the icon. For more information, see "Using Toolbar Commands in the Model Explorer" on page 650.

If you turn off the Model Explorer toolbars from the commands on the View menu, the tree view and viewer initially are blank the next time you display the Model Explorer. Click any of the pull-down menu headings to restore the proper display.

Related Procedures

- Displaying the Model Explorer
- Using Display Commands in the Model Explorer
- Viewing Objects on a Nonvisible Layer
- Maintaining Zoom Percentage and Position of an Object
- Using Toolbar Commands in the Model Explorer

Displaying the Model Explorer

Use this procedure to open the Model Explorer. Any mass groups in the current drawing display in the right pane. The tree view in the left pane lists the mass groups in your open drawings.

1 Select a mass group, right-click, and click Show Model Explorer.

2 You can move, resize, or close the Model Explorer:

If you want to . . .	Then . . .
move the Model Explorer	drag the Model Explorer title bar to the desired location.
resize the Model Explorer	click the edge of the Model Explorer and drag to the desired size.
close the Model Explorer	click the "X" in the top right side of the Model Explorer.

Using Display Commands in the Model Explorer

The following toolbar commands change the display of the objects in the Model Explorer:

Icon

Wireframe: Displays objects in the current view with all lines showing, including those hidden by other objects.

Hidden: Displays objects in the 3D wireframe representation with hidden lines.

Flat Shaded: Shades objects in a 3D view between the polygon faces. Objects appear flatter and less smooth than Gouraud shaded objects.

Icon	
	Gouraud Shaded: Shades objects in a 3D view and smooths the edges between polygon faces. Objects appear smoother and more realistic than flat shaded objects. AEC objects use a faceted representation, so there is no visible change when you switch from flat shading to Gouraud shading.
	Pan: Pans the view in the graphics area of the Object Viewer.
	Zoom: Real-time Zooms the Object Viewer display as you move your pointing device.
	Orbit: Sets the display in the graphics area to 3D orbit view.
	Adjust Distance: Moves the view in the graphics area.

You can select the following views from the list:

- six orthogonal views (Top, Bottom, Left, Right, Front, Back): Sets the current view to the selected view.
- four isometric views (SW Isometric, SE Isometric, NE Isometric, NW Isometric): Sets the current view to the selected isometric view.
- Any named views.

You can also use keyboard shortcuts to change the view in the graphics area:

- Hold down SHIFT and click to pan in the graphics area of the Model Explorer.
- Hold down CTRL and click to zoom in the graphics area of the Model Explorer.

Viewing Objects on a Nonvisible Layer

Use this procedure to change the settings in the Model Explorer to be able to view all objects, regardless of the visibility of the layer on which they reside. Any object on a layer that is frozen or turned off is not displayed initially.

1. Open the Model Explorer.
2. On the Model Explorer View menu, click Show All Layers.

The check mark in the menu next to Show All Layers indicates that all objects are displayed in the Model Explorer.

Maintaining Zoom Percentage and Position of an Object

Use this procedure to select an object in the Model Explorer tree view. The zoom percentage and location of the object is maintained. This is useful when you want to examine how the object relates to the rest of the drawing.

In the Model Explorer, you can specify to display the selected object only and display it at maximum size.

1. Open the Model Explorer.
2. On the Model Explorer View menu, click Auto Zoom Extents.
3. Select the object to view from the tree view.

   The Model Explorer graphics window displays only the selected object, zoomed to fit the window.

Using Toolbar Commands in the Model Explorer

The following toolbar commands allow you to work with mass elements and mass groups in the Model Explorer:

Icon	
	New Grouping: Creates a new mass group in the drawing.
	New Element: Creates a new mass element in the drawing.
	Cut: Cuts the selected item in the tree view to the Clipboard.
	Copy: Copies the selected item from the tree view to the Clipboard.
	Paste: Pastes the selected item into the tree view at the selected location.
	Delete Item: Deletes an item from the tree view and from the drawing.
	Attach Items: Attaches existing mass elements or objects to the selected mass group. Select one or more elements or objects in the drawing. This option is available only when a mass group is selected in the tree view.

Icon	
	Detach Items: Detaches the selected mass elements or objects from the mass group. This option is available only when a mass group is selected in the tree view.
	Properties: Opens the properties dialog box for the selected mass element, object, or mass group.
	Display Configuration: Changes the display configuration of the objects in the Model Explorer. Select a display configuration from the list.

Creating a Mass Element with the Model Explorer

Use this procedure to create a mass element in the Model Explorer. For detailed information about specifying the shape and dimensions of a mass element, see "Creating a Mass Element" on page 588.

1. Open the Model Explorer.
2. In the left pane, select the level at which you want the mass element created.

   If you select the drawing name, the new mass element is created at the next hierarchical level. If you select a mass group name with a drawing, the new mass element is attached to the selected mass group.
3. On the Model Explorer File menu, click Create Element, or click .
4. On the command line, specify a shape.
5. Specify the insertion point for the mass element.

   Depending on the shape you specified, you need to specify a second corner, the radius, or the height.
6. Specify the rotation angle.
7. Press ENTER.

Creating a Mass Group

Use this procedure to create a mass group in the Model Explorer.

1. Open the Model Explorer.
2. In the left pane, select the level at which you want the mass group created.

If you select the drawing name, the new mass group is created at the next hierarchical level. If you select a mass group name with a drawing, the new mass group is nested within the existing mass group.

3 On the Model Explorer File menu, click Create Group, or click .

4 Specify a location for the mass marker.

The location does not represent the location of the mass elements that are added to the marker. Therefore, you can locate the mass marker in any convenient area.

5 Specify the rotation angle.

The new mass group is added to the project tree in the Model Explorer.

Attaching a Mass Element to a Mass Group

Use this procedure to attach existing mass elements to the group after a mass group is created.

1 Open the Model Explorer.

2 In the left pane, select a mass group, right-click, and click Attach Elements.

3 Select the mass elements to add to the group.

4 Press ENTER.

Attaching Objects to a Mass Group

Use this procedure to attach objects, such as doors, walls, and curtain walls, to the group after a mass group is created.

1 Open the Model Explorer.

2 In the left pane, select a mass group, right-click, and click Attach Elements.

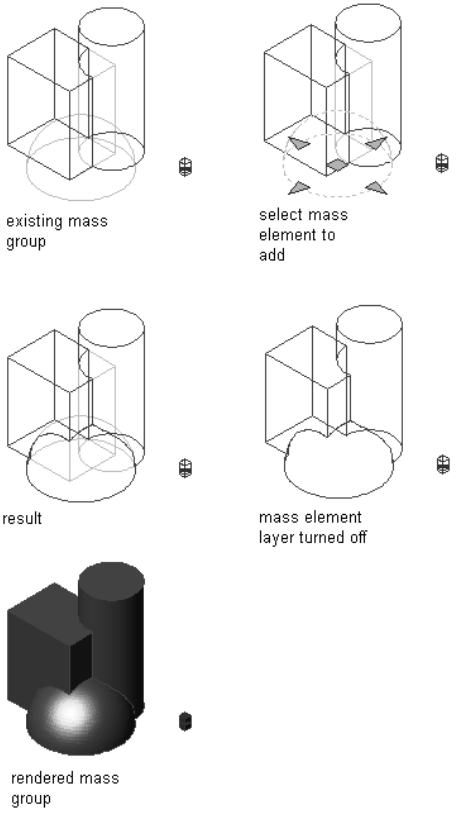
3 Select the objects to add to the group.

4 Press ENTER.

Changing a Mass Element Operation to Additive

Use this procedure to change a mass element operation to additive. Mass elements are additive when you create them. After a mass element is added to a mass group, its operation can be changed to produce different results.

Adding a mass element to a mass group



1. Open the Model Explorer.
2. In the left pane, select a mass element, right-click, and click Operation ➤ Additive.
3. In the left pane, click Project to update the display.

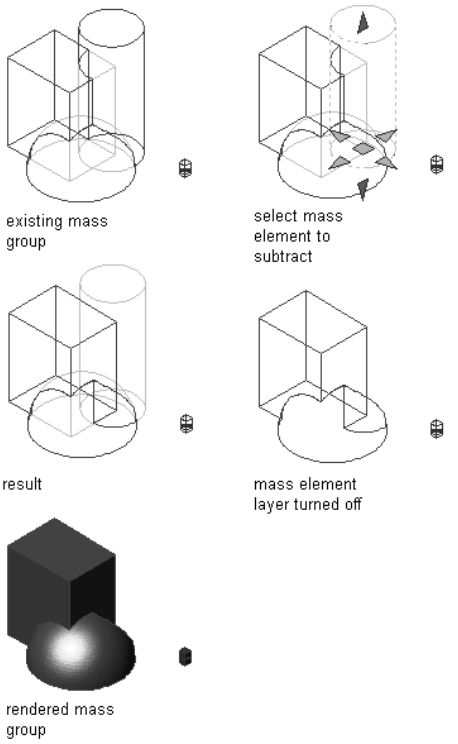
The display changes to indicate the new operation property of the mass element.

Changing a Mass Element Operation to Subtractive

Use this procedure to change a mass element operation to subtractive. Mass elements are additive when you create them. After a mass element is added

to a mass group, its operation can be changed to produce different results. If the mass element is subtractive, its shape is removed from the mass group.

Subtracting a mass element from a mass group



1. Open the Model Explorer.
2. In the left pane, select a mass element, right-click, and select Operation ➤ Subtractive.
3. In the left pane, click Project to update the display.

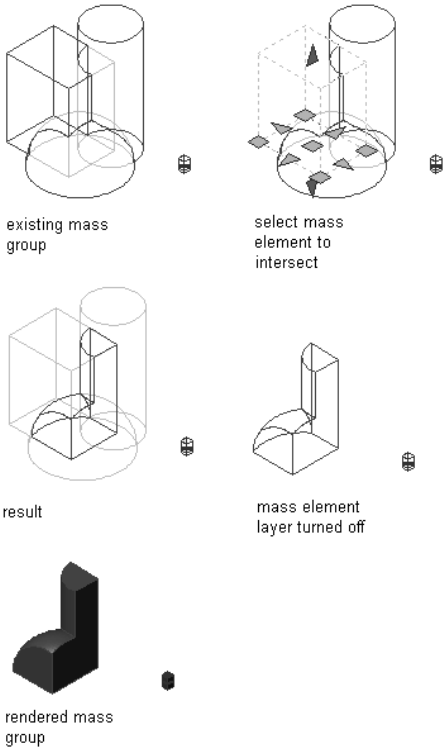
The display changes to indicate the new subtractive operation of the mass element.

Changing a Mass Element Operation to Intersection

Use this procedure to change a mass element operation to intersection. Mass elements are additive when you create them. After a mass element is added

to a mass group, its operation can be changed to produce different results. The intersect operation creates a shape that is defined by the overlap where the mass element intersects with another mass element.

Creating an intersection mass group from mass elements



1. Open the Model Explorer.
2. In the left pane, select a mass element, right-click, and select Operation ➤ Intersect.
3. In the left pane, click Project to update the display.

The display changes to indicate the new intersection operation of the mass element.

Specifying the Order of Mass Elements

Use this procedure to specify the order of mass elements. The operation (additive, subtractive, intersection) of each mass element in a mass group is based on the hierarchy of mass elements in the project tree. You can drag and

drop mass elements within mass groups in the project tree. By default, mass elements are listed in the left pane of the Model Explorer in the order they are created in the Model Explorer or selected for the mass group.

1 Open the Model Explorer.

2 Select the mass element you want to move, and drag it to the target location in the project tree.

Moving a Mass Element or Group from One Mass Group to Another

Use this procedure to move a mass element or a mass group from one mass group to another in the Model Explorer project tree.

1 Open the Model Explorer.

2 In the left pane, select the mass element or mass group you want to move, and drag it to another mass group.

When you move a mass group within another mass group, it is known as a nested mass group.

Spaces

Spaces and space boundaries are useful for planning an inside-out design process in which you define the interior spaces of the building and then define the boundary around those spaces.

Spaces are objects that are used to represent square footage at the conceptual level. As you design from the inside out, you can think of spaces as equivalent to rooms, edges as walls, and a group of spaces within a boundary as a department.

Using Spaces in Space Planning

Often, the controlling factor in the design of a building is not the overall form, but the size, proportion, and required relationships of the necessary spaces. You can use space objects to study these variables.

Solving Spatial Problems

You solve spatial problems conceptually, using space boundaries as forms and spaces as voids. The display system can help you visualize your spatial arrangement. For more information, see "The Display Manager" on page 449.

After all the spaces have been created, you can convert the boundaries into walls and use them later in the building design phase.

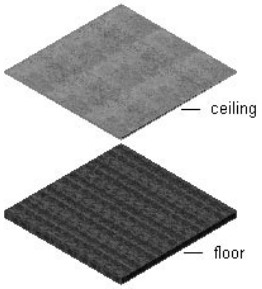
Variables Tracked in Spaces

A space is an object with volume that includes visual representations of a floor and ceiling. Its primary variables are area, length, width, and room height (measured from top of floor to bottom of ceiling). Additional variables are floor thickness, space height (measured from bottom of floor to top of ceiling), ceiling thickness, and distance above the ceiling to the top of the volume (this area is not normally visible but is reserved by the space object for use in conjunction with space boundaries). Spaces are used as placeholders for future rooms in the interior of a building.

Materials in Spaces

In Autodesk Architectural Desktop, you can assign materials to a space. These materials then are displayed in wireframe or rendered views. Materials have specific settings for individual components of a space, such as the floor and the ceiling.

Space with assigned materials



Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes, which contain settings for spaces. You can use these predefined materials, or modify them to your special designs. You can also create your own materials.

For more information, see "Using Materials for Spaces" on page 683.

Using Space Styles

You can create space styles and use them to create spaces that conform to certain size rules that you control. For example, you can set limits for an office space style to keep the size of an office within certain constraints. For more information, see "Creating a Space Style" on page 688.

Space styles hold the "target" size to allow you to quickly lay out required areas of a design. Space styles also include a net-to-gross offset that is used if the space perimeter is converted to a space boundary.

Creating Spaces from Other Objects
You can convert closed polylines into spaces. You can also generate spaces from walls and linework in your drawing, assigning tags and property set information automatically.

Organizing and Querying Spaces
You can place and organize spaces individually and then cluster them together to convert them to space boundaries. Spaces have a floor and a ceiling. Spaces have a separate query function that allows you to find square footages easily.

Spaces and Room Finish Schedules
All of the sample room tags and room finish schedules provided with the software are designed to be used in conjunction with spaces. When you drag a room tag into a drawing, it will need to be associated with a space object.

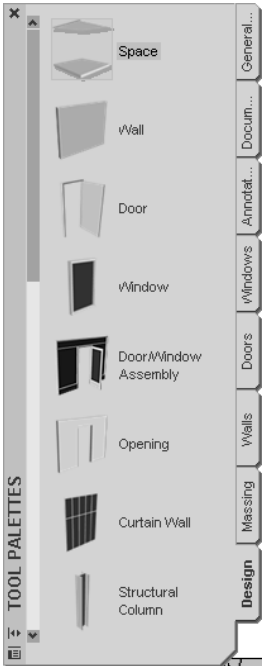
Related Procedures

- Using Space Tools to Create Spaces
- Editing Spaces
- Using Materials for Spaces
- Space Styles
- Viewing Information About Spaces
- Creating a Space Report

Using Space Tools to Create Spaces

Tools provided with Autodesk® Architectural Desktop let you quickly place spaces by selecting a space tool with a specific space style and other predefined properties. When you place spaces using space tools, you can use the default settings of the tool, or you can change settings for the space properties. You can also use space tools to convert linework to spaces and to apply the settings of a space tool to existing spaces.

Tool palettes containing space tools



The default tool palettes in the workspace contain sample space tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain space tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- Mytool catalog

Custom palettes created by your CAD manager or other users may also contain space tools with space styles and properties that are customized for your projects or office standards.

Related Procedures

- Creating a Space
- Creating a Space with a Ceiling Boundary
- Creating a Space with a Floor Boundary
- Constraining a Space
- Changing the Drag Point of a Space

- Converting Polylines to Spaces
- Generating a Space from Walls
- Generating a Space from Walls, Lines, Arcs, Polylines, and Circles
- Generating Spaces from All Linework
- Updating Generated Spaces
- Creating a Space Tool

Creating a Space

Use this procedure to add a new space that has the properties specified in the space tool that you select. To specify settings when you add a space, see "Creating a Space with User-Specified Settings" on page 660.

1. Open the tool palette that you want to use, and select a space tool.

   If necessary, scroll to display the tool that you want to use.

2. Specify the insertion point of the space.

   You can move or hide the Properties palette to expose more of the drawing area.

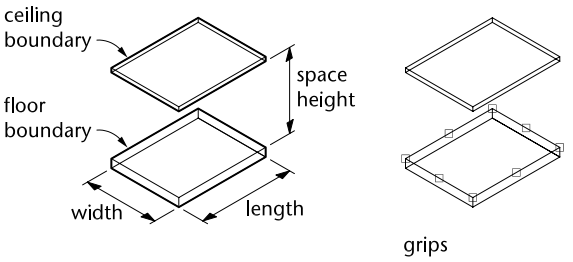
3. Specify the rotation angle.
4. Continue adding spaces, and press ENTER.

Creating a Space with User-Specified Settings

Use this procedure to add a space with settings that you specify. Spaces are inserted with a ceiling boundary and a floor boundary.

NOTE The space style controls the target area of the space. Although you cannot exceed the maximum space area while adding a space, you may adjust the space with stretch grip points after the space has been placed in the drawing.

Creating a space



1 Open the tool palette that you want to use, and select a space tool. If necessary, scroll to display the tool that you want to use.
2 On the Properties palette, expand Basic, and expand General.
3 Select a style.
4 Expand Component Dimensions.
5 Specify the component dimensions of the space:

If you want to . . .	Then . . .
specify the clear height of the space	enter a value for Space height.
specify the thickness of the space floor boundary	enter a value for Floor boundary thickness.
specify the thickness of the space ceiling boundary	enter a value for Ceiling boundary thickness.
specify the distance from the top of the space ceiling boundary to the top of the space	enter a values for Height above ceiling.

6 Expand Actual Dimensions.
7 Specify the actual dimensions of the space:

If you want to . . .	Then . . .
specify which dimension to contrain to	select Area, Length, Width, or None for Constrain.

If you want to . . .	Then . . .
specify the area of the space	enter a value for Area.
specify the length of the space along its relative X direction	enter a value for Length.
specify the width of the space along its relative Y direction	enter a values for Width.

8 Expand Target Dimensions.

9 Specify the target dimensions of the space:

If you want to . . .	Then . . .
specify the target area for the space	enter a value for Target area.
specify the maximum area allowed for the space	enter a value for Maximum area.
specify the minimum area allowed for the space	enter a value for Minimum area.
specify the target length of the space	enter a values for Target length.
specify the maximum length allowed for the space along its relative X direction	enter a value for Maximum length.
specify the minimum length allowed for the space along its relative X direction	enter a value for Minimum length.
specify the target width for the space	enter a value for Target width.
specify the maximum width allowed for the space along its relative Y direction	enter a value for Maximum width.

If you want to . . .	Then . . .
specify the minimum width allowed for the space along its relative Y direction	enter a value for Minimum width.

10 In the drawing area, specify the insertion point of the space.

You can move or hide the Properties palette to expose more of the drawing area.

11 Expand Location.

12 Specify the location of the space:

If you want to . . .	Then . . .
specify a rotation reference angle for the space object	enter a value for Rotation.
specify the elevation of the space	enter a value for Elevation.

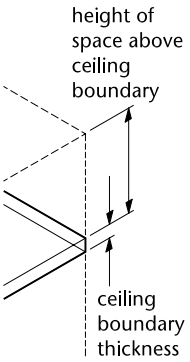
13 Continue adding spaces, and press ENTER.

Creating a Space with a Ceiling Boundary

Use this procedure to create a space with a ceiling boundary, which is a visual representation of a ceiling. The ceiling boundary is a solid volume above the space whose top represents the future ceiling. Defining a ceiling boundary at a point lower than the top of the space might represent a typical dropped ceiling grid in an office.

The thickness of the ceiling boundary is determined by the space style being used. You can change the ceiling thickness as you create spaces by changing the dimensions of the space. For more information, see "Changing the Component Dimensions of a Space" on page 681.

Ceiling Boundary Parameters



1. Open the tool palette that you want to use, and select a space tool.
2. On the Properties palette, expand Basic, and expand Component Dimensions.
3. Enter **0** for Floor boundary thickness.

   To remove a boundary, change its thickness to zero.
4. Specify a location for the space object.
5. Specify a rotation angle.
6. Press ENTER.

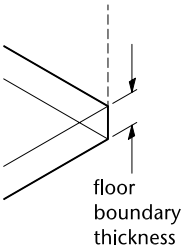
Creating a Space with a Floor Boundary

Use this procedure to create a space with a floor boundary, which is a solid volume below the space that represents the future floor.

By default, the floor extends below the current UCS by the depth of the floor as defined in the Space Properties dialog box.

The thickness of the floor boundary is determined by the space style being used. You can change the floor thickness as you create spaces by changing the dimensions of the space. For more information, see "Changing the Component Dimensions of a Space" on page 681.

Floor Boundary Thickness



NOTE To remove a floor boundary, change the thickness of the floor boundary to zero.

1. Open the tool palette that you want to use, and select a space tool.
2. On the Properties palette, expand Basic, and expand Component Dimensions.
3. Enter **0** for Ceiling boundary thickness.

   To remove a boundary, change its thickness to zero.
4. Specify a location for the space object.
5. Specify a rotation angle.
6. Press ENTER.

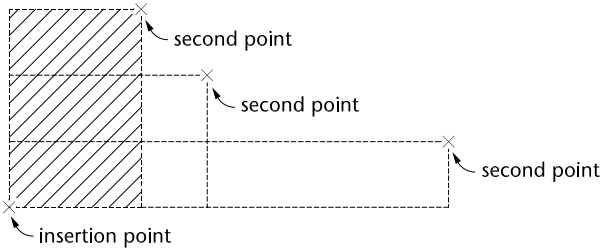
Constraining a Space

Use this procedure to create a space whose overall dimensions are constrained by any of the following individual dimensions:

- Area
- Length
- Width

For example, if you constrain a space by a specified area, the length and width of the space can vary, but their product must always equal the value specified for Area. The space style determines the initial constraint.

Creating a space with a specified area

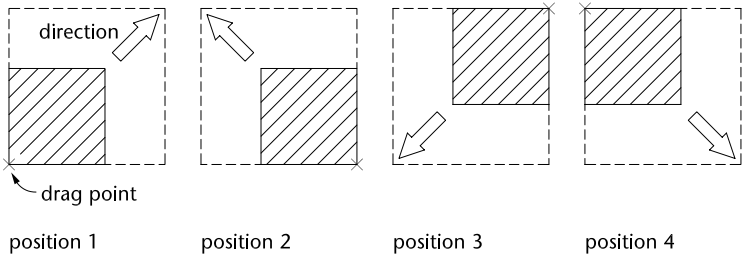


1 Open the tool palette that you want to use, and select a space tool.
2 On the Properties palette, expand Basic, and expand Actual Dimensions.
3 Select Area, Length, or Width for Constrain.
4 Select Yes for Specify On Screen.
5 In the drawing, right-click, and click Drag point.
6 Specify the insertion point of the space at the drag point.
7 Specify a second point.
8 Specify a rotation angle.
9 Press ENTER.

Changing the Drag Point of a Space

Use this procedure to change the drag point of a space, which is the corner point you use to insert the space in your drawing. You may want to place a group of space objects in a row or in a particular pattern. By changing the drag point of a space to a different corner and using an object snap, you can precisely locate the space in the drawing.

Specifying space object drag points



1 Open the tool palette that you want to use, and select a space tool.

2 In the drawing, right-click and click Drag point until the crosshairs are at the correct corner of the space.

3 Specify an insertion point.

NOTE You can use object snaps to locate the insertion point precisely.

4 Specify a rotation angle.

5 Click Close.

Converting Polylines to Spaces

Use this procedure to convert a closed polyline to a space. This method is also useful for creating a space with an irregular shape.

You can use a series of lines and arcs to create the polyline. The polyline must not intersect itself, and it must be closed.

1 Draw a closed polyline from which you want to create a space.

2 Right-click a space tool, and click Apply Tool Properties to ➤ Polyline.

3 Select the polyline.

4 Enter **y** (Yes) to erase the polyline, or enter **n** (No) to keep the polyline in the drawing.

5 Press ENTER.

Generating a Space from Walls

Use this procedure to create a space from walls. The walls need to be closed, but can have openings in them, such as doors or windows. These objects in the wall are ignored when creating a space. The space can have tags automatically associated with it.

For more information about tags and property sets, see "Adding and Editing Property Set Data" on page 2204.

1 Open the tool palette that you want to use, and select a space auto generate tool.

2 Select Walls only for Selection Filter, and click OK.

3 Select the walls from which to generate the spaces, and press ENTER.

4 Select a style for the spaces.

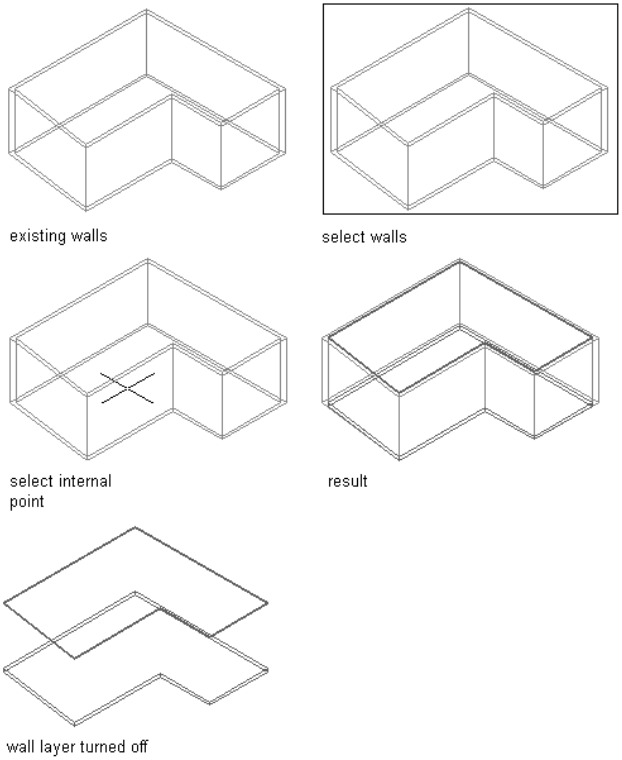
5 Click Tag Settings, and specify the settings:

If you want to . . .	Then . . .
add a tag to the space	select Add Tag to New Spaces, and specify a definition for Tag Definition.
add a property set to the space	select Add Property Set to New Spaces, and specify a property set for Property Set. Select either Number or Name for Property 1 and for Property 2.
automatically increment the number associated with the space tag	select Auto-Increment Numeric Properties, and enter a value for Increment.

6 Click OK.

7 Click within an area enclosed by the selected walls.

Creating a space from walls



A space is created in that area with the selected tag and property set, if selected.

8 To view information about all spaces in the drawing, click Space Query, and then click OK.

9 Click Close.

Generating a Space from Walls, Lines, Arcs, Polylines, and Circles

Use this procedure to create a space from walls, lines, arcs, polylines, and circles. The walls and lines need to be closed, but the walls can have openings in them, such as doors or windows. These objects in the wall are ignored when creating a space. The space can have tags automatically associated with it.

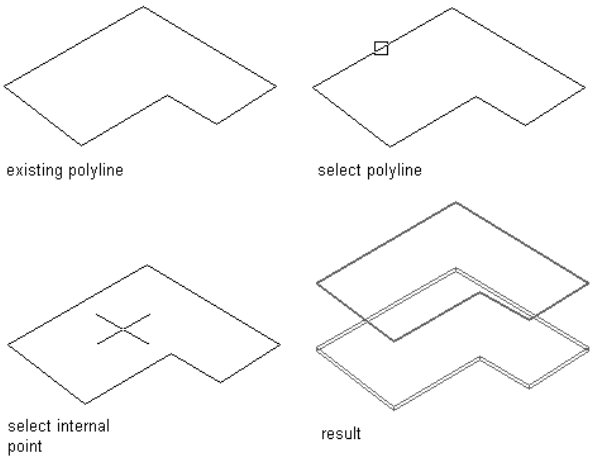
For more information about tags and property sets, see "Adding and Editing Property Set Data" on page 2204.

1. Open the tool palette that you want to use, and select a space auto generate tool.
2. Select Walls, lines, arcs, polylines, and circles for Selection Filter, and click OK.
3. Select the objects from which to generate the space, and press ENTER.
4. Select a style for the space.
5. Click Tag Settings, and specify the settings:

If you want to . . .	Then . . .
add a tag to the space	select Add Tag to New Spaces, and specify a definition for Tag Definition.
add a property set to the space	select Add Property Set to New Spaces, and specify a property set for Property Set. Select either Number or Name for Property 1 and for Property 2.
automatically increment the number associated with the space tag	select Auto-Increment Numeric Properties, and enter a value for Increment.

6. Click within each area enclosed by the selected walls and lines to create a space in that area.

Creating a space from a polyline



The space created in that area has the selected tag and property set, if selected.

7 To view information about all spaces in the drawing, click Space Query, and then click OK.

8 Click Close.

Generating Spaces from All Linework

Use this procedure to create spaces from all the lines in a drawing. The lines need to form closed areas. When generating spaces, it is similar to exploding all the objects and creating spaces from that linework. These spaces can have tags automatically associated with them.

For more information about tags and property sets, see "Adding Schedule Tags" on page 2231.

1 Open the tool palette that you want to use, and select a space auto generate tool.

2 Select All linework for Selection Filter, and click OK.

3 Select the objects from which to generate the spaces, and press ENTER.

4 Select a style for the spaces.

5 Click Tag Settings, and specify the settings:

If you want to . . .	Then . . .
add a tag to the space	select Add Tag to New Spaces, and specify a definition for Tag Definition.
add a property set to the space	select Add Property Set to New Spaces, and specify a property set for Property Set. Select either Number or Name for Property 1 and for Property 2.
automatically increment the number associated with the space tag	select Auto-Increment Numeric Properties, and enter a value for Increment.

6 Click within an area enclosed by the selected lines.

The space created in that area has the selected tag and property set, if selected.

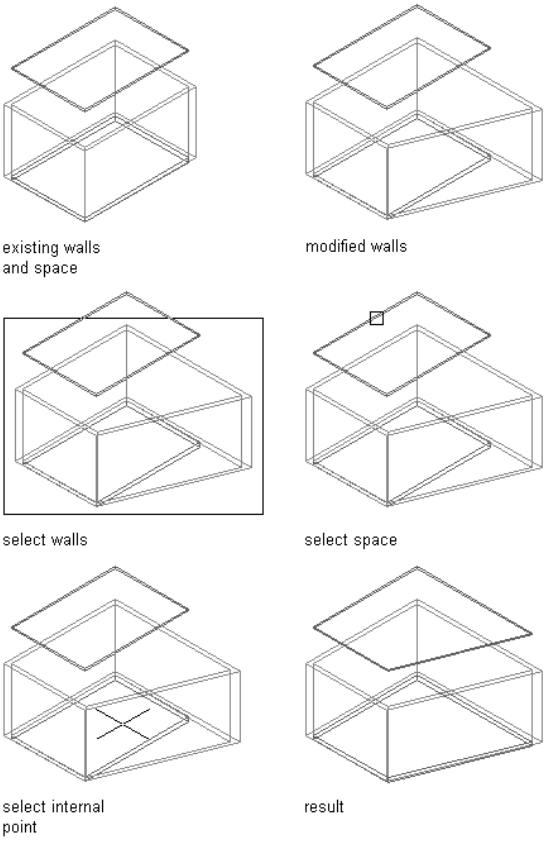
7 To view information about all spaces in the drawing, click Space Query, and then click OK.

8 Click Close.

Updating Generated Spaces

Use this procedure to update spaces that have been generated from walls and linework. If you have moved any of the objects that form the boundary set for the generated spaces, you can update the space to match the new shape.

Updating spaces after modifying walls



1. Open the tool palette that you want to use, and select a space auto generate tool.
2. Select the Selection Filter you used to generate the spaces, and click OK.
3. Select the items in the boundary set from which to update the spaces, and press ENTER.
4. Select a different style for the spaces, if needed.
5. Click Update Space.

6 Click the space to update.

7 Click an internal point in the new area for the space.

8 Click Close.

Creating a Space Tool

Use this procedure to create a space tool and add it to a tool palette. You may want to create your own space tools if you are placing multiple spaces of specific styles with additional space properties that you want to be the same each time you add a space of that type.

For example, you are creating an office floor plan with partition walls for cubicles. Although all partition walls use the same wall style in your floor plan, the walls in administrative areas are lower than the walls in office areas. To work efficiently, you can quickly create a wall tool for each wall height. You can then select the appropriate tool to place the walls with the correct height in each area of the floor plan.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a space in the drawing	select the object, and drag it to the tool palette.
create a tool from a space style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5. Click the setting for Description, enter a description of the tool, and click OK.
6. To add keywords to the tool, click More Info.
7. Enter the keywords, and click OK.
8. Expand Basic, and expand General.
9. Click the setting for Description, enter a description of the space created from this tool, and click OK.
10. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.
11. Select a space style.
12. Select the drawing file containing the style used for this space.
13. Expand Component Dimensions.
14. Specify the component dimensions of the space:

If you want to . . .	Then . . .
specify the clear height of the space	enter a value for Space height.
specify the thickness of the space floor boundary	enter a value for Floor boundary thickness.
specify the thickness of the space ceiling boundary	enter a value for Ceiling boundary thickness.
specify the distance from the top of the space ceiling boundary to the top of the space	enter a values for Height above ceiling.

15. Expand Actual Dimensions.
16. Specify the actual dimensions of the space:

If you want to . . .	Then . . .
specify which dimension to contrain to	select Area, Length, Width, or None for Constrain.
specify the area of the space	enter a value for Area.

If you want to . . .	Then . . .
specify the length of the space along its relative X direction	enter a value for Length.
specify the width of the space along its relative Y direction	enter a values for Width.

17 Click OK.

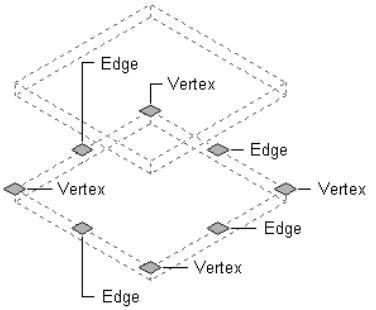
Editing Spaces

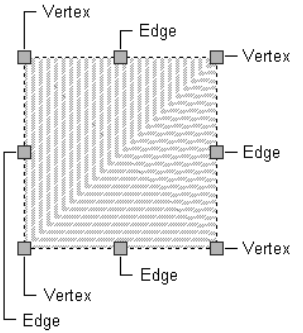
After you place space objects in a drawing, you can move them, resize them, create interference conditions, and change their properties to fit your design needs.

Autodesk® Architectural Desktop offers several methods for editing spaces:

- You can directly edit spaces using grips for dimensions and other physical characteristics.

Viewing spaces grips





- You can change space settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected space.

Related Procedures

- Changing the Style of a Space
- Changing the Size of a Space
- Changing a Space Using Grips
- Joining Spaces
- Dividing a Space
- Creating Interference Conditions for a Space
- Removing an Interference Condition from a Space
- Changing the Component Dimensions of a Space
- Changing the Location of a Space
- Attaching Hyperlinks, Notes, or Files to a Space

Changing the Style of a Space

Use this procedure to assign a different space style to an existing space. The new space style defines the target, minimum, and maximum size, and assigns display properties for the net boundary, gross boundary, and space hatch. You create the new space style before applying it to new or existing spaces.

1. Double-click the space you want to change.
2. In the Properties palette, select a new style for Style.

Changing the Size of a Space

Use this procedure to change the length and width of a space after it has been created. If the length is changed, the area is changed, keeping the width constant. Similarly, if you change the width, the area is changed and the length stays constant.

You can also change the height of the space or add or remove the floor or ceiling boundary.

NOTE The height displayed for Space Height is the space between the upper surface of the floor slab and the lower surface of the ceiling plane, which is referred to as the room height. It is not the overall height of the space object.

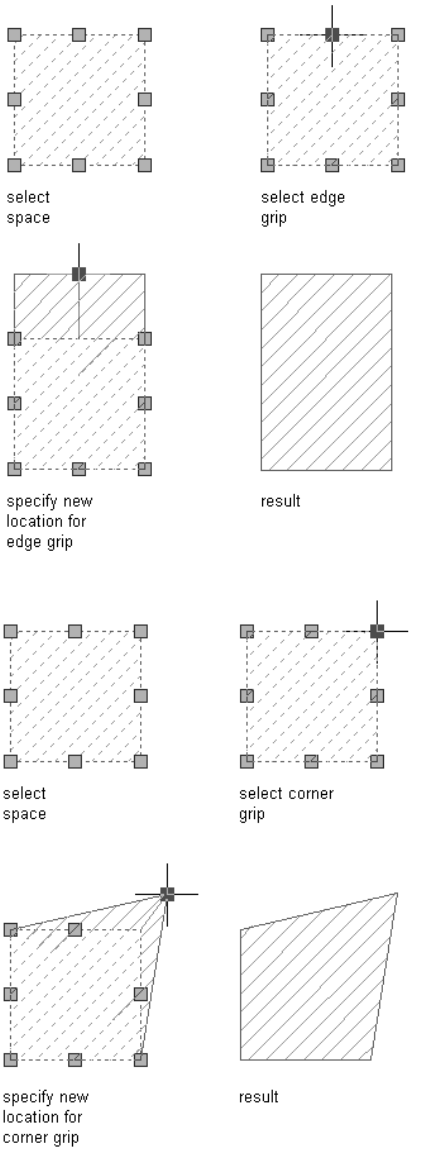
---

1. Double-click the space you want to change.
2. On the Properties palette, expand Basic, and expand Component Dimensions.
3. To change the height of the space, enter a new value for Space height.
4. To add or remove the floor boundary or the ceiling boundary, enter a new value for Floor boundary thickness or Ceiling boundary thickness.
5. Expand Actual Dimensions.
6. To change the length or width of the space, enter a new value for Length or Width.

Changing a Space Using Grips

Use this procedure to create non-rectangular spaces by using grips to edit spaces. The length of the space is displayed as the value of the longest distance between any two vertices on the *X* axis. The width is the longest distance between any two vertices on the *Y* axis. The area is calculated from the size of the space.

Changing a space using edge grips

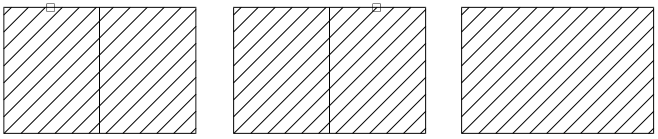


1. Select the space you want to change.
2. Select an Edge or a Vertex grip, and move it to change the size or shape of the space.

Joining Spaces

Use this procedure to join two spaces to create one larger space. The spaces may be overlapping, tangential, or separate. The resulting space is considered one space even if the two original spaces did not touch. The characteristics of the first space selected override those of the second space selected.

Joining existing spaces



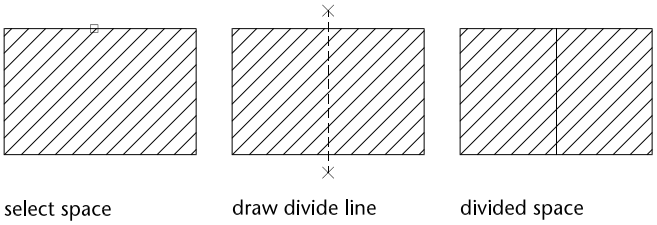
1. Select the first space, right-click, and click Join Spaces.
2. Select a space to join with the first space.

Dividing a Space

Use this procedure to divide a space into smaller spaces by using a divide line. The space is split at the line.

Adding space boundary edges also divides spaces if the space boundary is specified as Manage Contained Spaces. This option creates a space within the space boundary. Any changes to the space boundary also affect the space managed by the boundary. If the Manage Contained Spaces option is cleared when a space boundary is edited, any changes to the space boundary do not change the spaces within it. For more information, see "Adding Boundary Edges" on page 704.

Dividing existing spaces



NOTE The start point and endpoint of the divide line establish a line that extends to the edges of the space, dividing all parts of the selected space that lie on opposite sides of the line.

1. Select a space to divide, right-click and click Divide Spaces.
2. Specify the divide line start point.
3. Specify the divide line end point.

The space is divided into smaller spaces at the divide line.

Creating Interference Conditions for a Space

Use this procedure to place objects, such as mass elements, in a space to create custom openings or cutouts in the space. This process is called creating an interference condition. For example, a column grid structure might have columns within the space. Once defined as interference conditions, the columns cut out an area at the floor and ceiling of the space.

Calculations of the area of the space are correctly based on both the space and the interference conditions defined for that space. These calculations can be used in schedules. For more information, see "Creating and Editing Schedule Tables" on page 2211.

Other objects attached to the space, such as a ceiling grid, recognize the interference condition. For example, if you add a column to the space as an interference condition, as long as the ceiling grid is anchored to the space object, the ceiling grid is cut. If you move the column, the ceiling grid is updated automatically with the new column location.

1. Place the object you want to use as the interference condition in the location where it is needed.
2. Select the space to which you want to the interference condition, right-click and click Interference Condition.
3. Enter **a** (Add).
4. Select spaces you want to be affected by the interference condition.
5. Select the object intersecting the space as the interference condition, and press ENTER.

Removing an Interference Condition from a Space

Use this procedure to remove existing interference conditions from spaces.

NOTE Make sure that the interference object is visible in the drawing so you can select it to remove.

1. Select the space with the interference condition, right-click and click Interference Condition.
2. Enter **r** (Remove).
3. Select spaces that are affected by the interference condition.
4. Select the object intersecting the space as the interference condition, and press ENTER.

Changing the Component Dimensions of a Space

Use this procedure to control the constraints of the space and its component dimensions by changing its dimension properties.

You can control all dimension aspects of the space, including the floor and ceiling boundary thickness and the height of the space above the ceiling boundary.

1. Double-click the space you want to change.
2. On the Properties palette, expand Basic, and expand Component Dimensions.
3. Modify height and thickness dimensions:

If you want to . . .	Then . . .
change the height of the space	enter a new value for Space height.
change the thickness of the space floor boundary	enter a new value for Floor boundary thickness.
change the thickness of the space ceiling boundary	enter a new value for Ceiling boundary thickness.
change the height of the space above the ceiling boundary	enter a new value for Height above ceiling.

Changing the Location of a Space

Use this procedure to relocate a space by changing the coordinate values of its insertion point. The space also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the space are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the

space by aligning its normal with another axis. You can also rotate the space on its plane by changing the rotation angle.

For information about the WCS and the UCS, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Double-click the space you want to change.
2. On the Properties palette, expand Basic, and expand Location.
3. Click Additional information.
4. On the Location worksheet, specify the location of the space:

If you want to . . .	Then . . .
relocate the space	enter new coordinate values under Insertion Point.
locate the space on the *XY* plane	make the normal of the space parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the space on the *YZ* plane	make the normal of the space parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the space on the *XZ* plane	make the normal of the space parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the space	enter a new value for Rotation Angle.

5. Click OK.

Attaching Hyperlinks, Notes, or Files to a Space

Use this procedure to attach hyperlinks, notes, or files to a space. You can also edit hyperlinks and notes, and edit or detach reference files from a space.

1. Double-click the mass element you want to attach information to.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD®2004 Command Reference*.
4. Click OK.
5. To add a note, click the setting for Notes, and enter the note.
6. Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK twice.

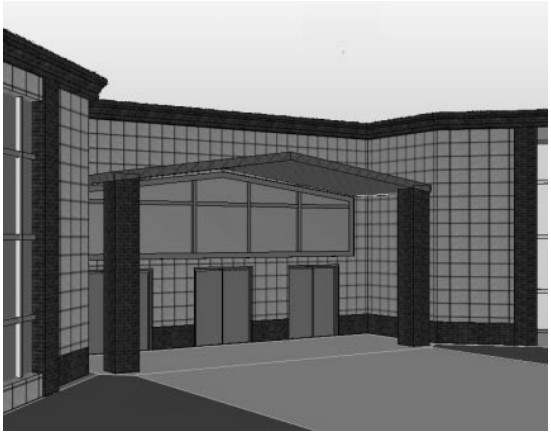
Using Materials for Spaces

Using materials simplifies defining the display of objects. You define the display of a material, such as shingles or glass, only once in the drawing or the drawing template, and then assign it to any object component or object style. For example, you can define a material "Glass" and then assign it to any number of windows, glass door insets, or cubicle walls.

Using a common set of materials provides centralized control across the display of objects in a drawing or throughout the whole project. When the particulars of a material change, you change them just once in the material definition and all objects are automatically updated.

For more information, see "Materials" on page 491.

Rendered building with different materials



Predefined Materials

Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes. You can use these predefined materials, or modify them to your special designs. You can also create your own materials.

Surface Hatching

The ability to assign surface hatches to objects has greatly been improved by materials. Surface hatches can display in both model views and section/elevation views. Placement and orientation of the hatch can be precisely controlled and specified for each object face individually.

For detailed information about surface hatches, see "Working with Surface Hatches" on page 504.

Related Topics

- Space Display Components and Materials
- Process Overview: Creating and Applying a Space Material

Space Display Components and Materials

A space object consists of a number of display components that can be determined by materials.

Workflow

When you assign materials to a space, you assign one material to each display component of the space. For example, you assign a tile material to the space floor and a concrete material to the ceiling.

If you want to use the display properties of the space instead of the material display properties or the space style, you can deactivate the material assignments in the display properties of the space or the space style.

Display Representations

The display properties of an object or an object style are specified for each display representation individually. A space has, by default, display representations for plan views, model views, reflected views, and volume views. You can create new display representations for spaces by copying an existing display representation. For example, you can create a new display representation "Plan 1:25" to create a plan view optimized for display in a view scaled to 1:25. This new display representation has the same display components as the original one from which it was copied. The copied components will be influenced by the same material components as the original components.

Material Component Assignments

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in Plan view. The Surface Hatch component of a material is used to hatch all object surfaces in 3D model views and elevations.

For a complete list of material components and their description, see "Material Components and Display Properties" on page 498.

The following table lists all space components plus information about which material components determine them in specific views.

Space Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Plan Presentation, Plan Screened	
Net Boundary	Plan Linework
Gross Boundary	No Material
Hatch	Plan Hatch
Model	
Floor	3D Body
Ceiling	3D Body
Reflected, Reflected Screened	
Net Boundary	Plan Linework
Gross Boundary	No Material

Space Component	Material Component
Hatch	Plan Hatch
Volume	
Entity	No Material

Process Overview: Creating and Applying a Space Material

If you create a material, you can then apply it to all types of objects that support materials. For example, a concrete material could be used for a wall and for a structural element. Spaces usually represent a room bounded by floor and ceilings, so that you might use floor tiles or cassette ceilings materials. If you want to create a material to use only for spaces, it is recommended that you name it accordingly. For example, if the materials have specific names such as Space - Floor Tile or Space - Cassette Ceiling, you can simplify the organization of your material definitions.

Step 1: Create a new material definition or edit an existing material definition.

For information on creating and editing materials, see "Creating and Editing Materials" on page 517.

Step 2: In the material definition, define the settings that affect the display of materials in spaces:

If you want to . . .	Then . . .
display a surface hatch for a space in 3D model views	turn on the Surface Hatch component and specify its display properties. For more information, see "Defining the Layer, Color and Linetype of a Material" on page 520 and "Specifying the Surface Hatch Pattern of a Material" on page 523.
display a section hatch for the space in a 2D section, 3D section, or live section	turn on the Section Hatch component and specify its display properties. For more information, see "Defining the Layer, Color and Linetype of a Material" on page 520 and and "Specifying the Plan and Section Hatch Patterns of a Material" on page 521.
display the sectioned boundary and sectioned body of a space in a live section	turn on the Sectioned Boundary and Sectioned Body components and specify their display properties. For more information, see "Defining the Layer, Color and Linetype of a Material" on page 520.

If you want to . . .	Then . . .
add special rendering materials for spaces in live sections	select rendering materials. For more information, see "Assigning Materials for Rendering" on page 526.
exclude space components from a 2D section shrinkwrap hatch	specify this setting in the material definition. For information, see "Excluding a Material from 2D Section Shrinkwrap" on page 528.

Step 3: Assign the materials created to the space styles used in your building model.

For information on assigning materials to space styles, see "Assigning Materials to a Space Style" on page 692.

Space Styles

A space style is a collection of settings for variables associated with a space object. Depending on the scope of the drawing, you could create different space styles to represent a wide range of different types of spaces, from separate zoning areas in a master plan to different room types in an office building.

Properties that Space Styles Control

The space style you select determines the properties of spaces you create in the drawing. The space style controls the target width, length, and area of a space. When you are creating a space, the minimum and maximum area, length, and width specified in the current space style cannot be exceeded.

You can enter a description of the style that is stored with the style. This information is used when you perform a space inquiry as one of the basic divisions in its queries. For more information, see "Viewing Information About Spaces" on page 695.

When you edit the display properties of a space style, those changes are applied to existing spaces of that style throughout the current drawing.

Creating Space Styles

Typically, you create space styles that represent the basic divisions of the drawing that you need to keep track of separately. These may be departmental or functional divisions. For example, space styles provided with Autodesk® Architectural Desktop include kitchens, offices of different sizes, restrooms, cafeterias, and libraries. When you name a space style, spaces are automatically grouped and can generate reports based on the first part of the space style name.

Editing Space Styles

The changes you make to an existing space style take effect the next time you use it to create a space. Spaces already created with the space style are not updated unless you change the display properties of the space style or the Net to Gross Offset. If you edit the display properties or the Net to Gross Offset of a space style, those changes are applied to existing spaces of that style.

Managing Space Styles

When you create, import, export, or edit styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Creating a Space Style
- Specifying the Dimensions of a Space Style
- Assigning Materials to a Space Style
- Specifying the Display Properties of a Space Style
- Specifying the Hatching for Components of a Space Style
- Attaching Notes and Files to a Space Style

Creating a Space Style

Use this procedure to create a space style. You can create a style using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Architectural Objects, and expand Space Styles.
3. Create a space style:

If you want to . . .	Then . . .
create a style with default properties	right-click Space Styles, and click New.
create a style from an existing style	right-click the space style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new space style, and press ENTER.

5 To edit the new space style, right-click the style, and click Edit:

If you want to . . .	Then . . .
specify default dimensions for the style	see "Specifying the Dimensions of a Space Style" on page 689.
specify materials for space components	see "Assigning Materials to a Space Style" on page 692 .
specify the display properties of the style	see "Specifying the Display Properties of a Space Style" on page 693.
specify hatching for components of the style	see "Specifying the Hatching for Components of a Space Style" on page 693.
add notes and files to the style	see "Attaching Notes and Files to a Space Style" on page 695.

6 When you finish specifying the properties of the space style, click OK twice.

Specifying the Dimensions of a Space Style

Use this procedure to specify the following dimensions for a space style:

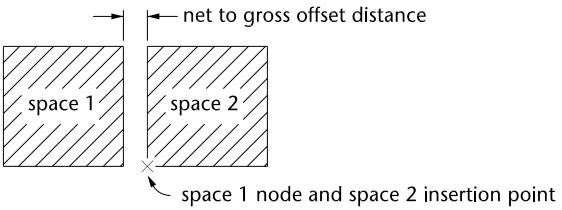
- the target area and the minimum and maximum areas
- the target length and the minimum and maximum lengths
- the target width and the minimum and maximum widths

When you create spaces, if you specify a space area, length, or width that falls outside the sizes specified for that style, the area, length, or width is truncated to the target size, and a warning is displayed.

The Net to Gross Offset value controls the width of the boundary when you convert spaces to walls. The net area of the space (after subtracting the offset) becomes the usable floor area. This value also defines the Node object snap for the placement of spaces. By default, the Net to Gross Offset is turned off (not visible).

NOTE When you change the Net to Gross Offset value for a space style, the new value is applied both to new and existing spaces of that style in the drawing.

Specifying a space net to gross offset



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Space Styles.
3. Select the space style that you want to change, right-click, and click Edit.
4. Click the Dimensions tab.
5. Specify the dimensions for the space style:

If you want to . . .	Then . . .
specify a different area for the space style	enter a new value for Target Area, Min Area, or Max Area.
specify a different length for the space style	enter a new value for Target Length, Min Length, or Max Length.
specify a different width for the space style	enter a new value for Target Width, Min Width, or Max Width.

Target values must fall between the set minimum and maximum values.

6. Enter a new value for Net to Gross Offset.
7. Click OK twice.

Specifying the Materials of a Space Style

A space consists of a number of components whose display properties can be determined by the materials assigned to each component.

When you assign materials to a space style, you assign one material to each physical component of the space. For example, you assign a wood material to the floor and a tile material to the ceiling. You assign materials to components in each display representation where you want the materials to be used.

If you want to use the display properties of the space style, instead of using material display properties, you can turn off the material assignments in the display properties of the space style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in three dimensional (3D) model views and in elevations.

Related Topics and Procedure

- Space Materials and Display Components
- Assigning Materials to a Space Style

Space Materials and Display Components

The following table lists all space components plus information about which material components determine them in specific views.

Space Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Plan Presentation, Plan Screened	
Net Boundary	Plan Linework
Gross Boundary	No Material
Hatch	Plan Hatch
Model	
Floor	3D Body
Ceiling	3D Body
Reflected, Reflected Screened	
Net Boundary	Plan Linework
Gross Boundary	No Material
Hatch	Plan Hatch
Volume	
Entity	No Material

Assigning Materials to a Space Style

Use this procedure to assign materials to the individual components of a space style. When you assign a material to a space component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the space. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, the floor and ceiling are physical components. The gross boundary is a symbolic component.

NOTE If a material assignment does not determine the display properties of a space component, you can change the display properties of the space style as described in "Specifying the Display Properties of a Space Style" on page 693.

---

1. Open a tool palette that has a space tool.
2. Right-click a space tool, and click Space Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Select the component you want to change, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

    ---
11. Click OK twice.

Specifying the Display Properties of a Space Style

Use this procedure to change the following display properties of the display components of a space style:

- Visibility (component is on or off)
- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

To change these display properties for an individual space, see "Space Display Components and Materials" on page 684.

NOTE If a material assignment determines the display properties of components in the space style, you can change the properties of the display component by clearing By Material. You can also override the material assignment with a different material. For more information, see "Specifying the Materials of a Space Style" on page 690.

---

1. Open a tool palette that has a space tool.
2. Right-click a space tool, and click Space Styles.
3. Right-click the space style you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. Select Space Style for the property source, and click Attach Override.
7. Click the Layer/Color/Linetype tab.
8. Select the component to change, and select a different setting for the property.
9. Click OK twice.

Specifying the Hatching for Components of a Space Style

Use this procedure to specify the hatching of the components of a space style. Space hatching is displayed only in display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

1. Open a tool palette that has a space tool.
2. Right-click a space tool, and click Space Styles.
3. Right-click the space style that you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and click Style Override.

   The display representation in bold is the current display representation.
6. Click the Hatching tab.
7. Select a display component, and click the setting for Pattern.
8. Select the hatching for the display component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

9. Click OK.
10. Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.
11. Click Angle, and enter the angle for the selected pattern.
12. Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

13 Click OK twice.

Attaching Notes and Files to a Space Style

Use this procedure to enter notes and attach reference files to a space style. You can also edit notes and edit or detach reference files from a space style.

1 Open a tool palette that has a space tool.
2 Right-click a space tool, and click Space Styles.
3 Right-click the space style you want to change, and click Edit.
4 Click the General tab.
5 To add a description to the space style, enter it for Description.
6 Click Notes.
7 To add a note, click the Notes tab, and enter the note.
8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK three times.

Viewing Information About Spaces

Use this procedure to view the total area used by each space, as well as the quantity of each space used. For individual spaces, you can view the space style, description, individual area, and maximum and minimum size.

1 On the command line, enter **space**, and then enter **q** (Query).

2 Specify the information you want to view:

If you want to . . .	Then . . .
view the information about the total spaces in the drawing	click the Space Info Total tab.
view the information about the individual spaces in the drawing	click the Space Information tab.

3 Click OK, and then press ENTER.

Creating a Space Report

Use this procedure to create a database file from the results of a space inquiry.

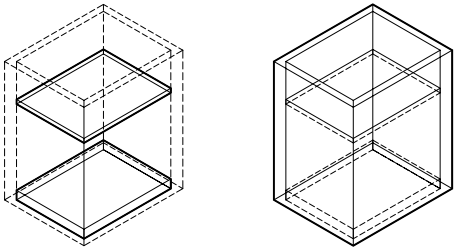
1 On the command line, enter **space**, and then enter **q** (Query).
2 Click either the Space Info Total tab or the Space Information tab.
3 Click Create MDB.
4 Enter a name for the database file.
The default name is the current drawing name.
5 Click Save, and then click OK.
6 Press ENTER.

Space Boundaries

A space boundary is a division between spaces that may exist as a solid form boundary or as an area separation boundary. In inside-out designing, you can think of spaces as equivalent to rooms, space boundary edges as walls, and the grouping of spaces by a boundary as a department.

Spaces and Space Boundaries
You can create space boundary objects with or without included space objects. If spaces are created with space boundary objects, the boundaries are dependent on those space objects. If you delete such a space, the boundary edges are removed as well. Spaces and boundaries combine to create the complete representation of the space, the interior space, and the surrounding boundaries. You can attach spaces to boundaries after both have been created.

Viewing spaces and space boundaries



space space boundary

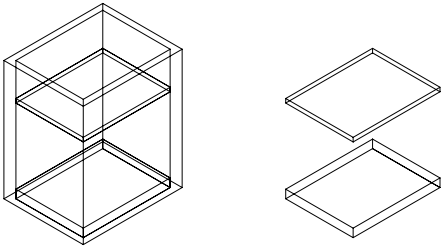
Solid Form and Area Separation Boundaries

There are two types of space boundaries, solid form and area separation. Solid form boundaries equate to walls with a specified thickness. You can convert a solid form boundary to a wall between two spaces. This boundary shares all the characteristics of a wall, including the following settings:

- Justification
- Base height
- Thickness (width)

Area separation boundaries have a thickness of zero and cannot be converted to walls. An area separation boundary divides a space without anything solid between the spaces. For example, an area separation boundary might separate two departments in an open office.

Viewing solid form and area separation space boundaries



solid form area separation

Creating Space Boundaries

You can create space boundaries from existing spaces, slices, polylines, arcs, and lines. For more information about slices, see "Creating Slice Floorplates from a Conceptual Model" on page 713.

Space Boundary Edges

Each section of a space boundary is also called a *space boundary edge*. When you select a section of the space boundary, the section that is highlighted is one space boundary edge. You can manipulate each edge separately.

Related Procedures

- Creating a Space Boundary
- Converting a Space to a Boundary
- Converting a Slice to a Boundary
- Converting Sketching to a Boundary
- Attaching Spaces to a Space Boundary
- Merging Boundaries
- Splitting Space Boundaries
- Adding Boundary Edges
- Editing Boundary Edges
- Removing Boundary Edges
- Anchoring Objects to Boundaries
- Releasing Objects from Space Boundaries
- Converting Space Boundaries to Walls
- Editing Space Boundaries

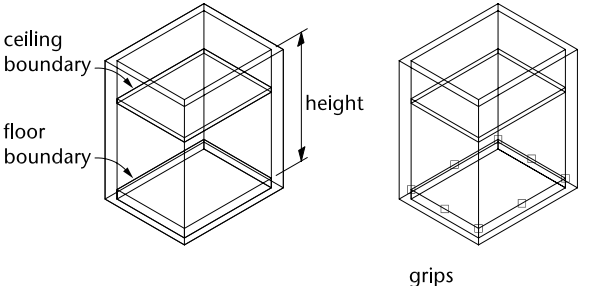
Creating a Space Boundary

Use this procedure to create a solid form boundary or an area separation boundary:

- You can create a space boundary with a solid form around the edge of the boundary that represents walls around the space. Solid form boundaries can be straight lines or arcs. You can later convert solid form boundaries to walls. See "Converting Space Boundaries to Walls" on page 710.
- You can create a space boundary with a line of zero thickness around the edge of the boundary. An area separation boundary cannot be converted to walls.

When you create a space boundary, you can also create a space object within the boundary. For more information about space objects, see "Spaces" on page 656.

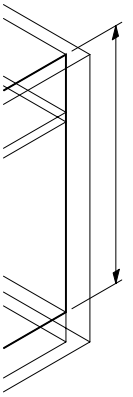
Creating a space boundary



1. Open the tool palette that you want to use, and select a space boundary tool.
2. On the Properties palette, expand Basic, and expand General.
3. Specify either Solid or Separation for Boundary type.
4. Specify either Line or Arc for Segment type.
5. Specify the dimensions of the space boundary:

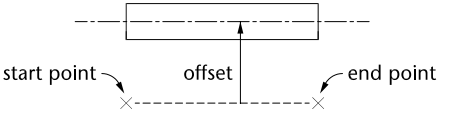
If you want to specify . . .	Then . . .
the distance between the top of the solid form space ceiling boundary to the top of the space	enter a value for Base height. When you convert the space boundary to a wall, the wall uses the height parameters of the space boundary.
the width of a solid form boundary	enter a value for Width. When you convert the space boundary to a wall, the wall uses the width of the space boundary.
the justification of a solid form boundary in relation to selected points	select Left, Center, or Right for Justify.
the offset distance of a solid form boundary as you draw the space boundary	enter a value for Baseline offset. The offset distance is measured from the start and end points of the space boundary segment to the space boundary baseline.
that the space is associative to its space boundary	select Yes for Manage contained spaces. Any changes to the space boundary also affect the space managed by the boundary.

Specifying the height of a space boundary

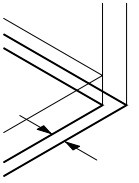


height

Specifying the offset distance of a space boundary

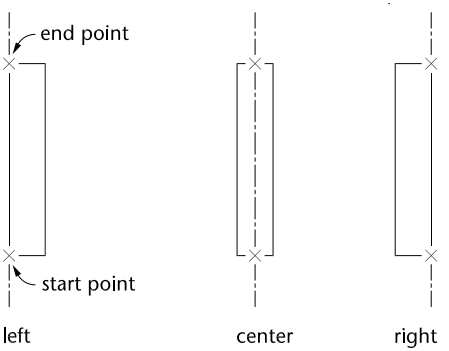


Specifying the width of a space boundary



width

Specifying space boundary justification



6 Specify boundary conditions:

If you want to specify . . .	Then . . .
the ceiling boundary automatically	select Automatic for Ceiling condition.
the ceiling to stop at the boundary	select Ceiling stops at boundary for Ceiling condition.
the boundary to stop at the ceiling	select Boundary stops at ceiling for Ceiling condition.
the floor boundary automatically	select Automatic for Floor condition.
the floor to stop at the boundary	select Floor stops at boundary for Floor condition.
the boundary to stop at the floor	select Boundary stops at floor for Floor condition.

7 Specify points to define the boundary.

8 Specify the endpoint of the boundary:

If you want to . . .	Then . . .
close the boundary by drawing two segments that meet at a right angle	enter **or** (Ortho Close), and then specify a point in the direction you want the boundary to close. The segment is extended until it meets a segment perpendicular to the first segment.

If you want to . . .	Then . . .
complete the segment at a point that you specify	specify the endpoint of the boundary, and enter **c** (Close).

9 Press ENTER.

When a closed shape is created, it is designated by a hatched space contained within the space boundary in plan view.

Converting a Space to a Boundary

Use this procedure to create space boundaries from existing spaces. Two or more non-overlapping spaces create one space boundary that surrounds each space object. These boundaries do not need to be connected to be considered the same space boundary.

NOTE If the space has a style with a net-to-gross offset, the space boundary is displayed in model view as a solid "wall" structure, where the width of the boundary edges is defined by the offset. If the space style has no net-to-gross offset, the space boundary is displayed as a flat area identical to the space ground area. For more information about net-to-gross offset, see "Using Space Styles" on page 657.

1 On the command line, enter **spaceboundary**, and enter **c** (Convert).

2 Enter **sp** (Spaces), and select the spaces to convert.

3 Press ENTER twice.

Converting a Slice to a Boundary

Use this procedure to create a space boundary from a slice. The interior floor line of the bounded space is set at the elevation of the slice; the thickness of the floor may extend below the slice.

The slice you select must have objects attached to it.

1 On the command line, enter **spaceboundary**, and enter **c** (Convert).

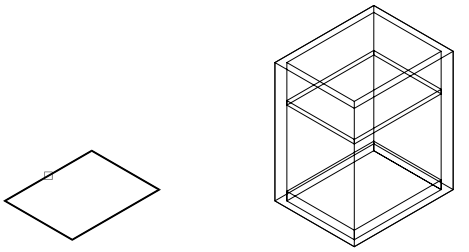
2 Enter **sl** (Slices), and select the slice to convert.

3 Press ENTER twice.

Converting Sketching to a Boundary

Use this procedure to create space boundary edges from polylines, lines, arcs, and circles.

Converting a polyline to a space boundary



select polyline resulting space boundary

1. On the command line, enter **spaceboundary**, and enter **c** (Convert).
2. Enter **e** (Edges), and select the polyline, line, arc, or circle to convert.
3. Enter **y** (Yes) to erase the original geometry, or enter **n** (No) to keep them in the drawing.
4. Specify the properties for the new space boundary edges.

   For more information, see "Editing Boundary Edges" on page 705.
5. Press ENTER twice.

Attaching Spaces to a Space Boundary

Use this procedure to add spaces to an existing space boundary. You add spaces by attaching them to an existing boundary and creating a space boundary around each space. The boundary is considered to be the same boundary, such as for space information totals.

NOTE The space boundary must have the Manage Contained Spaces option selected before spaces are attached to it. See "Creating a Space Boundary" on page 698.

---

1. Select the space boundary, right-click and click Attach Spaces to Boundary.
2. Select the spaces to attach to the selected boundary.
3. Press ENTER.

The spaces have boundaries created around each one, and they are added to the existing space boundary.

Merging Boundaries

Use this procedure to combine two or more boundaries to make one space boundary.

1. Select the first space boundary, right-click and click Merge Boundaries.
2. Select a second boundary to merge with the first boundary.

Splitting Space Boundaries

Use this procedure to split a space boundary into two smaller boundaries if the boundary contains more than one space.

1. Select the space boundary, right-click and click Split Boundary.
2. Select the spaces in the boundary to split from the larger boundary.
3. Press ENTER.

Adding Boundary Edges

Use this procedure to add an additional edge to an existing space boundary. The newly added edge becomes a part of the space boundary. The new edge cuts the space within the boundary if the boundary manages the spaces within it. For more information, see "Creating a Space Boundary" on page 698.

1. Select the space boundary, right-click and click Add Edges.
2. Select a space boundary.
3. Specify the properties of the space boundary:

If you want to . . .	Then . . .
specify unique properties for the newly added space boundary edge	select the segment type, and enter values for Base height, Width, Justify, and Baseline offset.
match the properties of an existing space boundary edge	click , and select the existing space boundary.

4. Specify a start point and an end point for the new space boundary edge.

The start point and end point must touch the spaces inside the existing boundaries to form a new space within the added edges.

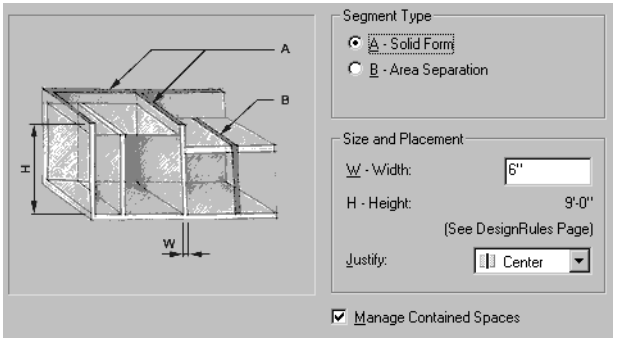
Editing Boundary Edges

Use this procedure to change specific edges on a space boundary. You can modify a space boundary edge by changing its segment type, width, height, and its boundary conditions for both floor and ceiling.

1 Select the space boundary, right-click and click Edit Edges.

2 Select space boundary edges to change, and press ENTER.

3 Click the Dimensions tab.



4 Change the segment type:

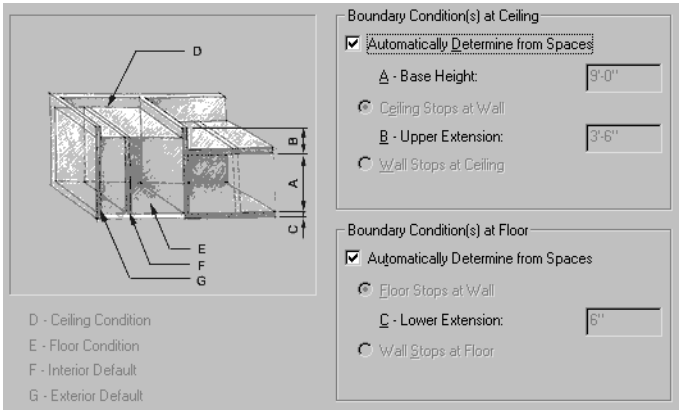
If you want to . . .	Then . . .
create boundary edges with a specific width	select Solid Form for Segment Type. The boundary edges can be later converted to a wall the width of the space boundary.
create a boundary that is a partition or space divider line	select Area Separation for Segment Type. An area separation boundary cannot be converted to a wall.

5 Enter a new value for Width, if needed.

6 Change the justification, which controls how the boundary is drawn with respect to the selected points:

If you want to . . .	Then . . .
use the selected points for the location of the inner surface of the space boundary	select Left for Justify.
use the selected points for the location of the centerline of the space boundary	select Center for Justify.
use the selected points for the location of the exterior face of the space boundary	select Right for Justify.

7 Click the Design Rules tab.

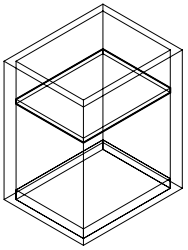


8 Specify the boundary conditions at the ceiling:

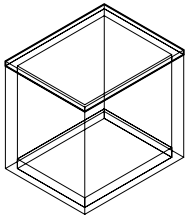
If you want to . . .	Then . . .
change the boundary conditions at the ceiling	clear Automatically Determine from Spaces. If you select this option, the conditions are automatically set from the contained spaces.
change the height of the space boundary from the top of the floor to the bottom of the ceiling.	enter a value for Base Height.

If you want to . . .	Then . . .
locate the ceiling below the top of the wall (for example, to create a dropped ceiling)	select Ceiling Stops at Wall, and enter a value for Upper Extension.
locate the bottom of the ceiling at the top of the wall	select Wall Stops at Ceiling.

Specifying ceiling conditions

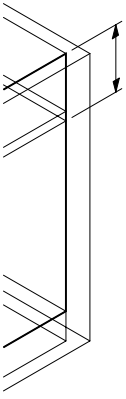


ceiling stops at wall



wall stops at ceiling

Specifying the upper extension of a boundary

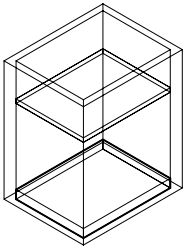


upper
extension

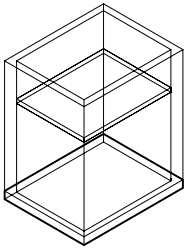
9 Specify the boundary conditions at the floor:

If you want to . . .	Then . . .
change the boundary conditions at the floor	clear Automatically Determine from Spaces. If you select this option, the conditions are automatically set from the contained spaces.
locate the floor below the bottom of the wall	select Floor Stops at Wall, and enter a value for Lower Extension.
locate the bottom of the wall at the top of the floor	select Wall Stops at Floor.

Specifying floor conditions

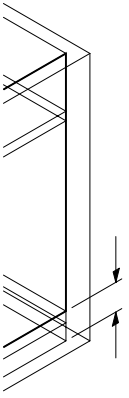


floor stops at wall



wall stops at floor

Specifying the lower extension of a boundary



lower extension

10 Click OK.

Removing Boundary Edges

Use this procedure to remove specific edges from a space boundary. If the space boundary is managing contained spaces and if removing the boundary edge opens an enclosed boundary, the managed spaces are deleted as well.

1 Select the space boundary, right-click and click Remove Edges.

2 Select the space boundary edges to delete, and press ENTER.

Anchoring Objects to Boundaries

Use this procedure to anchor objects to space boundaries. An anchored object is constrained to the space boundary. You can move an anchored object along the space boundary, but you cannot move the object off the boundary unless you release the object from the boundary.

The center of the bottom face of the object is anchored to the insertion point on the bottom face of the space boundary and midway in the boundary width.

For more information about anchors, see "Working with Curve Anchors" on page 754.

1 Select the space boundary, right-click and click Anchor to Boundary.

2 Enter **a** (Attach objects) to anchor an object to the space boundary.

3 Select the object to anchor to the boundary.

4 Select the space boundary to anchor the object to.

The object is placed on the space boundary and is anchored to the location you selected on the space boundary.

Releasing Objects from Space Boundaries

Use this procedure to detach objects that are anchored to space boundaries.

1 Select the space boundary, right-click and click Anchor to Boundary.

2 Enter **f** (Free objects) to detach an object from the space boundary.

3 Select the object to detach from the boundary.

4 Press ENTER to release the attached object.

The object is no longer anchored and can now be moved off the space boundary.

Converting Space Boundaries to Walls

Use this procedure to convert space boundaries to walls to be carried forward into the design phase of the drawing.

If you want to create a wall up to ceiling height only, set the value of the space above ceiling height to zero. Also, the wall generated has a baseline at zero if the boundary is created in the World Coordinate System (WCS), but the wall itself extends below baseline by a distance equal to the floor thickness. For more information about the WCS, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

NOTE When walls are generated from a space boundary, any boundary edges (segments) that are adjoining and collinear become a single wall. To prevent segments from joining automatically, make them different widths. This is useful, for example, when the resulting wall segments must be different styles. You can change the widths after converting the boundary to walls.

The walls created from space boundaries have the properties of the Standard wall style. After you convert the space boundaries to walls, you can edit them as you do any other walls, including changing their style. For more information, see "Editing Walls" on page 1769.

The space boundary and any spaces that it is managing stay in the drawing, but there is no link between the space boundary and the created wall object. If you need to edit a boundary, delete the walls, change the boundary, and then convert it to walls again.

NOTE Only space boundaries that have a Solid boundary type can be converted to walls.

- Select a space boundary, right-click and click Generate Walls.

Editing Space Boundaries

You can change an existing space boundary from a solid form boundary to an area separation boundary. You can also change the notes, descriptions, or reference files attached to a space boundary; segment type, width, and justification; design rules; and location properties.

Related Procedures

- Modifying a Space Boundary

- Changing the Location of a Space Boundary
- Attaching Hyperlinks, Notes, or Files to a Space Boundary

Modifying a Space Boundary

Use this procedure to change an existing space boundary from a solid form boundary to an area separation boundary. Depending on the type of boundary, you can change its height and width, how it is drawn with respect to the points you specified (justification), and whether changes to the boundary change the space contained within it.

1. Double-click the space boundary you want to change.
2. On the Properties palette, expand Basic, and expand General.
3. Specify the space boundary type:

If you want to . . .	Then . . .
designate the space boundary as one with edges of specific width	select Solid for Boundary type. This boundary edge can be later converted to a wall.
designate the space boundary as one that is a partition or space divider line	select Separation for Boundary type. An area separation boundary edge cannot be converted to a wall.

4. Expand Dimensions.
5. Specify the space boundary dimensions:

If you want to . . .	Then . . .
modify the height of the space boundary	enter a new value for Base height.
modify the width and justification of a solid space boundary	enter a new value for Width, and select a different option for Justify.
manage the spaces within the space boundary	select Manage contained spaces. Any changes to the space boundary also affect the space managed by the boundary. If the Manage contained spaces option is cleared when a space boundary is edited, any changes to the space boundary do not change the spaces within it.

Changing the Location of a Space Boundary

Use this procedure to relocate a space boundary by changing the coordinate values of its insertion point. The space boundary also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the space boundary are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the space boundary by aligning its normal with another axis. You can also rotate the space boundary on its plane by changing the rotation angle.

For information about the WCS and the UCS, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Double-click the space boundary you want to modify.
2. On the Properties palette, expand Basic, and expand Location.
3. Click Additional information.
4. Specify the location of the space boundary:

If you want to . . .	Then . . .
relocate the space boundary	enter new coordinate values under Insertion Point.
locate the space boundary on the *XY* plane	make the normal of the space boundary parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the space boundary on the *YZ* plane	make the normal of the space boundary parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the space boundary on the *XZ* plane	make the normal of the space boundary parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the space boundary	enter a new value for Rotation Angle.

5. Click OK.

Attaching Hyperlinks, Notes, or Files to a Space Boundary

Use this procedure to attach hyperlinks, notes, or files to a space boundary. You can also edit hyperlinks and notes, and edit or detach reference files from a space boundary.

1. Double-click the space boundary you want to attach information to.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.
4. To add a note, click the setting for Notes, and enter the note.
5. Click OK.
6. To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

7. Click OK twice.

Creating Slice Floorplates from a Conceptual Model

A slice can be thought of as a representation of a theoretical floor level. Slice floorplates provide a way to translate the 3D geometry of a mass group into something that can be used to generate the individual floors of a building. Slices can be converted to space boundaries or polylines, and then to walls.

Slices and Mass Models

Like mass groups, slices are chosen and manipulated by an associated marker, the slice marker. When you attach mass groups to the slice marker, the slice marker creates the perimeter geometry of the building, known as a floorplate. Anytime you change the mass groups attached to the slice marker, the floorplate is updated.

If you attach mass elements instead of mass groups to the slice, the operational aspects (additive, subtractive, and intersection) of the mass elements are not recognized by the slice. To have these aspects recorded by the slice, attach the mass group. For more information about additive, subtractive, and intersection operations, see "Creating a Mass Group" on page 628.

From Slice Floorplate to Walls

After you create the floorplates, you can convert slices to space boundaries or polylines, and then generate walls. You cannot create walls directly from the slice. The slice is simply a way to mark each floor level of the mass group.

Related Procedures

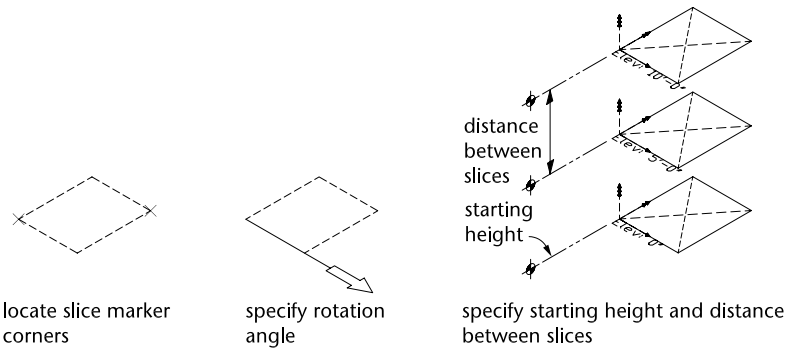
- Generating a Slice
- Specifying the Slice Elevation
- Attaching Objects to a Slice
- Detaching Objects from a Slice
- Converting a Slice to a Polyline
- Changing the Location of a Mass Element
- Attaching Hyperlinks, Notes, or Files to a Mass Element

Generating a Slice

Use this procedure to generate a slice. The slice object is defined by a small crossed box. Like the mass group marker, the slice marker can be located in a convenient place in your drawing. For more information about the mass group marker, see "Adding a Mass Group Marker" on page 630.

You can create multiple slices at regular height intervals. A slice marker is created for each slice.

Generating slice objects



1. Open the tool palette that you want to use, and select a slice tool.

   If necessary, scroll to display the tool that you want to use.

2. Specify the number of slices you want to create.
3. Specify the lower-left and upper-right corners for the slice marker.

TIP Keep the slice marker small so as not to clutter your drawing.

4. Specify a rotation for the slice marker.
5. Enter the starting height of the slice.
6. Enter the distance between the slices.
7. Press ENTER.

Specifying the Slice Elevation

Use this procedure to change the elevation of a slice after creating it.

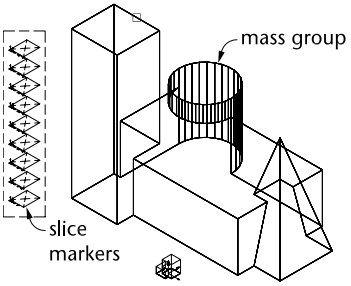
1. Select the slice marker, right-click, and click Set Elevation.
2. Enter a new slice elevation.

   If more than one slice was created together, only the elevation of the selected slice changes. The distance between slices remains constant.

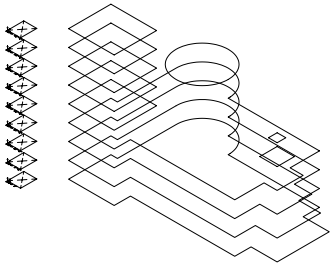
Attaching Objects to a Slice

Use this procedure to attach mass elements or mass groups to a slice to create the building floorplate. You can freeze the layer(s) containing the mass elements and mass groups to display only the slices.

Attaching a mass group to slice objects



select slice markers and mass group to attach



freeze a-mass-grps layer

1. Select the slice marker, right-click, and click Attach Objects.
2. Select the mass elements or mass groups you want to include in the slice.
3. Press ENTER.

Detaching Objects from a Slice

Use this procedure to detach mass elements or mass groups from a slice to change a floorplate.

1. Select the slice marker, right-click, and click Detach Objects.
2. Select the mass elements or mass groups you want to remove from the slice.
3. Press ENTER.

Converting a Slice to a Polyline

Use this procedure to convert a slice to a polyline after objects have been attached to a slice marker. You can then convert polylines to spaces, walls, or profiles.

- Select the slice marker, right-click, and click Convert to Polyline.

  The outlines of the objects attached to the slice marker are converted to polylines.

Changing the Location of a Slice

Use this procedure to relocate a slice by changing the coordinate values of its insertion point. The slice also has an orientation with respect to the world

coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the slice are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the slice by aligning its normal with another axis. You can also rotate the slice on its plane by changing the rotation angle.

For information about the WCS and the UCS, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Double-click the slice you want to modify.
2. On the Properties palette, expand Basic, and expand Location.
3. Click Additional information.
4. Specify the location of the slice:

If you want to . . .	Then . . .
relocate the slice	enter new coordinate values under Insertion Point.
locate the slice on the *XY* plane	make the normal of the slice parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the slice on the *YZ* plane	make the normal of the slice parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the slice on the *XZ* plane	make the normal of the slice parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the slice	enter a new value for Rotation Angle.

5. Click OK.

Attaching Hyperlinks, Notes, or Files to a Slice

Use this procedure to attach hyperlinks, notes, or files to a slice. You can also edit hyperlinks and notes, and edit or detach reference files from a slice.

1. Double-click the slice you want to attach information to.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 To add a note, click the setting for Notes, and enter the note.

5 Click OK.

6 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

7 Click OK.

Developing Designs

IV

Topics in Part 4

- AEC Polygons
- Anchors
- Curtain Walls
- Doors
- Door/Window Assemblies
- Grids
- Layout Curves and Grids
- Openings
- Roofs
- Stairs
- Structural Members
- Railings
- Slabs
- Walls
- Windows

AEC Polygons

12

An AEC Polygon is a two-dimensional (2D) area object that can be used as infill for structures such as curtain walls and layout grids. You can use a True Color display representation to assign a solid fill to the edges and interiors of AEC Polygons, making these objects useful for conceptual rendering.

In this chapter

- Using AEC Polygon Tools to Create AEC Polygons
- Creating a New AEC Polygon
- Creating an AEC Polygon with User-specified Settings
- Creating an AEC Polygon Tool
- Creating an AEC Polygon from a Polyline
- Creating an AEC Polygon from a Profile
- Editing AEC Polygons
- AEC Polygon Styles
- Rendering the Exact Colors of an AEC Polygon by Defeating Lighting and Shading Effects

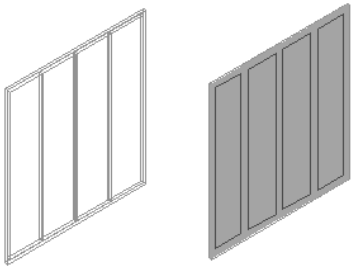
AEC Polygons and Curtain Walls

Curtain walls provide a framework for inserting objects such as panels, windows, and doors. You can use curtain walls to model structures such as the following:

- Large scale curtain walls
- Storefronts with components
- Assemblies of custom-shaped doors and windows

In Autodesk® Architectural Desktop, a curtain wall object consists of one or more grids. Each grid contains cells that can be filled by a panel, or by an object such as a window or door. AEC Polygons are ideally suited to create panel infills for curtain walls.

Curtain wall with AEC Polygon infill assignment



A curtain wall can include curtain wall units. Curtain wall units are similar to curtain walls except that their grid cells can contain only panel infills, and not objects. Curtain wall units are designed to represent complex elements that are repeated within the main curtain wall. You can use AEC Polygons to fill the grids in a curtain wall unit.

Paving and Tiling Patterns

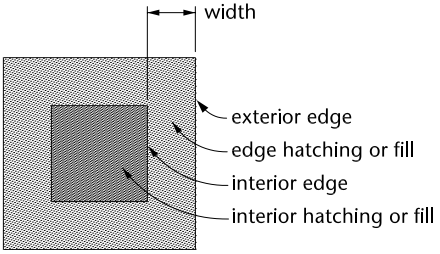
You can use AEC Polygons to create intricate paving and tiling patterns in a drawing. Using the join, subtract, trim, and split functions of AEC Polygons, and by creating AEC Polygons from profiles and polylines, you can create complex and irregular polygon outlines. By adding edges and hatch patterns to the AEC Polygons, you can display a realistic tiling and paving look.

AEC Polygon Style Components

You can use AEC Polygon styles to define the look and edge widths of a polygon. You can use the edges to display framing components of infill panels, or to represent a shadow. Framing components can have different dimensions,

casting shadows with different widths along the edges. When you render the curtain wall, you can depict different sun angles with different edge widths.

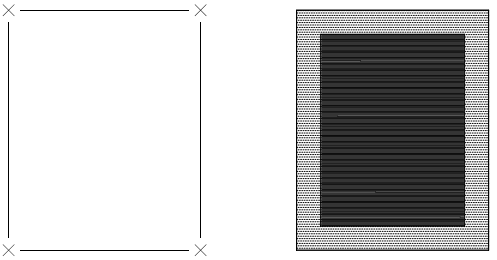
AEC Polygon components



Polylines and Profiles

Using straight line segments, you can create a freehand AEC Polygon by drawing a closed contour of the object.

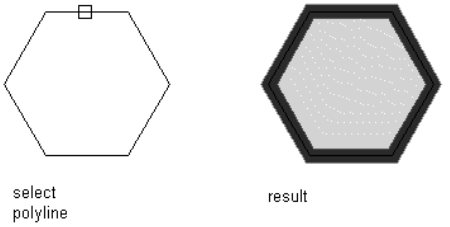
Creating an AEC Polygon



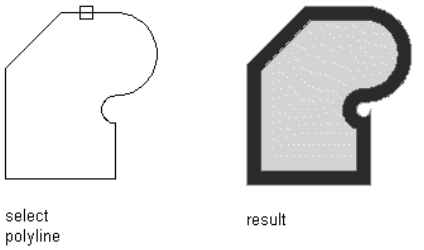
specify boundary points resulting AEC polygon

To define complex and curved shapes, either convert an existing polyline into an AEC Polygon or use a profile definition as the source of the AEC Polygon.

Converting a polyline to an AEC Polygon



Converting a complex polyline to an AEC Polygon



True Color Display

AEC Polygons have a True Color display representation. When you attach AEC Polygons as infill panels to curtain walls, you can use the True Color display representation to create a conceptual rendering of the curtain wall.

Related Procedures

- Creating a New AEC Polygon
- Creating an AEC Polygon from a Polyline
- Creating an AEC Polygon from a Profile
- Editing AEC Polygons
- AEC Polygon Styles
- Rendering the Exact Colors of an AEC Polygon by Defeating Lighting and Shading Effects

Using AEC Polygon Tools to Create AEC Polygons

Tools provided with Autodesk® Architectural Desktop let you quickly create AEC Polygons by selecting an AEC Polygon tool with a specific style and other predefined properties. You can use the default settings of tools, or you can change the settings for AEC Polygon properties. You can also use AEC Polygon tools to convert linework to AEC Polygons and to apply the settings of an AEC Polygon tool to existing AEC Polygons.

An AEC Polygon tool is included in the Autodesk® Architectural Desktop Stock Tool catalog supplied with the Content Browser. For information about using the Content Browser, see "Content Browser" on page 171.

Custom palettes created by your CAD manager or other users may also contain AEC Polygon tools with styles and properties customized for your projects or office standards.

Related Procedures

- Creating a New AEC Polygon
- Creating an AEC Polygon with User-specified Settings
- Creating an AEC Polygon Tool
- Creating an AEC Polygon from a Polyline
- Creating an AEC Polygon from a Profile

Creating a New AEC Polygon

Use this procedure to create a new AEC Polygon.

You create an AEC Polygon from straight line segments. The AEC Polygon must have a minimum of three sides and must not intersect itself. The style that you select controls the width and the justification of the AEC Polygon edges. The justification determines whether the edges are displayed inside, outside, or centered on the AEC Polygon vertices.

1 Open a tool palette containing an AEC Polygon tool, and select the tool.

To use the AEC Polygon tool supplied in the Autodesk® Architectural Desktop Stock Tool catalog, open the Content Browser and navigate to General Purpose Tools ➤ Helper Tools in the Stock Tool catalog; then drag the AEC Polygon to the drawing area. For more information on using a cata-

log tool, see "Using a Tool in the Autodesk Architectural Desktop Workspace" on page 201.

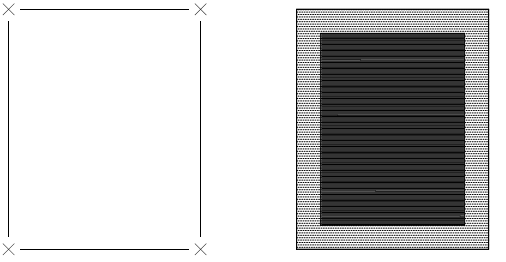
2 Specify the start point of the AEC Polygon.

3 Specify further points to define the AEC Polygon.

NOTE You must specify enough points to create at least three sides for the AEC Polygon.

4 Enter **c** (Close) to close the AEC Polygon.

Creating an AEC Polygon



specify boundary points resulting AEC polygon

Creating an AEC Polygon with User-specified Settings

Use this procedure to create an AEC Polygon with settings that you specify.

1 Open a tool palette containing an AEC Polygon tool, and select the tool.

To use the AEC Polygon tool supplied in the Autodesk®Architectural Desktop Stock Tool catalog, open the Content Browser and navigate to General Purpose Tools ➤ Helper Tools in the Stock Tool catalog; then drag the AEC Polygon to the drawing area. For more information on using a catalog tool, see "Using a Tool in the Autodesk Architectural Desktop Workspace" on page 201.

2 On the Properties palette, expand Basic, and expand General.

3 Specify the start point of the AEC Polygon.

4 Specify further points to define the AEC Polygon.

NOTE You must specify enough points to create at least three sides for the AEC Polygon.

5 Enter **c** (Close) to close the AEC Polygon.

Creating an AEC Polygon Tool

Use this procedure to create an AEC Polygon tool and add it to a tool palette. You may want to create your own AEC Polygon tools if you are placing multiple AEC Polygons of specific styles that have the same properties.

You can use any of the following methods to create an AEC Polygon tool:

- Drag an AEC Polygon with the desired properties to a tool palette.
- Drag an AEC Polygon style from the Style Manager to a tool palette, and then customize the properties of the new tool.
- Copy an existing AEC Polygon tool, and then customize the properties of the new tool.
- Drag an AEC Polygon tool from a tool catalog in the Content Browser to a tool palette, and then customize the properties of the tool.

1 Open the tool palette on which you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from an AEC Polygon in the drawing	select the AEC Polygon and drag it to the tool palette.
create a tool from an AEC Polygon style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy under Multi-Purpose Objects, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current palette	right-click the tool, click Copy, and click Paste.
copy a tool from another palette	right-click the tool and click Copy; open the other palette, and click Paste.

If you want to . . .	Then . . .
copy a tool from a tool catalog	open the tool catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

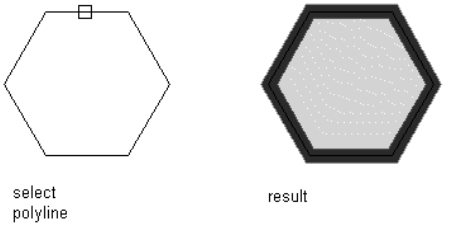
3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.

   This description is used as the tool's tooltip on the tool palette, and to describe the tool if it is stored in a tool catalog.
6. Expand Basic and expand General.
7. Enter a description of the AEC Polygon that you can create using this AEC Polygon tool.
8. Specify a layer key and any layer key overrides, if you do not want to use the layer assignments specified in the layer key style used in the drawing.
9. Select an AEC Polygon style.
10. For Style location, select the drawing file containing the style used for this AEC Polygon, or select Browse and use a standard file selection dialog box to select the file.
11. Click OK.

Creating an AEC Polygon from a Polyline

Use this procedure to create an AEC Polygon from a closed polyline in a drawing.

Converting a polyline to an AEC Polygon



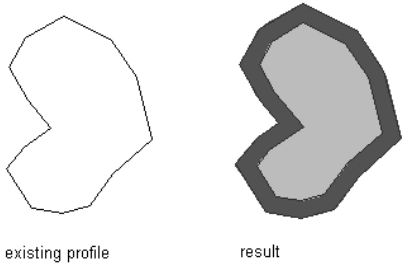
When you create an AEC Polygon by converting a closed polyline in your drawing, the object that you convert can be created from a combination of line and arc segments. The polyline must have a minimum of three sides and must not intersect itself. After you convert the polyline to an AEC Polygon, the width and justification of the AEC Polygon edges are set by the style that you select for the AEC Polygon.

1. Draw a polyline in your drawing.
2. Open a palette containing an AEC Polygon tool, right-click the tool, and click Apply Tool Properties to ➤ Closed Polyline.
3. Select the polyline that you created in step 1, and press ENTER.
4. Enter **y** (Yes) to erase the polyline after creating the AEC Polygon, or **n** (No) to keep the polyline in the drawing.
5. Press ENTER.

Creating an AEC Polygon from a Profile

Use this procedure to create an AEC Polygon from a profile definition in a drawing.

Converting a profile into an AEC Polygon



The profile definition that you convert can be created from a combination of line and arc segments. The profile definition must have a minimum of three sides and must not intersect itself. After you create an AEC Polygon from the profile definition, the width and justification of the AEC Polygon edges are set by the style that you select for the AEC Polygon.

1. At the Command prompt, enter **aecpolygon**.
2. Enter **c** (Convert) and press ENTER.
3. Enter **pr** (Profile) and press ENTER.
4. Select the desired profile definition and click OK.

5 Select the insertion point for the new AEC Polygon.

6 Press ENTER.

Editing AEC Polygons

You can change the location of an AEC Polygon, adjust the width and justification of its edges, and change how it is displayed in your drawing. You can also redefine the geometry of an AEC Polygon or define how AEC Polygons interact with each other. You can join two AEC Polygons, create a hole in an AEC Polygon by subtracting the area of another one, create an AEC Polygon from the intersection of two others, divide or trim an AEC Polygon, and add or remove its vertices.

Related Procedures

- Using Grips to Edit AEC Polygons
- Changing the AEC Polygon Style
- Joining Two AEC Polygons
- Creating a Hole in an AEC Polygon
- Creating AEC Polygons from the Intersection of Other AEC Polygons
- Trimming an AEC Polygon
- Dividing an AEC Polygon
- Adding a Vertex to an AEC Polygon
- Removing a Vertex from an AEC Polygon
- Creating a Polyline from an AEC Polygon
- Creating a Profile from an AEC Polygon
- Changing the Rotation of an AEC Polygon
- Changing the Elevation of an AEC Polygon
- Changing the Location of an AEC Polygon
- Attaching Hyperlinks, Notes, or Files to an AEC Polygon

Using Grips to Edit AEC Polygons

Use this procedure to change the shape and size of an AEC Polygon in your current drawing by using grips.

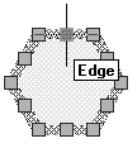
1 Select an existing AEC Polygon.

2 Select a vertex or edge grip.

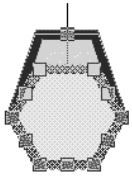
3 Move the pointing device to change the shape or size of the AEC Polygon.

Using grips to edit the edge of an AEC Polygon

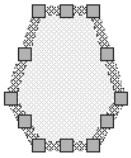
select AEC polygon



select edge grip



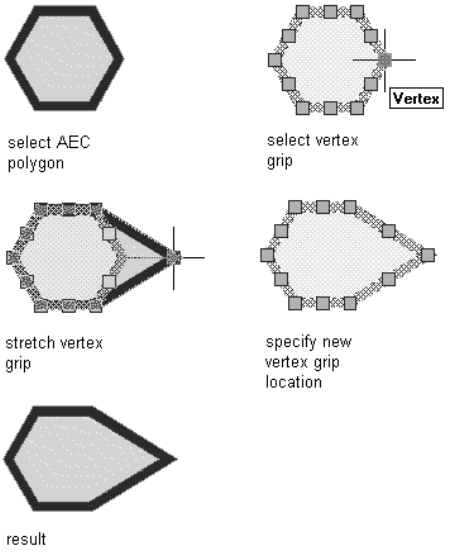
stretch edge grip



specify new edge grip location

result

Using grips to edit the vertex of an AEC Polygon



Changing the AEC Polygon Style

Use this procedure to change the style of one or more AEC Polygons. The style controls the width and justification of the AEC Polygon edges. The justification determines whether the edges are displayed inside, outside, or centered on the vertices of the AEC Polygon. The style can also control the display properties of the AEC Polygon.

1. Double-click the AEC Polygon you want to change.
2. On the Properties palette, expand Basic, and expand Location.
3. Select an AEC Polygon style.

Joining Two AEC Polygons

Use this procedure to join two or more AEC Polygons in a drawing. When you join two AEC Polygons that overlap each other, their common boundary is combined to form the boundary of the joined AEC Polygon.

NOTE When you join one AEC Polygon to another, the second AEC Polygon no longer exists as a separate object. Properties of the second AEC Polygon are deleted and replaced with the corresponding properties of the first one.

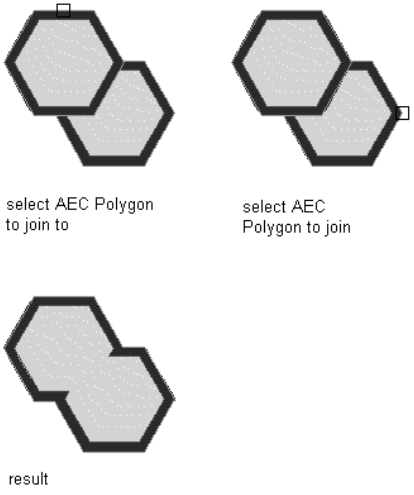
1 Create two overlapping AEC Polygons. For more information, see "Creating a New AEC Polygon" on page 725.

2 Select one of the AEC Polygons to be joined, right-click, and click Operation ➤ Join.

3 Select the AEC Polygon to join with the first AEC Polygon.

NOTE You can join only those AEC Polygons that lie on the same *Z*-plane. Two AEC Polygons with different *Z*-positions in the same coordinate system cannot be joined.

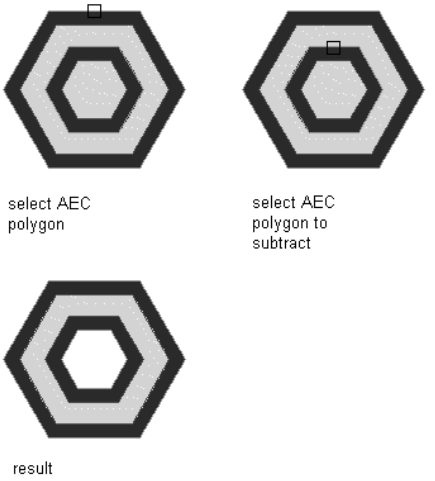
Joining two overlapping AEC Polygons



Creating a Hole in an AEC Polygon

Use this procedure to subtract AEC Polygons from one another in order to create a hole in an AEC Polygon. This would be useful, for example, for creating a complex pattern for a curtain wall infill.

Subtracting an AEC Polygon from an AEC Polygon



To perform a subtraction operation, you need to select AEC Polygons that intersect one another. You can choose whether to keep the subtracted AEC Polygon in the drawing as a separate unit. For example, you may want to keep the AEC Polygon if you need to subtract the same shape from other AEC Polygons.

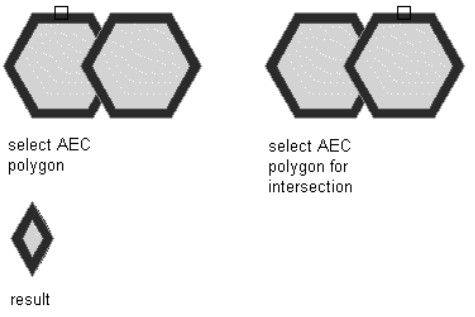
1. Create an AEC Polygon from which to subtract a hole. For more information, see "Creating a New AEC Polygon" on page 725.
2. Create a second, smaller AEC Polygon to represent the area to be subtracted from the larger AEC Polygon.

   You can draw the second AEC Polygon within or overlapping the area of the first AEC Polygon, or you can draw it in another location and then move it onto the larger AEC Polygon.
3. Select the larger AEC Polygon, right-click, and click Operation ➤ Subtract.
4. Select the smaller AEC Polygon to subtract from the larger AEC Polygon.
5. Enter **y** (Yes) to erase the subtracted AEC Polygon, or **n** (No) to leave the AEC Polygon in the drawing.

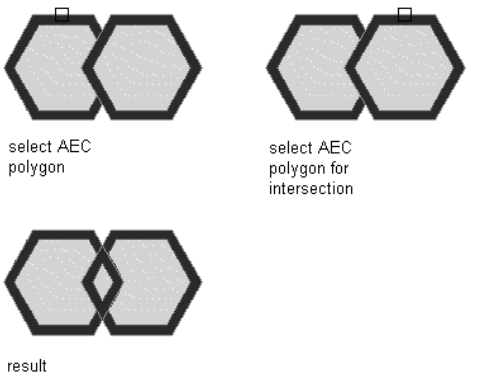
Creating AEC Polygons from the Intersection of Other AEC Polygons

Use this procedure to create a new AEC Polygon from the overlapping portion of two intersecting AEC Polygons. You can choose whether to retain the original geometry after creating the new intersection AEC Polygon.

Intersecting AEC Polygons with original geometry erased



Intersecting AEC Polygons with original geometry retained

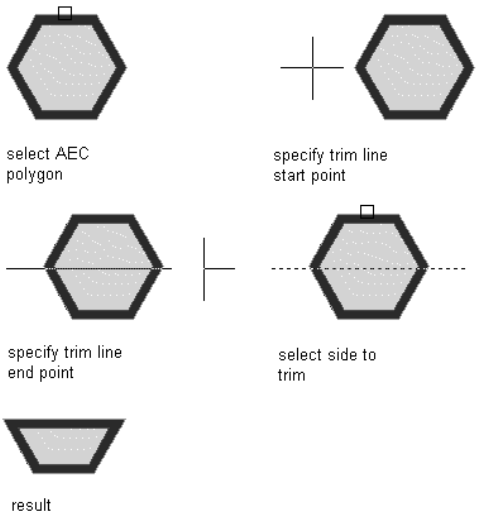


1. Create two overlapping AEC Polygons. For more information, see "Creating a New AEC Polygon" on page 725.
2. Select the first overlapping AEC Polygon, right-click, and click Operation ➤ Intersect.
3. Select the second overlapping AEC Polygon.
4. Enter **y** (Yes) to erase the original AEC Polygons, or **n** (No) to leave the AEC Polygons in the drawing.

Trimming an AEC Polygon

Use this procedure to trim a side from an AEC Polygon by defining a trim line through an existing AEC Polygon.

Trimming an AEC Polygon

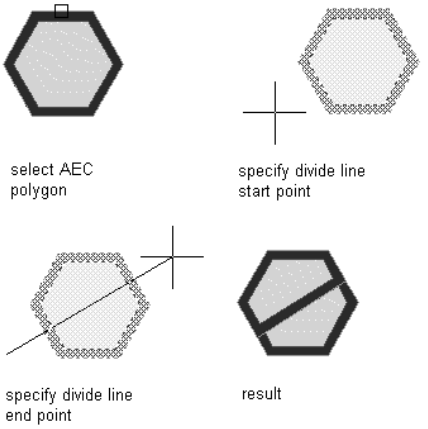


1. Select the AEC Polygon to be trimmed, right-click, and click Operation ➤ Trim.
2. Specify a start point for the trim line. This line cuts through the AEC Polygon, creating the area to trim and the area to retain.
3. Specify an endpoint for the trim line.
4. Select the side of the AEC Polygon to be trimmed.

Dividing an AEC Polygon

Use this procedure to divide an AEC Polygon into two separate AEC Polygons by defining a division line through it.

Dividing an AEC Polygon



1. Select the AEC Polygon to be divided, right-click, and click Operation ➤ Divide.
2. Specify a start point for the division line.

> **NOTE** You can specify only a start point and endpoint for your division line. You cannot specify additional points.

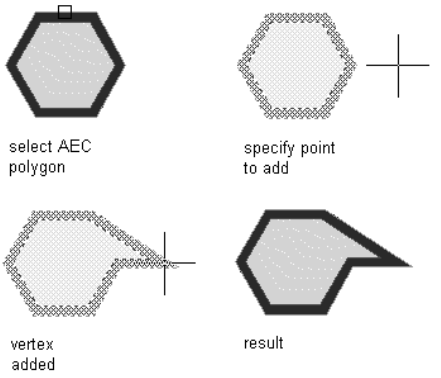
3. Specify an endpoint for the division line.

The AEC Polygon is divided by the line that you defined.

Adding a Vertex to an AEC Polygon

You can add a vertex to an existing AEC Polygon to change its shape. A vertex is the location where the edges of the AEC Polygon meet.

Adding a vertex to an AEC Polygon



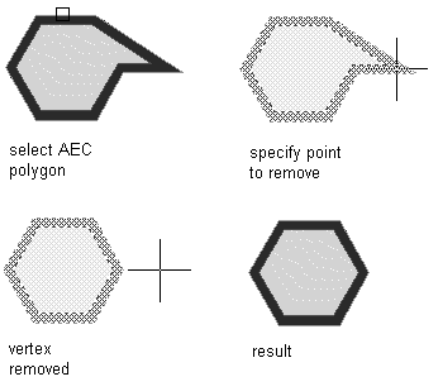
1. Select the AEC Polygon for which to add a vertex, right-click, and click Vertex ➤ Add.
2. Select the point in your drawing to add the new vertex.

   Line segments are drawn from the two existing vertices of the AEC Polygon closest to the point that you selected to form the new vertex.
3. Press ENTER.

Removing a Vertex from an AEC Polygon

You can remove a vertex from an existing AEC Polygon to change its shape.

Removing a vertex from an AEC Polygon



1. Select the AEC Polygon from which to remove a vertex, right-click, and click Vertex ➤ Remove.

2 Select the vertex you want to remove.

3 Press Enter.

Creating a Polyline from an AEC Polygon

Use this procedure to create polylines from an existing AEC Polygon. When you create a polyline from an AEC Polygon that contains a hole, each ring of the AEC Polygon is converted into an individual polyline.

1 Select the AEC Polygon from which to create a polyline, right click, and click Convert To ➤ Polyline.

2 Specify the base point of the resulting polyline, or press ENTER to use the centroid as the base point.

3 Specify the insertion point of the polyline.

Creating a Profile from an AEC Polygon

Use this procedure to create a profile definition from an existing AEC Polygon. You can create a new profile definition or overwrite an existing profile definition.

1 Select the AEC Polygon from which to create a profile definition, right click, and click Convert To ➤ Profile.

2 Specify the insertion point of the resulting profile, or press ENTER to use the centroid as the insertion point.

3 Enter **n** (New) to create a new profile definition, or **e** (Existing) to replace an existing profile.

4 Enter a name for the new profile definition, or select the profile definition to be replaced by the one you are creating from an AEC Polygon.

Changing the Rotation of an AEC Polygon

Use this procedure to change the rotation of an AEC Polygon.

1 Double-click the AEC Polygon whose rotation you want to change.

2 On the Properties palette, expand Basic, and expand Location.

3 Enter a value for Rotation.

Changing the Elevation of an AEC Polygon

Use this procedure to change the elevation of an AEC Polygon.

1 Double-click the AEC Polygon for which to change the elevation.

2 On the Properties palette, expand Basic, and expand Location.

3 Enter a value for Elevation.

Changing the Location of an AEC Polygon

Use this procedure to relocate an AEC Polygon by changing the coordinate values of its insertion point. You can also move an AEC Polygon by cutting and pasting it.

AEC Polygons are oriented with respect to the WCS or the current UCS. For example, if the top and bottom of an AEC Polygon are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the AEC Polygon by aligning its normal with another axis. You can also rotate the AEC Polygon on its plane by changing the rotation angle. For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the *AutoCAD 2004 User's Guide*.

1 Double-click the AEC Polygon you want to move.

2 On the Properties palette, expand Location.

3 Click Additional information.

4 Specify the location of the AEC Polygon:

If you want to . . .	**Then . . .**
relocate the AEC Polygon	enter new coordinate values under Insertion Point.
locate the AEC Polygon on the *XY* plane	make the normal of the AEC Polygon parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the AEC Polygon on the *YZ* plane	make the normal of the AEC Polygon parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the AEC Polygon on the *XZ* plane	make the normal of the AEC Polygon parallel to the *Y* axis: under Normal, enter **1** for Y and enter **0** for X and Z.
change the rotation of the AEC Polygon	enter a new value for Rotation Angle.

5 Click OK.

Attaching Hyperlinks, Notes, or Files to an AEC Polygon

Use this procedure to attach hyperlinks, enter notes, or attach reference files to an AEC Polygon. You can also edit notes and edit or detach reference files from an AEC Polygon.

1. Double-click the AEC Polygon to which to attach information.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click next to Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD®2004 Command Reference*.
4. To add or edit a note, click next to Notes, enter text, and click OK.
5. To attach, detach, or edit a reference file, click t to Reference documents, and then do any of the following:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6. Click OK.

AEC Polygon Styles

An AEC Polygon style is a group of properties that determines the appearance and other characteristics of AEC Polygons. AEC Polygon styles control the following parameters:

- default dimensions, including edge width and justification

- default display properties for the interior and edges of the AEC Polygon

  The display properties of an AEC Polygon allow you to hatch its interior and edges, or fill its edges and interior with a solid color fill.

Creating Tools from AEC Polygon Styles

You can create an AEC Polygon tool from any AEC Polygon style. You can drag the style from the Style Manager onto a tool palette. You can then specify default settings for any AEC Polygon created with that tool. For more information, see "Using AEC Polygon Tools to Create AEC Polygons" on page 725.

Managing AEC Polygon Styles

To create, copy, or edit styles, you access the Style Manager. The Style Manager provides a central location in Autodesk® Architectural Desktop where you can work with styles from multiple drawings and templates. For more information, see "Style Manager" on page 531.

Related Topics and Procedures

- Creating an AEC Polygon Style
- Changing the Width and Justification of the AEC Polygon Edges
- Specifying the Display Properties of an AEC Polygon Style
- Setting the Colors of the True Color Display Representation
- Attaching Notes and Files to an AEC Polygon Style
- Adding Classifications to an AEC Polygon Style

Creating an AEC Polygon Style

Use this procedure to create an AEC Polygon style. You can create a new style using default style properties, or by copying an existing style. After you create a style, you edit its properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects, and expand AEC Polygon Styles.
3. Create an AEC Polygon style:

If you want to . . .	Then . . .
create a style with default properties	right-click AEC Polygon Styles, and click New.
create a style from an existing style	right-click the AEC Polygon style you want to copy, and click Copy. Right-click, and click Paste.

4 To rename the new AEC Polygon style, right-click the style, and click Rename.

5 Enter a name for the new AEC Polygon style, and press ENTER.

6 To edit the style properties of the new AEC Polygon style, right-click the style, and click Edit:

If you want to . . .	Then . . .
change the edge width and edge alignment	see "Changing the Width and Justification of the AEC Polygon Edges" on page 743.
change the Layer/Color/ Linetype properties	see "Specifying the Layer, Color, and Linetype of an AEC Polygon Style" on page 746.
change the AEC Polygon interior and exterior hatching	see "Specifying the Hatching of an AEC Polygon Style" on page 747.
change the colors of the True Color display representation	see "Setting the Colors of the True Color Display Representation" on page 748.
add notes and files to the style	see "Attaching Notes and Files to an AEC Polygon Style" on page 749.
add classifications to an AEC Polygon style	see "Adding Classifications to an AEC Polygon Style" on page 750.

7 If you want to create an AEC Polygon tool from the new style, drag the style from the Style Manager to a tool palette.

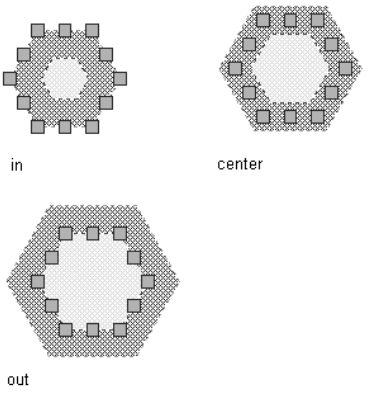
You can later rename the tool and specify other properties for it as described in "Creating an AEC Polygon Tool" on page 727.

8 Click OK.

Changing the Width and Justification of the AEC Polygon Edges

Use this procedure to change the width and justification of the edges of an AEC Polygon in the AEC Polygon style. The justification determines whether the edges are displayed inside, outside, or centered on the vertices of the AEC Polygon.

Justifying AEC Polygon edges



1. Open a tool palette containing an AEC Polygon tool.
2. Right-click an AEC Polygon tool, and click AEC Polygon Styles.
3. Select the AEC Polygon style, right-click, and click Edit.
4. Click the Dimensions tab.
5. To change the width of the AEC Polygon edges, enter a new value for Edge Width.
6. Change the justification of the AEC Polygon edges as desired:

If you want to . . .	Then . . .
display the edges inside the AEC Polygon vertices	select In for Justify.
display the edges centered within the vertices of the AEC Polygon	select Center for Justify.
display the edges outside the AEC Polygon vertices	select Out for Justify.

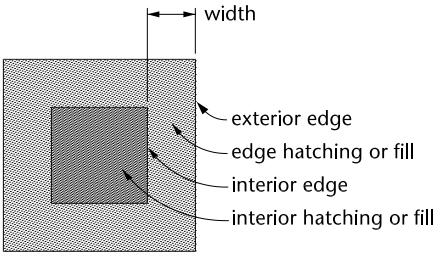
7. Click OK twice.

Specifying the Display Properties of an AEC Polygon Style

In most cases, you want the appearance of AEC Polygons that belong to the same style to be consistent throughout a drawing. To achieve this, you specify the display properties of the AEC Polygons in each AEC Polygon style:

- The layer, color, and linetype of AEC Polygon components
- The hatching used for the components of the AEC Polygon

AEC Polygon components



Display components in Model view

Component	Description
Interior Edge	Inner edge of the AEC Polygon. **NOTE** When the edge dimensions are set to 0, the interior edge is the only edge of the AEC Polygon.
Exterior Edge	Outer edge of the AEC Polygon. **NOTE** When the edge dimensions are set to 0, the exterior edge is not displayed in the AEC Polygon.
Interior Hatch	Hatch component of the inner part of the AEC Polygon. **NOTE** When the edge dimensions are set to 0, the interior hatch is the only hatch of the AEC Polygon.
Edge Hatch	Hatch component of the outer part of the AEC Polygon. **NOTE** When the edge dimensions are set to 0, the edge hatch is not displayed in the AEC Polygon.

Display components in Model view *(continued)*	
Component	**Description**
Interior Fill	The fill component of the inner part of the AEC Polygon. This component is displayed only in rendered views. Make sure that for each rendered view you use either the Interior Fill and Edge Fill components of the Model display representation or the Interior Fill and Edge Fill components of the True Color display representation. If you use both display representations simultaneously, the fills are drawn on top of each other. For detailed information, see "Setting the Colors of the True Color Display Representation" on page 748.
Edge fill	The fill component of the outer part of the AEC Polygon. This component is displayed only in rendered views. Make sure that for each rendered view you use either the Interior Fill and Edge Fill components of the Model display representation or the Interior Fill and Edge Fill components of the True Color display representation. If you use both display representations simultaneously, the fills are drawn on top of each other. For detailed information, see "Setting the Colors of the True Color Display Representation" on page 748. **NOTE** When the edge dimensions have been set to 0, the edge fill is not displayed in a rendered AEC Polygon.

Related Procedures

- Specifying the Layer, Color, and Linetype of an AEC Polygon Style
- Specifying the Hatching of an AEC Polygon Style

Specifying the Layer, Color, and Linetype of an AEC Polygon Style

Use this procedure to change the following display properties of an AEC Polygon style:

- Visibility (component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype Scale

Materials cannot be assigned to AEC Polygons.

1 Open a tool palette containing an AEC Polygon tool.
2 Right-click an AEC Polygon tool, and click AEC Polygon Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Display Properties tab.
5 Select the Model display representation, and select Style Override.
6 If necessary, click .
7 Click the Layer/Color/Linetype tab.
8 Select the component to change, and select a different setting for the property.
9 Click OK twice.

Specifying the Hatching of an AEC Polygon Style

Use this procedure to specify the hatching of an AEC Polygon style.

1 Open a tool palette containing an AEC Polygon tool.
2 Right-click an AEC Polygon tool, and click AEC Polygon Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Display Properties tab.
5 Select the display representation in which changes should appear, and select Style Override.
6 If necessary, click .
7 Click the Hatching tab.
8 Click the setting for Pattern.
9 Select the hatching pattern:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.

If you want to . . .	Then . . .
select solid fill	select Solid Fill for Type.

TIP Mask blocks do not hide the True Color representation of AEC Polygons, but you can use hatching to work around this. Use the Model representation of the AEC Polygon, set the hatch to Solid, and select the appropriate True Color for the hatch.

10 Click OK.

11 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

12 Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the AEC Polygon, regardless of the object's rotation	select object.
orient the hatching to the World Coordinate System	select global.

14 Click OK three times.

Setting the Colors of the True Color Display Representation

Use this procedure to set the colors of the AEC Polygon with True Color display representations. Use True Color display representation for high-resolution renderings.

NOTE Make sure that you do not use the True Color display representation and the Model display representation of an AEC Polygon simultaneously in one view. The Interior Fill and Edge Fill components of the Model display representation would be drawn on top of the Interior Fill and Edge Fill components of the True Color display representation. It is recommended that you create separate views for regular viewing and True Color renderings.

1 Open a tool palette containing an AEC Polygon tool.
2 Right-click an AEC Polygon tool, and click AEC Polygon Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Display Properties tab.
5 Select the True Color display representation, and select Style Override.
6 If necessary, click .
7 Specify the fill properties:

If you want . . .	Then . . .
a True Color fill for the outer part of the AEC Polygon	select Edge Fill, and select a color for Edge Color, or click Other to choose a different color.
a True Color fill for the inner part of the AEC Polygon	select Interior Fill, and select a color for Interior Color, or click Other to choose a different color.

NOTE If the edge dimensions of the AEC Polygon are set to 0, the edge fill is not displayed.

8 Click OK three times.

Attaching Notes and Files to an AEC Polygon Style

Use this procedure to enter notes and attach reference files to an AEC Polygon style. You can also edit notes and edit or detach reference files from an AEC Polygon style.

1 Open a tool palette containing an AEC Polygon tool.
2 Right-click an AEC Polygon tool, and click AEC Polygon Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the General tab.
5 To add a description to the AEC Polygon, enter it under Description.
6 Click Notes.
7 To add or edit a note, click the Notes tab, and enter the note.

8 To attach, edit, or detach a reference file, click the Reference Docs tab:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click open. Click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
change the reference file	double-click the reference file to start its application. Close the application when you are finished editing.
detach a reference file	select the file name, and click Delete.

9 Click OK three times.

Adding Classifications to an AEC Polygon Style

Use this procedure to specify classifications for any classification definition applied to an AEC Polygon style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1 Open a tool palette containing an AEC Polygon tool.

2 Right-click an AEC Polygon tool, and click AEC Polygon Styles.

3 Right-click the style that you want to change, and click Edit.

4 Click the Classifications tab.

By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to AEC Polygon styles.

5 For each classification definition, select the classification you want applied to the current AEC Polygon style.

6 Click OK twice.

Rendering the Exact Colors of an AEC Polygon by Defeating Lighting and Shading Effects

The procedures in this topic allow you to display the exact colors of an AEC Polygon on screen after you render it, without lighting or shading effects.

Related Procedures

- Changing the 3D Graphics System Display Properties
- Changing the Ambient Light Intensity
- Modifying the Global Rendering Material

Changing the 3D Graphics System Display Properties

Use this procedure to change the 3D graphics system display properties of the drawing.

1. On the Format menu, click Options.
2. Click the System tab.
3. Under Current 3D Graphics Display, click Properties.
4. Select Render Options.
5. Select Enable Lights.
6. Click Apply & Close.
7. Click OK.

Changing the Ambient Light Intensity

Use this procedure to change the ambient light intensity and create a new distant light.

1. At the Command prompt, enter **light**.
2. In the Lights dialog box, under Ambient Light, enter **1.0** for Intensity.
3. Select Distant Light from the list of lights (next to the New button).
4. Click New.
5. Enter a name for the new light.
6. Enter **0.0** for Intensity.

7. Under Color, set Red, Green, and Blue to 0.0.
8. Click OK.
9. Delete any lights other than the new distant light.

   To delete a light, select it from the Lights list, and click Delete.
10. Click OK.

Modifying the Global Rendering Material

Use this procedure to modify the global rendering material.

1. At the Command prompt, enter **rmat**.
2. In the Materials dialog box, under Materials, select *Global*, and click Modify.
3. In the Modify Standard Material dialog box, select Color/Pattern, and enter **1.0** for Value.
4. Select Ambient, and enter **1.0** for Value.
5. Select Reflection, and enter **1.0** for Value.
6. Click OK twice.

Now the RENDER and SHADEMODE settings match. When you render an AEC Polygon (or any other object), the AEC Polygon renders in the original object colors, without shading or lighting effects.

Anchors

13

An anchor links an AEC object to another object or to a layout curve or grid. You can create anchors between objects and also remove anchors from objects. AEC objects can be anchored to each other, to AutoCAD® objects like lines and circles, or to layout curves or grids.

Automatic and user-defined anchors in Autodesk® Architectural Desktop enable you to use anchors for many different purposes.

Automatic and User-Defined Anchors

Automatic anchors are set by the program. Certain objects are by default anchored to other objects. For example, doors and windows are usually anchored to walls or space boundaries. Curtain wall units or window assemblies might be anchored to curtain walls. Although these anchors are all inserted automatically, when you place the objects their behavior can differ slightly. For example, a door that is anchored to a wall can be moved to an unconnected wall. The door cannot, however, be moved outside a wall and stand alone. To do this, you must first remove the anchor between door and wall. The anchor of a column to a column grid behaves differently: you can move the column inside the grid, but you cannot move the column to another grid without first removing the anchor.

User-defined anchors are manual links that you can create between two objects. Most anchors are used with layout curves, layout grids, or volumes. You can also attach anchors to other AEC objects or AutoCAD objects.

In this chapter

- Working with Curve Anchors
- Working with Leader Anchors
- Working with Node Anchors
- Working with Cell Anchors
- Working with Volume Anchors
- Releasing and Positioning Anchored Objects
- Creating an Anchor Tool

Anchoring objects to a layout curve can be useful for positioning washbasins along a wall or rafters along a roof. Anchoring objects to layout grids can help you to position columns on a column grid, planters on a sidewalk grid, or tile accents on a floor tile grid. For information about layout curves or grids, see "Using Layout Curves" on page 1246 and "Using Layout Grids" on page 1253.

Types of User-Defined Anchors

There are five different types of anchors that you can use to attach objects:

If you want to . . .	Then . . .
attach objects to the base curve of other objects, such as lines, arcs, circles, mass elements, polylines, roofs, or walls	use curve anchors.
attach objects to nodes on layout curves or grids with leaders	use leader anchors.
attach objects to nodes on layout curves or grids	use node anchors.
attach objects to the cell positions on 2D layout grids and 3D volume grids	use cell anchors.
attach objects to volumes on 3D grids	use volume anchors.

Related Procedures

- Working with Curve Anchors
- Working with Leader Anchors
- Working with Node Anchors
- Working with Cell Anchors
- Working with Volume Anchors

Working with Curve Anchors

You can use curve anchors to attach AEC objects to the base curve of other AEC objects or AutoCAD objects, such as lines, arcs, circles, mass elements, polylines, roofs, or walls. The movement of an object that is anchored to

another object with a curve anchor is constrained by the object to which it is anchored. Curve anchors are best suited for attaching objects to linear objects like lines, arcs, or walls as opposed to grids or layout volumes.

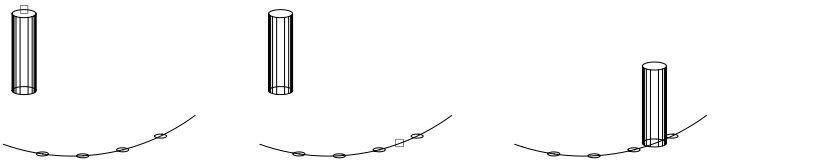
Related Procedures

- Adding Curve Anchors
- Changing the Position of Objects Anchored to Curves
- Anchoring Objects to New Curves

Adding Curve Anchors

Use this procedure to add a curve anchor to attach objects to the base of other objects.

Anchoring an object to a layout curve



1. Open the tool palette that you want to use, and select a curve anchor tool.

   If necessary, scroll to display the tool that you want to use.

   A curve anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Enter **at** (Attach object), and select the object to be anchored.
3. Select a point on the curve that you want to anchor the object to.

   The object is anchored to the curve at the *X* position. When the object is first placed, the *Y* and *Z* positions are 0.

4. Press ENTER.

Changing the Position of Objects Anchored to Curves

Use this procedure to change the position of objects anchored to curves. You can change the position of an anchored object relative to the curve in the *X, Y,* and *Z* directions. You can also rotate and flip the object along its axes.

NOTE The positioning of multi-view blocks assumes that the insertion point of the multi-view block is at its midpoint.

1. Double-click the anchored object.
2. On the Properties palette, expand Basic, and expand Location on Curve.
3. Click Anchor.
4. Change the position along the *X*-axis:

If you want to . . .	Then . . .
Select the *X* reference point on the curve	select start, midpoint, or end of curve.
Specify the *X* distance between the reference point on the curve and the anchored object	enter a value for distance.
Select from which point on the anchored object the *X* distance to the curve is measured	select start edge, center, or end edge.

5. Change the position along the *Y*-axis:

If you want to . . .	Then . . .
Select the *Y* reference point on the curve	select left edge of curve width, center, or right edge of curve width.
Specify the *Y* distance between the reference point on the curve and the anchored object	enter a value for distance.
Select from which point on the anchored object the *Y* distance to the curve is measured	select front, center, or back.

6 Change the position along the *Z*-axis (vertical):

If you want to . . .	Then . . .
Select the *Z* reference point on the curve	select bottom of curve height, center, or top of curve height.
Specify the *Z* distance between the reference point on the curve and the anchored object	enter a value for distance.
Select from which point on the anchored object the *Z* distance to the curve is measured	select bottom of object, center, or top of object.

7 To change the rotation of the anchored object, enter values for the *X* and *Z* rotation.

8 To flip the object along one of the axes, select Flip X, Flip Y, or Flip Z.

9 Click OK.

Anchoring Objects to New Curves

Use this procedure to anchor objects to new curves. You can anchor an object to a new object without first releasing the previous anchor. The new anchor is of the same type as the previous one; in this case, a curve anchor.

1 Open the tool palette that you want to use, and select a curve anchor tool.

If necessary, scroll to display the tool that you want to use.

A curve anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Enter **s** (Set curve), and select anchored objects.

NOTE You can select only AEC objects here.

3 Press ENTER.

4 Select a new object to anchor the object to.

NOTE You can select AEC objects and AutoCAD objects here.

5 Press ENTER.

Working with Leader Anchors

Use leader anchors to anchor objects to nodes on layout curves or grids with leaders. The movement of the anchored object is constrained by the leader on the anchor.

For information about creating layout curves or grids and nodes, see "Using Layout Curves" on page 1246 and "Using Layout Grids" on page 1253.

Related Procedures

- Adding Leader Anchors
- Changing the Position of Objects Anchored to Layout Nodes with Leader Anchors
- Grip Editing Leaders
- Extending Leaders
- Copying Objects to All Layout Nodes

Adding Leader Anchors

Use this procedure to add leader anchors to your drawing. An object can be anchored to only one node at a time. When you try to anchor it to a second node, the object is first released from the first node. You can, however, anchor any number of objects to a single layout node.

1 Open the tool palette that you want to use, and select a leader anchor tool.

If necessary, scroll to display the tool that you want to use.

A leader anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Enter **a** (Attach object), select the object to be anchored, then specify a point on or near a node on a layout curve, layout grid, or volume grid.

The object is anchored to the node that you selected. By default, the leader anchor is created at a direction of 0 from the node and has first and second extensions of 1 inch (2.54 cm) each. These extensions are measured from the node to the center of the anchored object.

3 Press ENTER.

Changing the Position of Objects Anchored to Layout Nodes with Leader Anchors

Use this procedure to change the position of objects anchored to layout nodes with leader anchors. You can change the coordinate system, orientation, and rotation of an object anchored to a layout node. You can also define offsets from the node.

1. Double-click the layout node.
2. On the Properties palette, expand Basic, and expand Location from Node.
3. Click Anchor.
4. Specify changes in the position or orientation of anchored objects:

If you want to . . .	Then . . .
specify an offset from the object to the node	specify insertion offset values for the X, Y, or Z position.
anchor the object to the center of the node	select Center on Node.
have the anchored object use the coordinate system of the node	select Use Node Coordinate System.
not have the anchored object use the coordinate system of the node	specify X, Y, or Z normals for the anchored object.
change the rotation angle of the anchored object	specify values for the X, Y, or Z rotation angles.
flip the object along the X, Y, or Z axes	select Flip X, Flip Y, or Flip Z.
change the angle of the leader to the node	specify a value for Angle to Node.

5. Click OK.

Grip Editing Leaders

Use this procedure to grip edit leaders. A leader anchor connects an object to a layout node with a leader between the two. You can change the length and shape of the leader.

A leader consists of one segment or several segments. You can change the leader shape by grip editing the object or by changing the values on the Anchors tab of the anchored object.

You can use grips to add segments to existing leaders.

1. Select the anchored object.
2. Move the leader grip to move the leader in the appropriate direction.
3. After you have released the leader, select the anchored object again.

   An additional leader grip is added at the point from which the leader originally started.

4. Move the leader grip at the start of the leader line to add another segment to the leader.
5. Repeat this procedure until the leader has all the segments you need.

   You can later edit the leader in the same way you edit an AutoCAD polyline.

Extending Leaders

Use this procedure to extend the leader line beyond the first and last grip points on the leader line.

1. Double-click the anchored object.
2. On the Properties palette, expand Basic, and expand Location from Node.
3. Click Anchor.
4. Edit the leader line:

If you want to extend . . .	Then . . .
the start point of the leader line	in the First Extension field, enter the extension value.
the end point of the leader line	in the Second Extension field, enter the extension value.

5. Click OK.

Copying Objects to All Layout Nodes

Use this procedure to copy objects to all layout nodes. You can select an AEC object and, instead of manually anchoring it to a layout node, you can copy the object and anchor one copy to each node on a layout curve or grid.

TIP If you want the leader to be displayed in the same way at every node, first anchor the object to a single node. Adjust the leader attributes (direction, extension, or properties), and then use the Copy to Nodes option. Next, select the object that is anchored to the single node, and select the layout curve or grid.

1. Open the tool palette that you want to use, and select a leader anchor tool.

   If necessary, scroll to display the tool that you want to use.

   A leader anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. To copy the object to every node on the layout curve or grid, enter **c** (Copy to Nodes).
3. Select the object that you want to copy and anchor to every node on the layout curve or grid.
4. Select the layout curve or grid.

   If there is an existing object anchored to any of the nodes, you are prompted to specify whether you want to skip nodes that already have something anchored to them. Enter **y** to avoid duplicate anchored objects on those nodes.

Working with Node Anchors

Use node anchors to attach objects to nodes on layout curves or grids. Anchoring objects to a layout curve might be useful for positioning washbasins along a wall or rafters along a roof. Anchoring objects to layout grids might help you to position columns on a column grid, planters on a sidewalk grid, or tile accents on a floor tile grid.

WARNING! When you change the position of an object that is anchored to a curve, the anchored objects need to stay on the curve. Keeping the association

between the object and the node prevents the objects that are being moved from all attaching to the same node.

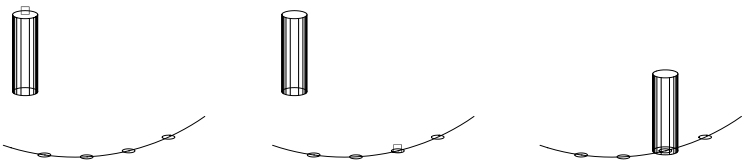
Related Procedures

- Adding Node Anchors
- Changing the Position of Objects Anchored to Layout Nodes with Node Anchors
- Anchoring Objects to Different Nodes
- Copying Objects to All Layout Nodes

Adding Node Anchors

Use this procedure to add node anchors. You can add as many node anchors in your drawing as you have layout nodes. An individual object can be anchored only to one layout node. If you try to anchor an object to a second node, the first anchor is released. You can, however, anchor several objects to the same layout node and edit them individually.

Anchoring an object to a layout curve node



select object to attach | select layout curve node | object attached to node

1. Open the tool palette that you want to use, and select a node anchor tool.

   If necessary, scroll to display the tool that you want to use.

   A node anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Enter **a** (Attach object), and select the object to be anchored.
3. Specify a point on or near a node on a layout curve or grid.

   The object is anchored to the node that you selected.

Changing the Position of Objects Anchored to Layout Nodes with Node Anchors

Use this procedure to change the position of objects anchored to layout nodes with node anchors. You can change the coordinate system and orientation of an object anchored to a layout node. You can also define offsets from the node.

1 Double-click the layout node.

2 On the Properties palette, expand Basic, and expand Location from Node.

3 Click Anchor.

4 Change the position or orientation of anchored objects:

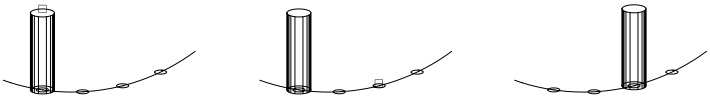
If you want to . . .	Then . . .
specify an offset from the object to the node	specify offset values for the X, Y, or Z position.
anchor the object to the center of the node	select Center on Node.
have the anchored object use the coordinate system of the node	select Use Node Coordinate System.
not have the anchored object use the coordinate system of the node	specify X, Y, or Z normals for the anchored object.
flip the object along the X, Y, or Z axes	select Flip X, Flip Y, or Flip Z.

5 Click OK.

Anchoring Objects to Different Nodes

Use this procedure to anchor objects to different nodes. You can attach an anchored object to another node on the same layout curve or grid, or to another layout curve or grid altogether.

Moving an anchored object to another layout curve node



select anchored object | select layout curve tool | new object location

NOTE If you want to move an anchored object to a different node on the same layout curve or grid, you can also drag the object to the node.

1. Open the tool palette that you want to use, and select a node anchor tool.

   If necessary, scroll to display the tool that you want to use.

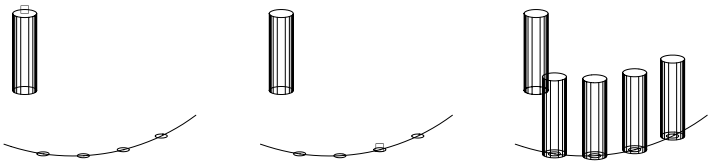
   A node anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Enter **s** (Set node), and select the anchored object.
3. Press ENTER.
4. Select the node you want to anchor the object to.

Copying Objects to All Layout Nodes

Use this procedure to copy objects to all layout nodes. You can select an AEC object and, instead of manually anchoring it to a layout node, you can copy the object and anchor one copy to each node on the layout curve or grid.

Copying an object to all layout curve nodes



select object to anchor | select layout tool | object copied to all nodes

1. Open the tool palette that you want to use, and select a node anchor tool.

   If necessary, scroll to display the tool that you want to use.

   A node anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add

this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 To copy the object to every node on the layout curve or grid, enter **c** (Copy to each node).

3 Select the object that you want to copy and anchor to every node on the layout curve or grid.

4 Select the layout curve or grid.

If an object is already anchored to any of the nodes, you are prompted to specify whether you want to skip nodes that already have something anchored to them. Enter **y** (Yes) to avoid duplicate anchored objects on those nodes.

Working with Cell Anchors

A cell is a subdivision of a layout grid or volume grid. A cell anchor attaches objects to cell positions on layout grids and volume grids. When an object is anchored to a cell, the object is resized to fit the cell size. When the grid or volume itself is resized, you can decide whether the anchored object is updated accordingly or remains its original size.

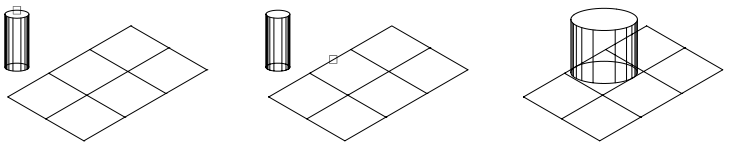
Related Procedures

- Adding Cell Anchors
- Changing the Position and Size of Objects Anchored to Layout Cells
- Anchoring Objects to a Different Cell
- Copying Objects to All Layout Cells

Adding Cell Anchors

Use this procedure to add cell anchors. You can add cell anchors to objects to connect them to cells in layout grids and volume grids.

Anchoring an object to a layout grid cell



select object to anchor | select layout tool cell | object anchored to cell

NOTE There is no rule that determines which cell the object attaches to when you anchor it. You can turn on the Node display component to display the cell nodes of the layout grid or volume for easier cell selection. You can also move the object after you anchor it to the layout grid or volume.

1. Open the tool palette that you want to use, and select a cell anchor tool.

   If necessary, scroll to display the tool that you want to use.

   A cell anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Enter **a** (Attach object), and select the object to be anchored.
3. Specify a point on or near a cell of a layout grid or volume grid.

   The object is automatically scaled to fill the entire cell.

4. Press ENTER.

Changing the Position and Size of Objects Anchored to Layout Cells

Use this procedure to change the position and size of objects anchored to layout cells. You can change the coordinate system and orientation of an object anchored to a layout cell. You can also define insertion and size offsets and indicate whether the object should be resized when the cell is resized.

1. Double-click the anchored object.
2. On the Properties palette, expand Basic, and expand Location from Cell.
3. Click Anchor.

4 Change the position or orientation of anchored objects:

If you want to . . .	Then . . .
specify an offset from the object to the cell	specify offset values for the X, Y, or Z position.
anchor the object to the center of the cell	select Center on Cell.
have the anchored object use the coordinate system of the cell	select Use Cell Coordinate System.
not have the anchored object use the coordinate system of the cell	specify X, Y, or Z normals for the anchored object.
flip the object along the X, Y, or Z axes	select Flip X, Flip Y, or Flip Z.

5 Specify how an anchored object is resized to fit the edges of the cell:

If you want to . . .	Then . . .
have the object be resized every time the cell is resized	select Apply Resize.
not have the object be resized every time the cell is resized	clear Apply Resize.
specify a distance between the anchored object and the cell	enter an appropriate negative value for Size Offset.
extend the anchored object beyond the cell edges	enter an appropriate positive value for Size Offset.

6 Click OK.

Anchoring Objects to a Different Cell

You can attach an anchored object to another cell in the same layout grid or volume grid, or to another layout curve or grid altogether.

1 Open the tool palette that you want to use, and select a cell anchor tool.

   If necessary, scroll to display the tool that you want to use.

   A cell anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Enter **se** (Set cell), and select the object.

3 Press ENTER.

4 Select the cell you want to anchor the object to.

   The object is moved to the new cell. If the new cell is different in size from the original one, the object is resized accordingly.

NOTE You can also drag the object if you want to move an anchored object to a different cell on the same layout grid or volume grid.

Copying Objects to All Layout Cells

Use this procedure to copy objects to all layout cells. You can select an AEC object and, instead of manually anchoring it to a layout cell, you can copy the object and anchor one copy to each cell on the layout grid or volume grid.

1 Open the tool palette that you want to use, and select a cell anchor tool.

   If necessary, scroll to display the tool that you want to use.

   A cell anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 To copy the anchored object to every cell in the layout grid or volume grid, enter **c** (Copy to each cell).

3 Select the object.

4 Select the layout grid or volume grid that you want to copy and anchor the object to.

   If there is already an object anchored to any of the cells, you are prompted to specify whether you want to skip cells that already have something anchored to them. Enter **y** (Yes) to avoid duplicate anchored objects appear in those cells.

Working with Volume Anchors

Use volume anchors to attach objects to volumes in 3D volume grids. The movement of an object that is anchored to a volume grid is constrained by that volume grid.

When an object is anchored to a volume inside a volume grid, the object is resized to fit the volume size. When the volume itself is resized, you can decide whether the anchored object is updated accordingly or remains its original size.

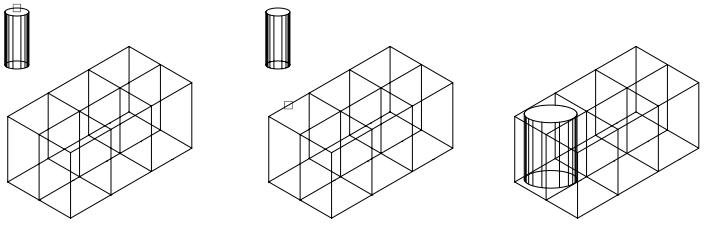
Related Procedures

- Adding Volume Anchors
- Changing the Position and Size of Objects Anchored to Volumes
- Anchoring Objects to a Different Volume
- Copying Objects to All Layout Volumes

Adding Volume Anchors

Use this procedure to add volume anchors. You can add volume anchors to objects to connect them to volume grids.

Anchoring an object to a volume grid



select object to anchor | select volume layout tool | object anchored to cell

1 Open the tool palette that you want to use, and select a volume anchor tool.

If necessary, scroll to display the tool that you want to use.

A volume anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Enter **a** (Attach object), and select the object to be anchored.

3 Specify a point on or near a volume in a volume grid.

The object is scaled to fill the entire volume.

4 Press ENTER.

Changing the Position and Size of Objects Anchored to Volumes

Use this procedure to change the position and size of objects anchored to volumes. You can change the coordinate system and orientation of an object anchored to a volume. You can also define insertion and size offsets and indicate whether the object should be resized when the volume is resized.

1 Double-click the anchored object.

2 On the Properties palette, expand Basic, and expand Location in Volume.

3 Click Anchor.

4 Change the position or orientation of anchored objects:

If you want to . . .	Then . . .
specify an offset from the object to the volume	specify offset values for the X, Y, or Z position.
anchor the object to the center of the volume	select Center on Node.
have the anchored object use the coordinate system of the volume grid	select Use Node Coordinate System.
not have the anchored object use the coordinate system of the volume grid	specify X, Y, or Z normals for the anchored object.
flip the object along the X, Y, or Z axes	select Flip X, Flip Y, or Flip Z.

5 Specify how an anchored object is resized to fit the edges of the volume:

If you want to . . .	Then . . .
have the object be resized every time the volume is resized	select Apply Resize.
not have the object be resized every time the volume is resized	clear Apply Resize.

If you want to . . .	Then . . .
specify a distance between the anchored object and the volume	enter an appropriate negative value for Size Offset.
extend the anchored object beyond the volume edges	enter an appropriate positive value for Size Offset.

6 Click OK.

Anchoring Objects to a Different Volume

Use this procedure to anchor objects to a different volume. You can attach an anchored object to another volume in the same volume grid, or to another volume grid.

NOTE If you want to move an anchored object to a different volume on the same volume grid, you can also drag it there.

1 Open the tool palette that you want to use, and select a volume anchor tool.

If necessary, scroll to display the tool that you want to use.

A volume anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Enter **s** (Set volume), and select the anchored object.

3 Press ENTER.

4 Select the volume you want to anchor the object to.

The object is moved to the new volume. If the new volume is different in size from the original one, the object is resized accordingly.

Copying Objects to All Layout Volumes

Use this procedure to copy objects to all layout volumes. You can select an AEC object and, instead of manually anchoring it to a volume, you can copy the object and anchor one copy to each volume on the volume grid.

1 Open the tool palette that you want to use, and select a volume anchor tool.

If necessary, scroll to display the tool that you want to use.

A volume anchor tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. To copy the anchored object to every volume in the volume grid, enter **c** (Copy to each volume).
3. Select the object that you want to copy and anchor to every volume in the volume grid.
4. Select the volume grid.

   If there is already an object anchored to any of the volumes, you are prompted to specify whether you want to skip volumes that already have something anchored to them. Enter **y** (Yes) to avoid duplicate anchored objects on those volumes.

Releasing and Positioning Anchored Objects

You can release and position anchored objects. Release an anchored object from another object to remove the relationship between the objects. Position an anchored object to offset it from the object it is anchored to.

Related Procedures

- Releasing Anchored Objects
- Positioning Anchored Objects

Releasing Anchored Objects

Use this procedure to release objects from anchors to remove the anchoring relationship. Any anchored object can be released, including a railing that is anchored to a stair object or a window that is anchored to a wall.

- Right-click the anchored object, and click Anchor ➤ Release.

Positioning Anchored Objects

Use this procedure to position anchored objects. You can position an object with anchors to offset it from the object that it is anchored to.

1 Right-click the anchored object, and change the position of the anchored object:

If you want to . . .	Then . . .
specify the X position	click Set X Position.
specify the Y position	click Set Y Position.
specify the Z position	click Set Z Position.
specify the end position	click Set Anchored End.
specify the rotation	click Set Rotation.
flip the X position	click Flip X.
flip the Y position	click Flip Y.
flip the Z position	click Flip Z.

2 Enter an *XYZ* coordinate value for the desired offset position.

Entering a coordinate for the offset distance is equivalent to setting all three of the individual position offsets.

Creating an Anchor Tool

Use this procedure to create an anchor tool and add it to a tool palette. You may want to create your own anchor tools if you are placing multiple anchors of specific styles with additional properties that you want to be the same each time you add an anchor of each type.

For example, you are creating an office floor plan with partition walls for cubicles. Although all partition walls use the same wall style in your floor plan, the walls in administrative areas are lower than the walls in office areas. To work efficiently, you can quickly create a wall tool for each wall height. You can then select the appropriate tool to place the walls with the correct height in each area of the floor plan.

You can use any of the following methods to create an anchor tool:

- Drag a copy of a tool from another palette to the current palette and then customize the properties of the new tool.

- Copy an existing tool in the current palette and then customize the properties of the new tool.
- Drag a tool from the Content Browser to a tool palette and then customize the properties of the new tool.

1. Open the tool palette where you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.
6. Click OK.

Curtain Walls

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Curtain walls provide a grid or framework for inserting objects such as windows and doors. Curtain walls have many similarities to standard walls, such as baseline, roof line, and floor line, and they allow for interferences. You can insert doors, windows, and door/window assemblies into a curtain wall, just like standard walls, but the insertion process is different.

Curtain walls are also different from standard walls in that they are made up of one or more grids.

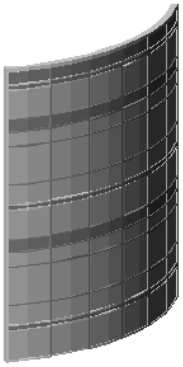
In this chapter

- Creating Curtain Walls Using Curtain Wall Tools
- Curtain Wall Styles
- Using Overrides in Curtain Walls
- Modifying Element Definitions for Curtain Wall Styles
- Editing Curtain Walls
- Changing the Roof Line and the Floor Line of a Curtain Wall
- Editing Objects Anchored in Curtain Walls
- Curtain Wall Units
- Creating Curtain Wall Units
- Curtain Wall Unit Styles
- Using Overrides in Curtain Wall Units
- Editing Curtain Wall Units

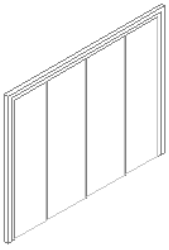
Curtain Wall Grids

Curtain walls are made up of one or more grids. Each grid in a curtain wall has either a horizontal division or a vertical division, but you can nest the grids to create a variety of patterns from simple to complex.

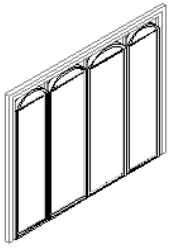
Curtain wall nested grid example



Each cell in a grid can contain either a panel infill, to represent basic cladding materials such as a stone wall panel or glazing, or an object such as a window or a door.



panel infill

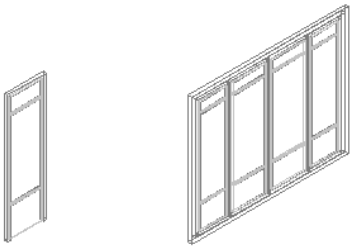


window infill

Curtain Wall Units and Door/Window Assemblies

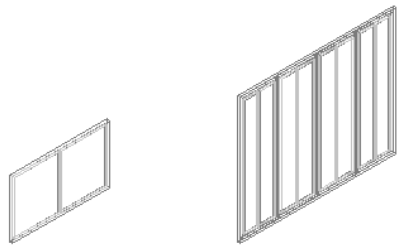
Other objects you can insert in a grid include curtain wall units and door/window assemblies. Curtain wall units are very similar to curtain walls except that the grid cells can contain only panel infills, not objects. Curtain wall units are designed to represent complex elements that are repeated within your main curtain wall.

Specifying curtain wall unit infill



Window assemblies serve a similar function as curtain wall units but can contain panel infills or objects such as doors or windows. Door/window assemblies can be inserted into curtain walls and standard walls.

Specifying door/window assembly infill



Both curtain wall units and door/window assemblies can reduce the need for nested grids, making edits to the curtain wall easier.

Elements of Grids

Grids are the foundation of curtain walls, curtain wall units, and door/window assemblies. Every grid has four element types:

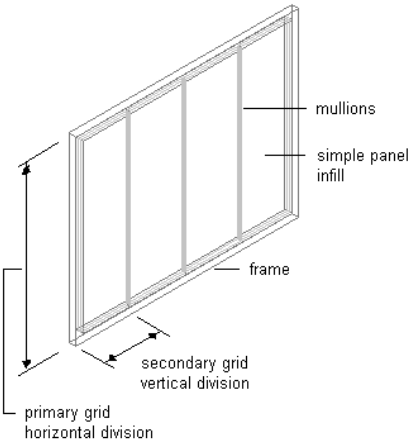
- **Divisions**: Define the direction of the grid (horizontal or vertical) and the number of cells
- **Cell Infills:** Contain another grid, a panel infill, or an object such as a window or a door
- **Frames:** Define the edge around the outside of the primary grid and nested grids
- **Mullions:** Define the edges between the cells

NOTE Division is an abstract element, in contrast to the other three element types that represent physical elements of the curtain wall.

Each element type is assigned a default definition that describes what elements of that type look like.

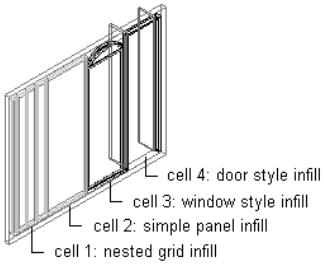
Element type	Default definitions
Divisions	Primary horizontal grid with a fixed cell dimension of 13' and secondary vertical grid with a fixed cell dimension of 3'
Cell Infills	Cells containing simple panels 2" thick
Frames	Left, right, top, and bottom outer edges of grid 3" wide and 3" deep
Mullions	Edges between cells 1" wide and 3" deep

Specifying grid element types



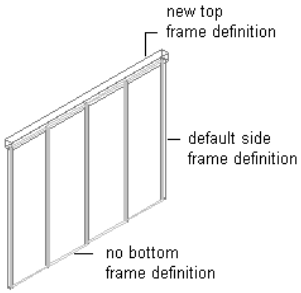
You can create new element definitions and assign those definitions within the curtain wall. For example, you can create multiple infill definitions, and then assign different infills to specific cells in the grid.

Assigning different infills to curtain wall cells



Likewise, you can create multiple frame definitions and then assign a different definition to each frame edge (top, bottom, left, or right). You can also create multiple mullion definitions.

Specifying different frame definitions for each edge of a frame



Experimenting with Curtain Wall Designs

The templates provided with Autodesk® Architectural Desktop offer curtain wall styles as well as curtain wall unit styles and door/window assembly styles. To familiarize yourself with the curtain wall feature, you can look at those existing styles and experiment with them. That will make it easier to understand curtain wall behavior and create your own curtain wall designs.

Related Procedures

- Creating Curtain Walls Using Curtain Wall Tools
- Curtain Wall Styles
- Using Overrides in Curtain Walls
- Modifying Element Definitions for Curtain Wall Styles
- Editing Curtain Walls
- Editing Objects Anchored in Curtain Walls

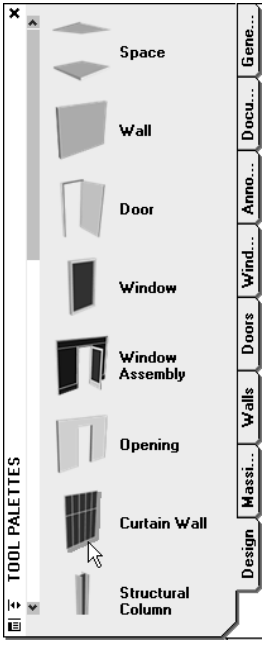
■ Curtain Wall Units

Creating Curtain Walls Using Curtain Wall Tools

Curtain walls are created in much the same way as standard walls. You can specify a style, a height, and start and endpoints. Curtain walls can be straight, curved, or a combination of the two. You can also create curtain walls that are based on a curve, convert a 2D layout grid to a curtain wall, or create a custom grid from two dimensional (2D) lines, arcs, and circles. You can also convert standard walls to curtain walls.

Tool palettes provided with Autodesk Architectural Desktop let you quickly place curtain walls by selecting a curtain wall tool with a specific curtain wall style and other predefined properties. You can also use curtain wall tools to convert linework to curtain walls and to apply the settings of a curtain wall tool to existing curtain walls.

Tool palettes containing curtain wall tools



The following palettes contain one or more curtain wall tools:

Tool Palette	Curtain Wall Tools
General Building Object palette in the Design Tools palette set	a tool for the Standard curtain wall style and default settings for other curtain wall properties
custom tool palettes created by your CAD manager	tools with curtain wall styles and properties that your CAD manager customized for your projects or office standards

When you place curtain walls using curtain wall tools, you can use the default settings of the tool, or you can change settings for any curtain wall properties that are not controlled by the style.

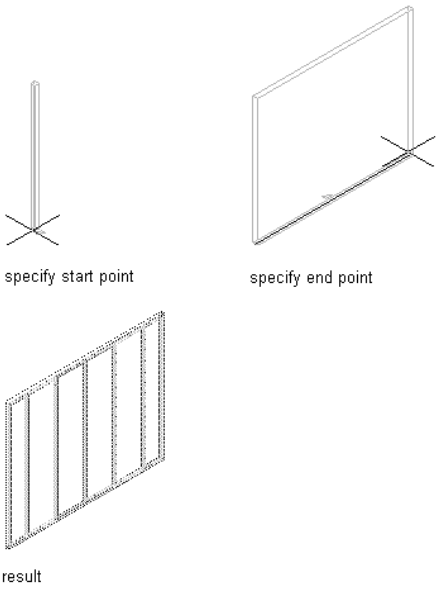
Related Procedures

- Creating a Straight Curtain Wall
- Creating a Curtain Wall with User-Specified Settings
- Creating a Curved Curtain Wall
- Creating a Curtain Wall that References a Curve
- Converting a Layout Grid to a Curtain Wall
- Creating a Curtain Wall from an Elevation Sketch
- Converting a Wall to a Curtain Wall
- Creating a Curtain Wall Tool

Creating a Straight Curtain Wall

Use this procedure to create a straight curtain wall that has the properties specified in the curtain wall tool that you select. To specify settings when you add a curtain wall, see "Creating a Curtain Wall with User-Specified Settings" on page 782.

Drawing a straight curtain wall segment



1. Open the tool palette that you want to use, and select a curtain wall tool. If necessary, scroll to display the tool that you want to use.
2. Specify a start point for the curtain wall.
   You can move or hide the Properties palette to expose more of the drawing area.
3. Specify an end point.
4. Press ENTER.

Creating a Curtain Wall with User-Specified Settings

Use this procedure to add a curtain wall with settings that you specify.

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

---

1. Open the tool palette that you want to use, and select a curtain wall tool. If necessary, scroll to display the tool that you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Select a style.

4 Expand Dimensions.

5 Modify the dimensions of the curtain wall:

If you want to specify . . .	Then . . .
the base height of the curtain wall	enter a value for Base Height.
the length of the curtain wall	enter a value for Length.
start and end miters	enter miter values for Start Miter and End Miter.

6 In the drawing area, specify the insertion point of the curtain wall.

You can move or hide the Properties palette to expose more of the drawing area.

7 Specify the endpoint of the curtain wall:

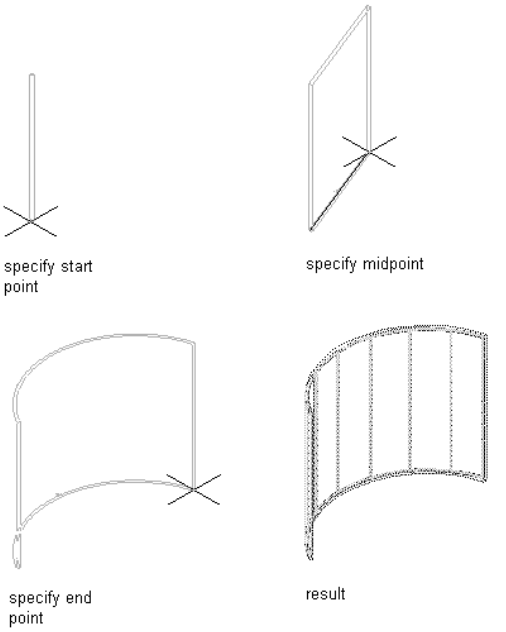
If you want to . . .	Then . . .
close the curtain wall by drawing two curtain wall segments that meet at a right angle	right-click, click Ortho, and then specify a point in the direction you want the curtain wall to close. The curtain wall segment is extended until it meets a wall segment perpendicular to the first wall segment.
close the curtain wall by adding a curtain wall segment from the previous point to the start point of the curtain wall	right-click, and click Close.
complete the curtain wall segment at a point that you specify	specify the endpoint of the curtain wall, and press ENTER.

Creating a Curved Curtain Wall

Use this procedure to create a curved curtain wall in a drawing.

The display of curved objects is dependent on the facet deviation set in the application. For information see “Facet Deviation” on page 999.

Drawing a curved curtain wall segment



1 Open the tool palette that you want to use, and select a curtain wall tool. If necessary, scroll to display the tool that you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Select a style.

4 Select Arc for Segment type.

5 Expand Dimensions.

6 Specify curtain wall settings:

If you want to specify . . .	Then . . .
the base height of the curtain wall,	enter a value for Base Height.
the length of the curtain wall	enter a value for Length.

If you want to specify . . .	Then . . .
start and end miters	enter miter values for Start Miter and End Miter.

7 Specify a start point for the curved curtain wall segment.

You can move or hide the Properties palette to expose more of the drawing area.

8 Specify the midpoint of the curved curtain wall segment.

9 Specify the endpoint of the curved curtain wall segment.

A marker on top of the curtain wall indicates the direction the curtain wall is being drawn.

10 Continue placing curtain walls to create, for example, a building exterior or a room.

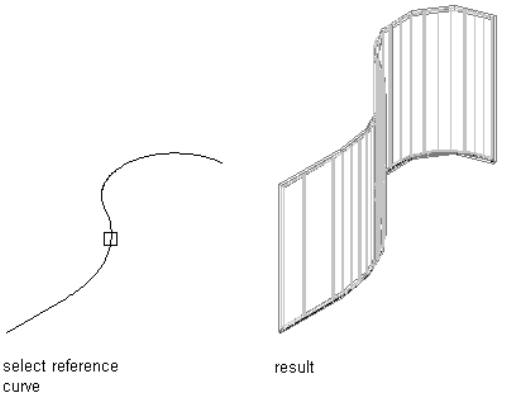
11 Press ENTER.

Creating a Curtain Wall that References a Curve

Use this procedure to create a curtain wall from linework such as lines, polylines, arcs, and circles.

If you want to create a curtain wall with a mixture of straight and curved segments, you can use the Add Curtain Wall command. However, for complicated designs, you might find it easier to draw the segments using lines, arcs, and circles, and then reference that curve as the baseline for the curtain wall. This method has an added advantage in that the curve remains in control of the length and baseline of the curtain wall. Any changes you make to the curve are reflected in changes to the curtain wall.

Creating a curtain wall that references a curve



Use any of the following objects to create the reference curve:

- Line
- Arc
- Circle
- Polyline
- Spline
- AEC objects (excluding stairs and multi-view blocks)

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

2. Right-click a curtain wall tool, and click Apply Tool Properties to ➤ Referenced Base Curve.
3. Select the geometry to reference.

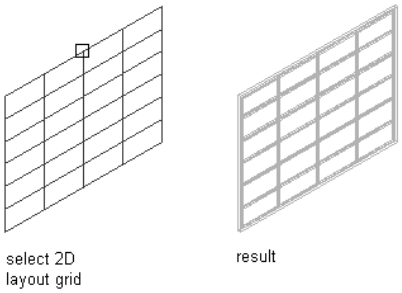
   If the geometry you want to reference consists of multiple segments, you must repeat this procedure for each segment.

4. Edit the properties of the curtain walls in the Properties palette, if needed.

Converting a Layout Grid to a Curtain Wall

Use this procedure to create a curtain wall that is based on a 2D layout grid. If you already have 2D layout grids in a drawing, you can easily convert them to curtain walls. Or if you are already familiar with layout grids, it is an efficient way to create a curtain wall, and then experiment with the curtain wall commands to learn more about them.

Converting a 2D layout grid to a curtain wall

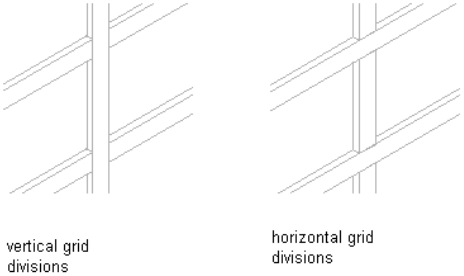


When you create a curtain wall from a 2D layout grid, you also create a new curtain wall style. The divisions in the new curtain wall style are taken from the divisions in the layout grid.

Curtain wall grids are one dimensional—divided either horizontally or vertically. To create the horizontal and vertical patterns in the 2D layout grid, the curtain wall uses a primary grid with a secondary grid nested inside it. For more information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

When you create a curtain wall grid from a 2D layout grid, you need to decide the direction of the primary grid in the curtain wall. If you select horizontal, the primary grid has horizontal divisions that cross over the vertical divisions of the secondary grid. If you select vertical, the primary grid has vertical divisions that cross over the horizontal divisions of the secondary grid.

Specifying primary division directions



The horizontal and vertical lines of the 2D layout grid define the divisions for the curtain wall grids. The grid cells, frame, and mullions are assigned default definitions. For more information, see "Assigning Definitions to Curtain Wall Elements" on page 832.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

2. Right-click a curtain wall tool, and click Apply Tool Properties to ➤ Layout Grid.
3. Select the layout grid to convert.
4. When prompted to erase the original geometry, press ENTER to keep the layout grid, or enter **y** (Yes) to erase it.
5. Press ENTER to specify horizontal as the orientation for the primary division, or enter **v** to specify vertical.
6. Enter a name for the curtain wall, and click OK.
7. Edit the properties of the curtain wall in the Properties palette, if needed.

Creating a Curtain Wall from an Elevation Sketch

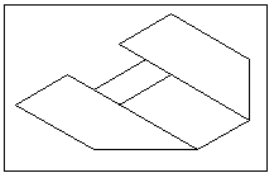
You can create a sketch of a custom grid with lines, arcs, and circles, and then convert that linework into a curtain wall.

NOTE Curtain wall grids are either horizontal or vertical. To create a grid pattern with horizontal and vertical cells, nested grids are used. For more information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

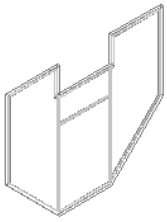
The resulting curtain wall is assigned a custom grid division definition, which you cannot modify. You can, however, assign a different division definition to it. For more information, see "Assigning a Division to a Curtain Wall Grid" on page 833.

1. Use lines, arcs, and circles to create an elevation sketch in the current world coordinate system (WCS).
2. Right-click a curtain wall tool, and click Apply Properties to ➤ Elevation Sketch.
3. Select the linework of the sketch.
4. Press ENTER.
5. Select one of the grid lines as the baseline for the curtain wall or press ENTER to use the line along the *X* axis as the default baseline.

Converting linework to curtain walls using the default baseline option



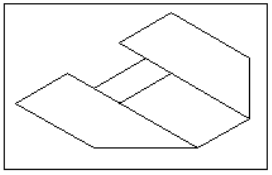
select elevation linework



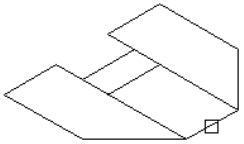
result

TIP If you draw your linework in the *XY* plane (in Plan view) and accept the default baseline, the resulting curtain wall is displayed as it is projected in the *Z* direction.

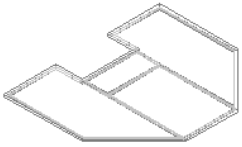
Converting linework to curtain walls using the specified baseline option



select elevation linework



specify baseline



result

6 To erase the lines, enter **y** (Yes). To have the lines remain after the curtain wall is created, enter **n** (No).

If there is a style applied to the curtain wall tool, the new custom style is based on the existing style. The infill, mullion, and frame definitions are those of the existing style. You can modify the style without having to create one from scratch. For more information, see "Assigning Definitions to Curtain Wall Elements" on page 832.

7 Select the resulting custom curtain wall, right-click, and click Design Rules ➤ Save to Style.

8 Click New to create a new curtain wall style.

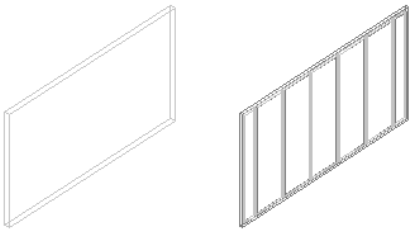
9 Enter a name for the new curtain wall style.

10 Click OK twice.

Converting a Wall to a Curtain Wall

Use this procedure to create curtain walls based on existing standard walls. For each wall segment, a separate curtain wall is created. During the conversion process, you are prompted to select a curtain wall style that determines the number and size of cells in the curtain wall grid as well as the appearance of the cells, frame, and mullions. For more information, see "Curtain Wall Styles" on page 793.

Converting a wall to a curtain wall



1 Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

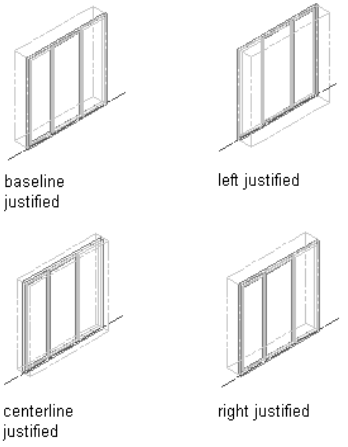
2 Right-click a curtain wall tool, and click Apply Tool Properties to ➤ Walls.

3 Select the wall, and press ENTER.

4 Specify the alignment.

   You can align the curtain wall baseline with the baseline, left, right, or center of the standard wall.

Specifying justification for converting walls to curtain walls



5 To erase the wall, enter **y** (Yes). To have the wall remain after the curtain wall is created, enter **n** (No).

6 Press ENTER.

Creating a Curtain Wall Tool

Use this procedure to create a curtain wall tool and add it to a tool palette. You may want to create your own curtain wall tools if you are placing multiple curtain walls of specific styles with additional properties that you want to be the same each time you add a curtain wall of each type.

You can use any of the following methods to create a curtain wall tool:

- Drag a curtain wall that has the properties you want to a tool palette.
- Drag a curtain wall style from the Style Manager to a tool palette, and then customize the properties of the new tool.
- Drag a copy of a tool from another palette to the current palette, and then customize the properties of the new tool.
- Copy an existing tool in the current palette and then customize the properties of the new tool.
- Drag a tool from the Content Browser to a tool palette and then customize the properties of the new tool.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a curtain wall in the drawing	select the object, and drag it to the tool palette.
create a tool from a curtain wall style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 Expand Basic, and expand General.

7 Click the setting for Description, enter a description of the curtain wall created from this tool, and click OK.

8 Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.

9 Select a style.

When you add a curtain wall using this tool, it is the style you specify on the Tool Properties worksheet.

10 Specify a style location.

Click Browse to navigate to an external file source for the style.

11 Modify the dimensions of the curtain wall:

If you want to specify . . .	Then . . .
the base height of the curtain wall	enter a value for Base Height.
start and end miter angles	enter miter values for Start Miter and End Miter.
the roof line offset from the base height of the curtain wall	enter a value for Roof line offset.
the floor line offset from the baseline of the curtain wall	enter a value for Floor line offset.

12 Click OK.

Curtain Wall Styles

Curtain walls are style-based, which means there are preset characteristics assigned to each curtain wall that determine its appearance and function. By changing from one style of curtain wall to another, you can quickly study several different design options. Any changes you make to the style updates all curtain walls of that particular style. You can also apply overrides to a single curtain wall, without changing other curtain walls of the same style.

A curtain wall style controls the following properties of a curtain wall:

- Element definitions
- Definition assignments for each element
- Materials for each element
- Display properties for each element
- Notes about the style and any associated reference files

Using Materials in Curtain Wall Styles

You can use materials to control how curtain walls of each style are displayed in a drawing. You assign materials to the curtain wall components in the style. The components are then displayed using the display properties of the assigned materials.

Autodesk Architectural Desktop provides a large number of predefined materials for common design purposes. You can use these materials, modify them for your project requirements, and define new materials. For more information about materials and how to define them, see "Materials" on page 491.

Creating Tools from Curtain Wall Styles

You can create a curtain wall tool from any curtain wall style. You can drag the style from the Style Manager onto a tool palette. You can then specify settings for any curtain wall properties for the tool. For more information, see "Creating a Curtain Wall Tool" on page 791.

To create, edit, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop to work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Process Overview: Creating a Curtain Wall Style
- Tips for Working Efficiently with Curtain Wall Styles
- Creating Element Definitions for a Curtain Wall Style
- Creating a Curtain Wall Style
- Defining Divisions for Curtain Wall Grids
- Defining Infills for Curtain Wall Cells
- Defining Curtain Wall Frames
- Defining Curtain Wall Mullions
- Assigning Definitions to Curtain Wall Elements
- Assigning a Division to a Curtain Wall Grid
- Assigning Infills to Curtain Wall Cells
- Assigning Definitions to Curtain Wall Frames
- Assigning Definitions to the Mullions of a Curtain Wall
- Specifying the Materials of a Curtain Wall Style
- Specifying the Display of Curtain Walls
- Attaching Notes and Files to a Curtain Wall Style

Process Overview: Creating a Curtain Wall Style

When you create a curtain wall style, you assign characteristics to any or all elements of a curtain wall and save them as a named style. In this way, you standardize the appearance of all curtain walls that use the style. When you

modify a style, all curtain walls in your drawing that use the style are updated to reflect the changes.

Step 1: Define divisions for the curtain wall grid.

For information on defining curtain wall grid definitions, see "Defining Divisions for Curtain Wall Grids" on page 799.

Step 2: Define the infill for the cells of the curtain wall.

For information on creating infills, see "Defining Infills for Curtain Wall Cells" on page 812.

Step 3: Define the curtain wall frame, including using profiles and specifying offsets.

For information on defining a frame for a curtain wall, see "Defining Curtain Wall Frames" on page 818.

Step 4: Define the mullions for the curtain wall, including using profiles and specifying offsets.

For information on ways to define mullions, see "Defining Curtain Wall Mullions" on page 825.

Step 5: Assign the element definitions you created:

If you want to assign . . .	Then . . .
a division to a curtain wall grid	see "Assigning a Division to a Curtain Wall Grid" on page 833.
infills to curtain wall cells	see "Assigning Infills to Curtain Wall Cells" on page 833.
definitions to curtain wall frames	see "Assigning Definitions to Curtain Wall Frames" on page 843.
definitions to curtain wall mullions	see "Assigning Definitions to the Mullions of a Curtain Wall" on page 846.

Step 6: Specify the materials of the curtain wall style.

For information on specifying materials, see "Specifying the Materials of a Curtain Wall Style" on page 850.

Step 7: Specify the display properties of the curtain wall, including layer, color, linetype, and hatching.

For information on specifying the display properties of a curtain wall, see "Specifying the Display of Curtain Walls" on page 852.

Step 8: Attach notes and reference documents to the curtain wall style.

For information on attaching notes and files, see "Attaching Notes and Files to a Curtain Wall Style" on page 858.

Tips for Working Efficiently with Curtain Wall Styles

Use these suggestions to work efficiently and productively with curtain wall styles:

- Name grids and elements very clearly to identify where they are used and what they are. For example, use the name L3-FL1-H to represent a third-level grid used on the first floor and that is horizontally divided. Incorporating this suggestion makes it easier to ensure that you are using elements correctly.
- Use the element definition that is applied most often as the default element definition. For example, if most cells are stone panels, define the default infill as the stone panel. This panel is then used in every cell that is not specifically assigned to another infill. Apply this rule to the default frame, mullion, and division.
- Use curtain wall units and door/window assemblies to simplify the complexity of a curtain wall style.
- Name the styles for doors, windows, curtain wall units, AEC polygons, and curtain walls to indicate where they are used and what they are.
- Remember that you can use cell and edge overrides to define special conditions not accounted for in the curtain wall style.

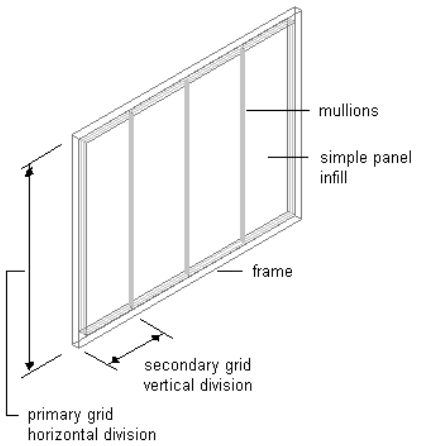
Creating Element Definitions for a Curtain Wall Style

Element definitions determine the appearance of the four basic curtain wall elements. There is a different definition type for each element.

Element type	Default definitions
Divisions	Primary horizontal grid with a fixed cell dimension of 13' and secondary vertical grid with a fixed cell dimension of 5'
Cell Infills	Cells containing simple panels

Element type	Default definitions
Frames	Left, right, top, and bottom outer edges of grid 3" wide and 3" deep
Mullions	Edges between cells 1" wide and 3" deep

Curtain wall grid element types



Each type of element can have multiple definitions. For example, you can define a division to create a horizontal grid or a vertical grid, and you can define the cells to contain a nested grid or a door/window assembly. To make reuse easier, you can save the element definitions, and then assign them to grids, cells, frames, or mullions as needed.

Element definitions are style-specific. When you create element definitions for a specific curtain wall style, those definitions are available only for curtain walls of that style. For example, if you define a door/window assembly infill for one curtain wall style, that infill is not available as an option when you edit a curtain wall of a different style.

For information about defining the color, linetype, or layer of curtain wall elements, see “Specifying the Display of Curtain Walls” on page 852.

Creating a Curtain Wall Style

Use this procedure to create a curtain wall style. You can create a style using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the

style. You can also create a curtain wall tool based on the newly created curtain wall style. When you use the tool to add curtain walls, each curtain wall has the style specific to the tool.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Create a new curtain wall style:

If you want to create a style . . .	Then . . .
with default properties	right-click Curtain Wall Styles, and click New.
from an existing style	right-click the curtain wall style you want to copy, and click Copy. Right-click, and click Paste.
from a curtain wall, curtain wall unit, or door/window assembly in the drawing	right-click Curtain Wall Styles, and click New. Right-click the new style, click Set From, and then select a curtain wall, a curtain wall unit, or a door/window assembly.

4. Enter a name for the new curtain wall style, and press ENTER.
5. To edit the new curtain wall style, right-click the style, and click Edit:

If you want to . . .	Then . . .
define the elements of a curtain wall style	see "Defining Divisions for Curtain Wall Grids" on page 799, "Defining Infills for Curtain Wall Cells" on page 812, "Defining Curtain Wall Frames" on page 818, and "Defining Curtain Wall Mullions" on page 825.
assign element definitions to the curtain wall style	see "Assigning Definitions to Curtain Wall Elements" on page 832, "Assigning a Division to a Curtain Wall Grid" on page 833, "Assigning Infills to Curtain Wall Cells" on page 833, "Assigning Definitions to Curtain Wall Frames" on page 843, and "Assigning Definitions to the Mullions of a Curtain Wall" on page 846.
add curtain wall element definitions as display components	see "Adding Curtain Wall Element Definitions as Display Components" on page 853.
specify layer, color and linetype settings for the display components of a curtain wall	see "Specifying the Layer, Color, and Linetype of a Curtain Wall Style" on page 854.

If you want to . . .	Then . . .
specify curtain wall hatching	see "Specifying the Hatching for Components of a Curtain Wall Style" on page 855.
add custom graphics as display components of a curtain wall style	see "Adding Custom Graphics as a Display Component of a Curtain Wall" on page 856
create individual cut planes for curtain wall styles	see "Creating Cut Planes for a Curtain Wall" on page 857.
specify the materials of the curtain wall style	see "Specifying the Materials of a Curtain Wall Style" on page 850.
add notes and files to the style	see "Attaching Notes and Files to a Curtain Wall Style" on page 858.

6 When you finish specifying the properties of the curtain wall style, click OK.

7 If you want to assign the style to a curtain wall tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating a Curtain Wall Tool" on page 791.

8 Click OK.

Defining Divisions for Curtain Wall Grids

The divisions of a grid define the orientation that determines the direction of the grid cells and mullions, and they define a division type that determines the number and size of cells.

NOTE Creating a nested grid is not a division rule. To create a nested grid, add a cell assignment. For more information, see "Creating a Nested Grid in a Curtain Wall" on page 837 and "Working with Nested Grids in Curtain Walls" on page 834.

You can create a variety of division definitions under different names, and then assign different divisions to each grid in your curtain wall. Although you can create multiple definitions, there can be only one division assignment per grid. You create division definitions for a specific curtain wall style and those definitions can be assigned only to grids in curtain walls of that style.

For more information about assigning divisions to a particular grid, see "Assigning a Division to a Curtain Wall Grid" on page 833.

Related Procedures

- Division of Curtain Wall Grids
- Creating a Division Definition for a Curtain Wall
- Specifying a Fixed Size for Cells in a Curtain Wall Grid
- Specifying a Fixed Number of Cells for a Curtain Wall Grid
- Manually Defining the Number and Size of Cells in a Curtain Wall Grid
- Excluding Gables and Steps from a Curtain Wall Grid
- Dividing a Vertical Curtain Wall Grid at Each Vertex Along a Polyline
- Specifying an Offset for a Curtain Wall Grid
- Removing a Division Definition from a Curtain Wall Style

Division of Curtain Wall Grids

A curtain wall consists of one or more grids, which are the framework for placing design elements in the curtain wall. The highest-level grid is the primary grid, which is also the outside edge of the curtain wall.

Each grid in a curtain wall has one division assignment that determines whether the grid is divided horizontally or vertically. The division also determines the number of cells, their size, and their placement.

Within the primary grid, you can define multiple levels of grids. These grids within the primary grid are called nested grids. Each subdivision of a grid is called a cell.

Creating a Division Definition for a Curtain Wall

Use this procedure to create divisions for a curtain wall grid.

Because curtain walls can contain multiple nested grids, it is helpful to use a naming convention for grids that indicates the level of each grid and the grid location or the purpose within the curtain wall. For example, L3-FL1-Stone Panels can identify a third level grid that provides a row of stone panels on Floor 1.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Click New Division.

7 Enter a name for this division definition.

8 Click either Vertical Orientation or Horizontal Orientation.

9 Select one of the following division types and specify offsets if needed.

Division Type	Description
Fixed Cell Dimension	Creates a grid where the size of the individual cells is predetermined. For more information, see "Specifying a Fixed Size for Cells in a Curtain Wall Grid" on page 801.
Fixed Number of Cells	Creates a grid where the number of grid cells is predetermined. For more information, see "Specifying a Fixed Number of Cells for a Curtain Wall Grid" on page 804.
Manual	Creates a grid where the size and number of individual cells is manually determined by the user. For more information, see "Manually Defining the Number and Size of Cells in a Curtain Wall Grid" on page 805.
Baseline/ Base Height (horizontal grids only)	Creates a horizontal grid that does not extend to gables or steps in a curtain wall. For more information, see "Excluding Gables and Steps from a Curtain Wall Grid" on page 807.
Polyline (vertical grids only)	Creates a vertical grid from a polyline that adds a grid line for each vertex of the polyline. For more information, see "Dividing a Vertical Curtain Wall Grid at Each Vertex Along a Polyline" on page 808.

After you create a division definition, you can assign the definition to a specific grid in a curtain wall. For more information, see "Assigning a Division to a Curtain Wall Grid" on page 833.

10 When you are finished creating division definitions, click OK.

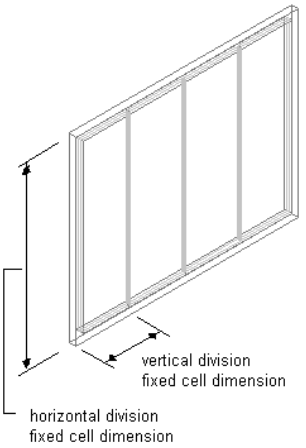
Specifying a Fixed Size for Cells in a Curtain Wall Grid

Use this procedure to define a specific size for the cells in a grid. In this case, the number of cells is determined by the length or height of the grid, depending on how the grid is divided.

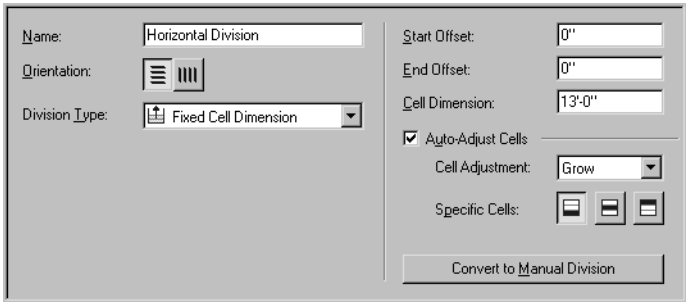
When you specify a fixed cell size in a grid, you can control how the cells of the grid adjust to accommodate any leftover space. This space occurs if the length (or the height) of the curtain wall cannot be evenly divided by the

fixed size of the cell. For more information, see "Using the Auto-Adjust Cells Option" on page 803.

Specifying a fixed size for cells



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Divisions definition or create a new one.
7. Select Fixed Cell Dimension as the division type.



8. Specify a size for the cells in Cell Dimension.

   If you are defining a vertical division, the cell dimension is the length of the cell from mullion to mullion. If you are defining a horizontal division, the cell dimension is the height of the cell.

9 To specify an offset for the grid, enter an offset distance in Start Offset or End Offset. For more information, see "Specifying an Offset for a Curtain Wall Grid" on page 809.

TIP The frame width is calculated as part of the cell size. Therefore, cells adjacent to the frame can appear to be a different size than the other cells. If you do not want the frame width included in the cell size, specify an offset for the grid that is equal to the frame width.

When you draw a curtain wall using a fixed cell dimension, there is often extra space between the last full-size cell and the end of the curtain wall.

10 Adjust the cells to accommodate this extra space:

If you want to . . .	Then . . .
add the space to grid cells	select Auto-Adjust Cells, select Grow for Cell Adjustment, and select the specific cells where the space is to be added. You can select any combination of Specific Cells.
remove the space from grid cells	select Auto-Adjust Cells, select Shrink for Cell Adjustment, and select the specific cells where the space is to be removed. You can select any combination of Specific Cells.

For information about offsets, see "Specifying an Offset for a Curtain Wall Grid" on page 809

11 Click OK.

For information about assigning the division definition to a specific grid in your curtain wall, see "Assigning a Division to a Curtain Wall Grid" on page 833.

Using the Auto-Adjust Cells Option

Use this procedure to automatically resize cells in a grid when the result of dividing the grid by the specified cell dimension is not a whole number.

For example, if a vertical primary grid in a curtain wall style is 17 feet in length and you specify a fixed cell dimension of 3 feet, the grid has five cells of 3 feet each with 2 feet remaining. Using the Auto-Adjust Cells option, you can specify how the grid distributes the remaining quantity.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.
3 Select a curtain wall style, right-click, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select Divisions under Element Definitions.
6 Select a Divisions definition or create a new one.
7 Select Fixed Cell Dimension as the division type.
8 Select Auto-Adjust Cells, and specify the cell adjustment:

If you want to . . .	Then . . .
add the remaining space to grid cells	select Grow, and select the specific cells to which you want the space added.
remove the remaining space from grid cells	select Shrink, and select the specific cells from which you want the space removed. You can then select Maintain at least half of cell dimension in order to control the cell shrinkage.

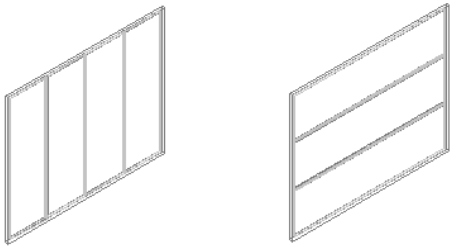
The cells that you do not select maintain the fixed value you specified for Cell Dimension.

Specifying a Fixed Number of Cells for a Curtain Wall Grid

Use this procedure to define a specific number of cells in a grid. In this case, the size of the cells is determined by the length or height of the grid, depending on how the grid is divided.

In some cases, when you create a complex curtain wall grid, you might want to start with a standard grid with a fixed number of cells, and then later fine-tune that manually. You can first create a grid with fixed cell numbers and then convert that to a manual grid. For information on manual grids, see "Manually Defining the Number and Size of Cells in a Curtain Wall Grid" on page 805.

Specifying a fixed number of cells



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Fixed Number of Cells for Division Type.
8. Specify the number of cells.
9. To specify an offset for the grid, enter an offset distance for Start Offset or End Offset.

   For more information, see "Specifying an Offset for a Curtain Wall Grid" on page 809.

   NOTE If you want to fine-tune the initial layout with a fixed number of cells, click Convert To Manual Division and edit the grid as described in"Manually Defining the Number and Size of Cells in a Curtain Wall Grid" on page 805.

10. Click OK.

For information about assigning the division definition to a specific grid in your curtain wall, see "Assigning a Division to a Curtain Wall Grid" on page 833.

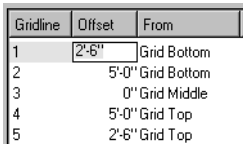
Manually Defining the Number and Size of Cells in a Curtain Wall Grid

Use this procedure to manually add gridlines and specify an offset for each one when you need to create a unique grid that does not fit into any of the

other division types. You can also start with a fixed cell dimension grid or a fixed number of cells grid, and then manually adjust the grid lines to suit your needs.

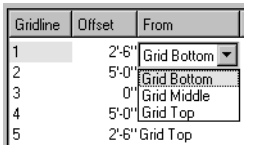
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Manual for Division Type.
8. Click Add Gridline to insert a grid line. Insert as many grid lines as you need. If you need to remove a grid line, select it from the table and click Remove Gridline.
9. Under Offset in the gridline table, specify an offset distance for each grid line.

   Gridline offset



10. Under From in the grid line table, select the grid location from which the grid line is offset.

    Offset grid line from option



11. To specify an offset for the grid, enter an offset distance for Start Offset or End Offset.

    For more information, see "Specifying an Offset for a Curtain Wall Grid" on page 809.

12. Click OK.

For information about assigning the division definition to a specific grid in your curtain wall, see "Assigning a Division to a Curtain Wall Grid" on page 833.

Excluding Gables and Steps from a Curtain Wall Grid

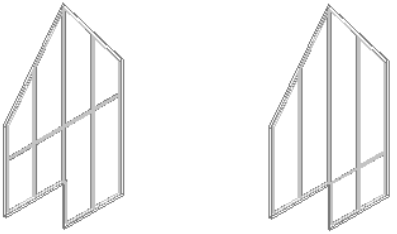
If you are designing a curtain wall that has gables in the roof line or steps in the floor line, there may be occasions when you do not want the grid to extend into those areas. To define your curtain wall in this case, you can define a single-cell horizontal grid that excludes those areas, and then use that grid as a starting point for nested grids. For information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

NOTE For information about adding steps or gables to your curtain wall, see "Changing the Roof Line and the Floor Line of a Curtain Wall" on page 891.

---

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Horizontal for Orientation.
8. Select Baseline/Base Height for Division Type.
9. Select Divide at Baseline or Divide at Base Height.

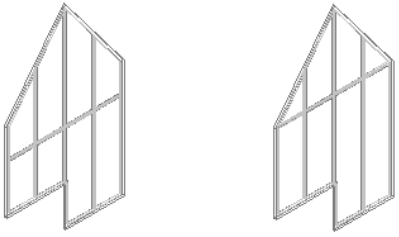
- Divide at Baseline: Forces a division at the baseline to exclude steps from the grid.



division at bottom of step

division at baseline with zero offset

- Divide at Base Height: Forces a division at the base height to exclude gables from the grid.



10 To offset the division from the baseline, enter a positive number for Baseline Offset.

11 To offset the division from the base height, enter a positive number for Base Height Offset.

12 Click OK twice.

The resulting grid contains a single, horizontal cell. To add additional divisions, use nested grids. For more information, see "Creating a Nested Grid in a Curtain Wall" on page 837.

For information about assigning the division definition to a specific grid in your curtain wall, see "Assigning a Division to a Curtain Wall Grid" on page 833.

Dividing a Vertical Curtain Wall Grid at Each Vertex Along a Polyline

If you create a curtain wall by referencing a polyline, you can define a vertical grid for your curtain wall by placing grid lines at each vertex along the polyline.

1 Draw a polyline and use it as a reference curve to create a curtain wall.

For more information, see "Creating a Curtain Wall that References a Curve" on page 785.

2 On the Format menu, click Style Manager.

3 Expand Architectural Objects, and expand Curtain Wall Styles.

4 Select a curtain wall style, right-click, and click Edit.

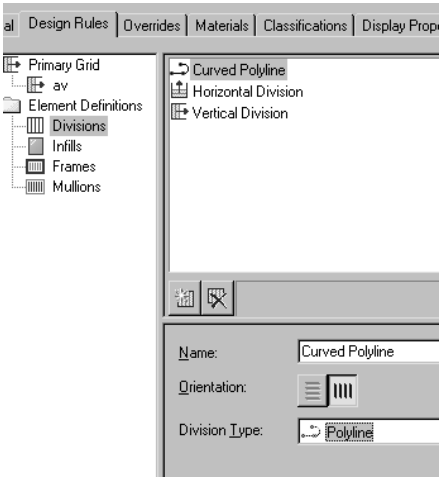
5 Click the Design Rules tab.

6 In the left pane, select Divisions under Element Definitions.

7 Select a Division definition or create a new one.

8 Select Vertical for Orientation.

9 Select Polyline for Division Type.



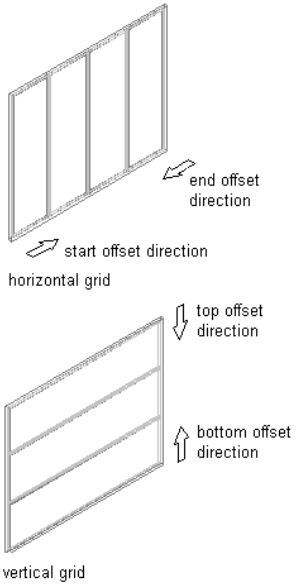
10 Click OK twice.

For information about assigning the division definition to a specific grid in your curtain wall, see "Assigning a Division to a Curtain Wall Grid" on page 833.

Specifying an Offset for a Curtain Wall Grid

By default, grids cells are measured from the start and end points of the curtain wall baseline (for horizontal divisions) or from the floor line to the roof line (for vertical divisions). The width of the grid frame is not considered in calculating the size of the cell. For example, if you draw a curtain wall with a 14' baseline and a 1' frame on the left and right, and you specify a fixed number of vertical cells, the cells do not appear equal in size. The first and last cells appear smaller because they include the frame. To make the cells equal in size, offset the start and end of the grid by the width of the frame.

Specifying grid offset directions



NOTE You can offset the grid only when the division type is Fixed Cell Dimension, Fixed Number of Cells, or Manual.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Fixed Cell Dimension, Fixed Number of Cells, or Manual for Division Type.
8. Specify an offset for the grid.

If you want to specify the distance between . . .	Then . . .
the start point of the curtain wall baseline and the start of the first cell in a horizontal grid	enter a value for Start Offset.

If you want to specify the distance between . . .	Then . . .
the end point of the curtain wall baseline and the end of the last cell in a horizontal grid	enter a value for End Offset.
the floor line of the curtain wall and the start of the bottom cell in a vertical grid	enter a value for Bottom Offset.
the roof line of the curtain wall and the end of the top cell in a vertical grid	enter a value for Top Offset.

9 Click OK twice.

Removing a Division Definition from a Curtain Wall Style

Use this procedure to remove a division definition that you no longer need. You cannot remove a division definition when it is currently assigned to a grid. In addition, you cannot remove the default division definition, but you can modify it.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

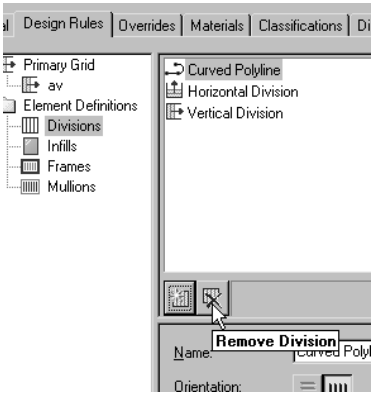
3 Select a curtain wall style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select Divisions under Element Definitions.

6 Select a Division definition that you want to remove.

7 Click Remove Division.

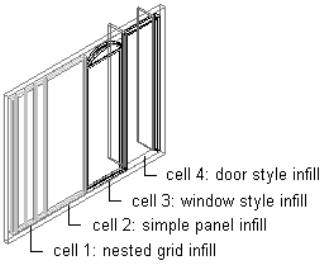


8 Click OK twice.

Defining Infills for Curtain Wall Cells

An infill defines the contents of a curtain wall cell. A curtain wall cell can be empty (no infill), can contain a grid (nested grid), or can contain one of two infills: a panel or a style. Use the style infill for inserting doors, windows, and other objects into a curtain wall. Panels typically represent glazing or other plain cladding, such as stone or concrete.

Specifying different infills



NOTE Nested grids and no infill are options you select when assigning an infill to a cell. These options do not require infill definitions. For more information, see "Creating a Nested Grid in a Curtain Wall" on page 837 and "Removing an Infill from a Curtain Wall Cell" on page 840.

You can define as many infills as you need, and then use cell assignments to specify the cells that use each infill. You can modify, as needed, a default infill that is used for all unassigned cells. For more information about cell assignments, see "Assigning Definitions to Curtain Wall Elements" on page 832.

NOTE Create infill definitions for a specific curtain wall style. Those definitions can be assigned only to grid cells in curtain walls of that style.

Materials

Styles use the materials of the object style assigned to each panel. For example, if you specify an infill to use the Standard door style, the materials of that infill are those designated in the door style. Simple Panels need material assigned in the curtain wall style.

If you do not use materials to control the display properties of infills, you can specify their display properties in the curtain wall style. The layer, color, linetype, and other display properties of the default infill are applied to all infills unless you create a custom display component for each infill definition. You

can then control the display of each infill definition independently. For more information, see "Specifying the Display of Curtain Walls" on page 852.

Related Procedures

- Creating a Panel Infill for a Curtain Wall
- Creating an Infill for Inserting an Object into a Curtain Wall
- Specifying an Alignment for a Curtain Wall Infill
- Specifying an Offset for a Curtain Wall Infill
- Removing an Infill Definition from a Curtain Wall Style

Creating a Panel Infill for a Curtain Wall

Use this procedure to create a simple panel infill to represent basic cladding materials in the curtain wall, such as a stone wall panel, concrete panel, metal panel, or glazing infill.

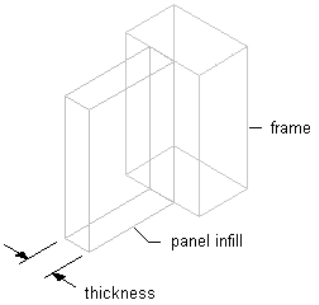
Because curtain walls can contain multiple infills, it is helpful to use a naming convention for panel infills that indicates the infill location or purpose within the curtain wall. For example, L3-FL1- Stone Panel can identify a stone panel in a third-level grid on Floor 1.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Click New Infill.
7. Enter a descriptive name for the infill.
8. Select Simple Panel as the infill type.
9. Specify an alignment for the infill.

   For more information, see "Specifying an Alignment for a Curtain Wall Infill" on page 815.
10. Specify an offset for the infill.

    For more information, see "Specifying an Offset for a Curtain Wall Infill" on page 816.
11. Specify a thickness for the panel.

Specifying infill panel thickness



12 Click OK twice.

After you create an infill definition, you can assign it to any cell in a curtain wall grid. For more information, see "Assigning Infills to Curtain Wall Cells" on page 833.

Creating an Infill for Inserting an Object into a Curtain Wall

Use this procedure to create a style infill to insert objects into a curtain wall. You can insert doors, windows, door/window assemblies, curtain wall units, and AEC Polygons by defining a specific style of that object as an infill.

TIP After you insert an object in a cell, you can select that object independent of the grid and access editing options for the object.

Because curtain walls can contain multiple object styles, it is helpful to use a naming convention for style infills that indicates the infill location or purpose within the curtain wall. For example, L3-FL1-Octagonal Window can identify an octagonal window in a third-level grid on Floor 1.

NOTE The object styles you use in infills must exist in the current drawing to be added to an infill definition.

---

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Click New Infill.

7 Enter a descriptive name for the infill.

8 Select Style as the infill type.

The bottom right pane changes to display a tree view of the object styles available for insertion into a curtain wall.

9 Select an object style.

There is a unique icon for each type of style. For example, the door style icon and the curtain wall unit icon . These icons are also displayed next to the infill name at the top of the dialog box to help you identify the type of infill.

10 Specify an alignment for the infill. For more information, see the next section "Specifying an Alignment for a Curtain Wall Infill" on page 815.

11 Specify an offset for the infill. For more information, see "Specifying an Offset for a Curtain Wall Infill" on page 816.

12 Click OK twice.

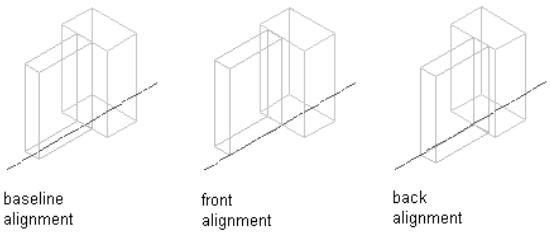
After you create an infill definition, you can assign it to any cell in a curtain wall grid. For more information, see "Assigning Infills to Curtain Wall Cells" on page 833.

Specifying an Alignment for a Curtain Wall Infill

Use this procedure to align an infill so that it is centered with the baseline of the curtain wall, in front of the baseline, or behind the baseline. In Plan view, the front of a curtain wall (drawn from left to right) is below the baseline and the back is above the baseline.

NOTE To move the infill away from the baseline, see "Specifying an Offset for a Curtain Wall Infill" on page 816.

Specifying infill alignments



1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

3 Select a curtain wall style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select Infills under Element Definitions.

6 Select an infill, or create a new one.

7 Select an alignment: front, center, or back.

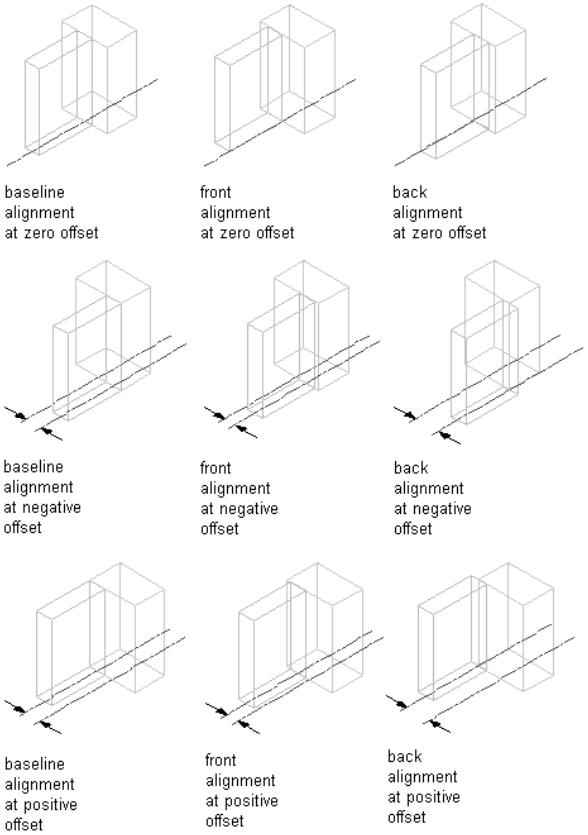
8 Click OK twice.

Specifying an Offset for a Curtain Wall Infill

Use this procedure to specify an offset for a curtain wall infill. By default, infills are centered on the curtain wall baseline. If your design requires that the infill be aligned with frame edges or some other part of the curtain wall, you can specify an offset for the infill.

You can also edit individual style-based infills directly in the drawing. The selected infill has Flip grips in both the *X* and *Y* directions so that you can change the orientation of the infill.

Specifying panel infill offsets



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Select an infill, or create a new one.
7. Enter an offset distance.

   In Plan view, positive numbers offset the infill above the baseline and negative numbers offset the infill below the baseline. The offset is also affected by the selected alignment for the infill.
8. Click OK twice.

Removing an Infill Definition from a Curtain Wall Style

Use this procedure to delete an infill definition that you no longer need from the Infills definitions list. You cannot remove an infill definition when it is currently assigned to a cell. In addition, you cannot remove the default infill definition, but you can modify it as needed.

NOTE For information about removing an infill from a cell, see "Removing an Infill from a Curtain Wall Cell" on page 840.

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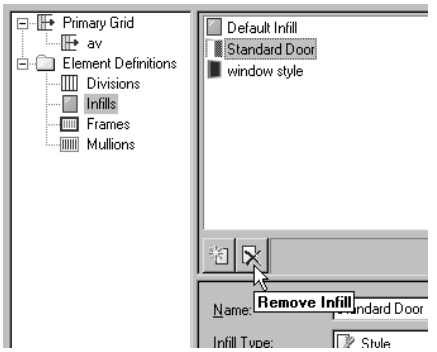
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Select the unneeded infill definition, and click Remove Infill.

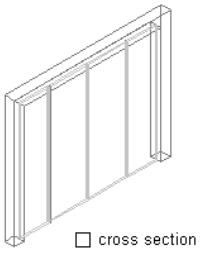


7. Click OK twice.

Defining Curtain Wall Frames

All curtain wall grids, including the primary grid, can have frame definitions. The frame of the primary grid defines the outer edges of the curtain wall. The overall frame size is determined by the length and height of the primary curtain wall grid or a nested curtain wall grid. You can define a frame by specifying a width and depth or by selecting a profile.

Specifying default and profile-based frames



You create frame definitions for a specific curtain wall style. Those definitions can be assigned only to frames in curtain walls of that style. You can create as many frame definitions as you want, and then assign the definitions to the frames as needed. If you have nested grids, each grid has its own frame. There is a default frame definition that you can modify and assign as needed. Unassigned frames are not displayed. For more information, see "Assigning Definitions to Curtain Wall Frames" on page 843.

TIP Using Style Manager, you can copy a mullion definition and use it as a frame definition. Select the mullion definition and drag it to Frames in the left pane of the Design Rules tab.

Materials and Display Properties for Frames

If you do not use materials to control the display properties of frames, you can specify their display properties in the curtain wall style. The layer, color, linetype, and other display properties of the default frame are applied to all frames unless you create a custom display component for each definition. You can then control the display of each frame definition independently. For more information, see "Specifying the Display of Curtain Walls" on page 852.

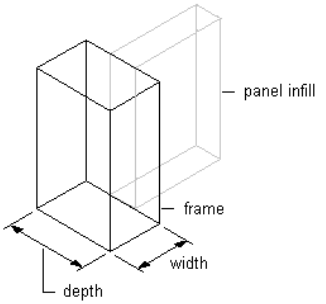
Related Procedures

- Defining a Curtain Wall Frame by Width and Depth
- Creating a Profile for a Curtain Wall Frame
- Defining a Curtain Wall Frame Using a Profile
- Specifying Offsets for a Curtain Wall Frame
- Removing a Frame Definition from a Curtain Wall Style

Defining a Curtain Wall Frame by Width and Depth

You can define a frame by specifying its width and depth. The overall frame size is determined by the length and height of the curtain wall grid.

Specifying frame width and depth



Because curtain walls can contain multiple object styles with different frames, it is helpful to use a naming convention for grid frames that indicates the grid location or purpose within the curtain wall. For example, L3-FL1-Metal Frame can identify a metal frame for a third-level grid on Floor 1.

TIP To remove the frame edge and have the infill adjust to fill the space occupied by the frame, create a frame definition with both width and depth set to zero. Then, assign that definition to the frame edge that you want to remove. This is necessary for the infill to be mitered as it would be for a butt-glazed condition. For more information, see "Removing a Frame Edge from a Curtain Wall" on page 844.

---

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Frames under Element Definitions.

6 Click to create a new frame definition.

7 Enter a descriptive name for the frame.

8 Specify a width and depth for the frame.

9 Specify any offsets.

For more information, see "Specifying Offsets for a Curtain Wall Frame" on page 823.

10 Click OK.

After you create a frame definition, you can assign it to any frame in a curtain wall. For more information, see "Assigning Definitions to Curtain Wall Frames" on page 843.

Creating a Profile for a Curtain Wall Frame

Use this procedure to create a profile that you can use to define the shape of a curtain wall frame. You can then extrude the profile to create a curtain wall frame.

The height and the width of the polyline you use to create the profile define the default height and width of the curtain wall frame. The insertion point of the profile is aligned with the centroid of the frame.

1 Draw a closed polyline of the height and the depth needed for the resulting curtain wall frame.

2 Select the polyline, right-click, and click Convert to ➤ Profile Definition.

3 Enter **c** (Centroid) for the insertion point of the profile.

The insertion point of the profile is aligned with the centroid of the frame.

4 Enter a name for the profile, and click OK.

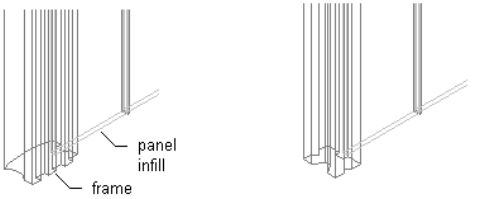
You can now use the profile as a curtain wall frame. For more information, see "Defining a Curtain Wall Frame Using a Profile" on page 821.

Defining a Curtain Wall Frame Using a Profile

Use this procedure to create a frame element definition from a profile. If you do not want a straight edge to your frame, you can use a profile to define edges with curves, jags, or any other shape you require.

You can also use an edit in-place routine to create a frame from a profile. For more information, see "Creating a Frame or Mullion Edge from a Polyline or Profile using In-Place Editing" on page 868.

Two profile-based frame examples



NOTE The insertion point of the profile is aligned with the centroid of the frame.

1. Create the profile for the frame.

   For information on creating profiles for curtain wall frames, see "Creating a Profile for a Curtain Wall Frame" on page 821.

2. On the Format menu, click Style Manager.
3. Expand Architectural Objects, and expand Curtain Wall Styles.
4. Select a curtain wall style, right-click, and click Edit.
5. Click the Design Rules tab.
6. In the left pane, select Frames under Element Definitions.
7. Click New Frame.
8. Enter a descriptive name for the frame.
9. Specify a width and depth for the frame edge.

   These dimensions are used to calculate the center point of the edge for aligning the profile and also to specify a boundary for the adjacent infill.

10. Select Use Profile.

    NOTE The Profile options are available only if you have profiles in the current drawing.

11. Select a profile from the list.

    By default, the profile is inserted using the same width and depth with which it was created.

12. To adjust the size of the profile to fit within the width or depth dimension of the frame edge, select Auto-Adjust Profile Width or Depth.
13. To mirror the profile, select to mirror along the X or Y axis.

14 To rotate the profile, specify an angle for Rotation.

15 Specify any offsets.

For more information, see "Specifying Offsets for a Curtain Wall Frame" on page 823.

16 Click OK.

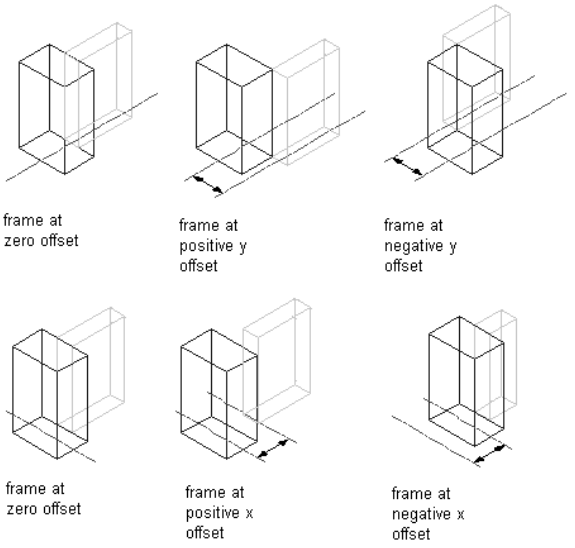
After you create a frame definition, you can assign it to any frame in a curtain wall. For more information, see "Assigning Definitions to Curtain Wall Frames" on page 843.

Specifying Offsets for a Curtain Wall Frame

Use this procedure to define the distance that a curtain wall frame is from the floor line, roof line, or baseline. By default, the outside edges of the frame align with the start and end of the floor line and the start and end of the roof line. When you adjust the width of the frame, the frame expands inward. However, you can use offsets to expand or contract the frame away from these default limits or to shift the frame away from the baseline in either the X or Y direction.

Offset	Description
X	Positive X offset moves the frame edge outward beyond the end of the curtain wall, while a negative X offset moves the frame edge inward toward the center of the curtain wall.
Y	In Plan view, a positive Y offset moves the frame edge above the baseline, while a negative Y offset moves the frame below the baseline.
Start	Negative Start offset lengthens the frame beyond the start point, while a positive Start offset shortens the frame. The start point for vertical edges is the baseline, and the start point for horizontal edges (drawn left to right) is the left side.
End	Negative End offset lengthens the frame beyond the end point, while a positive End offset shortens the frame. The end point for vertical edges is the base height, and the end point for horizontal edges (drawn left to right) is the right side.

Specifying frame offsets in the x and y directions



TIP To quickly identify the start and end of a curtain wall, select the curtain wall. The Reverse Direction grip is displayed near the center of the curtain wall and points toward the end of the curtain wall.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Frames under Element Definitions.
6. Select a frame definition from the list.
7. Specify an offset distance for the frame edge.
8. Click OK.

Removing a Frame Definition from a Curtain Wall Style

Use this procedure to remove a frame definition from the Frame definitions list. You cannot remove a frame definition if it is currently assigned to a frame edge, but you can remove it if it is assigned as an override to a frame edge. In addition, you cannot remove the default frame definition, but you can modify it as needed.

NOTE For information about removing a frame edge, see "Removing a Frame Edge from a Curtain Wall" on page 844.

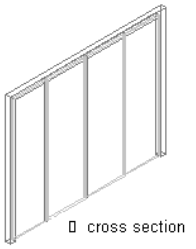
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Frames under Element Definitions.
6. Select the unneeded frame definition.
7. Click Remove Frame.
8. Click OK.

Defining Curtain Wall Mullions

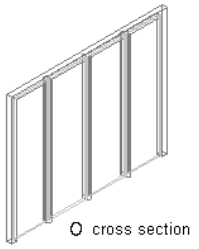
All curtain wall grids, including the primary grid, can have mullion definitions. The mullion of the primary grid defines the outer edges of the curtain wall. You can define the mullions by specifying a width and depth or by selecting a profile from which the mullion is extruded.

Because curtain walls can contain multiple nested grids with different mullions, it is helpful to use a naming convention for grid mullions that indicates the level of each grid and the grid location or purpose within the curtain wall. For example, L3-FL1-Window Mullion can identify a mullion for a window in a third-level grid on Floor 1.

Specifying default and profile-based mullions



default mullions



profile-based mullions

You create mullion definitions for a specific curtain wall style and those definitions can be assigned only to mullions in curtain walls of that style. You can create as many mullion definitions as you want, and then assign the definitions to mullions as needed. If you have nested grids, each grid has its own mullions. There is a default mullion definition that you can modify as needed that is used for any unassigned mullions. For more information, see "Assigning Definitions to the Mullions of a Curtain Wall" on page 846.

TIP Using Style Manager, you can copy a frame definition and use it as a mullion definition. Select the frame definition and drag it to Mullions in the left pane of the Design Rules tab.

Materials and Display Properties for Mullions

If you do not use materials to control the display properties of mullions, you can specify their display properties in the curtain wall style. The layer, color, linetype, and other display properties of the default mullion are applied to all mullions unless you create a custom display component for each definition. You can then control the display of each mullion definition independently. For more information, see "Specifying the Display of Curtain Walls" on page 852.

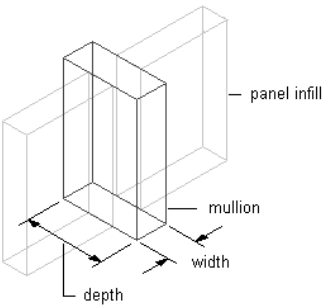
Related Procedures

- Defining Curtain Wall Mullions by Width and Depth
- Creating a Profile for Curtain Wall Mullions
- Defining the Mullions of a Curtain Wall Using a Profile
- Specifying Offsets for the Mullions of a Curtain Wall
- Removing a Mullion Definition from a Curtain Wall Style

Defining Curtain Wall Mullions by Width and Depth

You can define mullions by specifying a width and a depth.

Specifying mullion width and depth



TIP To remove mullions for butt glazing, create a definition with both width and depth set to zero. Then, assign that definition to the mullions that you want to remove. For more information, see "Removing Mullions from a Curtain Wall Grid" on page 849.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Mullions under Element Definitions.
6. Click New Mullion.
7. Enter a descriptive name for the mullion.
8. Specify a width and depth for the mullion.
9. Specify the offsets you want.

   For more information, see "Specifying Offsets for the Mullions of a Curtain Wall" on page 830.

10 Click OK.

After you create a mullion definition, you can assign it to any mullion in a curtain wall. For more information, see "Assigning Definitions to the Mullions of a Curtain Wall" on page 846.

Creating a Profile for Curtain Wall Mullions

Use this procedure to create a profile that you can use to define the shape of a curtain wall mullion definition. You can then extrude the profile to create mullions from it.

The height and the width of the polyline you use to create the profile define the default height and width of the curtain wall mullion. The insertion point of the profile is aligned with the centroid of the mullion.

1 Draw a closed polyline of the height and the depth needed for the resulting curtain wall mullion.

2 Select the polyline, right-click, and click Convert to ➤ Profile Definition.

3 Enter **c** (Centroid) for the insertion point of the profile.

The insertion point of the profile is aligned with the centroid of the mullion.

4 Enter a name for the profile, and click OK.

You can now use the profile as a curtain wall mullion. For more information, see "Defining the Mullions of a Curtain Wall Using a Profile" on page 828.

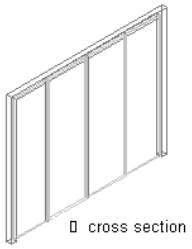
Defining the Mullions of a Curtain Wall Using a Profile

Use this procedure to create a mullion element definition from a profile. If you do not want a straight edge to your mullions, you can use a profile to define mullions with curves, jags, or any other shape.

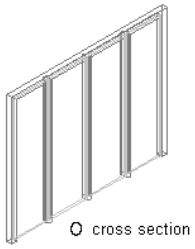
You can also use an edit in-place routine to create a mullion from a profile. For more information, see "Creating a Frame or Mullion Edge from a Polyline or Profile using In-Place Editing" on page 868.

NOTE The insertion point of the profile is aligned with the centroid of the mullion.

Infill alignments with default and profile-based mullions



default mullions



profile-based mullions

1. Create the profile to use for the mullion.

   For information, see "Creating a Profile for Curtain Wall Mullions" on page 828.

2. On the Format menu, click Style Manager.
3. Expand Architectural Objects, and expand Curtain Wall Styles.
4. Select a curtain wall style, right-click, and click Edit.
5. Click the Design Rules tab.
6. In the left pane, select Mullions under Element Definitions.
7. Click New Mullion.
8. Enter a descriptive name for the mullion.
9. Specify a width and depth for the mullion.

   These dimensions are used to calculate the center point of the mullion for aligning the profile, and also to specify a boundary for the adjacent infill.

10. Select Use Profile.

NOTE The Profile options are available only if you have profiles in the current drawing.

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11 Select a profile from the list.

   By default, the profile is inserted using the same width and depth with which it was created.

12 To adjust the size of the profile to fit within the width or depth dimension of the mullion, select Auto-Adjust Profile Width or Depth.

13 To mirror the profile, select X or Y for Mirror In.

14 To rotate the profile, specify a rotation angle for Rotation.

15 Specify any offsets.

   For more information, see "Specifying Offsets for the Mullions of a Curtain Wall" on page 830.

16 Click OK.

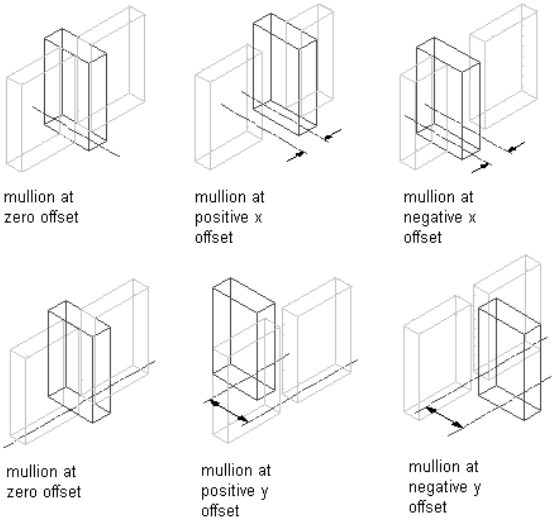
After you create a mullion definition, you can assign it to any mullion in a curtain wall. For more information, see "Assigning Definitions to the Mullions of a Curtain Wall" on page 846.

Specifying Offsets for the Mullions of a Curtain Wall

Use this procedure to define mullions that are offset from the start or end of the curtain wall to lengthen or shorten the edge or offset in the X or Y direction to shift the edge. For example, you might want to represent butt glazing by offsetting the mullions to be behind glass panel infills.

Offset	Description
X	For vertical mullions, a positive X offset moves the mullions toward the end of the curtain wall, while a negative X offset moves the mullions toward the start of the curtain wall. For horizontal mullions, a positive X offset moves the mullions toward the top of the curtain wall, while a negative X offset moves the mullions toward the bottom of the curtain wall.
Y	In Plan view, a positive Y offset moves the mullions above the baseline, while a negative Y offset moves the mullions below the baseline.
Start	Negative Start offset lengthens the mullions beyond the start point, while a positive Start offset shortens the mullions.
End	Negative End offset lengthens the mullions beyond the end point, while a positive End offset shortens the mullions.

Specifying mullion offsets in x and y directions



TIP To quickly identify the start and end of a curtain wall, select the curtain wall. The Reverse Direction grip is displayed near the center of the curtain wall and points toward the end of the curtain wall.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Mullions under Element Definitions.
6. Select a mullion definition from the list.
7. Specify an offset distance for the X, Y, Start, or End.
8. Click OK.

Removing a Mullion Definition from a Curtain Wall Style

Use this procedure to remove a mullion definition from the Mullions definitions list. You cannot remove a mullion definition if it is assigned to a mullion, but you can remove it if it is assigned as an override to a mullion. In addition, you cannot remove the default mullion definition, but you can modify it as needed.

NOTE For information about removing mullions from between cells, see "Removing Mullions from a Curtain Wall Grid" on page 849.

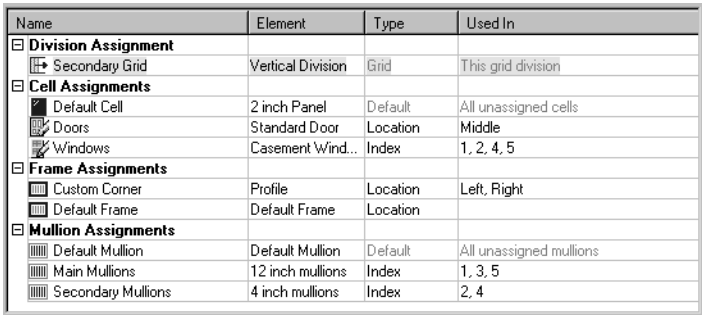
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Mullions under Element Definitions.
6. Select the unneeded mullion definition from the list.
7. Click Remove Mullion.
8. Click OK.

Assigning Definitions to Curtain Wall Elements

After you've created element definitions for a curtain wall style, you can assign those definitions to each of the curtain wall element types: divisions, cell infills, frames, and mullions.

By default, one definition is assigned to all elements of a particular type. However, you can assign definitions to individual elements as well. For example, all cells in the grid are assigned the default infill. You can, however, create a new cell assignment, select a different infill, and then specify the cells to use that infill.

Assignment list



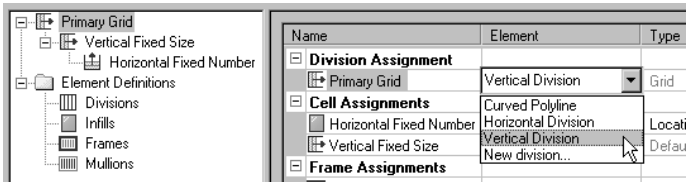
Name	Element	Type	Used In
Division Assignment			
Secondary Grid	Vertical Division	Grid	This grid division
Cell Assignments			
Default Cell	2 inch Panel	Default	All unassigned cells
Doors	Standard Door	Location	Middle
Windows	Casement Wind...	Index	1, 2, 4, 5
Frame Assignments			
Custom Corner	Profile	Location	Left, Right
Default Frame	Default Frame	Location	
Mullion Assignments			
Default Mullion	Default Mullion	Default	All unassigned mullions
Main Mullions	12 inch mullions	Index	1, 3, 5
Secondary Mullions	4 inch mullions	Index	2, 4

For more information about element definitions, see "Creating Element Definitions for a Curtain Wall Style" on page 796.

Assigning a Division to a Curtain Wall Grid

Use this procedure to assign a division to a curtain wall grid. A division defines the grid orientation (whether the direction of the grid cells and mullions is horizontal or vertical) and the division type (number and size of cells).

After you define a division, you can assign it to the primary grid or to nested grids. Nested grids are created by selecting Nested Grid as the cell assignment. For more information, see "Working with Nested Grids in Curtain Walls" on page 834.



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid you want to assign a division to.

   The name of the grid you select is displayed in the table under the Division Assignment row.

   TIP To rename a grid, select it, and click Rename and enter a new name.

6. Click the Element column for that grid and select a division definition from the list.
7. Click OK.

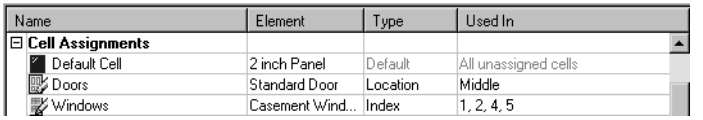
Assigning Infills to Curtain Wall Cells

An infill defines the contents of a curtain wall cell. A curtain wall cell can be empty (none), can contain a grid (nested grid), or can contain one of two infills: a panel or a style. The style infill is for inserting doors, windows, and other objects into a curtain wall.

Cell Assignments

A cell assignment defines the infill definition used for the cells. You can use one cell assignment to assign the same infill to all cells, or you can create multiple cell assignments to assign different infills to different cells.

Cell assignments



Do not assign multiple definitions to the same cell because only the last assigned definition to the cell is used.

Default Cell Assignment

The default cell assignment is used by all unassigned cells. You can modify the default assignment to be any type of infill, but you cannot delete the default cell assignment.

You may want to modify the default cell assignment to use the infill definition that occurs most frequently in your design. Any cells not assigned to other infills then use this infill definition.

Materials and Display Properties of Infills

The layer, color, linetype, and other display properties of the default infill are applied to all infills unless you assign materials to the infills you created or you create a custom display component for each definition. You can then control the display of each infill definition independently. For more information, see "Specifying the Display of Curtain Walls" on page 852.

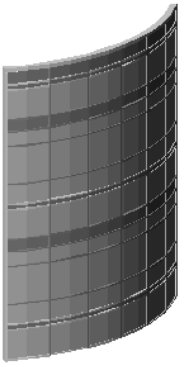
Related Procedures

- Working with Nested Grids in Curtain Walls
- Creating a Nested Grid in a Curtain Wall
- Filling a Curtain Wall Cell with a Simple Panel
- Inserting an Object into a Curtain Wall Cell
- Removing an Infill from a Curtain Wall Cell
- Specifying Which Curtain Wall Cells Use a Cell Assignment
- Removing an Assignment from a Curtain Wall Style

Working with Nested Grids in Curtain Walls

Each curtain wall grid is one-dimensional with either a horizontal or vertical division. By nesting grids in the curtain wall style, you can create a variety of patterns from simple to complex.

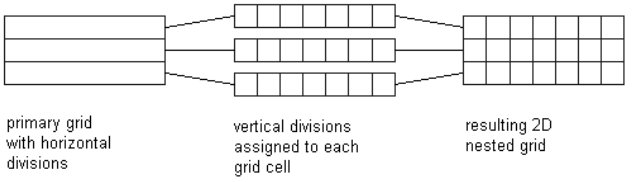
Example of nested grids



Simple Primary Grids

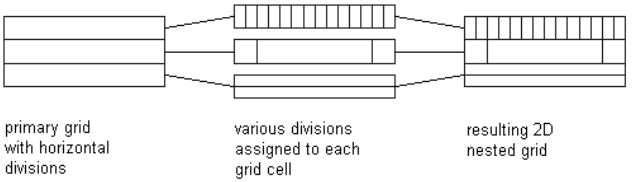
When you nest grids, you start with one primary grid. Each cell in the primary grid can then be filled with another grid. For example, if your primary grid is horizontal and has three cells, you can nest a vertical grid in each horizontal cell to create a simple two-dimensional (2D) grid. This is the nesting configuration for the Standard curtain wall style.

Specifying cell division definitions 1



The previous illustration shows all cells in the grid with the same cell assignment—a vertical division. However, each cell in a grid is independent and can have a separate assignment. For example, the following illustration shows a three cell horizontal grid with different assignments in each cell. The bottom cell contains another horizontal division, the middle cell contains vertical divisions of varying width, and the top cell contains a vertical divisions of a fixed width.

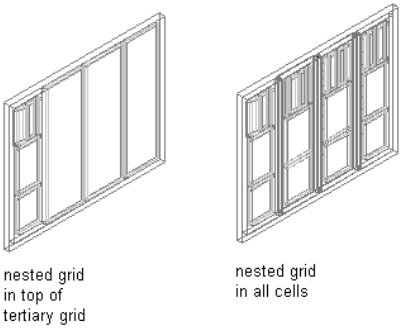
Specifying cell division definitions 2



Multiple Nested Grids

You can continue to nest grids to create multiple levels. For example, the following illustrations show the Standard curtain wall style, which is a simple two-dimensional (2D) grid, with one horizontal cell and three vertical cells. Another grid is nested in the first cell of the secondary grid. This creates a tertiary grid. The final illustration shows the nested grids assigned to all cells.

Specifying a sequence of nested grids



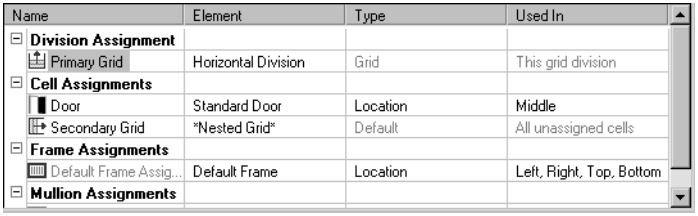
Defining Nested Grids

You can define nested grids by using the Design Rules tab of the Curtain Wall Style Properties dialog box. The tree in the left pane lists the grids. There is always one primary grid. The primary grid can have one or more secondary grids. Each secondary grid can have one or more tertiary grids, and so on.

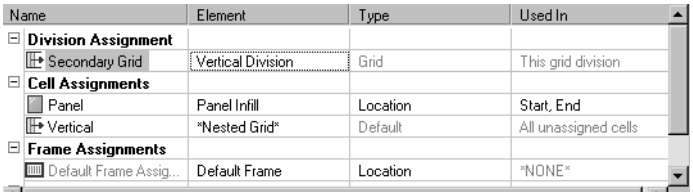
TIP To quickly create nested grids in all cells, change the default cell assignment to Nested Grid. If you want multiple levels of nesting, be sure to change the default cell assignment for each grid. For more information, see "Creating a Nested Grid in a Curtain Wall" on page 837.

Each grid has its own cell assignments. You assign cells to contain another grid, a panel infill, or an object such as a door or window. For more information, see "Assigning Infills to Curtain Wall Cells" on page 833.

Primary grid and cell assignments



Secondary grid and cell assignments



Creating a Nested Grid in a Curtain Wall

Use this procedure to create a nested grid in a curtain wall. A nested grid is a grid within a grid. Each nested grid has its own division, cell assignments, frame, and mullions. By default, the frame is turned off for nested grids.

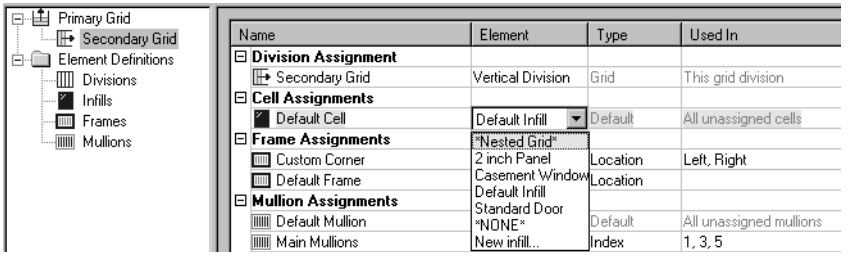
For more information, see "Working with Nested Grids in Curtain Walls" on page 834.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to create a nested grid.
6. Click New Cell Assignment.

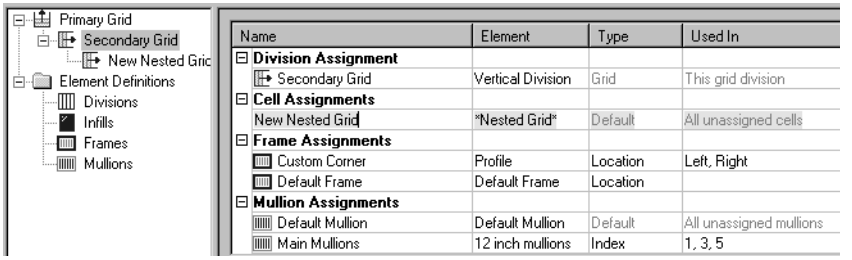
   A new cell assignment is displayed in the list of cell assignments.
7. Select the cell assignment in the top right frame, right-click and click Rename, and then enter a descriptive name.
8. Select Nested Grid in the Element column.

   A new grid is added to the list of grids in the left pane. If you are editing the primary grid, the new grid is added at the secondary level. If you are editing a grid at the secondary level, the additional grid is placed at the tertiary level, and so on.

Creating a nested grid



New nested grid in tree



NOTE To rename a grid, select it in the right pane, right-click and click Rename, and enter a new name.

9 Specify the cells to contain this nested grid.

For more information, see "Specifying Which Curtain Wall Cells Use a Cell Assignment" on page 841.

10 Click OK.

Filling a Curtain Wall Cell with a Simple Panel

Use this procedure to fill a curtain wall cell with a simple panel. Simple panels are generally used to represent basic cladding materials in the curtain wall, such as a stone wall panel or a concrete panel.

1 On the Format menu, click Style Manager.

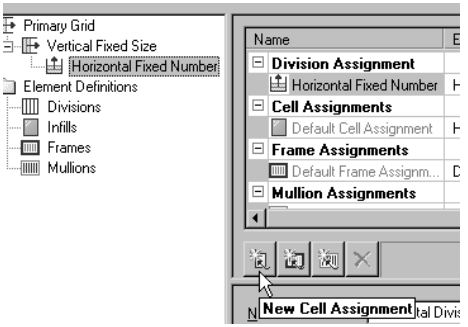
2 Expand Architectural Objects, and expand Curtain Wall Styles.

3 Select a curtain wall style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select the grid in which you want to put a simple panel infill.

6 Click New Cell Assignment.



A new cell assignment is displayed in the list of cell assignments.

7 Select the cell assignment in the top right pane, right-click and click Rename, and then enter a descriptive name.

8 Under Element, select an infill that defines a simple panel.

If you do not have a simple panel infill defined, then select New Infill and define one. For more information, see "Creating a Panel Infill for a Curtain Wall" on page 813.

9 Specify the cells to contain this simple panel.

For more information, see "Specifying Which Curtain Wall Cells Use a Cell Assignment" on page 841.

10 Click OK.

Inserting an Object into a Curtain Wall Cell

Use this procedure to insert objects, such as doors, windows, door/window assemblies, curtain wall units, and AEC Polygons, into a curtain wall cell. Curtain wall cells can contain these objects when you create infill definitions that use them. For more information, see "Creating an Infill for Inserting an Object into a Curtain Wall" on page 814.

TIP After you insert an object in a cell, you can select that object independent of the grid, right-click, and access editing options for the object.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

3 Select a curtain wall style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select the grid in which you want to insert objects.

6 Click New Cell Assignment.

A new cell assignment is displayed in the list of cell assignments.

7 Select the cell assignment in the top right frame, right-click and click Rename, and then enter a descriptive name.

8 Select an infill that uses an object style.

9 Specify the cells to contain this object.

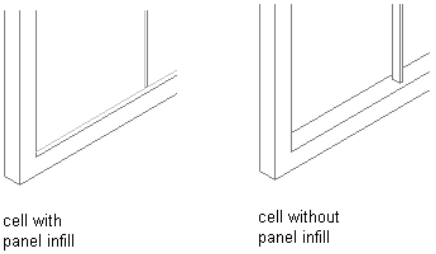
For more information, see "Specifying Which Curtain Wall Cells Use a Cell Assignment" on page 841.

10 Click OK.

Removing an Infill from a Curtain Wall Cell

Use this procedure to remove the infill of a cell and leave the cell empty. To do this, use None as the element definition. Using None also removes any frame edges that border the cell, but it does not affect the mullions.

Removing an infill assignment from a cell



1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

3 Select a curtain wall style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select the grid that contains the cells you want to assign to None.

6 Create a new cell assignment or select an existing cell assignment.

7 Select NONE under the Element column.

8 Specify the cells to contain the None infill.

For more information, see "Specifying Which Curtain Wall Cells Use a Cell Assignment" on page 841.

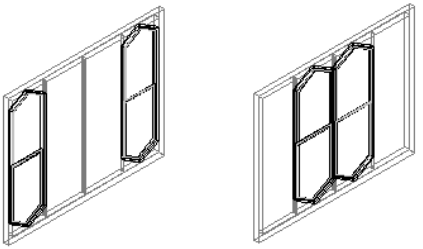
9 Click OK.

Specifying Which Curtain Wall Cells Use a Cell Assignment

When you create a cell assignment you need to specify the cells in the grid to use that assignment. There are two options for selecting cells:

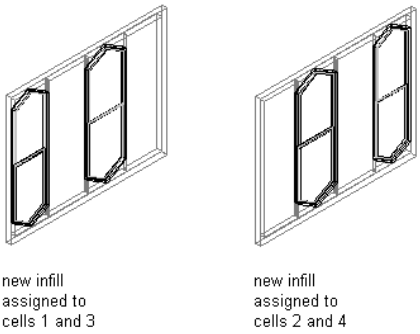
- Use Location to insert the infill into the start, middle, or end cells of a vertical grid or into the bottom, middle, or top cells of a horizontal grid. If there is an even number of cells (four or more), Middle refers to the two cells in the middle of the grid. If there is an odd number of cells (three or more), Middle refers to one cell in the middle of the grid.

  Specifying cell assignments by location



- Use Index to insert the infill into specific cells based on cell numbers. Cells are numbered from start to end or bottom to top. For example, typing 1, 3, 5 would place the infill in the first, third, and fifth cells.

  Specifying cell assignment by index



Any cells that are not assigned a specific cell assignment use the default infill.

1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Curtain Wall Styles.
3 Select a curtain wall style, right-click, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select a grid.
6 In the right pane, select Location or Index for Type.
7 Select a cell assignment:

If you select . . .	Then . . .
Location	click the Used In column, and click the button at the far right of the row. Select the cells you want to use this assignment, and click OK.
Index	enter the cell numbers separated by commas in the Used In column. For vertical grids, cells are numbered from start to end and for horizontal grids, cells are numbered from bottom to top.

NOTE Do not assign multiple definitions to a cell because the last definition assigned to the cell is used.

8 Click OK.

Removing an Assignment from a Curtain Wall Style

Use this procedure to remove cell assignments, frame assignments, and mullion assignments from a curtain wall style. You cannot remove default assignments, but you can modify them to suit your needs.

NOTE Each grid requires one division assignment. Therefore, you cannot remove the division assignment, although you can change the division element used for the division assignment.

1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Curtain Wall Styles.
3 Select a curtain wall style, right-click, and click Edit.
4 Click the Design Rules tab.

5 In the left pane, select the grid from which you want to remove an assignment.

6 Select a cell assignment, frame assignment, or a mullion assignment.

7 Click Remove Assignment.

8 Click OK.

Assigning Definitions to Curtain Wall Frames

The curtain wall frame is represented by the outer edges of the primary grid. Each nested grid has its own frame that is defined separately from the primary grid frame. By default, the frames of nested grids are turned off. For more information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

Frame Assignments

A frame assignment defines the frame definition that is used by each frame edge. You can use one frame assignment to assign the same definition to all four edges of the frame, or you can create multiple frame assignments to assign different definitions to different edges of the frame. Unassigned edges are not displayed.

Do not assign multiple definitions to the frame edge because only the last definition assigned to the edge is used.

Default Frame Assignment

There is a default frame assignment and you can select the frame edges it applies to. You can modify the default assignment to use any frame definition, but you cannot delete the default frame assignment.

Materials and Display Properties of Frames

The layer, color, linetype, and other display properties of the default frame are applied to all frame edges unless you assign materials to the frame definition or you create a custom display component for each definition. You can then control the display of each frame definition independently. For more information, see "Specifying the Display of Curtain Walls" on page 852.

Related Procedures

- Adding a New Frame Assignment to a Curtain Wall
- Removing a Frame Edge from a Curtain Wall
- Specifying Which Curtain Wall Edges Use a Frame Assignment

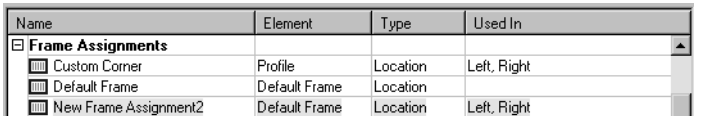
Adding a New Frame Assignment to a Curtain Wall

Use this procedure to add a frame assignment to a curtain wall. To assign different definitions to different frame edges, you need multiple frame assignments.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to create a new frame assignment.
6. Click New Frame Assignment.

   A new frame assignment is displayed in the list of frame assignments.

   New frame assignment



7. Select the frame assignment in the right pane, right-click and click Rename, and then enter a descriptive name.
8. Select a frame definition from the Element column.
9. Specify the sides of the frame to use this frame assignment.

   For more information, see "Specifying Which Curtain Wall Edges Use a Frame Assignment" on page 845.

10. Click OK.

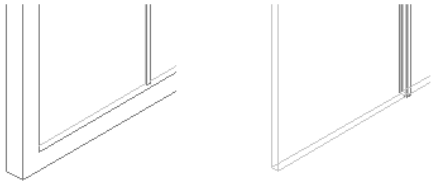
Removing a Frame Edge from a Curtain Wall

Use this procedure to remove a frame edge from a curtain wall. There are three ways to remove a frame edge:

- Set the width and depth of the edge to zero
- Leave the edge unassigned
- Specify None as an override to the edge assignment

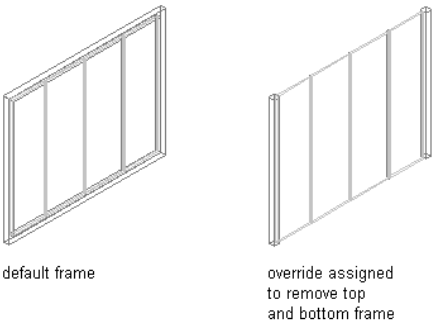
The first two methods remove the frame edge and expand the adjacent infills into the space occupied by the edge.

Specifying a frame width and depth of zero



By specifying None as an override, the frame edge is not displayed, but the adjacent infill is not expanded into the space the edge occupied.

Overriding a frame edge definition



For information about setting the width and depth to zero, see "Defining a Curtain Wall Frame by Width and Depth" on page 820.

For information about leaving the edge unassigned, see "Specifying Which Curtain Wall Edges Use a Frame Assignment" on page 845.

For information about overriding the edge, see "Overriding Curtain Wall Frames and Mullions" on page 866.

Specifying Which Curtain Wall Edges Use a Frame Assignment

Use this procedure to specify edges that use a frame assignment. When you create a frame assignment, you need to specify the edges of the frame to use that assignment.

Frame edges that are not assigned a frame definition are not displayed.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.

3 Select a curtain wall style, right-click, and click Edit.

4 Click the Design Rules tab.

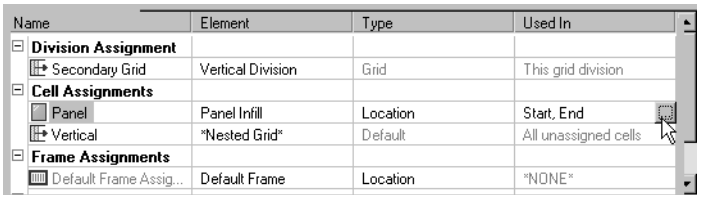
5 In the left pane, select a grid.

6 Select a frame assignment.

Location is the only way to specify the frame edges.

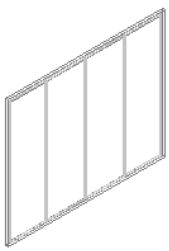
7 Click the Used In column, and then click the [...] button at the far right of the row.

Specifying frame location

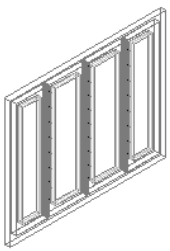


8 Select the edges that you want to use this assignment - Left, Right, Top, or Bottom - and click OK.

Assigning frames to nested grids



nested grids without assigned frames



nested grids with assigned frames

Do not assign multiple definitions to the same frame edge because only the last definition assigned to the edge is used.

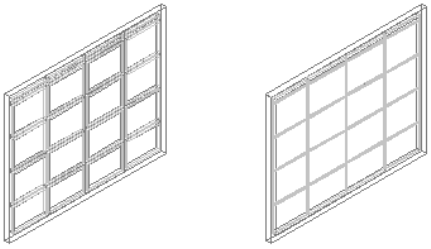
9 Click OK.

Assigning Definitions to the Mullions of a Curtain Wall

The mullions of a curtain wall are the edges between the grid cells. The primary grid and each nested grid have mullions that are defined separately

from the other grids. For more information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

Assign mullions to a nested grid



Mullion Assignments

A mullion assignment defines the definition used by each mullion. You can use one assignment to define all mullions, or you can create multiple assignments and assign different definitions to different mullions in any grid.

Do not assign multiple definitions to the same mullion because only the last definition assigned to the mullion is used.

Default Mullion Assignment

There is a default mullion assignment used by all unassigned mullions. You can modify the default assignment to be any mullion definition, but you cannot delete the default mullion assignment.

Related Procedures

- Adding a New Mullion Assignment to a Curtain Wall Style
- Removing Mullions from a Curtain Wall Grid
- Specifying Which Curtain Wall Mullions Use an Assignment

Adding a New Mullion Assignment to a Curtain Wall Style

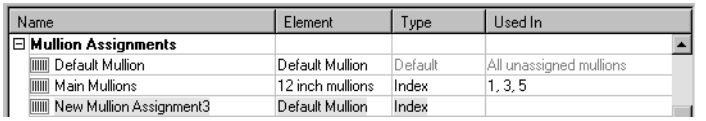
Use this procedure to add a new mullion assignment to a curtain wall style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to create a new mullion assignment.

6 Click New Mullion Assignment.

A new mullion assignment is displayed in the list of mullion assignments.

New mullion assignment



7 Select the mullion assignment, right-click and click Rename, and then enter a descriptive name.

8 Select a mullion definition from the Element column.

9 Specify the mullions to use this assignment.

For more information, see "Specifying Which Curtain Wall Mullions Use an Assignment" on page 848.

10 Click OK.

Specifying Which Curtain Wall Mullions Use an Assignment

When you create a mullion assignment you need to specify the mullions in the grid to use that assignment. There are two options for selecting mullions:

- Use Location to assign a definition to the start, middle, or end mullions of a vertical grid or the bottom, middle, or top mullions of a horizontal grid. If there is an even number of mullions (four or more), Middle refers to the two mullions in the middle of the grid. If there is an odd number of mullions (three or more), Middle refers to the one mullion in the middle of the grid.
- Use Index to assign a definition to specific mullions based on mullion numbers. Mullions are numbered from start to end or bottom to top. For example, typing 1, 2, 3 would assign the definition to the first, second, and third mullions.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

3 Select a curtain wall style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select a grid.

6 Create a new mullion assignment or select an existing assignment.

7 Select Location or Index for Type.

8 Select a cell assignment.

If you selected . . .	Then . . .
Location	click the Used In column, and click the button at the far right of the row. Select the cells you want to use this cell assignment, and click OK.
Index	enter the mullion numbers separated by commas in the Used In column. For vertical grids, mullions are numbered from start to end and, for horizontal grids, mullions are numbered from bottom to top.

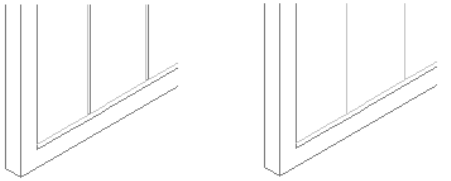
NOTE Do not assign multiple definitions to the same mullion because only the last definition assigned to the mullion is used.

9 Click OK.

Any mullions that are not assigned a specific mullion assignment use the default mullion definition.

Removing Mullions from a Curtain Wall Grid

Use this procedure to remove a mullion from the curtain wall. You can create a mullion definition whose edge width and depth are zero. Adjacent infills expand to fill in the space that was occupied by the mullion. This is an effective way to represent butt glazing.



1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Curtain Wall Styles.
3 Select a curtain wall style, right-click, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select the grid in which you want to remove a mullion.

6 Create a new mullion assignment and enter **0** (zero) for the width and depth.

For more information, see "Defining Curtain Wall Mullions by Width and Depth" on page 827.

7 Under Mullion Assignments, select the mullion definition you created for any cell edges of any mullion assignment, where you want to remove the mullions.

For more information, see "Specifying Which Curtain Wall Mullions Use an Assignment" on page 848.

8 Click OK.

Specifying the Materials of a Curtain Wall Style

A curtain wall consists of a number of components whose display properties can be determined by the materials assigned to each component.

When you assign materials to a curtain wall style, you assign one material to each display component of the curtain wall. For example, you assign a wood material to the frame and a glass material to the glass inset. You assign materials to components in each display representation where you want the materials to be used.

If you want to use the display properties of the curtain wall style, instead of using material display properties, you can turn off the material assignments in the display properties of the curtain wall style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in three dimensional (3D) model views and in elevations.

Related Topics and Procedure

- Curtain Wall Materials and Display Components
- Assigning Materials to a Curtain Wall Style

Curtain Wall Materials and Display Components

The following table identifies the material component that corresponds to each curtain wall component in the specified views.

Curtain Wall Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Screened, Reflected Plan	
Frame Definitions	Linework
Mullion Definitions	Linework
Infill Definitions	Linework
Frame Definitions Hatch	Linework
Mullion Definitions Hatch	Linework
Infill Definitions Hatch	Linework
Model	
Frame	3D Body
Mullion	3D Body
Infill	3D Body

Assigning Materials to a Curtain Wall Style

Use this procedure to assign materials to the individual components of a curtain wall style. When you assign a material to a curtain wall component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the curtain wall. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, the frame, mullion, and infill are physical components of a curtain wall. The cell marker is a symbolic component.

NOTE If a material assignment does not determine the display properties of a curtain wall component, you can change the display properties of the curtain wall style as described in "Specifying the Display of Curtain Walls" on page 852.

1. Open a tool palette that has a curtain wall tool.
2. Right-click a curtain wall tool, and click Curtain Wall Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Select the component you want to change, select the value for Material Definition, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.
11. Click OK twice.

Specifying the Display of Curtain Walls

The display of a curtain wall depends on the direction from which you view the curtain wall. In Plan view, the curtain wall object is displayed as parallel lines with vertices marking the grid lines, as an architect would typically draw a curtain wall. In 3D isometric views, the curtain wall object is displayed as it would appear in the real world, with surfaces showing length, thickness, and height. You control what you want to display in each particular view.

Element Definitions and Custom Display Components

By default, the display of all infills, frames, and mullions is controlled by the display properties of the default infill, default frame, and default mullions. However, you can add individual element definitions as components with

separate display properties. For example, if you define two infills called stone panel and glass panel, by default they are both controlled by the default infill display properties. However, you can add each definition as a new display component, and then control the display properties separately.

NOTE The component name in the Custom Display Component dialog box must match the name of element definition in the Design Rules tab. Otherwise the element definition does not display properly.

For more information about the display system, see "Display System" on page 435.

Materials and Display Properties

You can use materials to control the display of both default and custom infills, frames, and mullions. When you assign materials to the element definitions you create, you do not need to define these definitions as custom display components. For more information, see "Specifying the Materials of a Curtain Wall Style" on page 850.

Related Procedures

- Adding Curtain Wall Element Definitions as Display Components
- Specifying the Layer, Color, and Linetype of a Curtain Wall Style
- Specifying the Hatching for Components of a Curtain Wall Style
- Adding Custom Graphics as a Display Component of a Curtain Wall
- Creating Cut Planes for a Curtain Wall

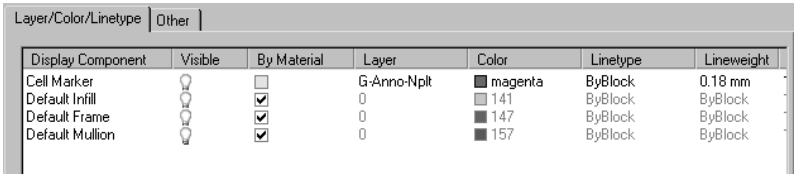
Adding Curtain Wall Element Definitions as Display Components

Use this procedure to add curtain wall element definitions. Before you can control the display properties of curtain wall elements according to the definition assigned to the element, you must create display components for each element definition.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select the curtain wall style that you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select Model as the display representation.
6. Click .

The default list of components includes only the three basic elements and cell markers.

Default Model display components for curtain walls



7 Click the Other tab, and then click Add.

8 Select Infill, Frame, or Mullion for Component Type.

9 Enter a name for Component Name, or click Select Element and select an element from the list.

10 Click OK.

11 Click the Layer/Color/Linetype tab.

The element definition that you added is displayed in the list of components.

12 Click the Other tab to continue adding element definitions, or click OK three times.

Specifying the Layer, Color, and Linetype of a Curtain Wall Style

Use this procedure to change the following display properties of the components of a curtain wall style:

- Visibility (component is on or off)
- By Material
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

3 Right-click the curtain wall style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear.

6 Click Style Override.

7 Click the Layer/Color/Linetype tab.

8 Select the component to change, and select a different setting for the property.

9 Click OK three times.

Specifying the Hatching for Components of a Curtain Wall Style

Use this procedure to specify the hatching of the components of a curtain wall style. Curtain wall hatching is displayed only in display representations, such as Plan, that are used in Top view (Plan view) of a drawing.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

3 Right-click the curtain wall style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and click Style Override.

6 Click the Hatching tab.

7 Select a component, and click the setting for Pattern.

8 Specify the hatching for the component:

If you want to specify . . .	Then . . .
a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
single hatching	select User-defined for Type, and clear Double Hatch.
double hatching	select User-defined for Type, and select Double Hatch.
solid fill	select Solid Fill for Type.

9 Click OK.

10 Click the setting for Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

11 Click the setting for Angle, and enter the angle for the selected pattern.

12 Click the setting for Orientation, and specify how the hatching is oriented:

If you want to orient the hatching . . .	Then . . .
to the object, regardless of the object rotation	select Object.
to the World Coordinate System	select Global.

13 Click OK three times.

Adding Custom Graphics as a Display Component of a Curtain Wall

There may be instances where an infill, frame, or mullion requires a custom two-dimensional (2D) or three-dimensional (3D) graphic. For example, you might need a highly detailed 3D truss as the mullions or a decorative light fixture applied to an infill. In cases like these, you can create a custom block, add a display component with the block attached, and associate that component with an element definition. When you assign that definition to an element, the block is also displayed.

1 Draw your custom component, and save it as a block.

2 Select a curtain wall, right-click and click Edit Curtain Wall Style.

3 Click the Display Properties tab.

4 Click .

5 Click the Other tab.

6 Click Add.

7 Select Infill, Frame, or Mullion as the element type.

8 Select the specific element from the list.

9 Select Draw Custom Graphics.

10 Specify the display of the element:

If you want to . . .	Then . . .
display the block instead of the associated curtain wall element	select Replace Graphics.

If you want to . . .	Then . . .
superimpose the block over the curtain wall element so that both are displayed	clear Replace Graphics.

11 Click Select Block, and select the custom block that you created.

12 Click OK.

13 Specify further settings for the custom display block:

If you want to . . .	Then . . .
scale the block to fit a particular dimension	select Width, Height, or Depth. To prevent the block from losing its proportions, select Lock XY Ratio.
specify how the block is inserted into the grid in the X, Y, and Z directions	specify an insertion point on the X, Y, and Z planes.
mirror the block	determine if it should mirror in the X, Y, or Z direction.
offset the block from the grid	specify the offset in the X, Y, or Z direction.

14 Click OK three times.

Creating Cut Planes for a Curtain Wall

Use this procedure to specify the properties of one or more cut planes for a curtain wall style. Cut plane display properties apply only to display representations, such as Plan, that are used in Top view (Plan view) of a drawing.

To better visualize the elements of a curtain wall in Plan view, you can create cut planes. The main cut plane is where the shrinkwrap and hatching are applied. The plan display shows the components and objects in the wall as they are displayed at the height of each cut plane.

1 Select a curtain wall, right-click, and click Edit Curtain Wall Style.

2 Click the Display Properties tab.

3 Select Plan, and click .

NOTE The Cut Plane tab is displayed only in some display representations, such as Plan.

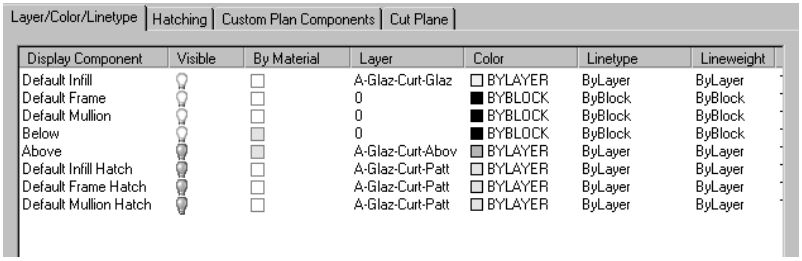
4 Click the Cut Plane tab to set the cut plane to be displayed in each display representation for the curtain wall style.

5 Enter a value for Cut Plane Height to specify the cut plane at which hatching takes effect.

6 To specifically define a cut plane, click Add, and enter the height of the new cut plane.

If you add a cut plane . . .	Then . . .
at a height that is lower than the value for Cut Plane Height	objects are displayed using the properties specified for the Below Cut Plane component on the Layer/Color/Linetype tab.
at a height that is higher than the value for Cut Plane Height	objects are displayed using the properties specified for the Above Cut Plane component on the Layer/Color/Linetype tab.

Below and Above components



You can click Remove to delete a cut plane that you added.

7 Click OK twice.

Attaching Notes and Files to a Curtain Wall Style

Use this procedure to enter notes and attach reference files to a curtain wall style. You can also edit notes and edit or detach reference files from a curtain wall style.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

3 Right-click the curtain wall style you want to change, and click Edit.

4 Click the General tab.

5 To add a description to the curtain wall style, enter it for Description.

6 Click Notes.

7 To add a note, click the Text Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK twice.

Using Overrides in Curtain Walls

Curtain walls are geometrically complex objects that often have a large number of different elements, such as frames, panels, and window infills. The settings for these elements are defined in the curtain wall style and can be modified using Style Manager. However, there are cases when modifying a curtain wall directly on screen is more suitable:

- You want to add custom frame or mullion edges to a curtain wall and need direct visual feedback.
- You want to create an override, like a merged infill or an irregular panel shape in only one specific place in the curtain wall.
- You want to experiment with different visuals without having to change the curtain wall style for each idea immediately.

When you have finished your onscreen edits, you have three choices:

- apply the overrides to the curtain wall you have edited.
- save the overrides to the current curtain wall style.
- create a new style for the overrides.

Overrides you can set include assigning a different definition to a selected cell, frame, or mullion, and assigning a profile to a frame or mullion edge. Note that the definition or profile must already exist in the current drawing before you can use it as an override. For example, if you want to override a cell that has a simple panel infill with an octagonal window infill, you must first define the window (octagonal) style as a valid infill in the curtain wall style. Similarly, if you want to override a frame or mullion edge assignment in the curtain wall, the curtain wall style must contain the edge profile as a frame or mullion definition.

NOTE You cannot modify a definition using the Override method. For information about modifying definitions, see "Modifying Element Definitions for Curtain Wall Styles" on page 878.

Overrides do not affect the Design Rules for the curtain wall style. However, you can transfer overrides to a curtain wall style if you want all curtain walls of that style to have the same overrides.

You can view a list of overrides that are currently assigned to a curtain wall from the Overrides tab of the Curtain Wall Properties dialog box. For more information, see "Removing Curtain Wall Overrides" on page 878.

NOTE Overrides are also listed on the Overrides tab in the Curtain Wall Style Properties dialog box.

Related Topics

- Overriding Curtain Wall Infills
- Overriding Curtain Wall Frames and Mullions
- Overriding Curtain Wall Divisions
- Removing Curtain Wall Overrides

Overriding Curtain Wall Infills

The cell infills of a curtain wall are set in the curtain wall style. You can, however, create overrides for these infills in cells. For example, you might want a row of glider windows for a first floor facade. In one specific position, however, you want a frosted glass window. In this case, you would set the row of glider windows in the curtain wall style, and then override the infill style in one specific cell with a frosted glass window.

Curtain wall infills can consist of simple panels, objects like windows or doors, or nested grids. You can change one infill for another, merge cells, or

remove the frame from an infill altogether. This would be useful if you add a door into a grid cell and want to remove the bottom frame from that cell.

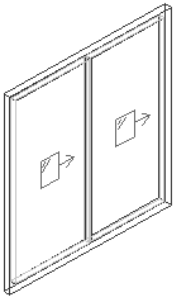
Related Procedures

- Turning on Cell Markers
- Merging Curtain Wall Cells
- Creating a Curtain Wall Infill Override

Turning on Cell Markers

Use this procedure to turn on the cell markers for each grid cell in a curtain wall. The cell markers must be on in order to select individual cells and make changes to them.

Viewing Cell Markers



1. Select the curtain wall for which you want to create an infill override.
2. Right-click, and click Infill ➤ Show Markers.

Merging Curtain Wall Cells

Use this procedure to merge two curtain wall cells.

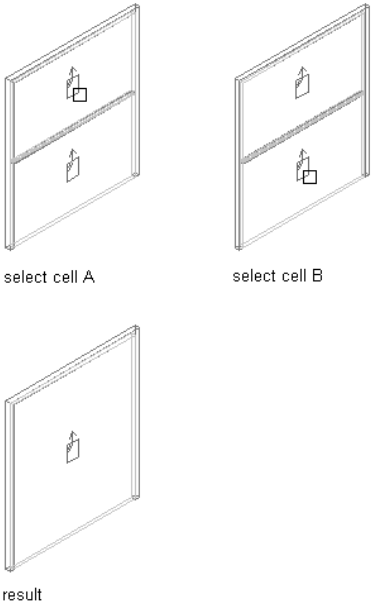
NOTE To merge curtain wall cells, the cell markers need to be visible. For information on turning on cell markers, see "Turning on Cell Markers" on page 861.

You can only merge cells which are adjacent to each other.

In most cases you merge cells with the same infill type. The merged cell is then the same type as the original cells. For example, if you merge two solid panel infills, the resulting merged cell also has a solid panel infill. In some cases however, you might want to merge two cells that have different infill types. In that case, the infill type of the first selected cell is used for the

merged cell. For example, if you want to merge a cell with a simple panel infill and a cell with a window infill, and you select the cell with the simple panel first during the merge command, the merged cell contains a simple panel infill, not a window. If you select the two cells in the opposite order, the merged cell contains a window and no simple panel infill.

Merging two cells



1. Select the curtain wall on which you want to merge two cells.
2. Right-click, and click Infill ➤ Merge.
3. Select the first cell to be merged.
4. Select the second cell to be merged.
   The cells are merged into one.
5. Specify where you want to save the curtain wall override:

If you want to save the override . . .	Then . . .
only on this specific curtain wall	no further steps are necessary. The override is saved to the curtain wall. For information about how to remove an override from a curtain wall, see "Removing Curtain Wall Overrides" on page 878.

If you want to save the override . . .	Then . . .
to a curtain wall style	select the curtain wall, right-click, and select Design Rules ➤ Transfer to Object.

6 If you have chosen to save the override to a curtain wall style, select the curtain wall again, right-click and click Design Rules ➤ Save to Style and decide to which curtain wall style you want to save the override.

If you want to save the override . . .	Then . . .
to the current curtain wall style	select Transfer Merge Operations to Style, and click OK. **NOTE** If you have created only a cell merge, only the Transfer Merge Operations to Style checkbox is active. If you have also created other overrides, such as a new cell assignment or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes, too.
to a new curtain wall style	select Transfer Merge Operations to Style, and click New. Then, enter a name for the new curtain wall style, and click OK. **NOTE** If you have created only a cell merge, only the Transfer Merge Operations to Style checkbox is active. If you have also created other overrides, such as a new cell assignment or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes, too.

NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides still remain on the curtain wall, where they can be removed as described in "Removing Curtain Wall Overrides" on page 878, but they are not saved back to a curtain wall style.

Creating a Curtain Wall Infill Override

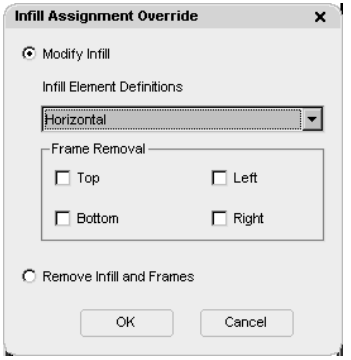
Use this procedure to override the infill of a curtain wall cell.

For example, you might have a row of simple concrete panels in your curtain wall, but want in one location a round window instead of the concrete panel. In that case, it might be simpler to use an infill override, instead of creating complex curtain wall unit definitions.

NOTE To override an infill assignment, the cell markers must be visible. For information on turning on cell markers, see "Turning on Cell Markers" on page 861.

To exchange an infill definition, the new infill definition must already be defined in the curtain wall style. For information on creating infill definitions, see "Defining Infills for Curtain Wall Cells" on page 812.

1. Select the curtain wall on which you want to override an infill.
2. Right-click, and click Infill ➤ Override Assignment.
3. Select the marker of the cell where you want to create an override, and press ENTER.



4. Create the override.

If you want to . . .	Then . . .
exchange the existing infill for another	select a new infill definition from the list.
remove one or more of the frames around the infill	select the frame component to be removed. You could, for example, override a cell to contain a door infill instead of a panel infill; in this case, you would want to remove the bottom frame of the cell.

If you want to . . .	Then . . .
remove the complete infill and its frame	select Remove Infill and Frames. **NOTE** This works only for infills that border the exterior of the curtain wall.

5 Click OK.

6 Specify where you want to save the curtain wall override.

If you want to save the override . . .	Then . . .
only on this specific curtain wall	no further steps are necessary. The override is saved to the curtain wall. For information about how to remove an override from a curtain wall, see "Removing Curtain Wall Overrides" on page 878.
to a curtain wall style	select the curtain wall, right-click, and select Design Rules ➤ Transfer to Object.

7 If you have chosen to save the override to a curtain wall style, select the curtain wall again, right-click and click Design Rules ➤ Save to Style and decide to which curtain wall style you want to save the override.

If you want to save the override . . .	Then . . .
to the current curtain wall style	select Transfer Cell Overrides to Style, and click OK. **NOTE** If you have created only an infill override, only the Transfer Cell Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes, too.
to a new curtain wall style	select Transfer Cell Overrides to Style, and click New. Then, enter a name for the new curtain wall style, and click OK. **NOTE** If you have created only an infill override, only the Transfer Cell Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes, too.

NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides remain on the curtain wall, where they can be removed as described in "Removing Curtain Wall Overrides" on page 878, but they are not saved back to a curtain wall style.

Overriding Curtain Wall Frames and Mullions

You can change a selected frame edge or mullion edge by using an edge assignment override.

NOTE To exchange a frame edge or mullion edge, the new edge definition must already be defined in the curtain wall style.

Removing the edge does not affect the width of the cell. To remove the edge and have the adjacent cell resize, create an edge definition with a width and depth of zero. For more information, see "Defining a Curtain Wall Frame by Width and Depth" on page 820 or "Defining Curtain Wall Mullions by Width and Depth" on page 827.

You can also create a new edge profile by drawing a polyline or using an existing profile in the drawing. This edge profile can be interactively edited onscreen by in-place editing.

Related Procedures

- Creating a Frame or Mullion Override
- Creating a Frame or Mullion Edge from a Polyline or Profile using In-Place Editing
- In-Place Editing of Edge Profiles for Curtain Walls

Creating a Frame or Mullion Override

Use this procedure to override an individual frame or mullion.

To exchange a frame or mullion, the new definition must already be defined in the curtain wall style. For information on creating frames and mullions, see "Defining Curtain Wall Frames" on page 818 and "Defining Curtain Wall Mullions" on page 825.

1. Select the curtain wall on which you want to override an edge.
2. Right-click, and click Frame/Mullion ➤ Override Assignment.
3. Select the frame or mullion edge you want to override.

If you selected a frame edge, the Frame Assignment Override dialog box is displayed.

If you selected a mullion, the Mullion Assignment Override dialog box is displayed.

4 Create the override.

If you want to . . .	Then . . .
exchange the existing edge for another	select a new edge definition from the list.
remove the frame or mullion edge	select Remove Edge.

5 Click OK.

6 Specify where you want to save the curtain wall override.

If you want to save the override . . .	Then . . .
only on this specific curtain wall	no further steps are necessary. The override is saved to the curtain wall. For information about how to remove an override from a curtain wall, see "Removing Curtain Wall Overrides" on page 878.
to a curtain wall style	select the curtain wall, right-click, and select Design Rules ➤ Transfer to Object.

7 If you have chosen to save the override to a curtain wall style, select the curtain wall again, right-click and click Design Rules ➤ Save to Style and decide to which curtain wall style you want to save the override.

If you want to save the override . . .	Then . . .
to the current curtain wall style	select Transfer Edge Overrides to Style, and click OK. **NOTE** If you have created only a frame or mullion edge override, only the Transfer Edge Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a division override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes, too.
to a new curtain wall style	select Transfer Edge Overrides to Style, and click New. Then, enter a name for the new curtain wall style, and click OK. **NOTE** If you have created only a frame or mullion edge override, only the Transfer Edge Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a division override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes, too.

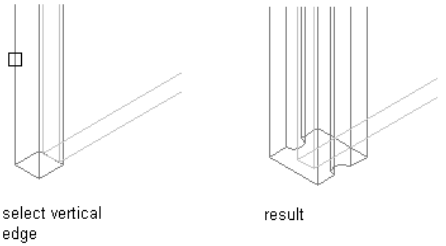
NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides remain on the curtain wall, where they can be removed as described in "Removing Curtain Wall Overrides" on page 878, but they are not saved back to a curtain wall style.

Creating a Frame or Mullion Edge from a Polyline or Profile using In-Place Editing

Use this procedure to assign a profile to a vertical edge of a frame or mullion. The curtain wall edge profile can be any profile or any closed polyline that you specify. You can use a profile edge to create a unique corner in situations where a simple miter is not sufficient.

NOTE Adjacent infills are not trimmed or expanded to accommodate the new edge. To adjust the infill, change the width of the frame edge. For more information, see "Defining a Curtain Wall Frame by Width and Depth" on page 820.

Overriding edge profile



1 Draw a closed polyline in the location where you want it to display in the curtain wall.

NOTE For best results, it is recommended to draw the polyline in Plan view.

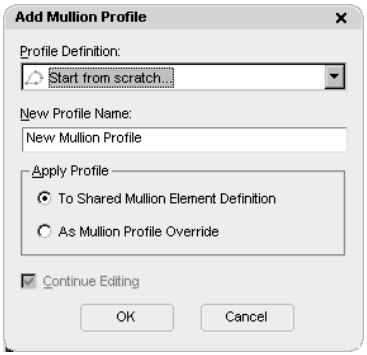
2 Select the curtain wall for which you want to create a frame or mullion edge profile override.

3 Specify the mode in which to edit the curtain wall:

If you want to edit . . .	Then . . .
this instance of the curtain wall	right-click, and click Design Rules ➤ Transfer to Object.
the curtain wall style	right-click, and click Design Rules ➤ Revert to Style Design Rules. If this option is not available, the design rules are already style-based for the curtain wall.

4 Right-click, and click Frame/Mullion ➤ Add Profile.

5 Select a vertical frame or mullion edge.



6 Select a profile for the override.

If you want to create the edge profile . . .	Then . . .
from the polyline drawn in step 1	select Start from scratch for Profile Definition, and enter a name for New Profile Name.
from an existing profile in the drawing	select the existing profile for Profile Definition, and click Continue Editing.

7 Select whether to apply the profile to the shared edge element definition or as an edge profile override.

8 Click OK.

You are now in in-place edit mode, and can edit the profile.

9 On the In-Place Edit toolbar, click to zoom to the profile.

10 Select the profile and edit it using Edge and Vertex grips, or by using the right-click context menu.

11 Save or discard changes to the curtain wall grid:

If you want to exit the in-place editing session . . .	Then . . .
without saving your changes	click on the In-Place Edit toolbar.

If you want to exit the in-place editing session . . .	Then . . .
after saving your changes	click on the In-Place Edit toolbar.

In-Place Editing of Edge Profiles for Curtain Walls

Use this procedure to edit profile edges using in-place editing.

With in-place editing, you can edit the profile directly and interactively on screen, and later save the changes to the profile definition.

1. Select a curtain wall that has the edge profile you want to edit onscreen with in-place editing.
2. Right-click, and click Frame/Mullion ➤ Edit Profile In Place.

   This command is only available if you have profile-based edges in the curtain wall.

   NOTE If the profile is not drawn to size, it must be converted in order for you to begin the in-place editing session. Click Yes if prompted to convert the profile to its actual size.

3. Select the edge you want to edit.

   NOTE You have entered the in-place editing session now. You can see this from the magenta-colored grips and light blue hatch of the temporary in-place editing profile, as well as the faded color of all other objects in the drawing. Note that while you are in the in-place editing session, you have only limited editing access to other commands in the drawing. Before working on other objects, you should first end the in-place editing session.

4. Edit the profile:

If you want to . . .	Then . . .
use grips to edit the profile	move the grips as needed.

If you want to . . .	Then . . .
add a vertex to the profile	select the profile, right-click and click Add Vertex. Then, add new vertices as needed. End adding new vertices by pressing ENTER.
remove a vertex from the profile	select the profile, right-click and click Remove Vertex. Then, remove vertices as needed. End removing vertices by pressing ENTER.
add a ring to the profile	select the profile, right-click and click Add Ring. Then, select a closed polyline, spline, ellipse, or circle for an additional ring. Specify if you want to erase the source linework, and press ENTER.
remove a ring from a profile	select the profile, right-click and click Remove Ring. Then select the ring you want to remove. **NOTE** You cannot remove the last ring from a profile.
replace a ring on a profile	select the profile, right-click and click Replace Ring. Then, select a closed polyline, spline, ellipse, or circle for the replaced ring. Specify if you want to erase the source linework, and press ENTER.

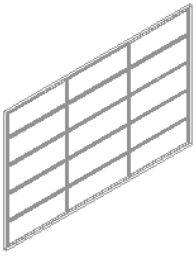
5 Save the changes to the profile.

If you want to . . .	Then . . .
change the existing profile definition to reflect the new shape	select the profile, right-click, and click Save. The in-place edit session is exited and the profile definition is updated.
create a new profile definition with the shape you have created	select the profile, right-click, and click Save As New Profile. Then, enter a name for the new profile and click OK. The in-place edit session is exited and the new profile definition is available in the Style Manager.
discard all changes on the profile and revert back to the previous shape	select the profile, right-click, and click Discard all Changes. The in-place edit session is exited and all changes you have made to the profile are purged.

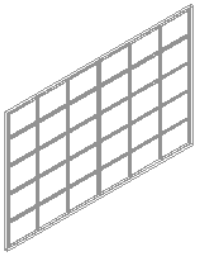
Overriding Curtain Wall Divisions

The grid of a curtain wall is made up of one or more divisions that define how the curtain wall is partitioned. Divisions can be horizontal or vertical, and can be nested in each other. For detailed information on curtain wall divisions, see "Defining Divisions for Curtain Wall Grids" on page 799.

You can override a division in a curtain wall, thereby changing the grid of the curtain wall.



five cell horizontal grid and three cell vertical grid before override



five cell horizontal grid and six cell vertical grid after override

Related Topics

- Creating a Division Override
- In-Place Editing of Curtain Wall Divisions

Creating a Division Override

Use this procedure to create a division override on a curtain wall.

NOTE To exchange a curtain wall division, the new division definition must already be defined in the curtain wall style. For information on curtain wall divisions, see "Defining Divisions for Curtain Wall Grids" on page 799.

---

1. Select the curtain wall for which you want to create a division override.
2. Right-click, and click Division ➤ Override Assignment.
3. Select an edge of the curtain wall to determine if a horizontal or vertical division is overridden.

   For example, if you want to override the primary horizontal division, you could select the bottom horizontal frame of the curtain wall.

   TIP The Division Assignment Override dialog box shows you which grid type and which grid division you have selected, e.g. Selected Nested Grid: Secondary Grid, Division Element Definition: Vertical 3 Cells. If you have accidentally selected the wrong division, click Cancel and reselect the correct grid.

   ---

4. Select the appropriate division override, and click OK.

5 Specify where you want to save the curtain wall override:

If you want to save the override . . .	Then . . .
only on this specific curtain wall	no further steps are necessary. The override is saved to the curtain wall. For information about how to remove an override from a curtain wall, see "Removing Curtain Wall Overrides" on page 878.
to a curtain wall style	select the curtain wall, right-click, and select Design Rules ➤ Transfer to Object.

6 If you have chosen to save the override to a curtain wall style, select the curtain wall again, right-click and click Design Rules ➤ Save to Style and decide to which curtain wall style you want to save the override.

If you want to save the override . . .	Then . . .
to the current curtain wall style	select Transfer Division Overrides to Style, and click OK. **NOTE** If you have created only a profile edge override, only the Transfer Division Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes, too.
to a new curtain wall style	select Transfer Division Overrides to Style, and click New. Then, enter a name for the new curtain wall style, and click OK. **NOTE** If you have created only a profile edge override, only the Transfer Division Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes, too.

NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides remain on the curtain wall, where they can be removed as described in

"Removing Curtain Wall Overrides" on page 878, but they are not saved back to a curtain wall style.

In-Place Editing of Curtain Wall Divisions

Use this procedure to edit divisions using in-place editing.

With in-place editing, you can edit the curtain wall directly and interactively on screen, and later save the changes to the curtain wall or curtain wall style.

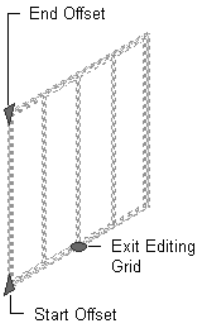
1. Select a curtain wall on which you want to edit divisions onscreen with in-place editing.
2. Specify the mode in which to edit the curtain wall:

If you want to edit . . .	Then . . .
this instance of the curtain wall	right-click, and click Design Rules ➤ Transfer to Object.
the curtain wall style	right-click, and click Design Rules ➤ Revert to Style Design Rules. If this option is not available, the design rules are already style-based for the curtain wall.

3. Click the Edit Grid grip.
4. Select an edge on the division you want to edit.

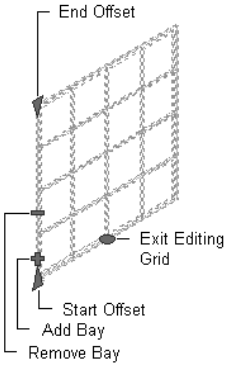
   For example, if you want to edit the primary grid, select an edge on the outer curtain wall frame.

   Viewing edit in-place grips for a primary division



NOTE You have entered the in-place editing session now. You can see this from the faded color of all objects in the drawing, as well as from the different grips at your disposal. Note that while you are in the in-place editing session, you have only limited editing access to other commands in the drawing. Before working on other objects, you should first end the in-place editing session.

Viewing edit in-place grips for adding and removing bays



5 Edit the division:

If you want to . . .	Then . . .
add a bay to the grid	click the Add Bay grip.
remove a bay from the grid	click the Remove Bay grip.
change the start offset of the grid	select the Start Offset grip and move it to the appropriate position.
change the end offset of the grid	select the End Offset grip and move it to the appropriate position.
change the spacing of bays	click the Auto Grid Bay Spacing grip and move it to the appropriate position.
manually edit the grid	right-click and click Convert To Manual. You can manually add and remove gridlines, change the offsets, and change the position of individual gridlines.

If you want to . . .	Then . . .
use a worksheet to edit the cell dimensions	click the Set Fixed Cell Dimension Rules command grip, and edit the values in the worksheet.

6 Save or discard changes to the curtain wall grid:

If you want to exit the in-place editing session . . .	Then . . .
without saving your changes	click on the In-Place Edit toolbar.
after saving your changes	click on the In-Place Edit toolbar. If you edited the grid by instance, the changes are saved to the design rules for the individual grid. If you edited the curtain wall style, the Save Changes dialog box is displayed.

7 In the Save Changes dialog box, specify to which division to save the changes:

If you want to . . .	Then . . .
save the changes to the style in the current curtain wall division	verify the current division is selected for Save Changes to Existing Division, and click Save. The changes are made in the style and affect all curtain walls of that style in the drawing.
create an override to the style by saving the changes in a new curtain wall division	click New, enter a name for the new division override, and click OK. Click Save. The changes are saved as an override to the style, and affect only the curtain walls to which the override is applied.

Removing Curtain Wall Overrides

Use this procedure to remove curtain wall overrides either from the curtain wall or the curtain wall style.

1 Select the curtain wall.

If you want to remove an override . . .	Then . . .
from a curtain wall	select the curtain wall, expand Advanced in the Properties palette, and click Overrides.
from the curtain wall style	select the curtain wall, right-click and click Edit Curtain Wall Style, and then click the Overrides tab.

2 Select an override from the list and click Remove.

3 Click OK.

Modifying Element Definitions for Curtain Wall Styles

Use this procedure to modify existing elements in a curtain wall style. A curtain wall consists of division, infill, frame and mullion elements, all of which are defined in the design rules of the curtain wall style.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Styles.

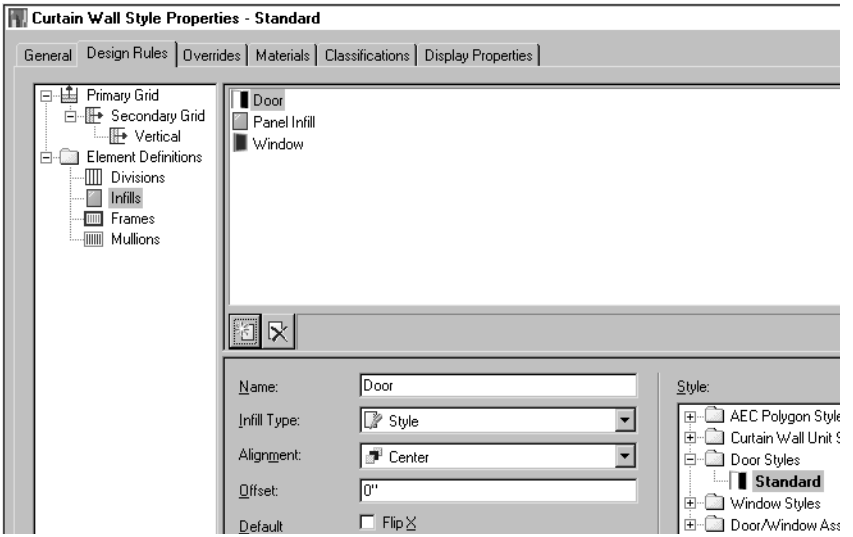
3 Right-click the curtain wall style that you want to change, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, click Element Definitions.

The list of element types is displayed.

Element definitions list



6 Decide the type of elements you want to edit:

If you want to modify . . .	Then . . .
a division definition	click Divisions under Element Definitions. In the right pane, select the division definition you want to modify and edit it as described in "Defining Divisions for Curtain Wall Grids" on page 799.
an infill definition	click Infills under Element Definitions. In the right pane, select the infill definition you want to modify and edit it as described in "Defining Infills for Curtain Wall Cells" on page 812.
a frame definition	click Frames under Element Definitions. In the right pane, select the frame definition you want to modify and edit it as described in "Defining Curtain Wall Frames" on page 818.
a mullion definition	click Mullions under Element Definitions. In the right pane, select the mullion definition you want to modify and edit it as described in "Defining Curtain Wall Mullions" on page 825.

7 Click OK twice.

Editing Curtain Walls

Most relevant settings for a curtain wall are defined in the curtain wall style. These include divisions, infills, frames, and mullions. For information on modifying a curtain wall style, see "Curtain Wall Styles" on page 793.

You can make other changes directly to individual curtain walls. These changes affect only the curtain wall you select:

- Dimensions of a curtain wall
- roof and floor line settings
- Interference conditions
- Cleanup settings

Methods of Editing Curtain Walls

Autodesk Architectural Desktop offers several methods for editing curtain walls:

- You can directly edit curtain walls using grips for dimensions and other physical characteristics.
- You can change curtain wall settings on the Properties palette.
- You can select editing commands from the context menu for a selected curtain wall.

Related Procedures

- Using Grips to Edit Curtain Walls
- Changing the Base Height of a Curtain Wall
- Changing the Length of a Curtain Wall
- Changing the Radius of a Curtain Wall
- Selecting a Different Curtain Wall Style
- Matching the Properties of an Existing Curtain Wall
- Changing the Dimensions of a Curtain Wall
- Reversing the Direction of a Curtain Wall
- Changing the Roof Line and the Floor Line of a Curtain Wall
- Changing the Curtain Wall Location Properties
- Adding an Interference Condition to a Curtain Wall
- Removing an Interference Condition from a Curtain Wall
- Mitering Curtain Walls
- Specifying a Miter Angle for a Curtain Wall Unit Adjacent to Another Object
- Attaching Hyperlinks, Notes, or Files to a Curtain Wall

Using Grips to Edit Curtain Walls

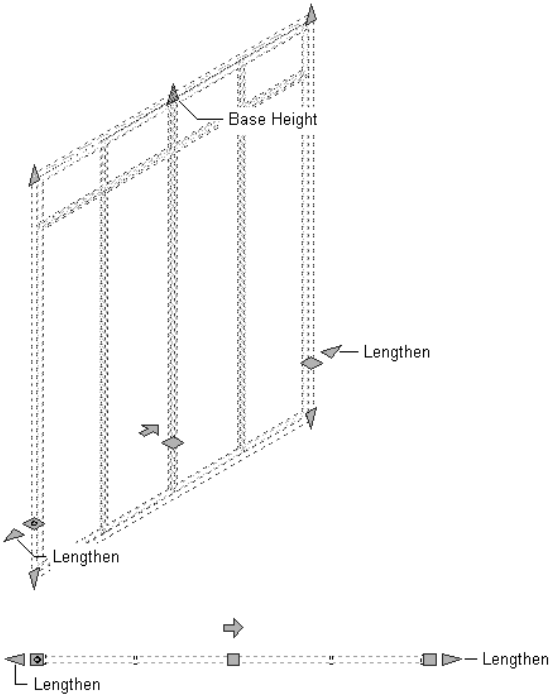
Refer to the illustrations and steps in this topic to use curtain wall grips to edit curtain walls.

Editing Curtain Wall Dimensions

1. Select the curtain wall.
2. Select the grip for the dimension you want to change.

   You can modify the dimensions of the base height, length, roof line, and floor line for a curtain wall.

   Veiwing Curtain Wall Lengthen and Base Height grips



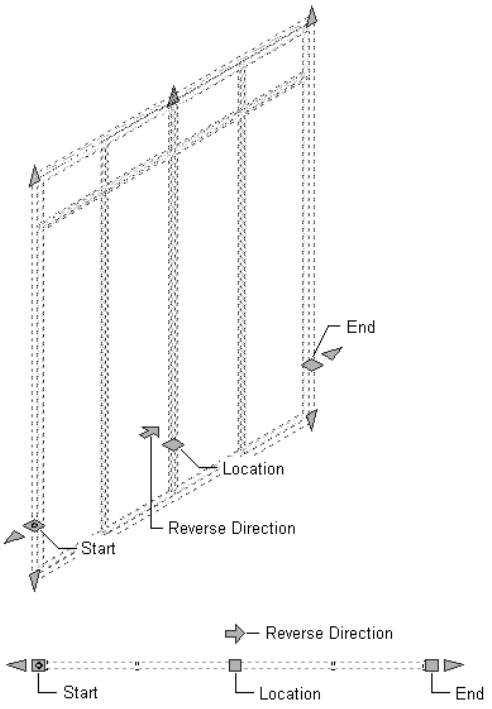
3. Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Changing the Location or Position of a Curtain Wall

1. Select the curtain wall.

2 Move the appropriate grip to change the location of the curtain wall, its start point, or its endpoint.

Viewing Curtain Wall Start, End, Location, and Reverse Direction Grips



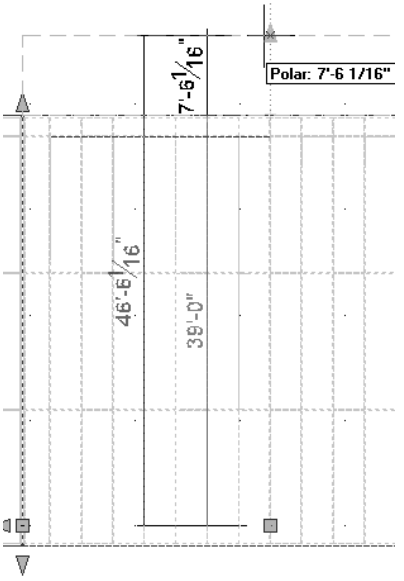
Changing the Base Height of a Curtain Wall

Use this procedure to change the base height of a curtain wall. You can also change the base height on the Properties palette.

1 Select the curtain wall.

2 Select the Base Height grip, move the grip until the height value you want is displayed, and click once.

NOTE As you move the grip, the original base height value is displayed in addition to the new base height and the difference between the two values.



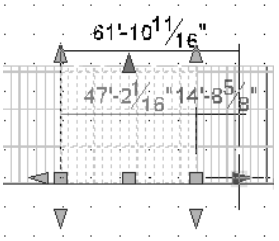
After selecting the grip, you can also enter a new value for the base height of the curtain wall.

Changing the Length of a Curtain Wall

Use this procedure to change the length of a curtain wall. You can also change the length on the Properties palette. For more information, see "Changing the Dimensions of a Curtain Wall" on page 886.

1. Select the curtain wall.
2. Select the Lengthen grip, move the grip until the length value you want is displayed, and click once.

NOTE As you move the grip, the original length value is displayed in addition to the new length and the difference between the two values.



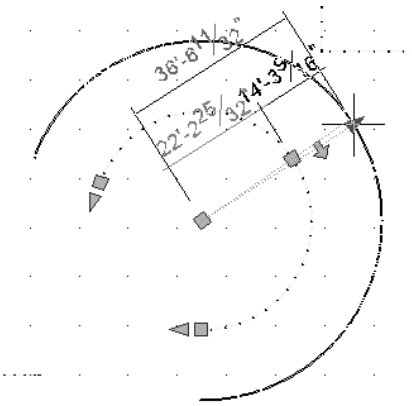
After selecting the grip, you can also enter a new value for the length of the curtain wall.

Changing the Radius of a Curtain Wall

Use this procedure to change the radius of a curved curtain wall. You can also change the radius on the Properties palette. For more information, see "Changing the Dimensions of a Curtain Wall" on page 886.

1. Select the curtain wall.
2. Select the Curve Radius grip, move the grip until the radius value you want is displayed, and click once.

NOTE As you move the grip, the original radius value is displayed in addition to the new radius and the difference between the two values.



After selecting the grip, you can also enter a new value for the radius of the curtain wall.

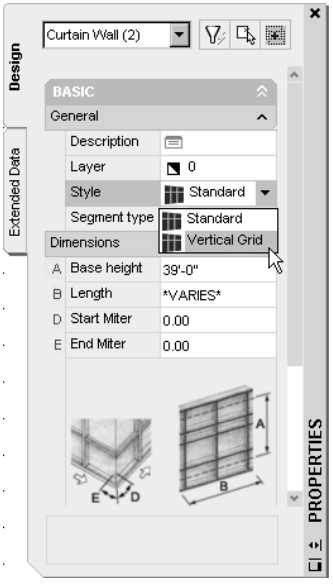
Selecting a Different Curtain Wall Style

Use this procedure to select a different style for the curtain wall.

1. Select the curtain wall for which you want to change the style.

   You can select multiple curtain walls and change the style for all at the same time.

2. On the Properties Palette, scroll to the General subcategory.
3. Select a different style.



Matching the Properties of an Existing Curtain Wall

Use this procedure to apply the properties of a curtain wall tool to one or more existing curtain walls. The properties include the curtain wall style and any other settings specified in the tool you select.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

2. Right-click a curtain wall tool, and click Apply Tool Properties to ➤ Curtain Wall.
3. Select the curtain wall(s), and press ENTER.

The properties of the selected curtain wall(s) match the properties of the curtain wall tool.

Changing the Dimensions of a Curtain Wall

Use this procedure to change the dimensions of a curtain wall.

1. Double-click a curtain wall.
2. Expand Dimensions.
3. Change the dimension:

Dimension	Description
Base Height	Height of the curtain wall from the baseline
Length	Length of a straight curtain wall from the start grip on the baseline to the end grip
Radius (curved curtain walls only)	Radius of a curved curtain wall from the start grip on the baseline to the end grip
Start Miter	Angle of all infills and horizontal edges (frame or mullion) at the start of the curtain wall: for more information about miter angles, see "Mitering Curtain Walls" on page 889
End Miter	Angle of all infills and horizontal edges (frame or mullion) at the end of the curtain wall

Reversing the Direction of a Curtain Wall

Use this procedure to change the direction in which a curtain wall is drawn by reversing the start point and the end point of the curtain wall.

Curtain walls are drawn from the first specified point to the last point. Some commands and properties are affected by that order.

To determine the direction in which a curtain wall was drawn, select the curtain wall. The Reverse Direction grip point points in the direction in which the curtain wall has been drawn.

1. Select the curtain wall for which you want to reverse the direction.
2. Click on the Reverse Direction grip, which is shaped like an arrow.

   The direction of the wall is reversed, which switches the Start and End grips.

Changing the Curtain Wall Location Properties

Use this procedure to relocate a curtain wall by changing the coordinate values of its insertion point. The curtain wall also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the curtain wall are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the curtain wall by aligning its normal with another axis. You can also rotate the curtain wall on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Double-click the curtain wall you want to change.
2. Expand Location.
3. Click Additional information.
4. Specify the location of the curtain wall:

If you want to . . .	Then . . .
relocate the curtain wall	enter new coordinate values under Insertion Point.
locate the curtain wall on the *XY* plane	make the normal of the wall parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the curtain wall on the *YZ* plane	make the normal of the curtain wall parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the curtain wall on the *XZ* plane	make the normal of the curtain wall parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the curtain wall	enter a new value for Rotation Angle.

5. Click OK.

Adding an Interference Condition to a Curtain Wall

Use this procedure to add an interference condition to a curtain wall. Interference conditions use the geometry of 3D objects to create custom openings

or cutouts in curtain walls. You can specify how the interference condition is applied to the curtain wall: added to the curtain wall, subtracted from the curtain wall, or ignored.

You can specify whether the interference condition applies to an infill, frame, or mullions of a curtain wall.

1. Place the object in the location where you want to specify the interference condition.
2. Select the curtain wall to which you want to add an interference condition, right-click, and click Interference ➤ Add.
3. Select the object intersecting the curtain wall, and press ENTER.
4. Specify to which curtain wall component the interference should be added:

If you want to add the interference condition . . .	Then . . .
to the infill	enter **y** (Yes) when prompted for the infill component.
to the frame	enter **y** (Yes) when prompted for the frame component.
to the mullion	enter **y** (Yes) when prompted for the mullion component.

5. Press ENTER.

Removing an Interference Condition from a Curtain Wall

Use this procedure to remove an object, such as a mass element, from a curtain wall that the object was added to as an interference condition.

1. Select the curtain wall from which you want to remove an interference object, right-click, and click Interference ➤ Remove.
2. Select the object intersecting the curtain wall, and press ENTER.

Mitering Curtain Walls

Use this procedure to miter the corners where curtain walls meet. The corner where adjacent curtain walls meet is not mitered by default. However, you can determine the necessary angles automatically.

The miter angle applies to all infills and horizontal edges (frame or mullion) that are adjacent to the corner. Vertical edges are not affected.

TIP If you want to create a custom corner condition between two curtain walls, you can replace the edge of one curtain wall with an AEC profile and remove the edge of the other curtain wall by using the frame override Remove Edge option. For more information, see "Overriding Curtain Wall Frames and Mullions" on page 866 and "Defining Curtain Wall Frames" on page 818.

1. Select one of the curtain walls, right-click, and click Set Miter Angles.
2. Select the other curtain wall.

   If you change the angle of either curtain wall, use Set Miter Angles again to recalculate the angles.

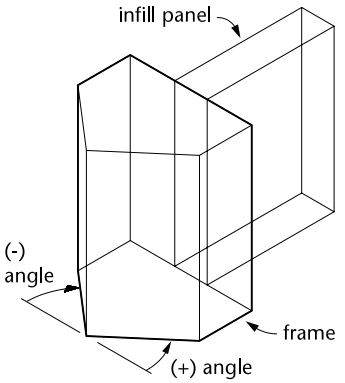
Specifying a Miter Angle for a Curtain Wall Adjacent to Another Object

Use this procedure to manually create a mitered corner between a curtain wall and another object, such as a standard wall or a mass element. For example, if your curtain wall connects with a standard wall that is at a 60-degree angle from the curtain wall, you would set the miter angle to 30.

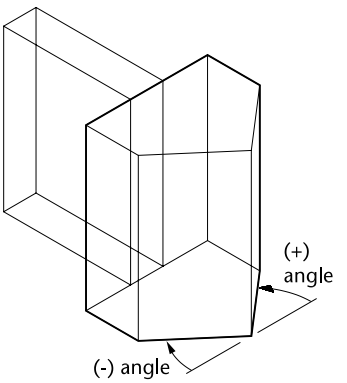
The miter angle applies to all infills and horizontal edges that are adjacent to the corner. Vertical edges are not affected.

TIP To quickly identify the start and end of a curtain wall, select the curtain wall. The Reverse Direction grip points toward the end of the curtain wall.

Frame miter angles for a curtain wall



start miter angle parameters



end miter angle parameters

1 Double-click the curtain wall.

2 Expand Dimensions.

3 Miter the curtain wall on the start or the end point:

If you want to miter the curtain wall . . .	Then . . .
at its start point	enter an angle for Start Miter, and press ENTER.
at its end point	enter an angle for End Miter, and press ENTER.

Attaching Hyperlinks, Notes, or Files to a Curtain Wall

Use this procedure to enter notes and attach reference files to a curtain wall. You can also edit notes and edit or detach reference files from a curtain wall.

1 Double-click the curtain wall.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 To add a note, click the setting for Notes, and enter the text.

5 Click OK.

6 To attach a reference file, click under Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click Open.
edit the description of a reference file	select the file, and click the description. Enter the new text, and press ENTER.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

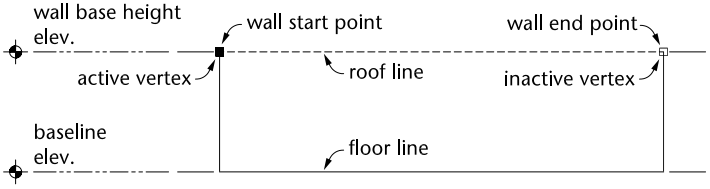
7 Click OK twice.

Changing the Roof Line and the Floor Line of a Curtain Wall

You can modify the roof and floor lines of a curtain wall to create a non-rectangular curtain wall:

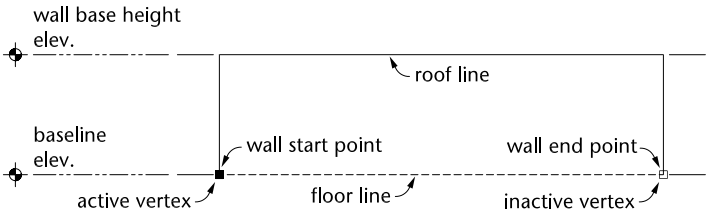
- You edit vertex locations on the roof line to create steps, gables, and other roof conditions.

Modifying the roof line of a curtain wall



- You edit vertex locations on the floor lines to create steps and other floor conditions.

Modifying the floor line of a curtain wall



You can also create non-rectangular roof and floor conditions by projecting to polylines.

Autodesk Architectural Desktop offers multiple methods of editing roof lines and floor lines. You may want to begin by graphically creating a custom roof line or floor line condition. You can then fine-tune that condition by specifying precise values in the Roof/Floor Line worksheet on the Properties palette.

Related Procedures

- Offsetting or Projecting the Roof Line of a Curtain Wall
- Offsetting or Projecting the Floor Line of a Curtain Wall
- Adding a Gable to the Roof Line of a Curtain Wall
- Adding a Step to the Roof Line or Floor Line of a Curtain Wall
- Changing Vertices in the Roof Line or Floor Line of a Curtain Wall
- Changing Vertices in the Roof Line or Floor Line of a Curtain Wall
- Specifying Gable Settings for a Roof Line
- Specifying Step Settings for a Roof Line or Floor Line
- Specifying Vertex Settings for a Roof Line or Floor Line

Offsetting or Projecting the Roof Line of a Curtain Wall

Use this procedure to change the height or the shape of the roof line of a curtain wall:

- Offset the roof line from the current height of the curtain wall.
- Project the roof line of the curtain wall to a polyline.
- Project the roof line of the curtain wall to another object, such as a roof or stairs.

You can also create a polyline that represents the current roof line of the selected curtain wall. You can then use this polyline to change the roof line of other curtain walls.

NOTE To project the roof line to a polyline, draw the polyline first in Elevation view. For best results, the polyline should be parallel to the curtain wall. The polyline does not need to be in the same plane as the curtain wall.

1 Select a curtain wall, right-click, and click Roof Line / Floor Line ➤ Modify Roof Line.

The current roof line is the default value in the curtain wall style.

2 Change the roof line of the wall:

If you want to . . .	Then . . .
offset the roof line from the current height of the curtain wall	enter **o** (Offset), select the curtain walls to change, and enter an offset distance. Enter a negative value to project the roof line below the current curtain wall height.
project the roof line to a polyline	enter **p** (Project), select the curtain walls to change, and select the polyline.
generate a polyline of the current roof line	enter **g** (Generate), and select the curtain walls for the polyline to be created from.
project the roof line to another object, such as a roof or stairs	enter **a** (Auto-project), select the curtain walls to change, and select the object to project to. When projecting to stairs, make sure that the bottom riser or the stringer does not create a zero-height segment of curtain wall.
remove any changes to the roof line	enter **r** (Reset), and select the curtain walls to change.

3 Press ENTER.

The new roof line value is used only on the selected curtain walls. The curtain wall style is unchanged.

Offsetting or Projecting the Floor Line of a Curtain Wall

Use this procedure to change the height or the shape of the floor line of a curtain wall:

- Offset the floor line from the current baseline of the curtain wall.
- Project the floor line of the curtain wall to a polyline.
- Project the floor line of the curtain wall to another object, such as a floor slab or stairs.

You can also create a polyline that represents the current floor line of the selected curtain walls. You can then use this polyline to change the floor line of other curtain walls.

NOTE To project the floor line to a polyline, draw the polyline first in Elevation view. For best results, the polyline should be parallel to the curtain wall. The polyline does not need to be in the same plane as the curtain wall.

1. Select a curtain wall, right-click, and click Roof Line / Floor Line ➤ Modify Floor Line.

   The current floor line is the default value in the curtain wall style.

2. Change the floor line of the curtain wall:

If you want to . . .	Then . . .
offset the floor line from the current baseline of the curtain wall	enter **o** (Offset), select the curtain walls to change, and enter an offset distance. Enter a negative value to offset the floor line below the current baseline.
project the floor line to a polyline	enter **p** (Project), select the curtain walls to change, and select the polyline.
generate a polyline of the current floor line	enter **g** (Generate), and select the curtain walls for the polyline to be created from.
project the floor line to another object, such as a floor slab or stairs	enter **a** (Auto-project), select the curtain walls to change, and select the object to project to.
remove any changes to the floor line	enter **r** (Reset), and select the curtain walls to change.

3 Press ENTER.

The new floor line value is used only in the selected curtain wall. The curtain wall style is unchanged.

Editing the Roof Line or the Floor Line of a Curtain Wall

Use this procedure to edit the geometry of the roof line or the floor line of a curtain wall:

- Add, modify, or remove gables.
- Add, modify, or remove steps.
- Project the roof line or the floor line to a polyline or to other objects, such as roofs, roof slabs, slabs, and stairs.
- Create custom roof line or floor line conditions by adding and adjusting vertices and edges.
- Reverse the roof line or the floor line of the curtain wall without reversing the curtain wall itself.
- Remove all changes to the roof line or the floor line of a curtain wall.

You can also edit the roof line and the floor line on the Roof/Floor Line worksheet on the Properties palette. For more information, see "Changing Vertices in the Roof Line or Floor Line of a Curtain Wall" on page 900.

NOTE If you want to project the roof line or the floor line to a polyline, draw the polyline before you start this procedure.

1 Select the curtain wall that has the roof line or floor line you want to change, right-click, and click Roof/Floor Line ➤ Edit in Place.

A temporary profile is created for you to edit the geometry of the roof line or the floor line.

NOTE After you perform an editing task from the shortcut menu, you may need to select the profile again to perform another editing task. If you do not see the editing commands that you expect on the menu, select the profile, and right-click to display the shortcut menu.

2 Edit the profile:

If you want to . . .	Then . . .
add a gable to the roof line or the floor line	select the profile, right-click, and click Add Gable. Select the roof line or the floor line.
add a step to the roof line or the floor line	select the profile, right-click, and click Add Step. Select the roof line or the floor line.
change the shape of the roof line or the floor line	select the profile, and use Vertex and Edge grips to adjust the shape.
add vertices to the roof line or the floor line	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the roof line or the floor line	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
project the roof line or the floor line to a polyline	select the profile, right-click, and click Project. Select the roof line or the floor line, and select the polyline. Press ENTER to keep the geometry, or enter **n** (No) to erase it.
project the roof line or the floor line to another object, such as a stair or a roof	select the profile, right-click, and click Auto Project. Select the roof line or the floor line, and select the object.
reverse the roof line or the floor line	select the profile, right-click, and click Reverse. Select the roof line or the floor line.
restore the roof line to the base height of the curtain wall, or restore the floor line to the baseline of the curtain wall	select the profile, right-click, and click Remove. Select the roof line or the floor line.

NOTE To add a gable or a step to a roof line or a floor line that has been edited, first use the Remove option on the shortcut menu to remove an existing roof line or floor line condition.

3 Save or discard the changes:

If you want to . . .	Then . . .
restore the roof line and the floor line to their shape before editing	select the profile, and click .
save the changes	select the profile, and click . The curtain wall uses the edited profile to define its geometry.

Changing the Roof Line and the Floor Line

Use this procedure to change the height or the shape of the roof line and the floor line using grips.

1 Select a curtain wall.

2 Select a Roof Line End or Floor Line End grip, move the grip to the appropriate position, and click once.

Adding a Gable to the Roof Line of a Curtain Wall

Use this procedure to add a gable to the roof line of a curtain wall. You can also add a gable on the Roof/Floor Line worksheet on the Properties palette. For more information, see "Specifying Gable Settings for a Roof Line" on page 901.

NOTE This option is available only if the roof line has not been edited. After the roof line changes, you cannot add a gable using this option. To add a gable to a roof line that has been edited, see "Changing Vertices in the Roof Line or Floor Line of a Curtain Wall" on page 900.

1 Select the curtain wall, right-click, and click Roof/Floor Line ➤ Edit in Place.

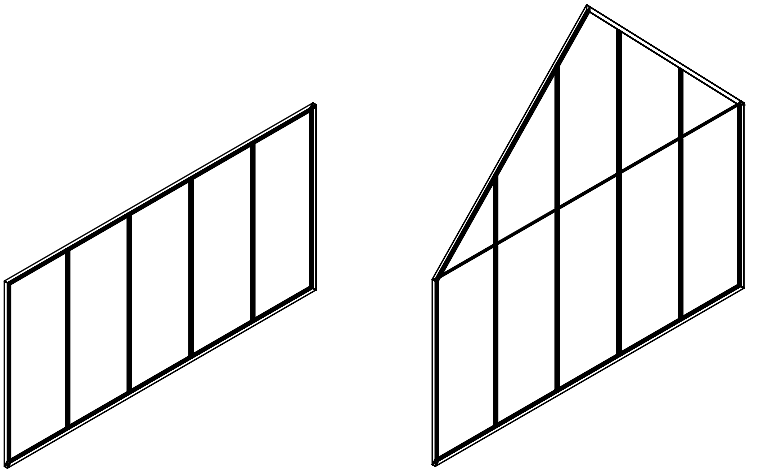
A temporary profile is created for you to edit the geometry of the Roof line.

2 Right-click, and click Add Gable.

If Add Gable is not listed on the menu, the roof line was previously edited.

3 Select the roof line.

Modifying a curtain wall roof line by adding a gable



curtain wall before modification

curtain wall with added gable

A third vertex is added to the roof line halfway between the two ends of the roof line.

4 Continue editing the roof line or the floor line, if needed.

For more information, see "Changing the Roof Line and the Floor Line" on page 897.

5 Save or discard the changes:

If you want to . . .	Then . . .
restore the roof line to its previous shape	select the profile, and click .
save the changes to the roof line	select the profile, and click .

Adding a Step to the Roof Line or Floor Line of a Curtain Wall

Use this procedure to add a step to the roof line or the floor line of a curtain wall. You can also add a step on the Roof/Floor Line worksheet on the Properties palette. For more information, see "Specifying Step Settings for a Roof Line or Floor Line" on page 903.

NOTE This option is available only when the roof line or the floor line has not been edited. After the line has been changed, you cannot automatically add a step using this option. To add a step to a roof line or a floor line that has been edited, see "Changing Vertices in the Roof Line or Floor Line of a Curtain Wall" on page 900.

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1. Select the curtain wall, right-click, and click Roof/Floor Line ➤ Edit in Place.

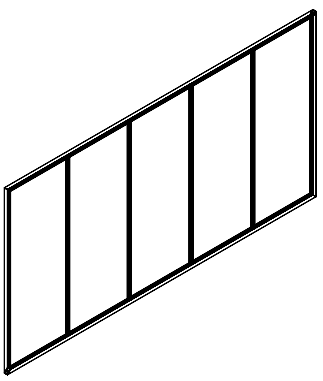
   A temporary profile is created for you to edit the geometry of the roof line or the floor line.

2. Right-click, and click Add Step.

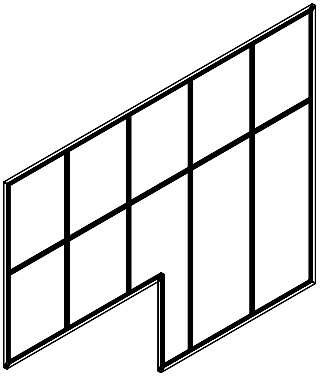
   If Add Step is not listed on the menu, the roof line or the floor line was previously edited.

3. Select the roof line or the floor line.

Modifying a curtain wall floor line by adding a step



curtain wall before modification



curtain wall with added step

A third vertex is added to the line halfway between the two ends of the line and four feet from the line. A step is created from the selected vertex to the second vertex.

4 Continue editing the roof line or the floor line, if needed.

For more information, see "Changing the Roof Line and the Floor Line" on page 897.

5 Save or discard the changes:

If you want to . . .	Then . . .
restore the roof line or the floor line to its previous shape	select the profile, and click .
save the changes to the roof line or the floor line	select the profile, and click .

Changing Vertices in the Roof Line or Floor Line of a Curtain Wall

Use this procedure to perform the following tasks:

- Add, move, or remove vertices and edges in the roof line or the floor line of a curtain wall.
- Add gables or steps to a roof line or steps to a floor line that was previously edited by adding vertices that define these conditions.
- Remove all changes to the roof line or the floor line, restoring the original base height or baseline of a curtain wall.

NOTE You can also edit vertices in a curtain wall with the curtain wall worksheets. For information, see "Specifying Vertex Settings for a Roof Line or Floor Line" on page 904.

1 Select the curtain wall in which you want to edit vertices, right-click, and click Roof Line/Floor Line ➤ Edit in Place.

A temporary profile is created for you to edit the geometry of the roof line or the floor line.

2 Edit the vertices:

If you want to . . .	Then . . .
change the position of a vertex or an edge	select its grip and move it to the appropriate position.
add a vertex	select the profile, right-click, and click Add Vertex. Specify new vertices in the drawing. When you are finished adding vertices, press ENTER.
remove a vertex	select the profile, right-click, and click Remove Vertex. Select the vertices you want to remove. Press ENTER.
restore the original roof line or floor line	select the profile, right-click, and click Remove. Select the roof line or the floor line.

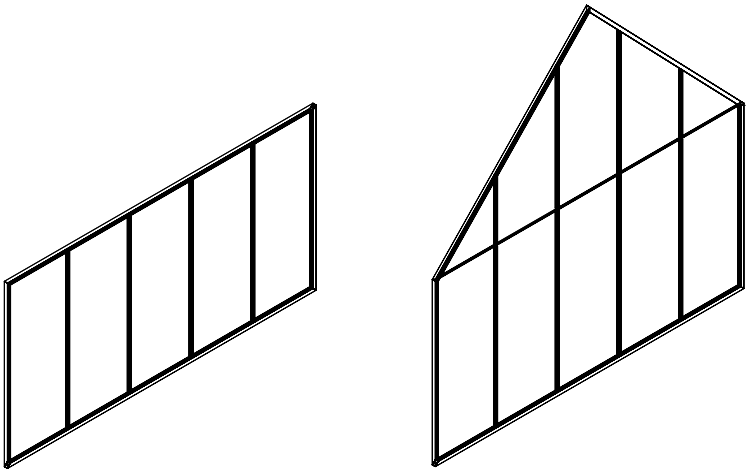
3 Save the changes to the curtain wall:

If you want to . . .	Then . . .
save the changes to the current curtain wall	select the profile, right-click, and click Save All Changes.
discard all changes on the curtain wall and revert back to the previous shape	select the profile, right-click, and click Discard all Changes. Changes you made to the roof line or floor line of the curtain wall are discarded.

Specifying Gable Settings for a Roof Line

Use this procedure to add a gable to the roof line of a curtain wall by adding a vertex to the roofline.

Modifying a curtain wall roof line by adding a gable



curtain wall before modification

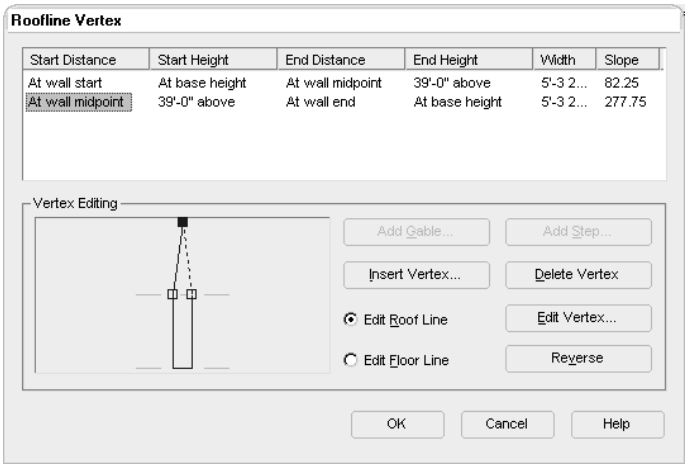
curtain wall with added gable

NOTE This option is available only if the roof line has not been edited. After the roof line changes, you cannot add a gable using this option. To add a gable to a roof line that has been edited, see "Changing Vertices in the Roof Line or Floor Line of a Curtain Wall" on page 900.

1. Double-click the curtain wall.
2. Expand Advanced.
3. Click Roof/floor line.
4. Select Edit Roof Line or Edit Floor Line.
5. Click Add Gable.

   A third vertex is added to the roof line halfway between the two ends of the roof line.

   The table at the top of the dialog box displays information about each vertex in the curtain wall. You can also select the vertex to edit from the list.

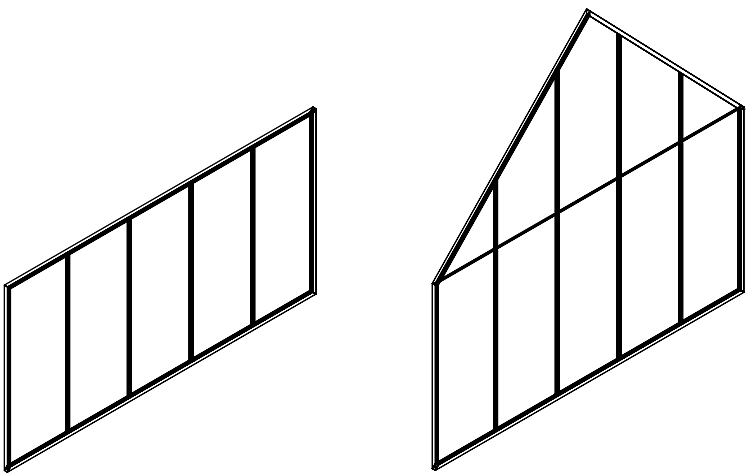


6 Click OK.

Specifying Step Settings for a Roof Line or Floor Line

Use this procedure to add a step to the roof line or the floor line of a curtain wall.

Modifying a curtain wall roof line by adding a gable



curtain wall before modification

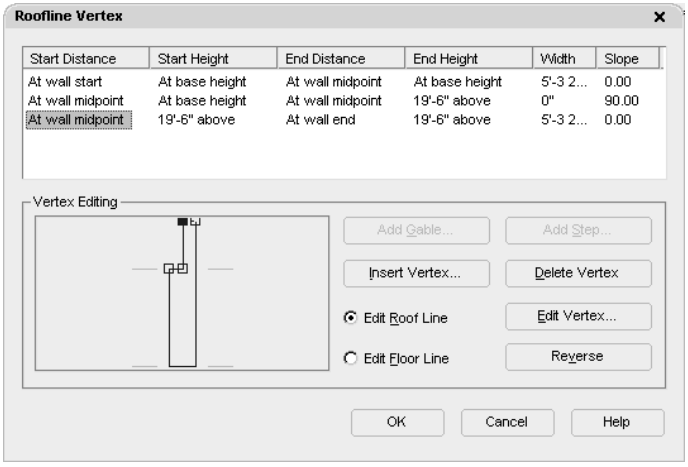
curtain wall with added gable

NOTE This option is available only when the roof line or the floor line has not been edited. After the line has been changed, you cannot automatically add a step using this option. To add a step to a roof line or a floor line that has been edited, see "Changing Vertices in the Roof Line or Floor Line of a Curtain Wall" on page 900

1. Double-click the curtain wall.
2. Expand Advanced.
3. Click Roof/floor line.
4. Select Edit Roof Line or Edit Floor Line.
5. Click Add Step.

   A third vertex is added to the line halfway between the two ends of the line. A step is created from the selected vertex to the second vertex.

   The table at the top displays information about each vertex in the curtain wall. You can select a vertex to edit from the list.



6. Click OK.

Specifying Vertex Settings for a Roof Line or Floor Line

Use this procedure to perform the following tasks:

- Add, move, or remove vertices in the roof line or the floor line of a curtain wall.

- Add gables or steps to a roof line or steps to a floor line that was previously edited by adding vertices that define these conditions.

1. Double-click the curtain wall.
2. Expand Advanced.
3. Click Roof/floor line.
4. Select Edit Roof Line or Edit Floor Line.

   The active vertex in the illustration changes when you select a different line to edit. Any changes you make to the wall are reflected in the illustration.

5. Specify vertex settings:

If you want to . . .	Then . . .
add a vertex	click Insert Vertex. In the Wall Roof/Floor Line Vertex dialog box, specify the horizontal offset and vertical offset for the new vertex, specify a distance, and click OK.
move a vertex	select a vertex from the list, and then click Edit Vertex.
delete a vertex	select a vertex from the list, and then click Delete Vertex. The selected vertex is deleted, and the line automatically connects the two adjacent vertices.

6. Specify the horizontal offset.

   The horizontal offset specifies the existing vertex from which to measure the placement of the next vertex and how far away from the existing vertex to place the new one. Distance is measured in the direction the curtain wall is drawn. You can enter a negative number to offset the vertex in the reverse direction.

7. Specify the vertical offset.

   The vertical offset specifies the location from which to measure the height of the next vertex and how far away from the existing location to place the new vertex. You can enter a negative number to offset the vertex toward the ground.

8. Click OK twice.

Editing Objects Anchored in Curtain Walls

When you fill a curtain wall cell with an infill that contains an object, such as a door or window, you can edit that object independently from the curtain wall. For example, you can select a door from a curtain wall and edit its properties. You can edit the anchor settings for the door to change the orientation of the door and the alignment or offset of the door in relation to the curtain wall.

You can also move objects from one cell to another or release the object anchor so that the object moves independently of the curtain wall.

When you move or release an object or edit its properties, you are creating a variation from the infill cell assignment for the curtain wall style. By default, these variations (except release) are allowed to persist in the drawing when you reapply the style to a curtain wall. However, if you want these variations to be overridden when you reapply a curtain wall style, turn off the Allow Variation from Infill Element Definition option on the Anchor worksheet of the Properties palette of the object. This option is set on a per object basis.

Related Procedures

- Changing the Orientation of an Object Anchored in a Curtain Wall
- Changing the Alignment of an Object Anchored in a Curtain Wall
- Changing the Offset of an Object Anchored in a Curtain Wall
- Swapping Two Objects Anchored in a Curtain Wall
- Releasing an Object Anchored in a Curtain Wall

Changing the Orientation of an Object Anchored in a Curtain Wall

Use this procedure to change the orientation of an object anchored in a curtain wall using grips.

1. Click the object in the curtain wall for which you want to change the orientation.
2. Click the appropriate Flip grip to change the *X* or *Y* direction of the object.

   You can also change the orientation of an object, including the *Z* direction, using the Anchor worksheet found on the object's Properties palette.

Changing the Alignment of an Object Anchored in a Curtain Wall

Use this procedure to modify the alignment of an object that is anchored in a curtain wall.

1. Double-click the object in the curtain wall.
2. Expand Location, and click Anchor.
3. Click Allow Variation from Infill Element Definition.
4. Select a new alignment for the object.

   For more information, see "Specifying an Alignment for a Curtain Wall Infill" on page 815.
5. Click OK.

Changing the Offset of an Object Anchored in a Curtain Wall

Use this procedure to change the offset of an object anchored in a curtain wall.

1. Double-click the object in the curtain wall.
2. Expand Location, and click Anchor.
3. Click Allow Variation from Infill Element Definition.
4. Specify a new offset for the object.

   For more information, see "Specifying an Offset for a Curtain Wall Infill" on page 816.
5. Click OK.

Swapping Two Objects Anchored in a Curtain Wall

When you fill a curtain wall cell with an object, such as a door or window, you can swap that object with another object in the curtain wall.

1. Select one of the objects from the curtain wall and click Infill Anchor ➤ Swap Objects.
2. Select the object you want to swap with.

Releasing an Object Anchored in a Curtain Wall

When you fill a curtain wall cell with an object, such as a door or window, that object is anchored to the curtain wall. While the anchor is in place, the object moves when you move the curtain wall and is removed when you erase the curtain wall. If you want to move or erase an object independently from the curtain wall, you can release the anchor of the object.

NOTE You can also move or erase the object by changing the element definition for the cell that contains the object. For more information, see "Defining Infills for Curtain Wall Cells" on page 812.

- Select one of the objects from the curtain wall, and click Infill Anchor ➤ Release.

Curtain Wall Units

Curtain wall units are an important building block of curtain walls.

The Concept of Curtain Wall Units

Curtain wall units can significantly reduce the complexity of the curtain wall design and, thereby, the necessary design time.

You can think of a curtain wall unit as a "mini" curtain wall itself, which can have frames, mullions and divisions, but is normally not a standalone building object. A curtain wall unit is used in the larger context of a curtain wall. You usually assign curtain wall units to specific cells within a curtain wall grid. For more information, see "Inserting an Object into a Curtain Wall Cell" on page 839.

Curtain Wall Unit Styles

Curtain wall units are style-based, permitting maximum efficiency and flexibility. Curtain wall unit styles are created and edited independently from the curtain wall style. You can use a curtain wall unit style in different curtain wall styles. For example, you can create a decorative three-tiled panel as a curtain wall unit and use that for several curtain wall styles.

Curtain Wall Units and Door/Window Assemblies

Curtain wall units and door/window assemblies are very similar in their functionality. Both can contain nested grids and be anchored as building blocks in curtain walls. A curtain wall unit, however, can contain no objects, such as windows or doors, but only panel infills. Furthermore, a curtain wall unit

usually is not used as a standalone object, whereas a door/window assembly could be.

Curtain Wall Unit Grids

Like curtain walls, curtain wall units are made up of one or more grids. Each grid has either a horizontal division or a vertical division, but you can nest the grids to create a variety of patterns.

Using curtain wall units in a curtain wall can help you limit the complexity in the curtain wall design.

Elements of Grids

Grids are the foundation of curtain walls and curtain wall units. Every grid has four element types:

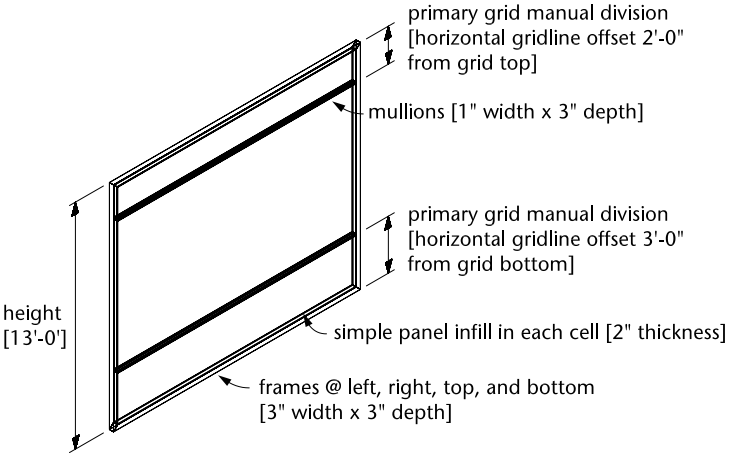
- **Divisions:** Define the direction of the grid (horizontal or vertical) and the number of cells
- **Cell Infills:** Contain another grid, a panel infill, or an object such as a window or a door
- **Frames:** Define the edge around the outside of the primary grid and nested grids
- **Mullions:** Define the edges between the cells

NOTE Division is an abstract element, in contrast to the other three element types that represent physical elements of the curtain wall unit.

Each element type is assigned a default definition that describes what elements of that type look like.

Element type	Default definitions
Divisions	Horizontal grid with two manual divisions offset from the top and bottom of the grid
Cell Infills	Cells containing simple panels
Frames	Outer edges of grid 3" wide and 3" deep
Mullions	Edges between cells 1" wide and 3" deep

Curtain wall units default element definitions



Getting Started with Curtain Wall Units

To get started with curtain wall units, draw a curtain wall unit using one of the methods described in "Creating Curtain Wall Units" on page 910. Try a variety of the existing curtain wall unit styles, find a style you like and make a copy of it. Then, modify the element definitions and assignments to suit your own needs. For more information, see "Creating Element Definitions for a Curtain Wall Unit Style" on page 916.

For more information about element definitions and assignments, see "Creating Element Definitions for a Curtain Wall Unit Style" on page 916 and "Assigning Infills to Curtain Wall Unit Cells" on page 946.

Creating Curtain Wall Units

Creating curtain wall units is similar to creating curtain walls. You specify a style, a height, and start and end points. You can also create curtain wall units by converting a 2D layout grid to a curtain wall or converting two-dimensional (2D) lines, arcs, and circles. Unlike curtain walls, you cannot create a curtain wall unit based on a curve. Curtain wall units can only be planar.

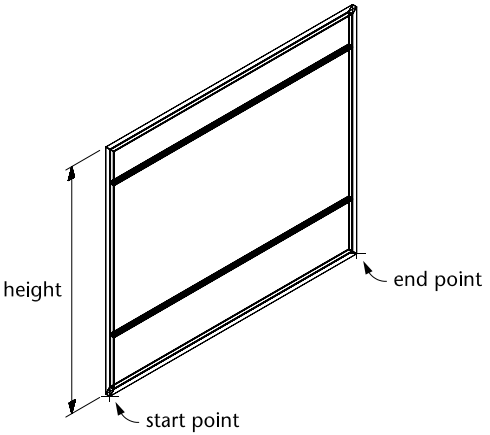
Related Procedures

- Creating a Curtain Wall Unit
- Converting a Layout Grid to a Curtain Wall Unit

Creating a Curtain Wall Unit

Use this procedure to create a curtain wall unit.

Drawing a curtain wall unit



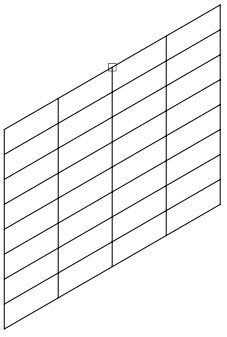
1. At the command line, enter **cwunit**.
2. Enter **a** (Add).
3. Select a start point and an end point.
4. Specify a height for the curtain wall unit.
5. Select a style, and click OK.

For information about curtain wall unit styles, see "Curtain Wall Unit Styles" on page 915.

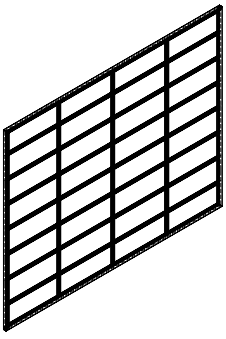
Converting a Layout Grid to a Curtain Wall Unit

You can create a curtain wall unit grid that is based on a 2D layout grid. If you already have 2D layout grids in a drawing, you can easily convert them to curtain wall units. Or if you are already familiar with layout grids, it is an efficient way to create a curtain wall unit, and then experiment with the curtain wall commands to learn more about them.

Converting a 2D layout grid to a curtain wall unit



select 2D layout grid



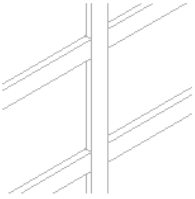
resulting curtain wall unit

When you create a curtain wall unit from a 2D layout grid, you also create a new curtain wall unit style. The divisions in the new curtain wall unit style are taken from the divisions in the layout grid.

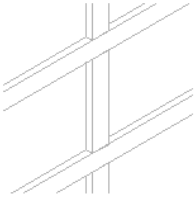
Curtain wall unit grids are one-dimensional, divided either horizontally or vertically. To create the horizontal and vertical patterns in the 2D layout grid, the curtain wall unit uses a primary grid with a secondary grid nested inside it. For more information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

When you create a curtain wall unit grid from a 2D layout grid, you need to decide the direction of the primary grid in the curtain wall unit. If you select horizontal, the primary grid has horizontal divisions that cross over the vertical divisions of the secondary grid. If you select vertical, the primary grid has vertical divisions that cross over the horizontal divisions of the secondary grid.

Specifying primary division directions



vertical grid divisions



horizontal grid divisions

The horizontal and vertical lines of the 2D layout grid define the divisions for the curtain wall unit grids. The grid cells, frame, and mullions are assigned default definitions.

1. Create a layout grid.

   For more information, see "Using Layout Grids" on page 1253.

2. At the command line, enter **cwunit**.
3. Enter **c** (Convert).
4. Enter **LA** (LAyoutGrid).
5. Select the layout grid.
6. To erase the layout grid, enter **y** (Yes). To have the layout grid remain after the curtain wall unit is created, enter **n** (No).
7. When prompted for the primary division, enter **v** (Vertical) or **h** (Horizontal) as the orientation.
8. Enter a name for this new curtain wall unit style.
9. Click OK, and press ENTER to end the command.

Creating a Curtain Wall Unit with a Custom Grid

Curtain wall units contain one or more grids. You can define a custom grid with lines, arcs, and circles, and then convert that linework into a curtain wall unit.

NOTE Curtain wall unit grids are either horizontal or vertical. To create a grid pattern with horizontal and vertical cells, nested grids are used. For more information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

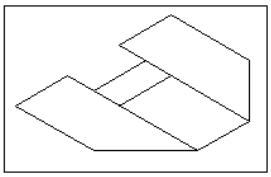
You cannot modify the division definition of a custom grid created from lines, arcs, and circles. You can, however, assign a different division definition to it. For more information, see "Assigning a Division to a Curtain Wall Unit Grid" on page 945.

1. Use lines, arcs, and circles to draw a grid in the current world coordinate system (WCS).
2. At the command line, enter **cwunit**.
3. Enter **c** (Convert).
4. Enter **LI** (LInework).
5. Select the lines, arcs, or circles that define your grid.

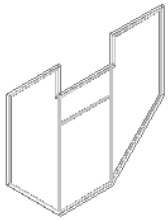
6 Press ENTER.

7 Select one of the grid lines as the baseline for the curtain wall or press ENTER to use the line along the *X* axis as the baseline.

Converting linework to curtain walls units using the default baseline option



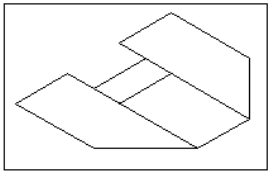
select elevation linework



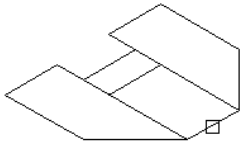
result

TIP If you draw your linework in the XY plane (in Plan view) and accept the default baseline, the resulting curtain wall unit is displayed as it is projected in the Z direction.

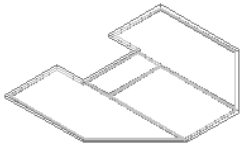
Converting linework to curtain walls using the specified baseline option



select elevation linework



specify baseline



result

8 To erase the lines, enter **y** (Yes). To have the lines remain after the curtain wall unit is created, enter **n** (No).

Each enclosed area is assigned the default cell infill. The lines between the cells are assigned the default mullion definition, and the boundary around the grid is assigned the default frame definition. For more information, see "Assigning Definitions to Curtain Wall Elements" on page 832.

9 Select the resulting custom curtain wall unit, right-click, and click Design Rules ➤ Save to Style.

10 Click New to create a new curtain wall unit style.

11 Enter a name for the new curtain wall unit style.

12 Click OK twice.

Curtain Wall Unit Styles

Curtain wall units are style-based, meaning there are preset characteristics assigned to each curtain wall unit that determine its appearance and function. By changing from one style of curtain wall unit to another, you can quickly study several different design options. Any changes you make to the style are reflected throughout your building, updating all curtain walls that use that particular curtain wall unit style. You can also apply overrides to a single curtain wall unit, without changing other curtain walls of the same style.

A curtain wall unit style controls the following properties of a curtain wall:

- Element definitions
- Definition assignments for each element
- Materials for each element
- Display properties for each element
- Notes about the style and any associated reference files

To create, edit, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Creating Element Definitions for a Curtain Wall Unit Style
- Creating a Curtain Wall Unit Style
- Defining Divisions for Curtain Wall Unit Grids
- Defining Infills for Curtain Wall Unit Cells
- Defining Curtain Wall Unit Frames
- Defining Curtain Wall Unit Mullions
- Assigning a Division to a Curtain Wall Unit Grid
- Assigning Infills to Curtain Wall Unit Cells

- Assigning Definitions to Curtain Wall Unit Frames
- Assigning Definitions to the Mullions of a Curtain Wall Unit
- Specifying the Materials of a Curtain Wall Unit Style
- Specifying the Display of Curtain Wall Units
- Attaching Notes and Files to a Curtain Wall Unit Style

Creating Element Definitions for a Curtain Wall Unit Style

Element definitions determine the appearance of the four basic curtain wall unit elements. There is a different definition type for each element.

Element type	Default definitions
Divisions	Horizontal grid with two manual divisions offset from the top and the bottom of the grid
Cell Infills	Cells containing simple panels
Frames	Left, right, top, and bottom outer edges of grid 3" wide and 3" deep
Mullions	Edges between cells 1" wide and 3" deep

Each type of element can have multiple definitions. For example, you can define a division to create a horizontal grid or a vertical grid, and you can define the cells to contain a nested grid or a panel infill. To make reuse easier, you can save the element definitions, and then assign them to grids, cells, frames, or mullions as needed.

Element definitions are style-specific. When you create element definitions for a specific curtain wall unit style, those definitions are available only for curtain wall units of that style. For example, if you define a panel infill for one curtain wall unit style, that infill is not available as an option when you edit a curtain wall unit of a different style.

For information about defining the color, linetype, or layer of curtain wall elements, see “Specifying the Display of Curtain Wall Units” on page 962.

Creating a Curtain Wall Unit Style

Use this procedure to create a curtain wall unit style. You can create a style using default style properties or by copying an existing style. After you create

the style, you edit the style properties to customize the characteristics of the style.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.

3 Create a new curtain wall style:

If you want to create a style . . .	Then . . .
with default properties	right-click Curtain Wall Unit Styles, and click New.
from an existing style	right-click the curtain wall unit style you want to copy, and click Copy. Right-click, and click Paste.
from a curtain wall, curtain wall unit, or door/window assembly in the drawing	right-click Curtain Wall Unit Styles, and click New. Right-click the new style, click Set From, and then pick a curtain wall, a curtain wall unit, or a door/window assembly.

4 Enter a name for the new curtain wall unit style, and press ENTER.

5 To edit the new curtain wall unit style, right-click the style, and click Edit:

If you want to . . .	Then . . .
define the elements of a curtain wall unit style	see "Defining Divisions for Curtain Wall Unit Grids" on page 918, "Defining Infills for Curtain Wall Unit Cells" on page 927, "Defining Curtain Wall Unit Frames" on page 932, and "Defining Curtain Wall Unit Mullions" on page 939.
assign element definitions to the curtain wall unit style	see "Assigning a Division to a Curtain Wall Unit Grid" on page 945, "Assigning Infills to Curtain Wall Unit Cells" on page 946, "Assigning Definitions to Curtain Wall Unit Frames" on page 952, and "Assigning Definitions to the Mullions of a Curtain Wall Unit" on page 956.
add curtain wall element definitions as display components	see "Adding Curtain Wall Unit Element Definitions as Display Components" on page 963.
specify layer, color and linetype settings for the display components of a curtain wall	see "Specifying the Layer, Color, and Linetype of a Curtain Wall Unit Style" on page 964.

If you want to . . .	Then . . .
specify curtain wall unit hatching	see "Specifying the Layer, Color, and Linetype of a Curtain Wall Unit Style" on page 964.
add custom graphics as display components of a curtain wall unit style	see "Adding Custom Graphics as a Display Component of a Curtain Wall Unit" on page 966.
create individual cut planes for curtain wall unit styles	see "Creating Cut Planes for a Curtain Wall Unit" on page 967.
add notes and files to the style	see "Attaching Notes and Files to a Curtain Wall Unit Style" on page 968.

6 Click OK twice.

Defining Divisions for Curtain Wall Unit Grids

The divisions of a grid define the orientation that determines the direction of the grid cells and mullions, and they define a division type that determines the number and size of cells.

NOTE Creating a nested grid is not a division rule. To create a nested grid, add a cell assignment. For more information, see "Creating a Nested Grid in a Curtain Wall Unit" on page 947 and "Working with Nested Grids in Curtain Walls" on page 834.

You can create a variety of division definitions under different names, and then assign different divisions to each grid in your curtain wall unit. Although you can create multiple definitions, there can be only one division assignment per grid. You create division definitions for a specific curtain wall unit style and those definitions can be assigned only to grids in curtain wall units of that style.

For more information about assigning divisions to a particular grid, see "Assigning a Division to a Curtain Wall Unit Grid" on page 945.

Related Procedures

- Division of Curtain Wall Unit Grids
- Creating a Division Definition for a Curtain Wall Unit
- Specifying a Fixed Size for Cells in a Curtain Wall Unit Grid
- Specifying a Fixed Number of Cells for a Curtain Wall Unit Grid

- Manually Defining the Number and Size of Cells in a Curtain Wall Unit Grid
- Specifying an Offset for a Curtain Wall Unit Grid
- Removing a Division Definition from a Curtain Wall Unit Style

Division of Curtain Wall Unit Grids

A curtain wall unit consists of one or more grids, which are the framework for placing design elements in the curtain wall unit. The highest-level grid is the primary grid, which is also the outside edge of the curtain wall unit.

Each grid in a curtain wall unit has one division assignment that determines whether the grid is divided horizontally or vertically. The division also determines the number of cells, their size and their placement.

Within the primary grid, you can define multiple levels of grids. These grids within are called nested grids. Each subdivision of a grid is called a cell.

Creating a Division Definition for a Curtain Wall Unit

Use this procedure to create divisions for a curtain wall unit grid.

Because curtain wall units can contain multiple nested grids, it is helpful to use a naming convention for grids that indicates the level of each grid and the grid location or the purpose within the curtain wall unit. For example, L3-FL1-Stone Panels can identify a third level grid that provides a row of stone panels on Floor 1.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Click New Division.
7. Enter a name for this division definition.
8. Click either Horizontal or Vertical for Orientation.
9. Select one of the following division types and specify offsets if needed.

Division Type	Description
Fixed Cell Dimension	Creates a grid where the size of the individual cells is predetermined. For more information, see "Specifying a Fixed Size for Cells in a Curtain Wall Unit Grid" on page 920.

Division Type	Description
Fixed Number of Cells	Creates a grid where the number of grid cells is predetermined. For more information, see "Specifying a Fixed Number of Cells for a Curtain Wall Unit Grid" on page 923.
Manual	Creates a grid where the size and number of individual cells is manually determined by the user. For more information, see "Manually Defining the Number and Size of Cells in a Curtain Wall Unit Grid" on page 924.

After you create a division definition, you can assign the definition to a specific grid in a curtain wall unit. For more information, see "Assigning a Division to a Curtain Wall Unit Grid" on page 945.

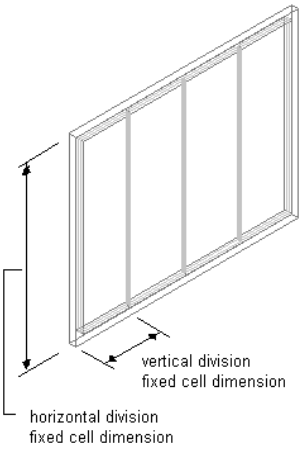
10 When you are finished creating division definitions, click OK twice.

Specifying a Fixed Size for Cells in a Curtain Wall Unit Grid

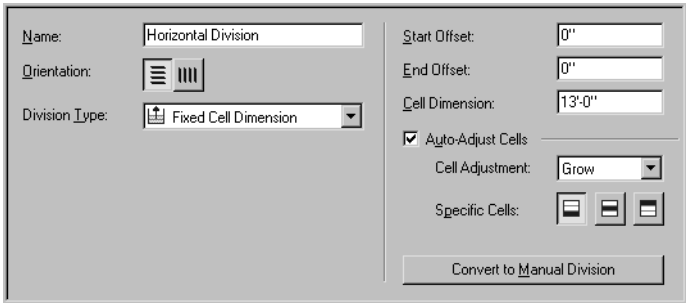
Use this procedure to define a specific size for the cells in a grid. In this case, the number of cells is determined by the length or height of the grid, depending on how the grid is divided.

When you specify a fixed cell size in a grid, you can control how the cells of the grid adjust to accommodate any leftover space. This space occurs if the length (or the height) of the curtain wall unit cannot be evenly divided by the fixed size of the cell. For more information, see "Using the Auto-Adjust Cells Option to Resize Cells in a Curtain Wall Unit Grid" on page 922.

Specifying a fixed size for cells



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Fixed Cell Dimension for Division Type.



8. Specify a size for the cells in Cell Dimension.

   If you are defining a vertical division, the cell dimension is the length of the cell from mullion to mullion. If you are defining a horizontal division, the cell dimension is the height of the cell.

9 To specify an offset for the grid, enter an offset distance in Start Offset or End Offset. For more information, see "Specifying an Offset for a Curtain Wall Unit Grid" on page 926.

TIP The frame width is calculated as part of the cell size. Therefore, cells adjacent to the frame can appear to be a different size than the other cells. If you do not want the frame width included in the cell size, specify an offset for the grid that is equal to the frame width.

When you draw a curtain wall unit using a fixed cell dimension, there is often extra space between the last full-size cell and the end of the curtain wall unit.

10 To adjust the cells and accommodate this extra space automatically as you draw curtain wall units, select the Auto-Adjust Cells option.

11 Adjust the cells to accommodate this extra space:

If you want to . . .	Then . . .
add the space to grid cells	select Auto-Adjust Cells, select Grow for Cell Adjustment, and select the specific cells where the space is added. You can select any combination of specific cells.
remove the space from grid cells	select Auto-Adjust Cells, select Shrink for Cell Adjustment, and select the specific cells where the space is removed. You can select any combination of specific cells.

For information about offsets, see "Specifying an Offset for a Curtain Wall Unit Grid" on page 926.

12 Click OK.

For information about assigning the division definition to a specific grid in your curtain wall unit, see "Assigning a Division to a Curtain Wall Unit Grid" on page 945.

Using the Auto-Adjust Cells Option to Resize Cells in a Curtain Wall Unit Grid

Use this procedure to automatically resize cells in a grid when the result of dividing the grid by the specified cell dimension is not a whole number.

For example, if a vertical primary grid in a curtain wall unit style is 17 feet in length and you specify a fixed cell dimension of 3 feet, the grid has five cells of 3 feet each with 2 feet remaining. Using the Auto-Adjust Cells option, you can specify how the grid distributes the remaining quantity.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Divisions definition or create a new one.
7. Select Fixed Cell Dimension as the division type.
8. Select Auto-Adjust Cells, and specify the cell adjustment:

If you want to . . .	Then . . .
add the remaining space to grid cells	select Grow, and select the specific cells to which you want the space added.
remove the remaining space from grid cells	select Shrink, and select the specific cells from which you want the space removed. You can then select Maintain at least half of cell dimension in order to control the cell shrinkage.

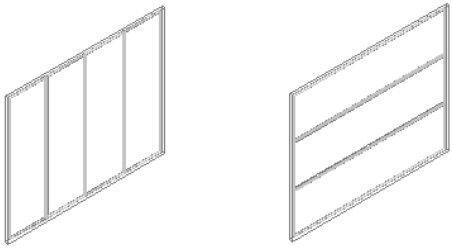
The cells that you do not select maintain the fixed value you specified for Cell Dimension.

Specifying a Fixed Number of Cells for a Curtain Wall Unit Grid

Use this procedure to define a specific number of cells in a grid. In this case, the size of the cells is determined by the length or height of the grid, depending on how the grid is divided.

In some cases, when you create a complex curtain wall unit grid, you might want to start with a standard grid with a fixed number of cells, and then later fine-tune that manually. You can first create a grid with fixed cell numbers and then convert that to a manual grid. For information on manual grids, see "Manually Defining the Number and Size of Cells in a Curtain Wall Unit Grid" on page 924.

Specifying a fixed number of cells



vertical divisions with four cells

horizontal divisions with three cells

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Fixed Number of Cells for Division Type.
8. Specify the number of cells.
9. To specify an offset for the grid, enter an offset distance for Start Offset or End Offset. For more information, see "Specifying an Offset for a Curtain Wall Unit Grid" on page 926.

NOTE If you want to fine-tune the initial layout with a fixed number of cells, click Convert To Manual Division and edit the grid as described in"Manually Defining the Number and Size of Cells in a Curtain Wall Unit Grid" on page 924.

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10. Click OK.

For information about assigning the division definition to a specific grid in your curtain wall unit, see "Assigning a Division to a Curtain Wall Unit Grid" on page 945.

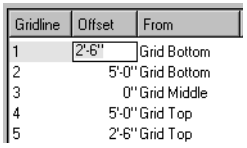
Manually Defining the Number and Size of Cells in a Curtain Wall Unit Grid

Use this procedure to manually add gridlines and specify an offset for each one when you need to create a unique grid that does not fit into any of the other division types. You can also start with a fixed cell dimension grid or a

fixed number of cells grid, and then manually adjust the grid lines to suit your needs.

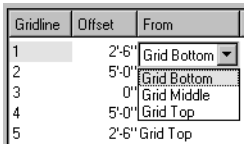
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Manual for Division Type.
8. Click the Add Gridline icon to insert a grid line. Insert as many grid lines as you need. If you need to remove a grid line, select it from the table and click the Remove Gridline icon.
9. Under Offset in the gridline table, specify an offset distance for each grid line.

   Gridline offset



10. Under From in the grid line table, select the grid location from which the grid line is offset.

    Offset grid line from option



11. To specify an offset for the grid, enter an offset distance for Start Offset or End Offset.

    For more information, see "Specifying an Offset for a Curtain Wall Unit Grid" on page 926.

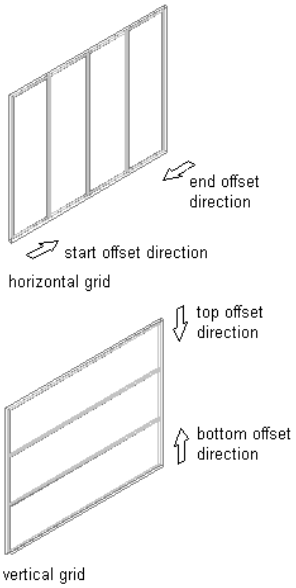
12. Click OK.

    For information about assigning the division definition to a specific grid in your curtain wall, see "Assigning a Division to a Curtain Wall Unit Grid" on page 945.

Specifying an Offset for a Curtain Wall Unit Grid

By default, grids cells are measured from the start and end points of the curtain wall unit baseline. The width of the grid frame is not considered in calculating the size of the cell. For example, if you draw a curtain wall unit with a 14' baseline and a 1' frame on the left and right, and you specify a fixed number of vertical cells, the cells do not appear equal in size. The first and last cells appear smaller because they include the frame. To make the cells equal in size, offset the start and end of the grid by the width of the frame.

Specifying grid offset directions



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.

7 Specify an offset for the grid:

If you want to specify the distance between . . .	Then . . .
the start point of the curtain wall baseline and the start of the first cell in a horizontal grid	enter a value for Start Offset.
the end point of the curtain wall baseline and the end of the last cell in a horizontal grid	enter a value for End Offset.
the floor line of the curtain wall and the start of the first cell in a vertical grid	enter a value for Bottom Offset.
the roof line of the curtain wall and the end of the top cell in a vertical grid	enter a value for Top Offset.

8 Click OK twice.

Removing a Division Definition from a Curtain Wall Unit Style

Use this procedure to remove a division definition that you no longer need. You cannot remove a division definition when it is currently assigned to a grid. In addition, you cannot remove the default division definition, but you can modify it.

1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3 Select a curtain wall unit style, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select Divisions under Element Definitions.
6 Select a Division definition that you want to remove.
7 Click Remove Division.
8 Click OK twice.

Defining Infills for Curtain Wall Unit Cells

An infill defines the contents of a curtain wall unit cell. A curtain wall unit cell can be empty (no infill), can contain a grid (nested grid), or can contain a panel. Panels typically represent glazing or other plain cladding, such as stone or concrete.

Curtain wall units cannot contain object infills like doors or windows. If you want to create a subunit for a curtain wall that contains a combination of windows, doors, and panels, you must create a door/window assembly. For information on door/window assemblies see "Door/Window Assemblies" on page 1089.

NOTE Nested grids and no infill are options you select when assigning an infill to cell. These options do not require infill definitions. For information, see "Creating a Nested Grid in a Curtain Wall Unit" on page 947 and "Removing an Infill Definition from a Curtain Wall Unit Style" on page 932.

You can define as many infills as you need, and then use cell assignments to specify the cells that use each infill. You can modify, a default infill that is used for all unassigned cells.

NOTE Create infill definitions for a specific curtain wall unit style. Those definitions can be assigned only to grid cells in curtain wall units of that style.

Materials

Styles use the materials of the object style assigned to each panel. For example, if you specify an infill to use the Standard door/window assembly style, the materials of that infill are those designated in the door/window assembly style. Simple panels need material assigned in the curtain wall style.

If you do not use materials to control the display properties of infills, you can specify their display properties in the curtain wall unit style. The layer, color, linetype, and other display properties of the default infill are applied to all infills unless you create a custom display component for each infill definition. You can then control the display of each infill definition independently. For more information, see "Specifying the Display of Curtain Wall Units" on page 962.

Related Procedures

- Creating a Panel Infill for a Curtain Wall Unit
- Specifying an Alignment for a Curtain Wall Unit Infill
- Specifying an Offset for a Curtain Wall Unit Infill
- Removing an Infill Definition from a Curtain Wall Unit Style

Creating a Panel Infill for a Curtain Wall Unit

Use this procedure to create a simple panel infill to represent basic cladding materials in the curtain wall, such as a stone wall panel, concrete panel, metal panel, or glazing infill.

Because curtain wall units can contain multiple infills, it is helpful to use a naming convention for panel infills that indicates the infill location or purpose within the curtain wall unit. For example, L3-FL1- Stone Panel can identify a stone panel in a third-level grid on Floor 1.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Click New Infill.
7. Enter a descriptive name for the infill.
8. Specify an alignment for the infill.

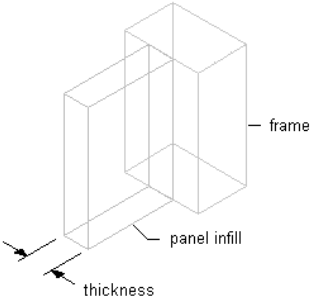
   For more information, see "Specifying an Alignment for a Curtain Wall Unit Infill" on page 930.

9. Specify an offset for the infill.

   For more information, see "Specifying an Offset for a Curtain Wall Unit Infill" on page 930.

10. Specify a thickness for the panel.

    Specifying infill panel thickness



11. Click OK twice.

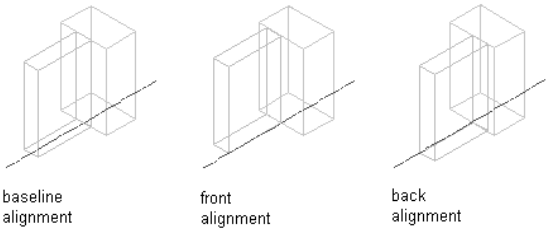
After you create an infill definition, you can assign it to any cell in a curtain wall unit grid. For more information, see "Assigning Infills to Curtain Wall Unit Cells" on page 946.

Specifying an Alignment for a Curtain Wall Unit Infill

Use this procedure to align an infill so that it is centered with the baseline of the curtain wall unit, in front of the baseline, or behind the baseline. In Plan view, the front of a curtain wall unit (drawn from left to right) is below the baseline and the back is above the baseline.

NOTE To move the infill away from the baseline, see "Specifying an Offset for a Curtain Wall Unit Infill" on page 930.

Specifying infill alignments

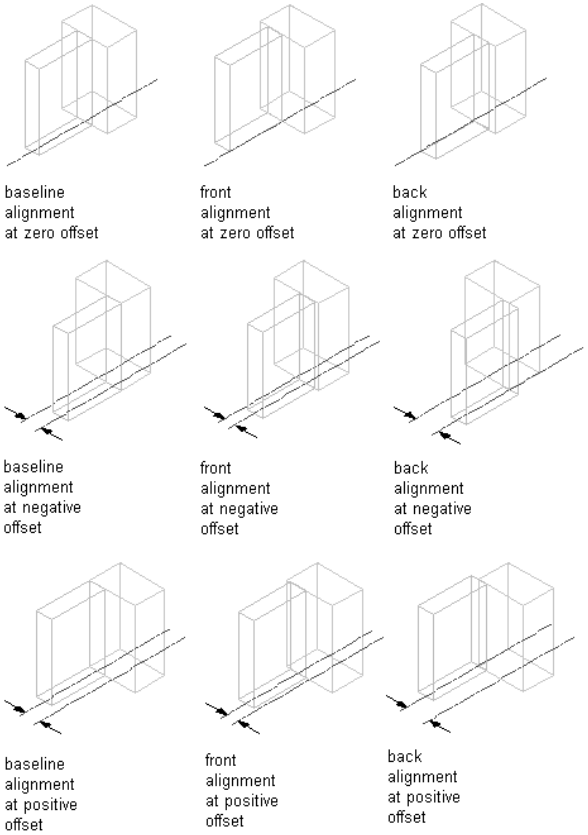


1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Select an infill, or create a new one.
7. Select an alignment: front, center, or back.
8. Click OK twice.

Specifying an Offset for a Curtain Wall Unit Infill

Use this procedure to specify an offset for a curtain wall unit infill. By default, infills are centered on the curtain wall unit baseline. If your design requires that the infill be aligned with frame edges or some other part of the curtain wall unit, you can specify an offset for the infill.

Specifying panel infill offsets



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Select an infill, or create a new one.
7. Enter an offset distance.

   In Plan view, positive numbers offset the infill above the baseline and negative numbers offset the infill below the baseline. The offset is also affected by the selected alignment for the infill.

8. Click OK twice.

Removing an Infill Definition from a Curtain Wall Unit Style

Use this procedure to delete an infill definition that you no longer need from the Infills definitions list. You cannot remove an infill definition when it is currently assigned to a cell. In addition, you cannot remove the default infill definition, but you can modify it.

NOTE For information about removing an infill from a cell, see "Removing an Infill from a Curtain Wall Unit Cell" on page 949.

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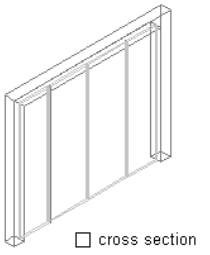
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Select the unneeded infill definition from the list.
7. Click Remove Infill.
8. Click OK twice.

Defining Curtain Wall Unit Frames

All curtain wall unit grids, including the primary grid, can have frame definitions. The frame of the primary grid defines the outer edges of the curtain wall unit. The overall frame size is determined by the length and height of the primary curtain wall unit grid or a nested curtain wall unit grid. You can define a frame by specifying a width and depth or by selecting a profile.

Specifying default and profile-based frames



You create frame definitions for a specific curtain wall unit style. Those definitions can be assigned only to frames in curtain wall units of that style. You can create as many frame definitions as you want, and then assign the definitions to the frames. If you have nested grids, each grid has its own frame. There is a default frame definition that you can modify and assign as needed. Unassigned frames are not displayed. For more information, see "Assigning Definitions to Curtain Wall Unit Frames" on page 952.

TIP You can copy a mullion definition and use it as a frame definition. Select the mullion definition and drag it to Frames in the tree on the left side of the dialog box.

Materials and Display Properties for Frames

If you do not use materials to control the display properties of frames, you can specify their display properties in the curtain wall style. The layer, color, linetype, and other display properties of the default frame are applied to all frames unless you create a custom display component for each definition. You can then control the display of each frame definition independently. For more information, see "Specifying the Display of Curtain Wall Units" on page 962.

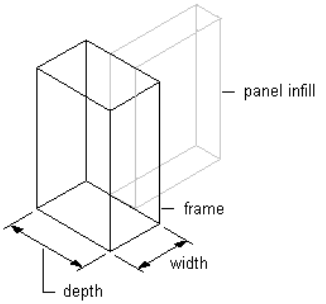
Related Procedures

- Defining a Curtain Wall Unit Frame by Width and Depth
- Creating a Profile for a Curtain Wall Unit Frame
- Defining a Curtain Wall Unit Frame Using a Profile
- Specifying Offsets for a Curtain Wall Unit Frame
- Removing a Frame Definition from a Curtain Wall Unit Style

Defining a Curtain Wall Unit Frame by Width and Depth

You can define a frame by specifying its width and depth. The overall frame size is determined by the length and height of the curtain wall unit grid.

Specifying frame width and depth



Because curtain wall units can contain multiple nested grids with different frames, it is helpful to use a naming convention for grid frames that indicates the grid location or purpose within the curtain wall unit. For example, L3-FL1- Metal Frame can identify a metal frame for a third-level grid on Floor 1.

TIP To remove the frame edge and have the infill adjust to fill the space occupied by the frame, create a frame definition with both width and depth set to zero. Then, assign that definition to the frame edge that you want to remove. This is necessary for the infill to be mitered as it would be for a butt-glazed condition. For more information, see "Removing a Frame Edge from a Curtain Wall Unit" on page 954.

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1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Frames under Element Definitions.

6 Click the New Frame icon to create a new frame definition.

7 Enter a descriptive name for the frame.

8 Specify a width and depth for the frame.

9 Specify any offsets.

For more information, see "Specifying Offsets for a Curtain Wall Unit Frame" on page 937.

10 Click OK twice.

After you create a frame definition, you can assign it to any frame in a curtain wall unit. For more information, see "Assigning Definitions to Curtain Wall Unit Frames" on page 952.

Creating a Profile for a Curtain Wall Unit Frame

Use this procedure to create a profile that you can use to define the shape of a curtain wall unit frame. You can then extrude the profile to create a curtain wall unit frame.

The height and the width of the polyline you use to create the profile define the default height and width of the curtain wall unit frame. The insertion point of the profile is aligned with the centroid of the frame.

1 Draw a closed polyline of the height and the depth needed for the resulting curtain wall unit frame.

2 Select the polyline, right-click, and click Convert to ➤ Profile Definition.

3 Enter **c** (Centroid) for the insertion point of the profile.

The insertion point of the profile is aligned with the centroid of the frame.

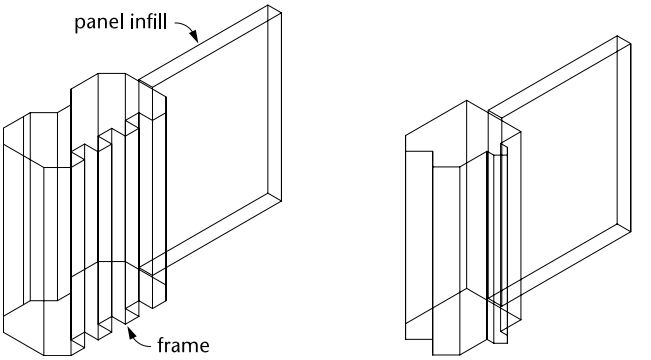
4 Enter a name for the profile, and click OK.

You can now use the profile as a curtain wall frame. For more information, see "Defining a Curtain Wall Unit Frame Using a Profile" on page 935.

Defining a Curtain Wall Unit Frame Using a Profile

Use this procedure to create a frame element definition from a profile. If you do not want a straight edge to your frame, you can use a profile to define edges with curves, jags, or any other shape.

Two profile-based frame examples



NOTE The insertion point of the profile is aligned with the centroid of the frame.

1. Create the profile for the frame.

   For information on creating profiles for curtain wall unit frames, see "Creating a Profile for a Curtain Wall Unit Frame" on page 935.

2. On the Format menu, click Style Manager.
3. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
4. Select a curtain wall unit style, and click Edit.
5. Click the Design Rules tab.
6. In the left pane, select Frames under Element Definitions.
7. Click New Frame.
8. Enter a descriptive name for the frame.
9. Specify a width and depth for the frame edge.

   These dimensions are used to calculate the center point of the edge for aligning the profile and also to specify a boundary for the adjacent infill.
10. Select Use Profile.

    NOTE The Profile options are available only if you have profiles in the current drawing.

11. Select a profile from the list.

    By default, the profile is inserted using the same width and depth with which it was created.

12 To adjust the size of the profile to fit within the width or depth dimension of the frame edge, select Auto-Adjust Profile Width or Depth.

13 To mirror the profile, select X or Y for Mirror In.

14 To rotate the profile, specify an angle for Rotation.

15 Specify any offsets.

For more information, see "Specifying Offsets for a Curtain Wall Unit Frame" on page 937.

16 Click OK twice.

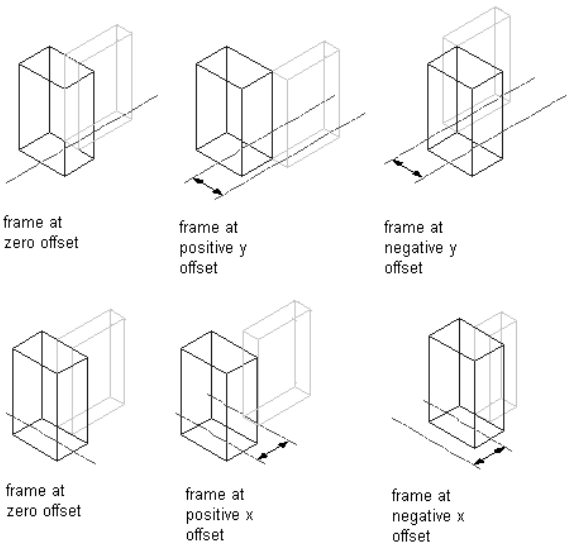
After you create a frame definition, you can assign it to any frame in a curtain wall unit. For more information, see "Assigning Definitions to Curtain Wall Unit Frames" on page 952.

Specifying Offsets for a Curtain Wall Unit Frame

Use this procedure to define the distance that a curtain wall unit frame is from the floor line, roof line, or baseline. By default, the outside edges of the frame align with start and end of the floor line and the start and end of the roof line. When you adjust the width of the frame, the frame expands inward. However, you can use offsets to expand or contract the frame away from these default limits or to shift the frame away from the baseline in either the X or Y direction.

Offset	Description
X	Positive X offset moves the frame edge outward beyond the end of the curtain wall unit, while a negative X offset moves the frame edge inward toward the center of the curtain wall unit.
Y	In Plan view, a positive Y offset moves the frame edge above the baseline, while a negative Y offset moves the frame below the baseline.
Start	Negative Start offset lengthens the frame beyond the start point, while a positive Start offset shortens the frame. The start point for vertical edges is the baseline and, for horizontal edges (drawn left to right), it is the left side.
End	Negative End offset lengthens the frame beyond the end point, while a positive End offset shortens the frame. The end point for vertical edges is the base height and, for horizontal edges (drawn left to right), it is the right side.

Specifying frame offsets



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Frames under Element Definitions.
6. Select a frame definition from the list.
7. Specify an offset distance for the frame edge X, Y, Start, or End.
8. Click OK twice.

Removing a Frame Definition from a Curtain Wall Unit Style

Use this procedure to remove a frame definition from the Frame definitions list. You cannot remove a frame definition if it is currently assigned to a frame edge, but you can remove it if it is assigned as an override to a frame edge. In addition, you cannot remove the default frame definition, but you can modify it.

NOTE For information about removing a frame edge, see "Removing a Frame Edge from a Curtain Wall Unit" on page 954.

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1. On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.

3 Select a curtain wall unit style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select Frames under Element Definitions.

6 Select the unneeded frame definition from the list.

7 Click the Remove Frame icon.

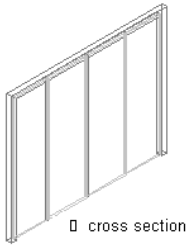
8 Click OK twice.

Defining Curtain Wall Unit Mullions

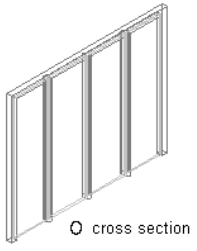
The mullions of a curtain wall unit are the edges between the grid cells. You can define the mullions by specifying a width and depth or by selecting a profile from which the mullion is extruded.

Because curtain wall units can contain multiple nested grids with different mullions, it is helpful to use a naming convention for grid mullions that indicates the grid location or purpose within the curtain wall unit. For example, L3-FL1- Panel Decorative Mullion can identify a mullion for a panel in a third-level grid on Floor 1.

Specifying default and profile-based mullions



default mullions



profile-based mullions

You create mullion definitions for a specific curtain wall unit style and those definitions can be assigned only to mullions in curtain wall units of that style. You can create as many mullion definitions as you want, and then assign the definitions to mullions as needed. If you have nested grids, each grid has its own mullions. There is a default mullion definition that you can modify as needed that is used for any unassigned mullions. For more information, see "Assigning Definitions to the Mullions of a Curtain Wall Unit" on page 956.

TIP You can copy a frame definition and use it as a mullion definition. Select the frame definition and drag it to Mullions in the left pane of the dialog box.

Materials and Display Properties for Mullions

If you do not use materials to control the display properties of mullions, you can specify their display properties in the curtain wall unit style. The layer, color, linetype, and other display properties of the default mullion are applied to all mullions unless you create a custom display component for each definition. You can then control the display of each mullion definition independently. For more information, see "Specifying the Display of Curtain Wall Units" on page 962.

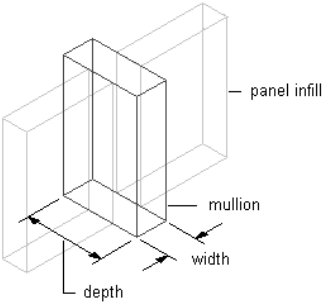
Related Procedures

- Defining Curtain Wall Unit Mullions by Width and Depth
- Creating a Profile for Curtain Wall Unit Mullions
- Defining the Mullions of a Curtain Wall Unit Using a Profile
- Specifying Offsets for the Mullions of a Curtain Wall Unit
- Removing a Mullion Definition from a Curtain Wall Unit Style

Defining Curtain Wall Unit Mullions by Width and Depth

You can define mullions by specifying a width and a depth.

Specifying mullion width and depth



TIP To remove mullions for butt glazing, create a definition with both width and depth set to zero. Then, assign that definition to the mullions that you want to remove. For more information, see "Removing Mullions from a Curtain Wall Unit Grid" on page 959.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Mullions under Element Definitions.
6. Click New Mullion.
7. Enter a descriptive name for the mullion.
8. Specify a width and depth for the mullion.
9. Specify the offsets you want.

   For more information, see "Specifying Offsets for the Mullions of a Curtain Wall Unit" on page 943.
10. Click OK twice.

After you create a mullion definition, you can assign it to any mullion in a curtain wall unit. For more information, see "Assigning Definitions to the Mullions of a Curtain Wall Unit" on page 956.

Creating a Profile for Curtain Wall Unit Mullions

Use this procedure to create a profile that you can use to define the shape of a curtain wall unit mullion definition. You can then extrude the profile to create mullions from it.

The height and the width of the polyline you use to create the profile define the default height and width of the curtain wall unit mullion. The insertion point of the profile is aligned with the centroid of the mullion.

1. Draw a closed polyline of the height and the depth needed for the resulting curtain wall unit mullion.
2. Select the polyline, right-click, and click Convert to ➤ Profile Definition.
3. Enter c (Centroid) for the insertion point of the profile.

   The insertion point of the profile is aligned with the centroid of the mullion.

4. Enter a name for the profile, and click OK.

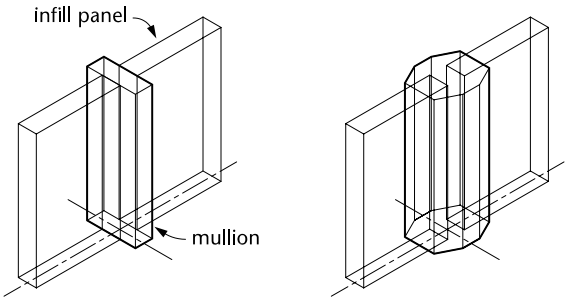
   You can now use the profile as a curtain wall unit mullion. For more information, see "Defining the Mullions of a Curtain Wall Unit Using a Profile" on page 942.

Defining the Mullions of a Curtain Wall Unit Using a Profile

Use this procedure to create a mullion element definition from a profile. If you do not want a straight edge to your mullions, you can use a profile to define mullions with curves, jags, or any other shape.

NOTE The insertion point of the profile is aligned with the centroid of the mullion.

Infill alignments with default and profile-based mullions



default mullion profile-based mullion

1. Create the profile to use for the mullion.

   For information, see "Creating a Profile for Curtain Wall Unit Mullions" on page 941.

2. On the Format menu, click Style Manager.
3. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
4. Select a curtain wall unit style, right-click, and click Edit.
5. Click the Design Rules tab.
6. In the left pane, select Mullions under Element Definitions.
7. Click the New Mullion icon to create a new mullion definition.
8. Enter a descriptive name for the mullion.
9. Specify a width and depth for the mullion.

   These dimensions are used to calculate the center point of the mullion for aligning the profile and also to specify a boundary for the adjacent infill.
10. Select Use Profile.

NOTE The Profile options are available only if you have profiles in the current drawing.

---

11. Select a profile from the list.

    By default, the profile is inserted using the same width and depth with which it was created.
12. To adjust the size of the profile to fit within the width or depth dimension of the mullion, select Auto-Adjust Profile Width or Depth.
13. To mirror the profile, select X or Y for Mirror In.
14. To rotate the profile, specify a rotation angle for Rotation.
15. Specify any offsets.

    For more information, see "Specifying Offsets for the Mullions of a Curtain Wall Unit" on page 943.
16. Click OK twice.

After you create a mullion definition, you can assign it to any mullion in a curtain wall unit. For more information, see "Assigning Definitions to the Mullions of a Curtain Wall Unit" on page 956.

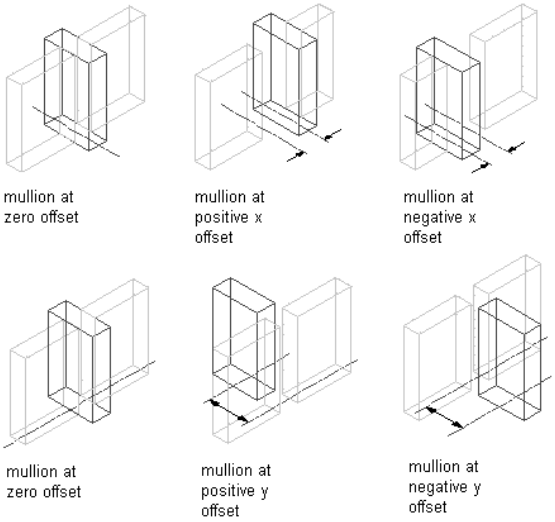
Specifying Offsets for the Mullions of a Curtain Wall Unit

Use this procedure to define mullions that are offset from the start or end of the curtain wall unit to lengthen or shorten the edge or offset in the X or Y

direction to shift the edge. For example, you might want to represent butt glazing by offsetting the mullions to be behind glass panel infills.

Offset	Description
X	For vertical mullions, a positive X offset moves the mullions toward the end of the curtain wall unit, while a negative X offset moves the mullions toward the start of the curtain wall unit. For horizontal mullions, a positive X offset moves the mullions toward the top of the curtain wall unit, while a negative X offset moves the mullions toward the bottom of the curtain wall unit.
Y	In Plan view, a positive Y offset moves the mullions above the baseline, while a negative Y offset moves the mullions below the baseline.
Start	Negative Start offset lengthens the mullions beyond the start point, while a positive Start offset shortens the mullions.
End	Negative End offset lengthens the mullions beyond the end point, while a positive End offset shortens the mullions.

Specifying mullion offsets



1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3 Select a curtain wall unit style, right-click, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select Mullions under Element Definitions.
6 Select a mullion definition from the list.
7 Specify an offset distance for the X, Y, Start, or End.
8 Click OK twice.

Removing a Mullion Definition from a Curtain Wall Unit Style

Use this procedure to remove a mullion definition from the Mullions definitions list. You cannot remove a mullion definition if it is assigned to a mullion. In addition, you cannot remove the default mullion definition, but you can modify it as needed.

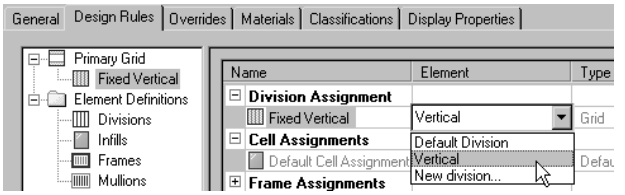
NOTE For information about removing mullions from between cells, see "Removing Mullions from a Curtain Wall Unit Grid" on page 959.

1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3 Select a curtain wall unit style, right-click, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select Mullions under Element Definitions.
6 Select the unneeded mullion definition from the list.
7 Click the Remove Mullion icon to remove the mullion definition.
8 Click OK twice.

Assigning a Division to a Curtain Wall Unit Grid

Use this procedure to assign a division to a curtain wall unit grid. A division defines the grid orientation (whether the direction of the grid cells and mullions is horizontal or vertical) and the division type (number and size of cells).

After you define a division, you can assign it to the primary grid or to nested grids. Nested grids are created by selecting Nested Grid as the cell assignment. For more information, see "Working with Nested Grids in Curtain Walls" on page 834.



1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.

3 Select a curtain wall unit style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select the grid you want to assign a division to. The name of the grid you select is displayed in the table under the Division Assignment row.

TIP To rename a grid, select it, and click Rename, and enter a new name.

6 Click the Element column for that grid and select a division definition from the list.

7 Click OK twice.

Assigning Infills to Curtain Wall Unit Cells

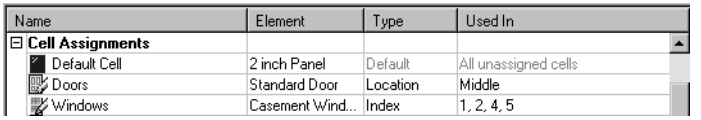
An infill defines the contents of a curtain wall unit cell. A curtain wall unit cell can be empty (none), can contain a grid (nested grid), or can contain a panel.

NOTE Curtain wall units cannot contain object infills like doors or windows. If you want to create a subunit for a curtain wall that contains a combination of windows, doors and panels, you must create a door/window assembly. For information on door/window assemblies see "Door/Window Assemblies" on page 1089.

Cell Assignments

A cell assignment defines the infill definition used for the cells. You can use one cell assignment to assign the same infill to all cells, or you can create multiple cell assignments to assign different infills to different cells.

Cell assignments



Do not assign multiple definitions to the same cell because only the last definition assigned to the cell is used.

Default Cell Assignment

The default cell assignment is used by all unassigned cells. You can modify the default assignment to be any type of infill, but you cannot delete the default cell assignment.

You may want to modify the default cell assignment to use the infill definition that occurs most frequently in your design. Any cells not assigned to other infills then use this infill definition.

Materials and Display Properties of Infills

The layer, color, linetype, and other display properties of the default infill are applied to all infills unless you assign materials to the infills you created or you create a custom display component for each definition. You can then control the display of each infill definition independently. For more information, see "Specifying the Display of Curtain Wall Units" on page 962.

Related Procedures

- Creating a Nested Grid in a Curtain Wall Unit
- Filling a Curtain Wall Unit Cell with a Simple Panel
- Removing an Infill from a Curtain Wall Unit Cell
- Specifying Which Curtain Wall Unit Cells Use a Cell Assignment
- Removing an Assignment from a Curtain Wall Unit Style

Creating a Nested Grid in a Curtain Wall Unit

Use this procedure to create a nested grid in a curtain wall unit. A nested grid is a grid within a grid. Each nested grid has its own division, cell assignments, frame, and mullions. By default, the frame is turned off for nested grids.

For more information, see "Working with Nested Grids in Curtain Walls" on page 834.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.

5 In the left pane, select the grid in which you want to create a nested grid.

6 Click the New Cell Assignment icon.

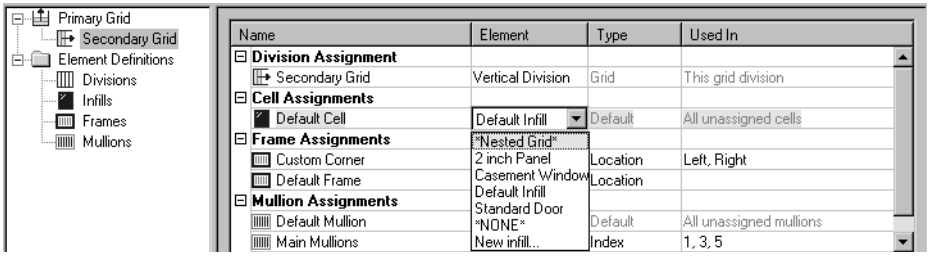
A new cell assignment is displayed in the list of cell assignments.

7 Click New Cell Assignment, and enter a descriptive name for the assignment.

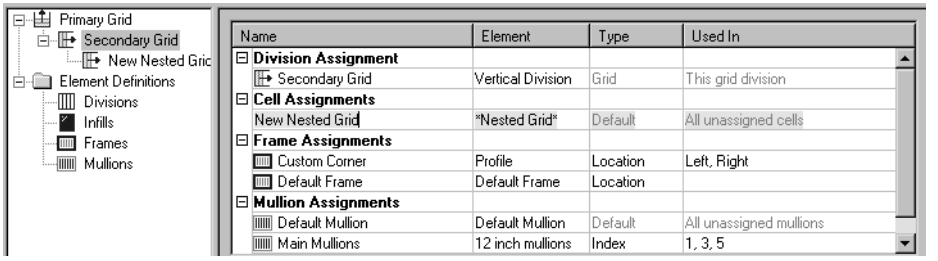
8 Select Nested Grid in the Element column.

A new grid is added to the list of grids in the tree view to the left of the dialog box. If you are editing the primary grid, the new grid is added at the secondary level. If you are editing a grid at the secondary level, the additional grid is placed at the tertiary level, and so on.

Creating a nested grid



New nested grid in tree



NOTE To rename a grid, select it in the right pane, right-click and click Rename, and enter a new name.

9 Specify the cells to contain this nested grid.

For more information, see "Specifying Which Curtain Wall Unit Cells Use a Cell Assignment" on page 950.

10 Click OK twice.

Filling a Curtain Wall Unit Cell with a Simple Panel

Use this procedure to fill a curtain wall unit cell with a simple panel. Simple panels are generally used to represent basic cladding materials in the curtain wall, such as a stone wall panel or a concrete panel.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to put a simple panel infill.
6. Click the New Cell Assignment icon.

   A new cell assignment is displayed in the list of cell assignments.
7. Click New Cell Assignment, and enter a descriptive name for the assignment.
8. Under Element, select an infill that defines a simple panel.

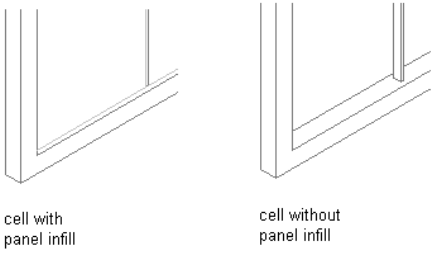
   If you do not have a simple panel infill defined, select New Infill and define one. For more information, see "Creating a Panel Infill for a Curtain Wall Unit" on page 929.
9. Specify the cells to contain this simple panel.

   For more information, see "Specifying Which Curtain Wall Unit Cells Use a Cell Assignment" on page 950.
10. Click OK twice.

Removing an Infill from a Curtain Wall Unit Cell

Use this procedure to remove the infill of a cell and leave the cell empty. To do this, use None as the element definition. Using None also removes any frame edges that border the cell, but it does not affect the mullions.

Removing an infill assignment from a cell



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid that contains the cells you want to assign to None.
6. Create a new cell assignment or select an existing cell assignment.
7. Select None under the Element column.
8. Specify the cells to contain the None infill.

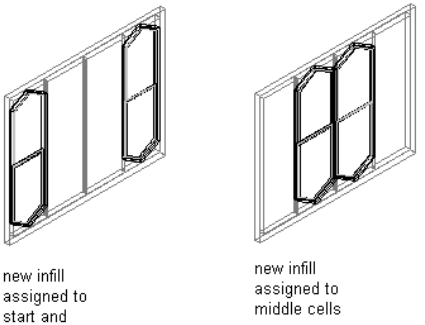
   For more information, see "Specifying Which Curtain Wall Unit Cells Use a Cell Assignment" on page 950.
9. Click OK twice.

Specifying Which Curtain Wall Unit Cells Use a Cell Assignment

When you create a cell assignment you need to specify the cells in the grid to use that assignment. There are two options for selecting cells:

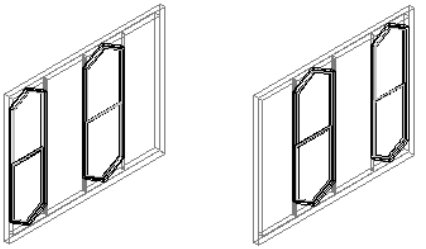
- Use Location to insert the infill into the start, middle, or end cells of a vertical grid or into the bottom, middle, or top cells of a horizontal grid. If there is an even number of cells (four or more), Middle refers to the two cells in the middle of the grid. If there is an odd number of cells (three or more), Middle refers to one cell in the middle of the grid.

  Specifying cell assignments by location



- Use Index to insert the infill into specific cells based on cell numbers. Cells are numbered from start to end or bottom to top. For example, typing 1, 3, 5 would place the infill in the first, third, and fifth cells.

Specifying cell assignment by index



Any cells that are not assigned a specific cell assignment use the default infill.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select a grid.
6. Under the Type column, select Location or Index.
7. Select a cell assignment:

If you selected . . .	Then . . .
Location	click the Used In column, and click the button at the far right of the row. Select the cells you want to use this assignment, and click OK.
Index	enter the cell numbers separated by commas in the Used In column. For vertical grids, cells are numbered from start to end and for horizontal grids, cells are numbered from bottom to top.

NOTE Do not assign multiple definitions to a cell because the last definition assigned to the cell is used.

8. Click OK twice.

Removing an Assignment from a Curtain Wall Unit Style

Use this procedure to remove cell assignments, frame assignments, and mullion assignments from a curtain wall unit style. You cannot remove default assignments, but you can modify them to suit your needs.

NOTE Each grid requires one division assignment. Therefore, you cannot remove the division assignment, although you can change the division element used for the division assignment.

---

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid from which you want to remove an assignment.
6. Select a cell assignment, frame assignment, or a mullion assignment.
7. Click the Remove Assignment icon.
8. Click OK twice.

Assigning Definitions to Curtain Wall Unit Frames

The curtain wall unit frame is represented by the outer edges of the primary grid. Each nested grid has its own frame that is defined separately from the primary grid frame. By default, the frames of nested grids are turned off. For more information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

Frame Assignments

A frame assignment defines the frame definition that is used by each frame edge. You can use one frame assignment to assign the same definition to all four edges of the frame, or you can create multiple frame assignments to assign different definitions to different edges of the frame. Unassigned edges are not displayed.

Do not assign multiple definitions to the frame edge because the last definition assigned to the edge is used.

Default Frame Assignment

There is a default frame assignment, and you can select the frame edges it applies to. You can modify the default assignment to use any frame definition, but you cannot delete the default frame assignment.

Materials and Display Properties of Frames

The layer, color, linetype, and other display properties of the default frame are applied to all frame edges unless you assign materials to the frame definition or you create a custom display component for each definition. You can then control the display of each frame definition independently. For more information, see "Specifying the Display of Curtain Wall Units" on page 962.

Related Procedures

- Adding a New Frame Assignment to a Curtain Wall Unit
- Removing a Frame Edge from a Curtain Wall Unit
- Specifying Which Curtain Wall Unit Edges Use a Frame Assignment

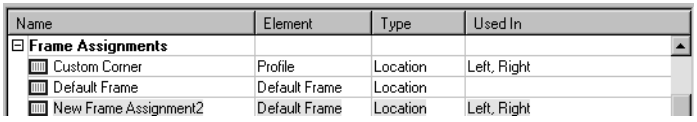
Adding a New Frame Assignment to a Curtain Wall Unit

Use this procedure to add a frame assignment to a curtain wall unit. To assign different definitions to different frame edges, you need multiple frame assignments.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to create a new frame assignment.
6. Click the New Frame Assignment icon.

   A new frame assignment is displayed in the list of frame assignments.

   New frame definition



7. Click New Frame Assignment and enter a descriptive name for the assignment.
8. Select a frame definition from the Element column.
9. Specify the sides of the frame to use this frame assignment.

For more information, see "Specifying Which Curtain Wall Unit Edges Use a Frame Assignment" on page 955.

10 Click OK twice.

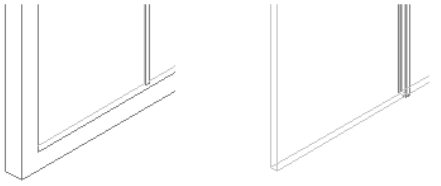
Removing a Frame Edge from a Curtain Wall Unit

Use this procedure to remove a frame edge from a curtain wall unit. There are three ways to remove a frame edge:

- Set the width and depth of the edge to zero
- Leave the edge unassigned
- Specify None as an override to the edge assignment

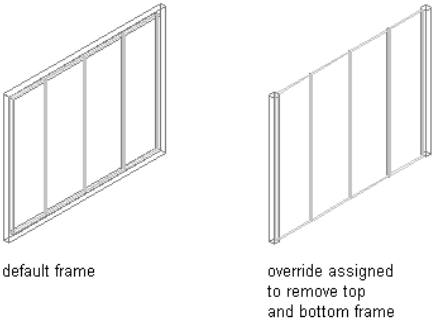
The first two methods remove the frame edge and expand the adjacent infills into the space occupied by the edge.

Specifying a frame width and depth of zero



By specifying None as an override, the frame edge is not displayed, but the adjacent infill is not expanded into the space the edge occupied.

Overriding a frame edge definition



For information about setting the width and depth to zero, see "Defining a Curtain Wall Unit Frame by Width and Depth" on page 934.

For information about leaving the edge unassigned, see "Specifying Which Curtain Wall Unit Edges Use a Frame Assignment" on page 955.

Specifying Which Curtain Wall Unit Edges Use a Frame Assignment

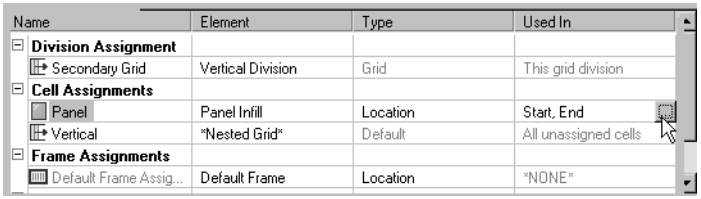
Use this procedure to specify edges that use a frame assignment. When you create a frame assignment, you need to specify the edges of the frame to use that assignment.

Frame edges that are not assigned a frame definition are not displayed.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select a grid.
6. Select a frame assignment.

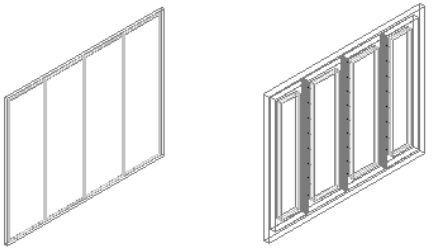
   Location is the only way to specify the frame edges.
7. Click the Used In column, and then click the [...] button at the far right of the row.

   Specifying frame location



8. Select the edges that you want to use this assignment - Left, Right, Top, or Bottom - and click OK.

Assigning frames to nested grids



nested grids without assigned frames

nested grids with assigned frames

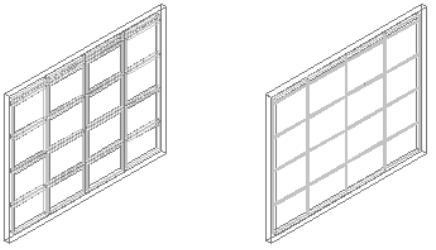
Do not assign multiple definitions to the same frame edge because only the last definition assigned to the edge is used.

9 Click OK twice.

Assigning Definitions to the Mullions of a Curtain Wall Unit

The mullions of a curtain wall unit are the edges between the grid cells. The primary grid and each nested grid have mullions that are defined separately from the other grids. For more information about nested grids, see "Working with Nested Grids in Curtain Walls" on page 834.

Assign mullions to a nested grid



nested grids without assigned mullions

nested grids with assigned mullions

Mullion Assignments

A mullion assignment defines the definition used by each mullion. You can use one assignment to define all mullions, or you can create multiple assignments and assign different definitions to different mullions in any grid.

Do not assign multiple definitions to the same mullion because only the last definition assigned to the mullion is used.

Default Mullion Assignment

There is a default mullion assignment used by all unassigned mullions. You can modify the default assignment to be any mullion definition, but you cannot delete the default mullion assignment.

Related Procedures

- Adding a New Mullion Assignment to a Curtain Wall Unit Style
- Removing Mullions from a Curtain Wall Unit Grid
- Specifying Which Curtain Wall Unit Mullions Use an Assignment

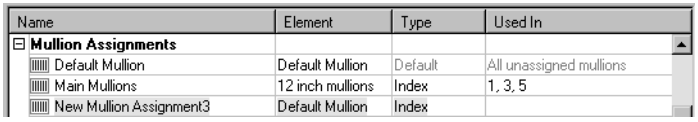
Adding a New Mullion Assignment to a Curtain Wall Unit Style

Use this procedure to add a new mullion assignment to a curtain wall unit style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to create a new mullion assignment.
6. Click New Mullion Assignment.

   A new mullion assignment is displayed in the list of mullion assignments.

   New mullion assignment



7. Select the mullion assignment, right-click and click Rename, and then enter a descriptive name.
8. Select a mullion definition from the Element column.
9. Specify the mullions to use this assignment.

   For more information, see "Specifying Which Curtain Wall Unit Mullions Use an Assignment" on page 958.
10. Click OK twice.

Specifying Which Curtain Wall Unit Mullions Use an Assignment

When you create a mullion assignment you need to specify the mullions in the grid to use that assignment. There are two options for selecting mullions:

- Use Location to assign a definition to the start, middle, or end mullions of a vertical grid or the bottom, middle, or top mullions of a horizontal grid. If there is an even number of mullions (four or more), Middle refers to the two mullions in the middle of the grid. If there is an odd number of mullions (three or more), Middle refers to the one mullion in the middle of the grid.
- Use Index to assign a definition to specific mullions based on mullion numbers. Mullions are numbered from start to end or bottom to top. For example, entering **1, 2, 3** would assign the definition to the first, second, and third mullions.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select a grid.
6. Create a new mullion assignment or select an existing assignment.
7. Select Location or Index for Type.
8. Select a cell assignment.

If you selected . . .	Then . . .
Location	click the Used In column, and click the button at the far right of the row. Select the cells you want to use this assignment, and click OK.
Index	enter the mullion numbers separated by commas in the Used In column. For vertical grids, mullions are numbered start to end and for horizontal grids, mullions are numbered from bottom to top.

NOTE Do not assign multiple definitions to the same mullion because only the last definition assigned to the mullion is used.

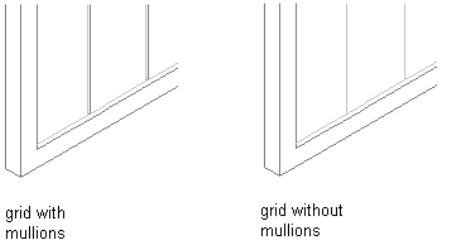
9. Click OK twice.

Any mullions that are not assigned a specific mullion assignment use the default mullion definition.

Removing Mullions from a Curtain Wall Unit Grid

Use this procedure to remove a mullion from the curtain wall unit. You can create a mullion definition whose edge width and depth are zero. Adjacent infills expand to fill in the space that was occupied by the mullion. This is an effective way to represent butt glazing.

Removing mullions from a curtain wall unit grid



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select a curtain wall unit style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to remove a mullion.
6. Create a new mullion assignment and enter **0** (zero) for the width and depth.

   For more information, see "Defining Curtain Wall Unit Mullions by Width and Depth" on page 940.
7. Under Mullion Assignments, select the mullion definition you created for any cell edges of any mullion assignment where you want to remove the mullions.

   For more information, see "Specifying Which Curtain Wall Unit Mullions Use an Assignment" on page 958.
8. Click OK twice.

Specifying the Materials of a Curtain Wall Unit Style

A curtain wall unit consists of a number of components whose display properties can be determined by the materials assigned to each component.

When you assign materials to a curtain wall unit style, you assign one material to each display component of the curtain wall unit. For example, you assign a wood material to the frame and a glass material to the glass inset. You assign materials to components in each display representation where you want the materials to be used.

If you want to use the display properties of the curtain wall unit style, instead of using material display properties, you can turn off the material assignments in the display properties of the curtain wall unit style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in three dimensional (3D) model views and in elevations.

Related Topics and Procedure

- Curtain Wall Unit Materials and Display Components
- Assigning Materials to a Curtain Wall Unit Style

Curtain Wall Unit Materials and Display Components

The following table identifies the material component that corresponds to each curtain wall unit component in the specified views.

Curtain Wall Unit Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Screened, Reflected Plan	
Frame Definitions	Linework
Mullion Definitions	Linework
Infill Definitions	Linework
Frame Definitions Hatch	Linework
Mullion Definitions Hatch	Linework
Infill Definitions Hatch	Linework

Curtain Wall Unit Component	Material Component
Model	
Frame	3D Body
Mullion	3D Body
Infill	3D Body

Assigning Materials to a Curtain Wall Unit Style

Use this procedure to assign materials to the individual components of a curtain wall unit style. When you assign a material to a curtain wall unit component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the curtain wall unit. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, the frame, mullion, and infill are physical components of a curtain wall unit. The cell marker is a symbolic component.

NOTE If a material assignment does not determine the display properties of a curtain wall unit component, you can change the display properties of the curtain wall unit style as described in "Specifying the Display of Curtain Wall Units" on page 962.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.

10 Select the component you want to change, select the value for Material Definition, and select a different material definition.

You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

11 Click OK twice.

Specifying the Display of Curtain Wall Units

The display of a curtain wall unit depends on the direction from which you view the curtain wall unit. In Plan view, the curtain wall unit is displayed as parallel lines with vertices marking the grid lines, as an architect would typically draw a curtain wall unit. In 3D isometric views, the curtain wall unit is displayed as it would appear in the real world, with surfaces showing length, thickness, and height. You control what you want to display in each particular view.

Element Definitions and Custom Display Components

By default, the display of all infills, frames, and mullions are controlled by the display properties of the default infill, default frame, and default mullions. However, you can add individual element definitions as components with separate display properties. For example, if you define two infills called stone panel and acetylene panel, by default they are both controlled by the same default infill display properties. However, you can add each definition as a new display component and control the display properties separately.

NOTE The component name in the Custom Display Component dialog box must match the name of element definition in the Design Rules tab. Otherwise the element definition does not display properly.

For more information about the display system, see "Display System" on page 435.

Materials and Display Properties

You can use materials to control the display of both default and custom infills, frames, and mullions. When you assign materials to the element definitions you create, you do not need to define these definitions as custom dis-

play components. For more information, see “Specifying the Materials of a Curtain Wall Unit Style” on page 960.

Related Procedures

- Adding Curtain Wall Unit Element Definitions as Display Components
- Specifying the Layer, Color, and Linetype of a Curtain Wall Unit Style
- Specifying the Hatching for Components of a Curtain Wall Unit Style
- Adding Custom Graphics as a Display Component of a Curtain Wall Unit
- Creating Cut Planes for a Curtain Wall Unit

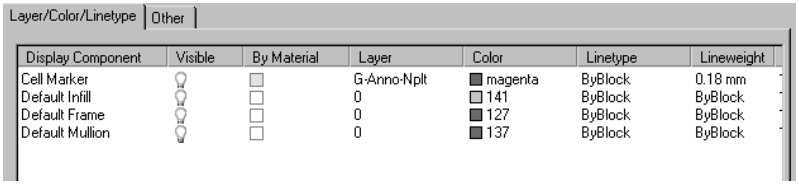
Adding Curtain Wall Unit Element Definitions as Display Components

Use this procedure to add curtain wall unit element definitions. Before you can control the display properties of curtain wall unit elements according to the definition assigned to the element, you must create display components for each element definition.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Curtain Wall Unit Styles.
3. Select the curtain wall unit style that you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select Model as the display representation.
6. Click .

   The default list of components includes only the three basic elements and cell markers.

   Default Model display components for curtain wall units



7. Click the Other tab, and then click Add.
8. Select Infill, Frame, or Mullion for Component Type.
9. Enter a name for Component Name, or click Select Element and select an element from the list.
10. Click OK.
11. Click the Layer/Color/Linetype tab.

The element definition that you added is displayed in the list of components.

12 Click the Other tab to continue adding element definitions, or click OK three times.

Specifying the Layer, Color, and Linetype of a Curtain Wall Unit Style

Use this procedure to change the following display properties of the components of a curtain wall unit style:

- Visibility (component is on or off)
- By Material
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.

3 Right-click the curtain wall unit style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear.

6 Click Style Override.

7 Click the Layer/Color/Linetype tab.

8 Select the component to change, and select a different setting for the property.

9 Click OK three times.

Specifying the Hatching for Components of a Curtain Wall Unit Style

Use this procedure to specify the hatching of the components of a curtain wall unit style. Curtain wall hatching is displayed only in display representations, such as Plan, that are used in Top view (Plan view) of a drawing.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.

3 Right-click the curtain wall unit style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and click Style Override.

6 Click the Hatching tab.

7 Select a component, and click the setting for Pattern.

8 Specify the hatching for the component:

If you want to select . . .	Then . . .
a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
single hatching	select User-defined for Type, and clear Double Hatch.
double hatching	select User-defined for Type, and select Double Hatch.
solid fill	select Solid Fill for Type.

9 Click OK.

10 Click the setting for Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

11 Click the setting for Angle, and enter the angle for the selected pattern.

12 Click the setting for Orientation, and specify how the hatching is oriented:

If you want to orient the hatching . . .	Then . . .
to the object, regardless of the object rotation	select Object.
to the World Coordinate System	select Global.

13 Click OK three times.

Adding Custom Graphics as a Display Component of a Curtain Wall Unit

There may be instances where an infill, frame, or mullion requires a custom two-dimensional (2D) or three-dimensional (3D) graphic. For example, you might need a highly detailed three-dimensional truss as the mullions or a decorative light fixture applied to an infill. In cases like these, you can create a custom block, add a display component with the block attached, and associate that component with an element definition. When you assign that definition to an element, the block is also displayed.

1. Draw your custom component and save it as a block.
2. Select a curtain wall unit, right-click, and click Edit Curtain Wall Unit Style.
3. Click the Display Properties tab.
4. Click .
5. Click the Custom Plan Components tab.

   If Model is the current display representation, the tab is called Other.
6. Click Add.
7. Select Infill, Frame, or Mullion for Component Type.
8. Select the specific element from the list.
9. Select Draw Custom Graphics.
10. Specify the display of the component:

If you want to . . .	Then . . .
display the block instead of the associated curtain wall unit element	select Replace Graphics.
superimpose the block over the curtain wall unit element so that both are displayed	clear Replace Graphics.

11. Click Select Block, and select the custom block that you created.
12. Click OK.

13 Specify further settings for the custom display block:

If you want to . . .	Then . . .
scale the block to fit a particular dimension	select Width, Height, or Depth. To prevent the block from losing its proportions, select Lock XY Ratio.
specify how the block is inserted into the grid in the X, Y, and Z directions	specify an insertion point on the X, Y, and Z planes.
mirror the block	determine if it should mirror in the X, Y, or Z direction.
offset the block from the grid	specify the offset in the X, Y, or Z direction.

14 Click OK three times.

Creating Cut Planes for a Curtain Wall Unit

Use this procedure to specify the properties of one or more cut planes for a curtain wall unit style. Cut plane display properties apply only to display representations, such as Plan, that are used in Top view (Plan view) of a drawing.

To better visualize the elements of a curtain wall unit in Plan view, you can create cut planes. The main cut plane is where the shrinkwrap and hatching are applied. The plan display shows the components and objects in the wall as they are displayed at the height of each cut plane.

1 Select a curtain wall unit, right-click, and click Edit Curtain Wall Unit Style.

2 Click the Display Properties tab.

3 Select Plan, and click .

NOTE The Cut Plane tab is displayed only in some display representations, such as Plan.

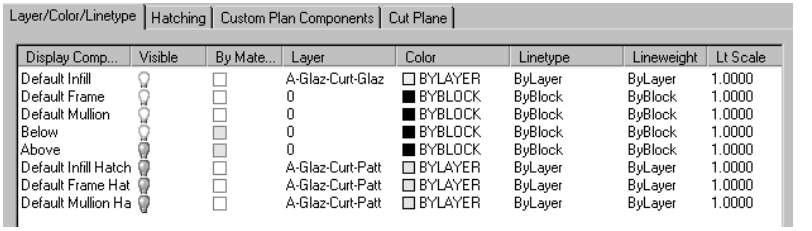
4 Click the Cut Plane tab to set the cut plane to be displayed in each display representation for the curtain wall unit style.

5 Enter a value for Cut Plane Height to specify the cut plane at which hatching takes effect.

6 To specifically define a cut plane, click Add, and enter the height of the new cut plane:

If you add a cut plane . . .	Then . . .
at a height that is lower than the value for Cut Plane Height	objects are displayed using the properties specified for the Below Cut Plane component on the Layer/Color/Linetype tab.
at a height that is higher than the value for Cut Plane Height	objects are displayed using the properties specified for the Above Cut Plane component on the Layer/Color/Linetype tab.

Below and Above components



You can click Remove to delete a cut plane that you added.

7 Click OK to exit all dialog boxes.

Attaching Notes and Files to a Curtain Wall Unit Style

Use this procedure to enter notes and attach reference files to a curtain wall unit style. You can also edit notes and edit or detach reference files from a curtain wall unit style.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Curtain Wall Unit Styles.

3 Right-click the curtain wall unit style you want to change, and click Edit.

4 Click the General tab.

5 To add a description to the curtain wall unit style, enter the description for Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK three times.

Using Overrides in Curtain Wall Units

Curtain wall units are subunits of geometrically complex curtain walls, which often have a large number of different elements, like frames, panels, and infills. Most of these settings are defined in the style. However, there are cases when modifying a curtain wall unit directly on screen is more suitable:

- You want to add custom frame or mullion edges to a curtain wall unit and need direct visual feedback.
- You want to create an override, like a merged infill or nested grid, in only one specific place in the curtain wall unit.
- You want to experiment with different visuals without having to change the curtain wall unit style for each idea immediately.

When you have finished your onscreen edits, you can decide if you want to

- Apply the overrides to the curtain wall unit you have edited.
- Save the overrides to the current curtain wall unit style.
- Create a new style for the overrides.

Overrides you can set include assigning a different definition to a selected cell, frame, or mullion, and assigning a profile to a frame or mullion edge. Note that the definition or profile must already exist in the current drawing before you can use it as an override.

Overrides do not affect the Design Rules for the curtain wall unit style. However, you can transfer overrides to a curtain wall unit style if you want all curtain wall units of that style to have the same overrides.

You can view a list of overrides that are currently assigned to a curtain wall unit from the Overrides tab of the Curtain Wall Unit Properties dialog box. For more information, see "Removing Curtain Wall Unit Overrides" on page 988.

NOTE Overrides are also listed on the Overrides tab in the Curtain Wall Unit Style Properties dialog box.

Related Topics

- Overriding Curtain Wall Unit Infills
- Overriding Curtain Wall Unit Frames and Mullions
- Overriding Curtain Wall Unit Divisions
- Removing Curtain Wall Unit Overrides

Overriding Curtain Wall Unit Infills

The cell infills of a curtain wall unit are set in the curtain wall unit style. You can however, create overrides for these infill overrides in cells. For example, you might want a row of normal rectangular panel infills for a first floor facade. In one specific position, however, you want a decorative nested grid. In this case, you would set the row of concrete panels in the curtain wall unit style, and then override the panel at one specific place with the nested grid.

Curtain wall unit infills can consist of simple panels or nested grids. You can change one infill for another, merge cells, or remove frames from an infill altogether.

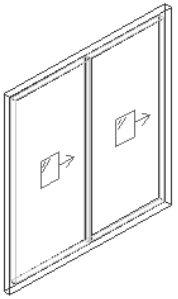
Related Procedures

- Turning on Cell Markers for Curtain Wall Units
- Merging Curtain Wall Unit Cells
- Creating a Curtain Wall Unit Infill Override

Turning on Cell Markers for Curtain Wall Units

Use this procedure to turn on the cell markers for each grid cell in a curtain wall unit. The cell markers must be on in order to select individual cells and make changes to them.

Viewing Cell Markers



1. Select the curtain wall unit for which you want to create an infill override.
2. Right-click, and click Infill ➤ Show Markers.

Merging Curtain Wall Unit Cells

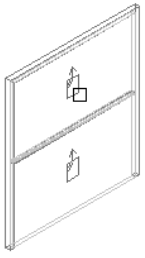
Use this procedure to merge two curtain wall unit cells.

NOTE To merge curtain wall unit cells, the cell markers need to be visible. For information on turning on cell markers, see "Turning on Cell Markers for Curtain Wall Units" on page 970.

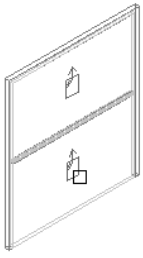
You can only merge cells that are adjacent to each other.

In most cases, you merge cells with the same infill type. The merged cell is then of the same type as the original cells. For example, if you merge two solid panel infills, the resulting merged cell also has a solid panel infill. In some cases, however, you might want to merge two cells that have different infill types. In that case, the infill type of the first selected cell is used for the merged cell. For example, if you want to merge a cell with a simple panel infill and a cell with a nested grid, and you select the cell with the simple panel first during the merge command, the merged cell contains a simple panel infill, and not a nested grid. If you select the two cells in the opposite order, the merged cell contains a nested grid and no simple panel infill.

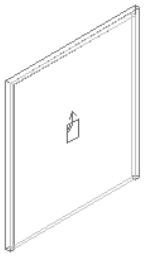
Merging two cells



select cell A



select cell B



result

1. Select the curtain wall unit on which you want to merge two cells.
2. Right-click, and click Infill ➤ Merge.
3. Select the first cell to be merged.
4. Select the second cell to be merged.

   The cells are merged into one.
5. Specify where you want to save the curtain wall unit override.

If you want to save the override . . .	Then . . .
only on this specific curtain wall unit	no further steps are necessary. The override is saved to the curtain wall unit. For information about how to remove an override from a curtain wall unit, see "Removing Curtain Wall Unit Overrides" on page 988.
to a curtain wall unit style	select the curtain wall unit, right-click, and select Design Rules ➤ Transfer to Object.

6 If you have chosen to save the override to a curtain wall unit style, select the curtain wall unit again, right-click and click Design Rules ➤ Save to Style and decide to which curtain wall unit style you want to save the override.

If you want to save the override . . .	Then . . .
to the current curtain wall unit style	select Transfer Merge Operations to Style, and click OK. **NOTE** If you have created only a cell merge, only the Transfer Merge Operations to Style checkbox is active. If you have also created other overrides, such as a new cell assignment or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.
to a new curtain wall unit style	select Transfer Merge Operations to Style, and click New. Enter a name for the new curtain wall unit style, and click OK. **NOTE** If you have created only a cell merge, only the Transfer Merge Operations to Style checkbox is active. If you have also created other overrides, such as a new cell assignment or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides still remain on the curtain wall unit, where they can be removed as described in "Removing Curtain Wall Unit Overrides" on page 988, but they are not saved back to a curtain wall unit style.

Creating a Curtain Wall Unit Infill Override

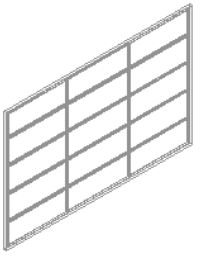
Use this procedure to override the infill of a curtain wall unit cell.

For example, you might have a row of simple concrete panels in your curtain wall unit, but want in one location a nested grid instead of the concrete panel. In that case, it might be simpler to use an infill override, instead of creating a complex curtain wall unit style setting.

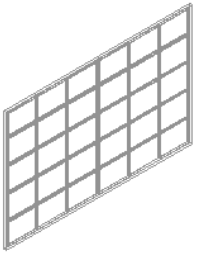
NOTE To override an infill assignment, the cell markers need to be visible. For information on turning on cell markers, see "Turning on Cell Markers for Curtain Wall Units" on page 970.

To exchange an infill definition, the new infill definition must already be defined in the curtain wall unit style. For information on creating infill definitions, see "Defining Infills for Curtain Wall Unit Cells" on page 927.

Overriding a curtain wall unit cell definition

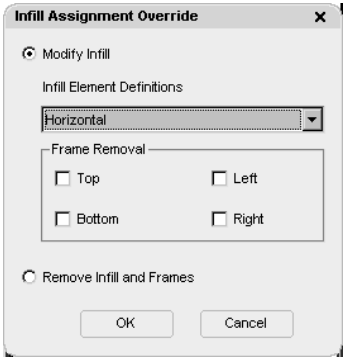


five cell horizontal grid and three cell vertical grid before override



five cell horizontal grid and six cell vertical grid after override

1. Select the curtain wall unit on which you want to override an infill.
2. Right-click, and click Infill ➤ Override Assignments.
3. Select the marker of the cell where you want to create an override.



4 Create the override:

If you want to . . .	Then . . .
exchange the existing infill for another	select a new infill definition from the list. **NOTE** To exchange an infill definition, the new infill definition must already be defined in the curtain wall unit style.
remove one or more of the frames around the infill	select the frame component to be removed.
remove the complete infill and its frame	select Remove Infill and Frames. **NOTE** This works only for infills that are bordering the exterior of the curtain wall unit.

5 Click OK.

6 Specify where you want to save the curtain wall unit override.

If you want to save the override . . .	Then . . .
only on this specific curtain wall unit	no further steps are necessary. The override is saved to the curtain wall unit. For information about how to remove an override from a curtain wall unit, see "Removing Curtain Wall Unit Overrides" on page 988.
to a curtain wall unit style	select the curtain wall unit, right-click, and select Design Rules ➤ Transfer to Object.

7 If you have chosen to save the override to a curtain wall unit style, select the curtain wall unit again, right-click and click Design Rules ➤ Save to

Style and decide to which curtain wall unit style you want to save the override.

If you want to save the override . . .	Then . . .
to the current curtain wall unit style	select Transfer Cell Overrides to Style, and click OK. **NOTE** If you have created only an infill override, only the Transfer Cell Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.
to a new curtain wall unit style	select Transfer Cell Overrides to Style, and click New. Enter a name for the new curtain wall unit style, and click OK. **NOTE** If you have created only an infill override, only the Transfer Cell Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides still remain on the curtain wall unit, where they can be removed as described in "Removing Curtain Wall Unit Overrides" on page 988, but they are not saved back to a curtain wall unit style.

Overriding Curtain Wall Unit Frames and Mullions

You can change a selected frame edge or mullion edge by using an edge assignment override.

NOTE To exchange a frame edge or mullion edge, the new edge definition must already be defined in the curtain wall unit style.

Removing the edge does not affect the width of the cell. To remove the edge and have the adjacent cell resize, create an edge definition with a width and

depth of zero. For more information, see "Defining a Curtain Wall Unit Frame by Width and Depth" on page 934 or "Defining Curtain Wall Unit Mullions by Width and Depth" on page 940.

You can also create a new edge profile by drawing a polyline or using an existing profile in the drawing. This edge profile can be interactively edited onscreen using in-place editing.

Related Procedures

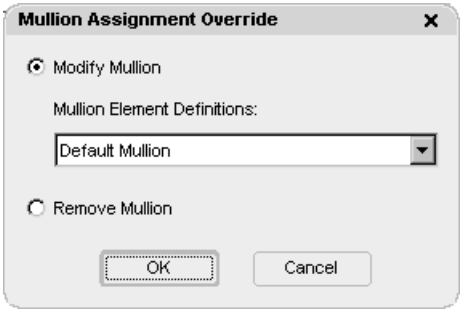
- Creating a Curtain Wall Unit Frame or Mullion Override
- Creating a Curtain Wall Unit Frame or Mullion Edge from a Polyline or Profile
- In-Place Editing of Edge Profiles for Curtain Wall Units

Creating a Curtain Wall Unit Frame or Mullion Override

Use this procedure to override an individual frame or mullion in a curtain wall unit.

To exchange a frame or mullion, the new definition must already be defined in the curtain wall unit style. For information on creating frames and mullions, see "Defining Curtain Wall Unit Frames" on page 932 and "Defining Curtain Wall Unit Mullions" on page 939

1. Select the curtain wall unit on which you want to override an edge.
2. Right-click, and click Frame/Mullion ➤ Override Assignment.
3. Select the frame or mullion edge you want to override.



4 Create the override:

If you want to . . .	Then . . .
exchange the existing edge for another	select a new edge definition from the list. **NOTE** To exchange an edge definition, the new edge definition must already be defined in the curtain wall unit style.
remove the frame or mullion edge	select Remove Edge.

5 Click OK.

6 Specify where you want to save the curtain wall unit override.

If you want to save the override . . .	Then . . .
only on this specific curtain wall unit	no further steps are necessary. The override is saved to the curtain wall unit. For information about how to remove an override from a curtain wall unit, see "Removing Curtain Wall Unit Overrides" on page 988.
to a curtain wall unit style	select the curtain wall unit, right-click, and select Design Rules ➤ Transfer to Object.

7 If you have chosen to save the override to a curtain wall unit style, select the curtain wall unit again, right-click and click Design Rules ➤ Save to Style and decide to which curtain wall unit style you want to save the override.

If you want to save the override . . .	Then . . .
to the current curtain wall unit style	select Transfer Edge Overrides to Style, and click OK. **NOTE** If you have created only a frame or mullion edge override, only the Transfer Edge Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a division override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

If you want to save the override . . .	Then . . .
to a new curtain wall unit style	select Transfer Edge Overrides to Style, and click New. Then, enter a name for the new curtain wall style, and click OK. **NOTE** If you have created only a frame or mullion edge override, only the Transfer Edge Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a division override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

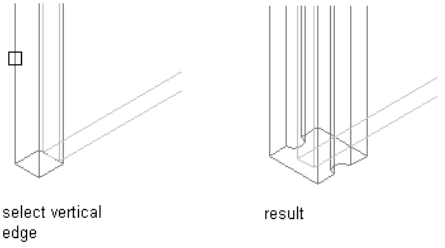
NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides still remain on the curtain wall unit, where they can be removed as described in "Removing Curtain Wall Unit Overrides" on page 988, but they are not saved back to a curtain wall unit style.

Creating a Curtain Wall Unit Frame or Mullion Edge from a Polyline or Profile

You can assign a profile to any vertical edge of a frame or mullion. The profile can be any profile or any closed polyline that you specify. You can use a profile edge to create a unique corner in situations where a simple miter is not sufficient.

NOTE Adjacent infills are not trimmed or expanded to accommodate the new edge. To adjust the infill, change the width of the frame edge. For more information, see "Defining a Curtain Wall Unit Frame by Width and Depth" on page 934.

Overriding edge profile



1 Draw a closed polyline in the location where you want it to display in the curtain wall unit.

NOTE For best results, it is recommended that you draw the polyline in Plan view.

2 Select the curtain wall for which you want to create a frame or mullion edge profile override.

3 Right-click, and click Frame/Mullion ➤ Add Profile.

4 Select a vertical frame or mullion edge.

5 Select a profile for the override:

If you want to create the edge profile . . .	Then . . .
from the polyline drawn in step 1	select it in the drawing, and enter a name for it. Click OK.
from an existing profile in the drawing	press ENTER, select the profile, and click OK.

6 Specify where you want to save the curtain wall unit override.

If you want to save the override . . .	Then . . .
only on this specific curtain wall unit	no further steps are necessary. The override is saved to the curtain wall unit. For information about how to remove an override from a curtain wall unit, see "Removing Curtain Wall Unit Overrides" on page 988.
to a curtain wall unit style	select the curtain wall unit, right-click, and select Design Rules ➤ Transfer to Object.

7 If you have chosen to save the override to a curtain wall unit style, select the curtain wall unit again, right-click and click Design Rules ➤ Save to

Style and decide to which curtain wall unit style you want to save the override.

If you want to . . .	Then . . .
to the current curtain wall unit style	select Transfer Edge Profile Overrides to Style, and click OK. **NOTE** If you have created only a profile edge override, only the Transfer Edge Profile Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a division override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.
to a new curtain wall unit style	select Transfer Edge Overrides to Style, and click New. Enter a name for the new curtain wall unit style, and click OK. **NOTE** If you have created only a profile edge override, only the Transfer Edge Profile Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a division override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides still remain on the curtain wall unit, where they can be removed as described in "Removing Curtain Wall Unit Overrides" on page 988, but they are not saved back to a curtain wall unit style.

In-Place Editing of Edge Profiles for Curtain Wall Units

Use this procedure to edit profile edges with in-place editing.

With in-place editing, you can edit the profile directly and interactively on screen, and later save the changes to the profile definition.

1. Select a curtain wall unit that has the edge profile you want to edit onscreen with in-place editing.
2. Right-click, and click Frame/Mullion ➤ Edit Profile In Place.

   This command is only available if you have profile-based edges in the curtain wall unit.

NOTE If the profile is not drawn to size, it must be converted in order for you to begin the in-place editing session. Click Yes if prompted to convert the profile to its actual size.

3 Select the edge you want to edit.

NOTE You have entered the in-place editing session now. You can see this from the magenta colored grips and light blue hatch of the temporary in-place editing profile, as well as the faded color of all other objects in the drawing. Note that while you are in the in-place editing session, you have only limited editing access to other commands in the drawing. Before working on other objects, you should first end the in-place editing session.

4 Edit the profile:

If you want to . . .	Then . . .
use grips to edit the profile	move the grips as needed.
add a vertex to the profile	select the profile, right-click and click Add Vertex. Add new vertices as needed. Press ENTER.
remove a vertex from the profile	select the profile, right-click and click Remove Vertex. Remove vertices as needed. Press ENTER.
add a ring to the profile	select the profile, right-click and click Add Ring. Select a closed polyline, spline, ellipse, or circle for an additional ring. Specify if you want to erase the source linework, and press ENTER.
remove a ring from a profile	select the profile, right-click and click Remove Ring. Select the ring you want to remove. **NOTE** You cannot remove the last ring from a profile.
replace a ring on a profile	select the profile, right-click and click Replace Ring. Select a closed polyline, spline, ellipse, or circle for the replaced ring. Specify if you want to erase the source linework, and press ENTER.

5 Save the changes to the profile.

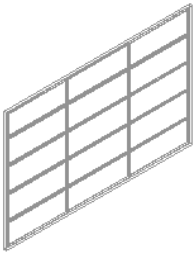
If you want to . . .	Then . . .
change the existing profile definition to reflect the new shape	select the profile, right-click, and click Save. The in-place edit session is exited and the profile definition is updated.
create a new profile definition with the shape you have created	select the profile, right-click, and click Save As New Profile. Enter a name for the new profile and click OK. The in-place edit session is exited and the new profile definition is available in the Style Manager.
discard all changes on the profile and revert back to the previous shape	select the profile, right-click, and click Discard all Changes. The in-place edit session is exited and all changes you have made to the profile are purged.

Overriding Curtain Wall Unit Divisions

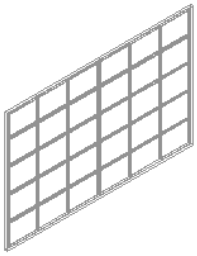
The grid of a curtain wall unit is made up of one or more divisions that define how the curtain wall unit is partitioned. Divisions can be horizontal or vertical and can be nested in each other. For detailed information on curtain wall unit divisions, see "Defining Divisions for Curtain Wall Unit Grids" on page 918.

You can override a division in a curtain wall unit, thereby changing the grid of the curtain wall unit.

Overriding number of Curtain Wall Unit cells



five cell horizontal grid and three cell vertical grid before override



five cell horizontal grid and six cell vertical grid after override

Related Topics

- Creating a Curtain Wall Unit Division Override

Creating a Curtain Wall Unit Division Override

Use this procedure to create a division override on a curtain wall unit.

NOTE To exchange a curtain wall unit division, the new division definition must already be defined in the curtain wall unit style. For information on curtain wall unit divisions, see "Defining Divisions for Curtain Wall Unit Grids" on page 918.

1. Select the curtain wall unit for which you want to create a division override.
2. Right-click, and click Division ➤ Override Assignment.
3. Select an edge of the curtain wall unit to determine if a horizontal or vertical division is overridden.

   For example, if you want to override the primary horizontal division, you could select the bottom horizontal frame of the curtain wall unit.

   TIP The Division Assignment Override dialog box shows you which grid type and which grid division you have selected, e.g., Selected Nested Grid: Secondary Grid, Division Element Definitions: Vertical 3 Cells. If you accidentally selected the wrong division, click Cancel and reselect the correct grid.

4. Select the appropriate division override, and click OK.
5. Specify where you want to save the curtain wall unit override.

If you want to save the override . . .	Then . . .
only on this specific curtain wall unit	no further steps are necessary. The override is saved to the curtain wall unit. For information about how to remove an override from a curtain wall unit, see "Removing Curtain Wall Unit Overrides" on page 988.
to a curtain wall unit style	select the curtain wall unit, right-click, and select Design Rules ➤ Transfer to Object.

6. If you have chosen to save the override to a curtain wall unit style, select the curtain wall unit again, right-click and click Design Rules ➤ Save to

Style and decide to which curtain wall unit style you want to save the override.

If you want to save the override . . .	Then . . .
to the current curtain wall unit style	select Transfer Division Overrides to Style, and click OK. **NOTE** If you have created only a profile edge override, only the Transfer Division Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.
to a new curtain wall unit style	select Transfer Division Overrides to Style, and click New. Enter a name for the new curtain wall unit style, and click OK. **NOTE** If you have created only a profile edge override, only the Transfer Division Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

NOTE If you do not want to save the override back to a style at all, right-click and click Design Rules ➤ Revert to Style Design Rules. The overrides still remain on the curtain wall unit, where they can be removed as described in "Removing Curtain Wall Unit Overrides" on page 988, but they are not saved back to a curtain wall unit style.

In-Place Editing of Curtain Wall Unit Divisions

Use this procedure to edit divisions using in-place editing.

With in-place editing, you can edit the curtain wall unit directly and interactively on screen, and later save the changes to the curtain wall unit or curtain wall unit style.

1 Select a curtain wall unit on which you want to edit divisions onscreen with in-place editing.

2 Specify the mode in which to edit the curtain wall unit:

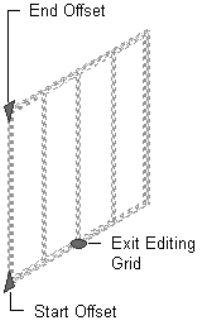
If you want to edit . . .	Then . . .
this instance of the curtain wall unit	right-click, and click Design Rules ➤ Transfer to Object.
the curtain wall unit style	right-click, and click Design Rules ➤ Revert to Style Design Rules. If this option is not available, the design rules are already style-based for the curtain wall unit.

3 Click the Edit Grid grip.

4 Select an edge on the division you want to edit.

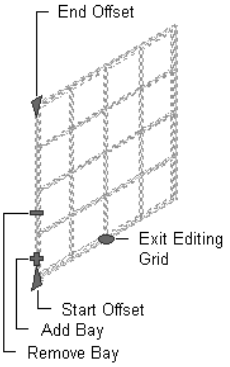
For example, if you want to edit the primary grid, select an edge on the outer curtain wall unit frame.

Viewing Curtain Wall Unit primary division edit in-place grips



NOTE You have entered the in-place editing session now. You can see this from the faded color of all objects in the drawing, as well as from the different grips at your disposal. Note that while you are in the in-place editing session, you have only limited editing access to other commands in the drawing. Before working on other objects, you should first end the in-place editing session.

Viewing Curtain Wall Unit edit in-place grips for adding and removing bays



5 Edit the division:

If you want to . . .	Then . . .
add a bay to the grid	click the Add Bay grip.
remove a bay from the grid	click the Remove Bay grip.
change the start offset of the grid	select the Start Offset grip and move it to the position.
change the end offset of the grid	select the End Offset grip and move it to the position.
change the spacing of bays	click the Auto Grid Bay Spacing grip and move it to the position.
manually edit the grid	right-click and click Convert To Manual. You can manually add and remove gridlines, change the offsets, and change the position of individual gridlines.
use a worksheet to edit the cell dimensions	click the Set Fixed Cell Dimension Rules command grip, and edit the values in the worksheet.

6 Save or discard changes to the curtain wall unit grid:

If you want to exit the in-place editing session . . .	Then . . .
without saving your changes	click on the In-Place Edit toolbar.
after saving your changes	click on the In-Place Edit toolbar. If you edited the grid by instance, the changes are saved to the design rules for the individual grid. If you edited the curtain wall unit style, the Save Changes dialog box is displayed.

7 In the Save Changes dialog box, specify to which division to save the changes:

If you want to . . .	Then . . .
save the changes to the style in the current curtain wall unit division	verify the current division is selected for Save Changes to Existing Division, and click Save. The changes are made in the style and affect all curtain wall units of that style in the drawing.
create an override to the style by saving the changes in a new curtain wall unit division	click New, enter a name for the new division override, and click OK. Click Save. The changes are saved as an override to the style, and affect only the curtain wall units to which the override is applied.

Removing Curtain Wall Unit Overrides

Use this procedure to remove curtain wall unit overrides either from the curtain wall unit or the curtain wall unit style.

1 Select the curtain wall unit:

If you want to remove an override . . .	Then . . .
from a curtain wall unit	select the curtain wall unit, right-click and click Curtain Wall Unit Properties. Click the Overrides tab.
from the curtain wall unit style	select the curtain wall unit, right-click, and click Edit Curtain Wall Style. Click the Overrides tab.

2 Select an override from the list and click Remove.

3 Click OK.

Editing Curtain Wall Units

Most relevant settings for a curtain wall unit are defined in the curtain wall unit style. These include divisions, infills, frames, and mullions. For information on modifying a curtain wall unit style, see "Curtain Wall Unit Styles" on page 915.

You can make other changes directly to individual curtain wall units. These changes affect only the curtain wall unit you select:

- Dimensions of a curtain wall unit
- Roof and floor line settings
- Interference conditions
- Cleanup settings

Methods of Editing Curtain Wall Units

Autodesk Architectural Desktop offers several methods for editing curtain wall units:

- You can directly edit curtain wall units using grips for dimensions and other physical characteristics.
- You can change curtain wall unit settings on the Properties palette.
- You can select editing commands from the context menu for a selected curtain wall unit.

Related Procedures

- Using Grips to Edit Curtain Wall Units

- Selecting a Different Curtain Wall Unit Style
- Changing the Dimensions of a Curtain Wall Unit
- Specifying a Miter Angle for a Curtain Wall Unit Adjacent to Another Object
- Changing the Location of a Freestanding Curtain Wall Unit
- Modifying the Position of Anchored Curtain Wall Units
- Attaching Hyperlinks, Notes, or Files to a Curtain Wall Unit

Using Grips to Edit Curtain Wall Units

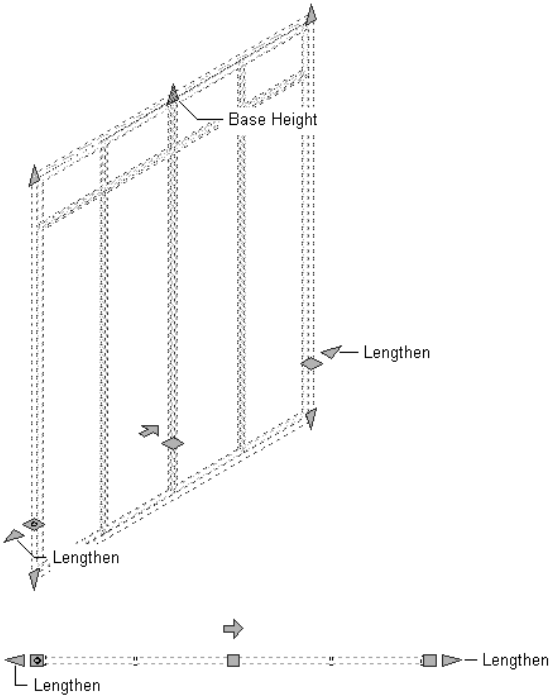
Refer to the illustrations and steps in this topic to use curtain wall unit grips to edit curtain wall units.

Editing Curtain Wall Unit Dimensions

1. Select the curtain wall unit.
2. Select the grip for the dimension you want to change.

   You can modify the dimensions of the base height and length for a curtain wall.

Viewing Curtain Wall Unit Lengthen and Base Height grips



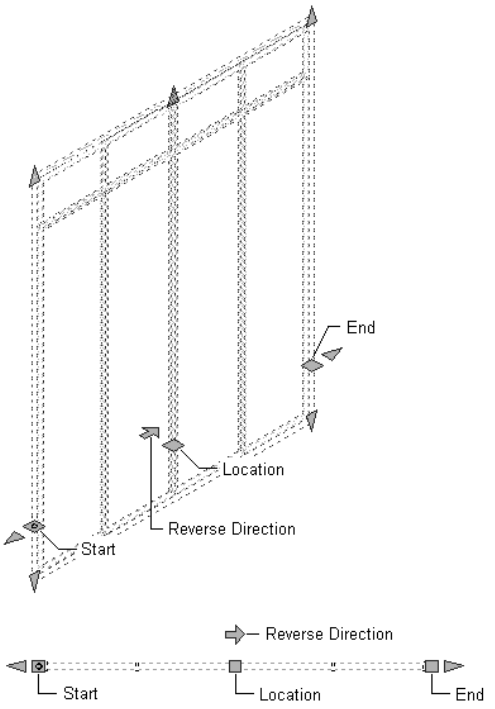
3 Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Changing the Location or Position of a Curtain Wall Unit

1 Select the curtain wall unit.

2 Move the appropriate grip to change the location of the curtain wall unit, its start point, or its end point.

Viewing Curtain Wall Start, End, Location, and Reverse Direction Grips

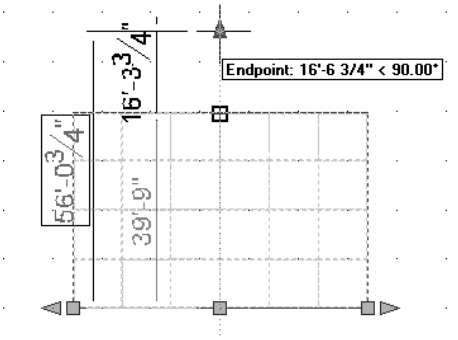


Changing the Base Height of a Curtain Wall Unit

Use this procedure to change the base height of a curtain wall unit. You can also change the base height on the Properties palette.

1. Select the curtain wall unit.
2. Select the Base Height grip, move the grip until the height value you want is displayed, and click once.

   As you move the grip, the original base height value is displayed in addition to the new base height and the difference between the two values.



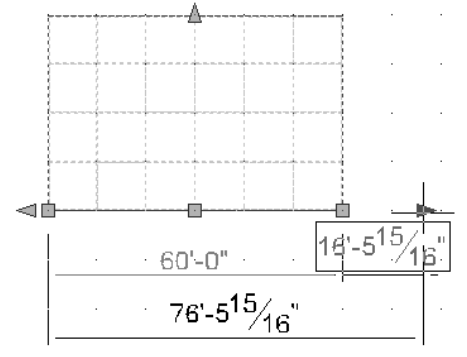
After selecting the grip, you can also enter a new value for the base height of the curtain wall.

Changing the Length of a Curtain Wall Unit

Use this procedure to change the length of a curtain wall unit. You can also change the length on the Properties palette. For more information, see "Changing the Dimensions of a Curtain Wall Unit" on page 995.

1. Select the curtain wall unit.
2. Select the Lengthen grip, move the grip until the length value you want is displayed, and click once.

   As you move the grip, the original length value is displayed in addition to the new length and the difference between the two values.



After selecting the grip, you can also enter a new value for the length of the curtain wall.

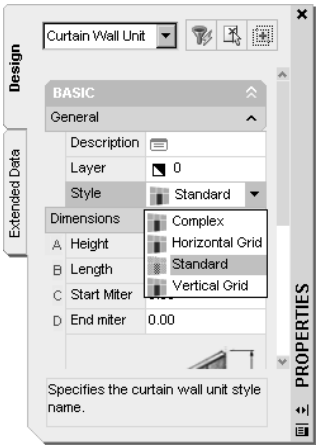
Selecting a Different Curtain Wall Unit Style

Use this procedure to select a different style for the curtain wall unit.

1. Select the curtain wall unit for which you want to change the style.

   You can select multiple curtain wall units and change the style for all at the same time.

2. On the Properties Palette, scroll to the General subcategory.
3. Select a different style.



Matching the Properties of an Existing Curtain Wall Unit

Use this procedure to apply the properties of a curtain wall unit tool to one or more existing curtain wall units. The properties include the curtain wall unit style and any other settings specified in the tool you select.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

2. Right-click a curtain wall unit tool, and click Apply Tool Properties to ➤ Curtain Wall Unit.
3. Select the curtain wall units, and press ENTER.

   The properties of the selected curtain wall units match the properties of the curtain wall unit tool.

Changing the Dimensions of a Curtain Wall Unit

Use this procedure to change the dimensions of a curtain wall.

Dimension	Description
Height	Height of the curtain wall unit from the baseline
Length	Length of a straight curtain wall unit from the start grip on the baseline to the end grip
Start Miter	Angle of all infills and horizontal edges (frame or mullion) at the start of the curtain wall unit. For more information about miter angles, see "Mitering Curtain Walls" on page 889.
End Miter	Angle of all infills and horizontal edges (frame or mullion) at the end of the curtain wall unit. For more information about miter angles, see "Mitering Curtain Walls" on page 889.

1. Select a curtain wall unit.
2. Expand Dimensions.
3. Change the dimension.

Specifying a Miter Angle for a Curtain Wall Unit Adjacent to Another Object

Use this procedure to manually create a mitered corner between a curtain wall unit and another object, such as a standard wall or a mass element. For example, if your curtain wall unit connects with a standard wall that is at 60-degree angle from the curtain wall unit, you would specify the miter angle as 30.

The miter angle applies to all infills and horizontal edges that are adjacent to the corner. Vertical edges are not affected.

TIP To quickly identify the start and end of a curtain wall unit, select the curtain wall unit. The Reverse Direction grip points toward the end of the curtain wall unit.

1. Select a curtain wall unit.
2. Expand Dimensions.

3 Miter the curtain wall unit on the start or the end point:

If you want to miter the curtain wall unit . . .	Then . . .
at its start point	enter an angle for Start Miter Angle, and press ENTER.
at its end point	enter an angle for End Miter Angle, and press ENTER.

Changing the Location of a Freestanding Curtain Wall Unit

Use this procedure to relocate a freestanding curtain wall unit by changing the coordinate values of its insertion point. The curtain wall unit also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the curtain wall unit are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the curtain wall unit by aligning its normal with another axis. You can also rotate the curtain wall unit on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1 Double-click the curtain wall unit you want to change.

2 Expand Location.

3 Click Additional information.

4 Specify the location of the curtain wall unit:

If you want to . . .	Then . . .
relocate the curtain wall unit	enter new coordinate values under Insertion Point.
locate the curtain wall unit on the *XY* plane	make the normal of the wall parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the curtain wall unit on the *YZ* plane	make the normal of the curtain wall unit parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.

If you want to . . .	Then . . .
locate the curtain wall unit on the *XZ* plane	make the normal of the curtain wall parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the curtain wall unit	enter a new value for Rotation Angle.

5 Click OK.

Modifying the Position of Anchored Curtain Wall Units

When you use a curtain wall unit as an infill for a curtain wall or a door/window assembly, the curtain wall unit is anchored to the other object. While anchored, the curtain wall unit moves when you move the curtain wall and is erased when you erase the curtain wall.

You can change the orientation, alignment, or offset of the curtain wall unit without affecting the anchor.

NOTE For information about releasing the curtain wall unit anchor so that it moves and erases independently from the curtain wall, see "Releasing an Object Anchored in a Curtain Wall" on page 908.

Related Procedures

- Changing the Orientation of an Anchored Curtain Wall Unit
- Changing the Alignment of an Anchored Curtain Wall Unit
- Changing the Offset of an Anchored Curtain Wall Unit

Changing the Orientation of an Anchored Curtain Wall Unit

Use this procedure to change the orientation of an anchored curtain wall unit using grips.

1 Click the anchored curtain wall unit for which you want to change the orientation.

2 Click the appropriate Flip grip to change the *X* or *Y* direction of the object.

You can also change the orientation of an object, including the *Z* direction, using the Anchor worksheet found on the object's Properties palette.

Changing the Alignment of an Anchored Curtain Wall Unit

Use this procedure to change the alignment of a curtain wall unit anchored into a curtain wall.

1. Double-click the anchored curtain wall unit.
2. Expand Location, and click Anchor.
3. Click Allow Variation from Infill Element Definition.
4. Select a new alignment for the curtain wall unit.

   For more information, see "Specifying an Alignment for a Curtain Wall Unit Infill" on page 930.

5. Click OK.

Changing the Offset of an Anchored Curtain Wall Unit

Use this procedure to change the offset of an anchored curtain wall unit.

1. Double-click the anchored curtain wall unit.
2. Expand Location, and click Anchor.
3. Click Allow Variation from Infill Element Definition.
4. Specify a new offset for the curtain wall unit.

   For more information, see "Specifying an Offset for a Curtain Wall Unit Infill" on page 930.

5. Click OK.

Attaching Hyperlinks, Notes, or Files to a Curtain Wall Unit

Use this procedure to enter notes and attach reference files to a curtain wall unit. You can also edit notes and edit or detach reference files from a curtain wall unit.

1. Double-click the curtain wall unit.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4. To add a note, click the setting for Notes, and enter the text.
5. Click OK.

6 Click under Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click Open.
edit the description of a reference file	select the file, and click the description. Enter the new text, and press ENTER.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

7 Click OK twice.

Facet Deviation

The smoothness (tesselation) of curved curtain wall edges is controlled by the FACETDEV variable. Specify the facet deviation to set the number of facets to display on curved objects. This must be set before converting a polyline to a curtain wall.

The facet deviation is available only on the command line by typing **AecFacetDev**.

The number you set as the facet deviation defines the maximum distance from the chord to the arc, the chord being an edge that is created from faceting the curve, to the true mathematical arc. The facet deviation has a range of greater than zero (0) and no upper limit.

The minimum number of facets is 8. For example, when you create a cylinder mass element with a 1' radius, and specify a FACETDEV value of 1', the cylinder has 8 faces.

Doors

15

A door is an AEC object that interacts with walls and space boundaries. You can also create freestanding doors for door-type drawings.

In this chapter

- Using Door Tools to Create Doors
- Creating a Door
- Creating a Door with User-specified Settings
- Creating a Door Tool
- Editing Doors
- Door Styles

Creating Doors

You can create doors using the typical design parameters for style, standard size, width and height, threshold height, and head height. You can choose styles with glass shapes that receive standard muntins patterns, and create your own custom glass shapes from profiles.

Doors Styles

Autodesk® Architectural Desktop provides ready-to-use door styles. The design rules of a door style determine the default dimensions of doors and the door shape and type

- The door shape determines the geometry of the door panel, such as rectangular, half-round, and arch. You can also create custom door shapes from profiles.
- The door type determines the number of panels and the method of opening the door, such as single, double, bifold, pocket, revolving, and overhead.

You can define standard sizes in a door style and then select the size you want to use when you place the door in a drawing.

Anchoring Doors

After a door is placed in a wall or space boundary, the door is constrained to the object and cannot move outside it.

Doors can also be anchored to specific locations in walls or space boundaries, so that when the wall or space boundary moves or changes size, the location of the door in that object remains constant.

Door Dimensions

Some door dimensions depend on the shape and type specified in the door style.

Rise is the height from the top of the rectangular portion of a door to the peak of the door opening for Gothic, Arch, and Peak Pentagon door shapes.

Leaf specifies the door size for pairs of Uneven, Uneven-Dhung, and Uneven Opposing door types. For more information about leaf, see "Changing the Door Leaf" on page 1020.

Vertical Alignment of Doors

You use vertical alignment settings to control the placement of the door in the wall, the location of the working point vertically in the wall, and how the door responds to modifications in height. To determine the working point on the door, use the threshold and head height settings. You can place the working point at the sill or at the head. For example, if you specify the vertical alignment as 0" and the door height as 7'–0", the door opening height is

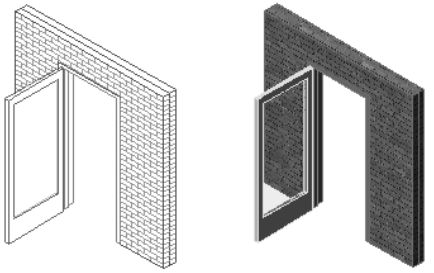
7’–0". If you next specify the height of the door as 6'–8", the door threshold remains at 0" and the door opening height becomes 6’–8".

For the door head working point, if you specify the vertical alignment as 7'–0" and the door height as 7'–0", the door opening height is 7–0". If you specify the door height as 6'–8", the door head remains at 7'–0" and the door threshold becomes 4".

Materials in Doors

You can assign materials to a door. Materials are displayed in wireframe and working shade views, or when linked in VIZ®Render. Materials have specific settings for individual components of a door, such as the panel, the stop, the frame, or a glass inset.

Doors in 2D wireframe and rendered views



Autodesk Architectural Desktop provides predefined materials for common design purposes, which contain settings for doors. You can use the predefined materials “as is,” or modify them for your special designs. You can also create your own materials. Styles provided with the software have appropriate materials already assigned to them. For more information, see “About Door Display Components and Materials” on page 1043.

Related Topics and Procedures

- Using Door Tools to Create Doors
- Editing Doors
- Door Styles

Using Door Tools to Create Doors

Door tools provided with Autodesk® Architectural Desktop let you quickly place doors. A door tool has a specific style and other predefined properties. You can also use door tools to apply properties to existing doors.

The following palettes contain one or more door tools:

Palette	Tools
Design	Contains a door tool for the Standard door style and default settings for other door properties
Doors	Contains door tools for sample door styles, with default properties appropriate for each door style
Custom tool palettes created by your CAD manager	Contain door tools with styles and properties customized for your projects or office standards

Door tools are also included in the Autodesk Architectural Desktop Stock Tool catalog supplied with the Content Browser. For information about using the Content Browser, see "Content Browser."

You can use the default settings of a door tool, or you can change settings for any door properties that are not controlled by the style.

Related Procedures

- Creating a Door
- Creating a Door with User-specified Settings
- Creating a Door Tool

Creating a Door

Use this procedure to add a door that has the properties specified in the door tool that you select. To specify settings when you add a door, see "Creating a Door with User-specified Settings" on page 1005.

1 Open the tool palette that you want to use, and select a door tool.

If necessary, scroll the palette to display the tool that you want to use.

2. Select a wall or space boundary in which to insert the door, or press ENTER to add a freestanding door.

   You can move or hide the Properties palette to expose more of the drawing area.

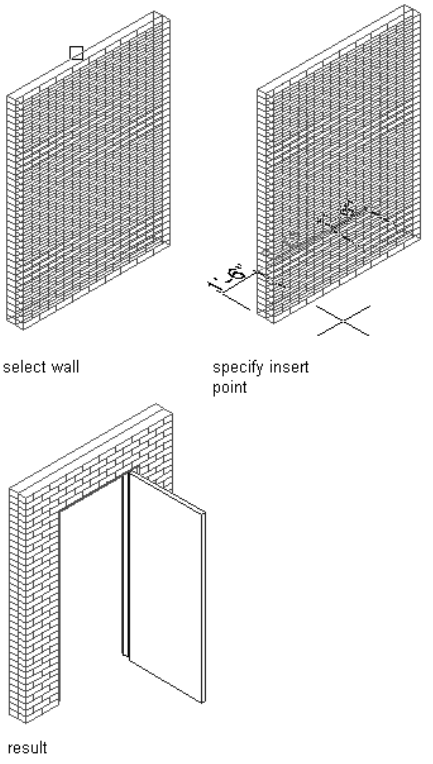
3. Specify the insertion point of the door.
4. Continue adding doors, and press ENTER.

Creating a Door with User-specified Settings

Use this procedure to create any of the following, with settings that you specify:

- Freestanding doors
- Doors in walls
- Doors in space boundaries

Adding a door to a wall



1 Open the tool palette that you want to use, and select a Door tool.
If necessary, scroll the tool palette to display the tool you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Select a door style.

4 Expand Dimensions.

5 Specify a door size:

If you want to . . .	Then . . .
use a standard door size	click Standard Sizes, and then select a door size.
use a custom door size	enter values for Width and Height.

6 Enter values for rise and leaf.

These values depend on the selected style and door type.

7 Enter a value for swing angle or opening percent.

Zero indicates a closed door.

8 Expand Location.

9 If you are placing the door in a wall or a space boundary, specify the door position:

If you want to . . .	Then . . .
position the door at a specific distance between the edge of the opening and the end of a wall segment or space boundary	Select Offset/Center for Position along wall, and enter a value for Automatic offset.
center the door on a wall segment or space boundary	Select Offset/Center for Position along wall, and specify a point near the center of the wall segment or space boundary.
position the door anywhere along the wall or space boundary	click Position along wall, and select Unconstrained.

10 Specify whether you want the door to be aligned vertically by threshold height or by head height:

If you want to . . .	Then . . .
align the door by threshold height	select Threshold for Vertical alignment, and enter a value for Threshold height.
align the door by head height	select Head for Vertical alignment, and enter a value for Head height.

11 Specify the insertion point for a door in a wall or space boundary, or for a freestanding door:

If you want to . . .	Then . . .
insert a door in a wall	select the wall and specify an insertion point along the wall.

If you want to . . .	Then . . .
insert a door in a space boundary	select the space boundary and specify an insertion point in the space boundary.
insert a freestanding door	press ENTER, and specify an insertion point and a rotation angle for the door.

12 Continue to place doors, and press ENTER when you are finished.

Creating a Door Tool

Use this procedure to create a door tool and add it to a tool palette. You may want to create your own door tools if you are placing multiple doors of specific styles that have the same properties.

For example, you are creating an office floor plan that contains two custom door styles: single solid doors for offices, and solid double doors for conference rooms. To work efficiently, you can create a door tool for each style. You can then select the appropriate tool to place doors in offices and conference rooms.

You can use any of the following methods to create a door tool:

- Drag a door that has the properties you want to a tool palette.
- Drag a door style from the Style Manager to a tool palette, and then customize the properties of the new tool.
- Copy an existing tool, and then customize the properties of the new tool.
- Drag a tool from a tool catalog in the Content Browser, and then customize the properties of the tool.

  For information about using the Content Browser to create a tool, see "Using Tool Catalog Items in Autodesk Architectural Desktop" on page 199.

1 Open the tool palette on which to create the tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a door in the drawing	select the door and drag it to the tool palette.

If you want to . . .	Then . . .
create a tool from a door style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current palette	right-click the tool, click Copy, and click Paste.
copy a tool from another palette	open the other tool palette. Right-click the tool, and click Copy. Open the other palette, and click Paste.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.

   This description is used as the tool's tooltip on the tool palette, and to describe the tool if it is stored in a tool catalog.
6. Expand Basic and expand General.
7. Enter a description of the tool.
8. If you do not want to use the default layer key for doors, select a layer key.
9. If you want to override the default layer name for doors, select a layer override.
10. Select a door style.
11. For Style location, select the drawing file containing the style used for this door, or select Browse and use a standard file selection dialog box to select the file.
12. Expand Dimensions.
13. Specify a door size:

If you want to . . .	Then . . .
use a standard door size	click Standard Sizes, and then select a door size.
use a custom door size	enter values for Width and Height.

14 Specify how the door width and height are measured:

If you want to . . .	Then . . .
measure to the outside of the door frame	Select Outside of frame for Measure to.
measure to the inside of the door frame	Select Inside of frame for Measure to.

15 Enter a value for swing angle or opening percent.

Zero indicates a closed door.

16 Expand Location.

17 Specify the door's position in a wall or a space boundary:

If you want to . . .	Then . . .
position the door at a specific distance between the edge of the opening and the end of a wall segment or space boundary	Select Offset/Center for Position along wall, and enter a value for Automatic offset.
center the door in a wall segment or space boundary	Select Offset/Center for Position along wall, and specify a point near the center of the wall or space boundary.
freely position the door anywhere in the wall or space boundary	click Position along wall, and select Unconstrained.

18 Enter a value for head height.

19 Enter a value for threshold height.

20 Click OK.

Editing Doors

After you create a door, you can change the size, height, width, rise, leaf, and opening. You can also move the door within the wall, flip the hinge or swing, and change the swing opening.

You can change the properties of doors by changing the door style or the dimensions of the door, moving the anchor location of the door, or specifying the endcap conditions of the door.

Autodesk® Architectural Desktop offers several methods for editing doors:

- Edit doors directly using grips for dimensions and other physical characteristics.
- Change door settings on the Properties palette.
- Select editing commands from the shortcut menu for a selected door.

Related Procedures

- Using Grips to Edit Doors
- Changing the Door Style
- Changing the Door Leaf
- Changing the Vertical Alignment of a Door
- Changing How Door Width is Measured
- Changing the Door Swing Angle or Opening Percent
- Moving a Door Along a Wall or Space Boundary
- Moving a Door Within a Wall or Space Boundary
- Using Anchors to Change the Horizontal Position of a Door
- Using Anchors to Change the Vertical Position of a Door
- Using Anchors to Change the Position of a Door Within a Wall or Space Boundary
- Changing the Orientation of a Door to a Wall or Space Boundary
- Moving a Door to a Different Wall
- Releasing a Door from a Wall
- Changing the Opening Endcap Assigned to a Door
- Changing the Location of a Freestanding Door
- Attaching Hyperlinks, Notes, and Files to a Door

Using Grips to Edit Doors

You can use grips to modify the following door properties:

- Dimensions (width and height)

  For overhead doors, the width determines the opening cut in the wall. The width dimensions extend beyond the frame opening because the door rides behind the opening.

- Location in a wall or space boundary

- Hinge side (left or right)
- Swing direction
- Rise

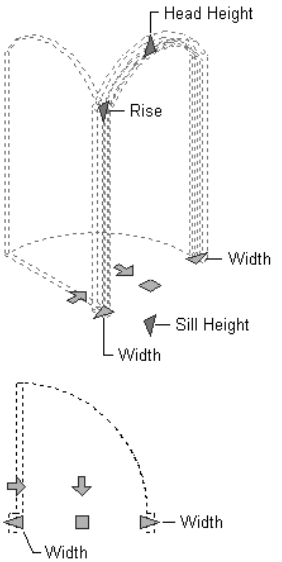
  Rise applies to Peak Pentagon, Arch, and Gothic door shapes. For more information, see "Specifying the Design Rules of a Door Style" on page 1039.

Refer to the illustrations and steps in this topic to use door grips to edit doors.

Editing the Dimensions of a Door That Has Standard Sizes

1 Select the door.

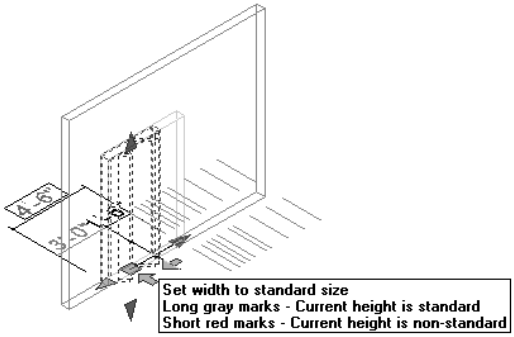
Door dimension grips



2 Select the grip for the dimension you want to change.

The grip initially is set to constrain the sizing to one of the standard values defined for the door's style. For example, if you select the width grip, the grip is set to constrain the width to one of the standard values defined for the door's style.

Standard height door with width grip selected



The CTRL key acts as a toggle between standard and custom sizing.

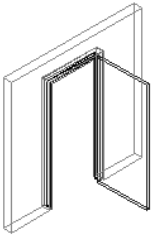
A series of tick marks indicates the standard sizes for the selected dimension. As you move the grip, it snaps to each tick mark and displays the measurement at that mark.

The size and color of the grip tick marks indicate whether setting a standard value for the dimension will result in a standard door size. For example, if the height of the door is set to a non-standard value, then even if you set the door width to a standard value for that door's style, the door is still not a standard size. Long grey tick marks indicate that a standard size is possible; short red marks indicate that another dimension is already set to a non-standard value.

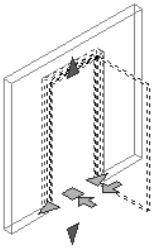
3 Resize the dimension as necessary:

If you want to . . .	Then . . .
change the dimension using a standard size	move the grip until the value you want is displayed, and click once.
change the dimension using a non-standard size	press CTRL, and either move the grip until the value you want is displayed and then click once, or enter a value.

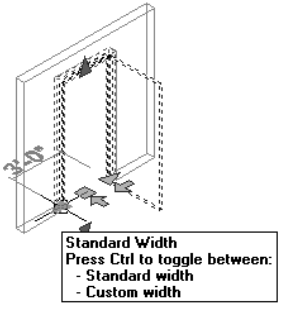
Changing a door width



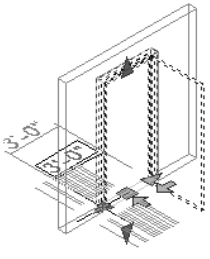
door with
initial width



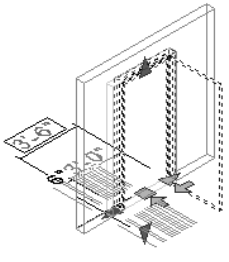
select door



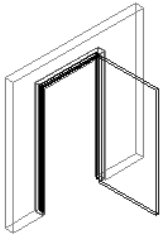
select Width grip



view standard
size width markers

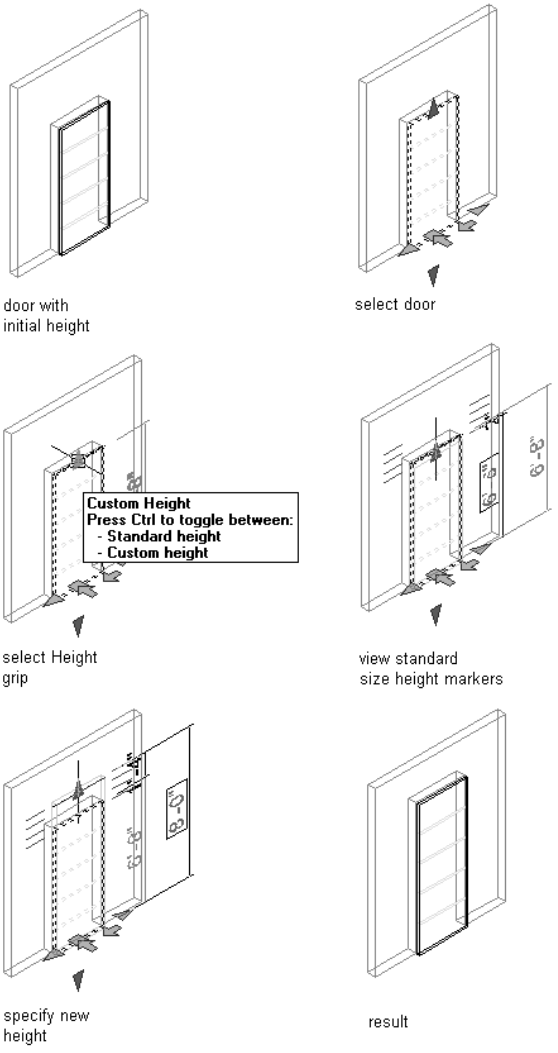


specify new width



result

Changing a door height



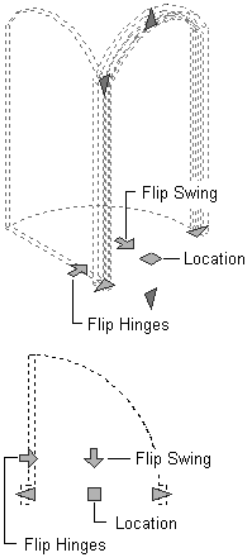
Editing the Dimensions of a Door That Does Not Have Standard Sizes

1. Select the door.
2. Select the grip for the dimension you want to change.
3. Either move the grip until the dimension value you want is displayed and then click once, or enter a value.

Moving a Door Anchored to a Wall or Space Boundary

1. Select the door.
2. Select the Location grip.

Door location and flip grips



3. With the grip selected, press the CTRL key to switch the direction of movement. You can move along the wall, within the wall, and vertically.
4. Move the grip until the door is in the desired location, and click once.

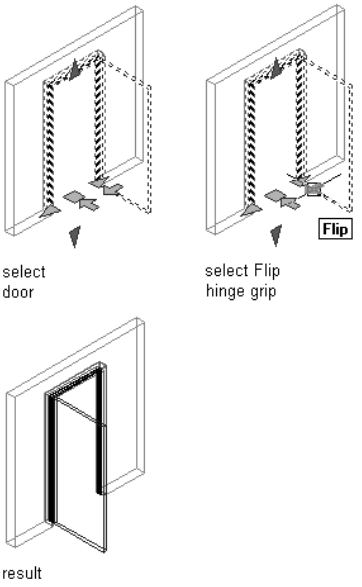
Moving a Freestanding Door

1. Select the door.
2. Select the Location grip.
3. Move the door to the desired location, and click once.

Changing the Hinge Side of a Door

1. Select the door.
2. Select the Flip grip to reverse the side of the door where hinges are located.

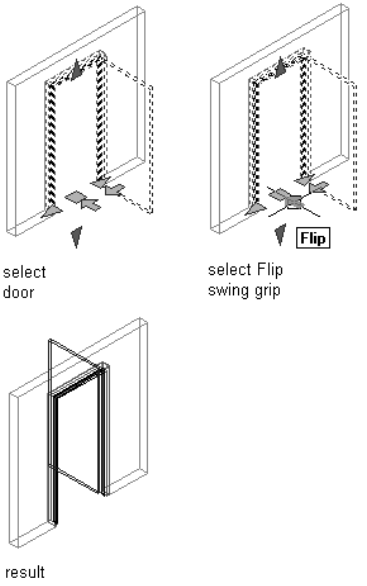
Flipping a door hinge



Changing the Swing Direction of a Door

1. Select the door.
2. Select the Flip grip to reverse the swing direction of the door.

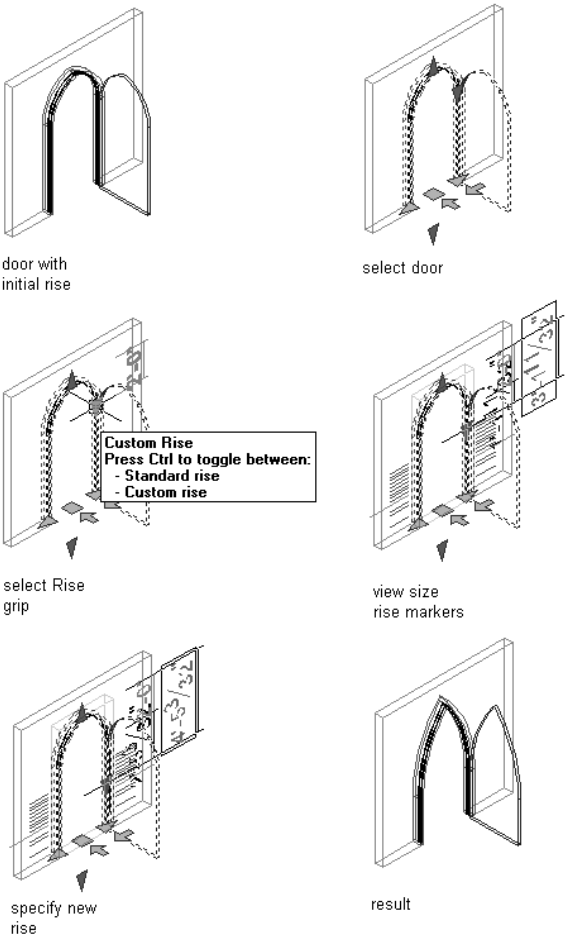
Flipping a door swing



Changing the Rise of a Door

1. Select the door.
2. Select the Rise grip.

Changing a door rise



3 Move the grip until the rise value you want is displayed and click once, or enter a value.

Changing the Door Style

Use this procedure to change the style for a door or group of doors.

1 Select one or more doors, and double-click one of them.

2 Select a door style.

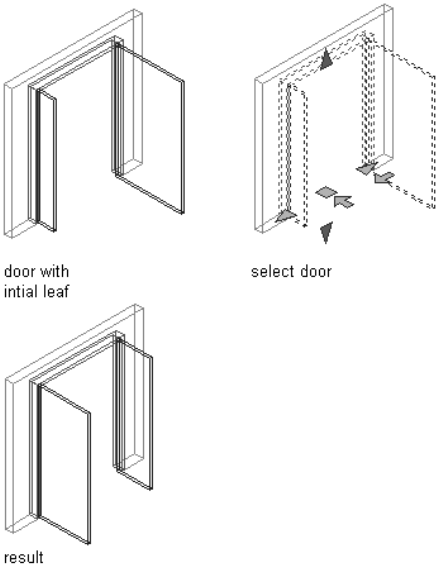
Changing the Door Leaf

Use this procedure to change the leaf value for a door or group of doors.

Leaf applies to Uneven, Uneven-Dhung, and Uneven Opposing door types. For more information, see "Specifying the Design Rules of a Door Style" on page 1039.

1. Select the doors you want to change, and double-click one of them.
2. Expand Basic, and expand Dimensions.
3. Enter a value for Leaf Width, or click Leaf Width and then click to pick points on the screen to specify the width.

Changing a door leaf



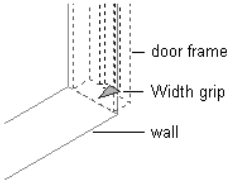
Changing How Door Width is Measured

Use this procedure to change how the width of doors is measured.

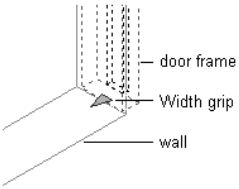
Changing how a door width is measured also affects the dimensions of the opening.

1. Select the doors you want to change, and double-click one of them.

Specifying door frame measurements



measuring to
inside of frame



measuring to
outside of frame

2 Expand Basic, and expand Dimensions.

3 Specify the location to which door width is measured:

If you want to . . .	Then . . .
size the doors to the inside frame	select Inside of frame for Measure to.
size the doors to the outside frame	select Outside of frame for Measure to.

Changing the Door Swing Angle or Opening Percent

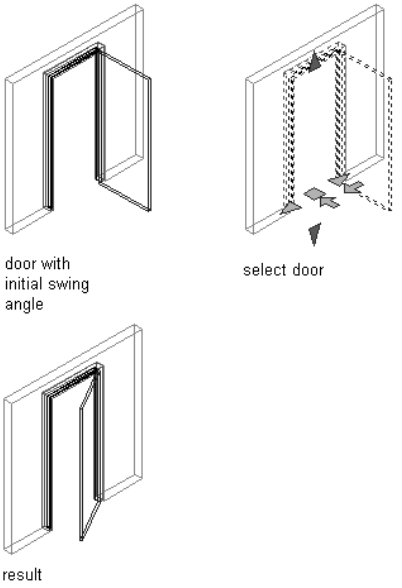
Use this procedure to change the swing angle or opening percent of a door or group of doors.

A door with a swing angle of zero is closed. The swing angle for overhead doors moves the door panel vertically, with graphics above the door head disappearing. The swing display moves with the panel.

NOTE Defining the opening percent in display properties overrides this setting.

1. Select the doors you want to change, and double-click one of them.
2. Expand Basic, and expand Dimensions.
3. Enter a value for Swing angle or Opening percent.

Changing a door swing angle



Changing the Vertical Alignment of a Door

Use this procedure to change the vertical alignment of a door or group of doors.

1. Select the doors you want to change, and double-click one of them.
2. Expand Basic, and expand Location.

3 Specify whether you want the door to be aligned vertically by threshold height or by head height:

If you want to . . .	Then . . .
align the doors by threshold height	select Threshold for Vertical alignment, and enter a value for Threshold height.
align the doors by head height	select Head for Vertical alignment, and enter a value for Head height.

Moving a Door Along a Wall or Space Boundary

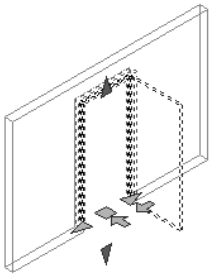
Use this procedure to change the location of one or more doors along a wall or space boundary by offsetting the doors from a reference location.

This feature is useful when you want to position a door at a specified distance from another object. For example, you may want to specify an exact distance between a series of doors along a wall.

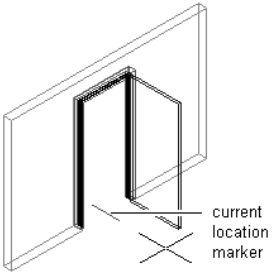
1 Select the doors you want to move, right-click, and click Reposition Along Wall.

A marker indicates the current location within the opening: left jamb, center of door, or right jamb.

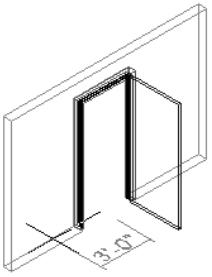
Repositioning a door along a wall



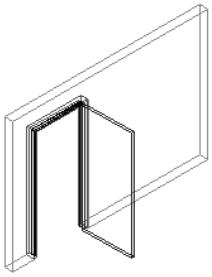
select door



select position
on the opening



select reference
point



result

2 Specify how to measure the offset:

If you want to . . .	Then . . .
measure the offset from the center of the door	select a point near the center of the door.
measure the offset from the left or right jamb	select a point on the jamb of the door you want to measure from.

3 Select a point to measure to (the reference point).

You can select a point along the wall.

4 Specify the distance between the points you selected:

If you want to . . .	Then . . .
move the door to the reference point	enter 0.
move the door a specified distance from the reference point	enter a value for the offset distance.
specify the distance as a measurement between two points, such as the distance between the centers of two doors that are correctly positioned	select the two points measuring the distance.

Moving a Door Within a Wall or Space Boundary

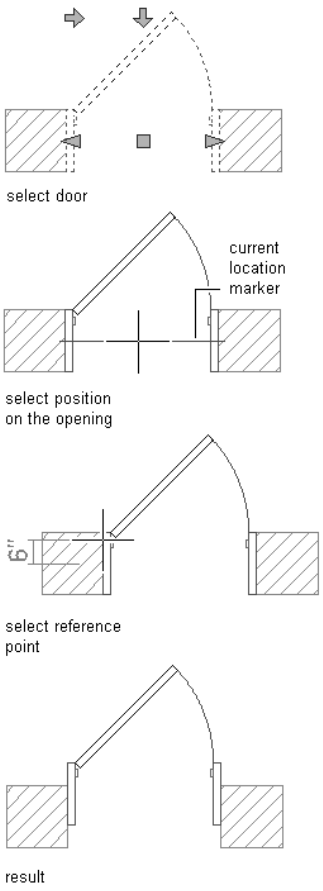
Use this procedure to move one or more doors within a wall or space boundary by offsetting the doors from a reference location.

This feature allows you to align doors within the thickness of a wall or space boundary. You can set an offset distance from any point within a wall, or center the doors between the faces of a wall or space boundary. You can select doors, windows, or openings, and reposition them at the same time. If you select more than one object, you can select only one side to offset.

1 Select the doors you want to move, right-click, and click Reposition Within Wall.

A marker indicates the current location within the opening. This may be the center of the frame, the interior face of the frame, or the exterior face of the frame.

Repositioning a door within a wall



2 Specify how to measure the offset:

If you want to . . .	Then . . .
center the doors between the faces of the wall or space boundary	select a point near the center of the door jamb.

If you want to . . .	Then . . .
offset the doors from the interior or exterior face	select a point on the side of the face you want to measure from.

3 Select a point to measure to.

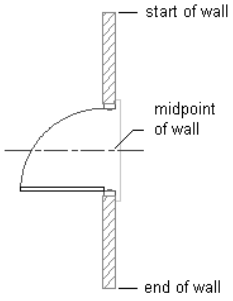
4 Specify the offset distance from the selected point:

If you want to . . .	Then . . .
center the doors between the faces of the wall or space boundary	use the Midpoint osnap to select the midpoint of the end of the wall.
move the doors to the reference point	enter 0.
move the doors a specified distance	enter a value for the offset distance.
specify the distance as a measurement between two points	select the two points measuring the distance.

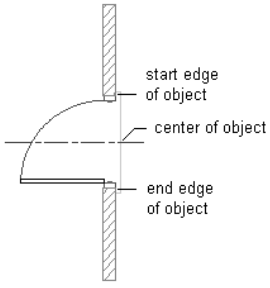
Using Anchors to Change the Horizontal Position of a Door

Use this procedure to change the horizontal position of doors along a wall or space boundary to which the doors are anchored.

Door position along the *X* axis parameters



x-axis wall parameters



x-axis door parameters

1. Select the doors you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand Location.
   For space boundaries, expand Location on space boundary.
3. Click Anchor.
4. Select the reference point for the anchor along the *X* axis:

If you want to . . .	**Then . . .**
use the start of the wall or space boundary as your reference point	under Position Along (X), select Start of wall (curve) for From.
use the midpoint of the wall or space boundary as your reference point	under Position Along (X), select Midpoint of wall (curve) for From.
use the end of the wall or space boundary as your reference point	under Position Along (X), select End of Wall (curve) for From.

5 Enter the distance from the reference point at which to place the doors. Use a negative value to measure from endpoint to start point.

6 Select the position of the doors to measure to:

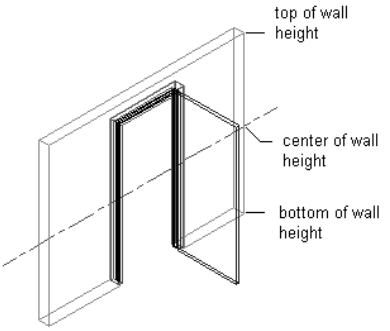
If you want to . . .	Then . . .
measure to the start edge of the doors	select Start Edge of object for To.
measure to the center of the doors	select Center of object for To.
measure to the end edge of the doors	select End Edge of object for To.

7 Click OK.

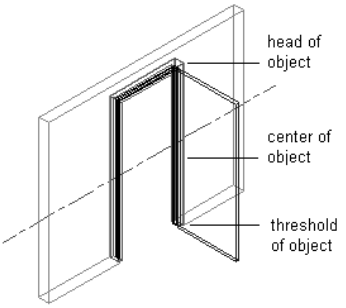
Using Anchors to Change the Vertical Position of a Door

Use this procedure to change the vertical position of doors in a wall or space boundary to which the doors are anchored.

Door position along the *Z* axis parameters



z-axis wall parameters



z-axis door parameters

1 Select the doors you want to change, and double-click one of them.

2 On the Properties palette, expand Basic, and expand Location.

3 Click Anchor.

4 Select the reference point for the anchor along the *Z* axis:

If you want to . . .	**Then . . .**
use the bottom of the wall or space boundary height as your reference point	select Bottom of wall (curve) height for From.
use the center of the wall or space boundary height as your reference point	Select Center of wall (curve) height for From.
use the top of the wall or space boundary height as your reference point	Select Top of wall (curve) height for From.

5 Enter the distance from the reference point at which to place the doors. Use a negative value to measure from endpoint to start point.

6 Select the position of the doors to measure to:

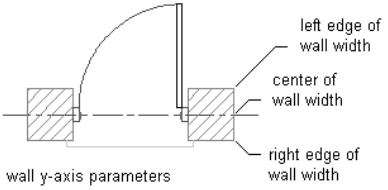
If you want to . . .	Then . . .
measure to the bottom of the doors	select Threshold (Bottom) of object for To.
measure to the center of the doors	select Center of object for To.
measure to the top of the doors	select Head (Top) of object for To.

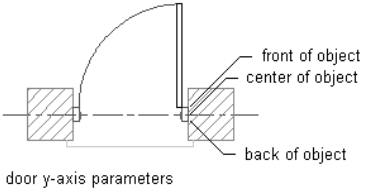
7 Click OK.

Using Anchors to Change the Position of a Door Within a Wall or Space Boundary

Use this procedure to change the position of doors horizontally within a wall or space boundary to which the doors are anchored.

Door position along the *Y* axis parameters





1 Select the doors you want to change, and double-click one of them.

2 On the Properties palette, expand Basic, and expand Location.

3 Click Anchor.

4 Select the reference point for the anchor along the *Y* axis:

If you want to . . .	Then . . .
use the left edge of the wall or space boundary as your reference point	select Left edge of wall (curve) width for From.
use the center of the wall or space boundary as your reference point	select Center of wall (curve) width for From.
use the right edge of the wall or space boundary as your reference point	select Right edge of wall (curve) width for From.

5 Enter the distance from the reference point at which to place the doors. Use a negative value to measure from endpoint to start point.

6 Select the position of the doors to measure to:

If you want to . . .	Then . . .
measure to the front of the doors	select Front for To.
measure to the center of the doors	select Center for To.
measure to the back of the doors	select Back for To.

7 Click OK.

Changing the Orientation of a Door to a Wall or Space Boundary

Use this procedure to change the vertical orientation of doors in a wall or space boundary to which the doors are anchored.

1 Select the doors you want to change, and double-click one of them.
2 On the Properties palette, expand Basic, and expand Location.
3 Click Anchor.
4 Enter the *X* and *Z* rotation angles of the doors.

5 Indicate if you want to reverse the flip direction of the doors in the *X*, *Y*, and *Z* axes:

If you want to . . .	Then . . .
reverse the direction the doors open to	select Flip X.
reverse the side of the wall the doors open to	select Flip Y.
reverse the top and bottom of the doors	select Flip Z.

6 Click OK.

Moving a Door to a Different Wall

Use this procedure to move a door from one wall to another.

1 Select the door you want to move, right-click, and click Wall Anchor ➤ Set Wall.

2 Select the wall to move the door to.

Releasing a Door from a Wall

Use this procedure to release doors from the wall they are anchored to.

- Select the doors you want to release, right-click, and click Wall Anchor ➤ Release.

Changing the Opening Endcap Assigned to a Door

Use this procedure to change the opening endcap style assigned to doors.

NOTE Each opening endcap style generally is created for use with a specific wall style. Changing the opening endcap style used for individual doors may cause the wall to display a defect marker.

For more information, see "Opening Endcap Styles."

1. Select the doors whose endcaps you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand Location.
3. Expand Endcaps.
4. Select the opening endcap style.

Changing the Location of a Freestanding Door

Use this procedure to relocate a freestanding door by changing the coordinate values of its insertion point. The door also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the door are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the door by aligning its normal with another axis. You can also rotate the door on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see ""Use Coordinates and Coordinate Systems" in the online *AutoCAD User's Guide*.

1. Double-click the door you want to move.
2. On the Properties palette, expand Basic, then expand Location and click Additional Information.
3. In the Location dialog box, specify the door's location:

If you want to . . .	**Then . . .**
relocate the door	enter new coordinate values under Insertion Point.
locate the door on the *XY* plane	make the normal of the door parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the door on the *YZ* plane	make the normal of the door parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the door on the *XZ* plane	make the normal of the door parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the door	enter a new value for Rotation Angle.

4. Click OK.

Attaching Hyperlinks, Notes, and Files to a Door

Use this procedure to enter notes and attach reference files to a door. You can also edit notes and edit or detach reference files from a door.

1. Double-click the door to which to attach notes or files.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD Command Reference*.
4. To add a note, click next to Notes, enter text, and click OK.
5. To attach, detach, or edit a reference file, click next to Reference documents, and then do any of the following:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6. Click OK.

Door Styles

A door style is a group of properties assigned to a door that determines the appearance and characteristics of the door.

You can use door styles to represent standard door types for specific jobs and drawings or for your office standards. When you create or modify a door style, the doors using the style have the settings and characteristics of the style. Templates provided with Autodesk® Architectural Desktop contain door styles for many typical doors. You can create a style using default style

properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

Creating Tools from Door Styles
To create a door tool from any door style, you drag the style from the Style Manager onto a tool palette. You can then specify default settings for doors created with that tool. For more information, see "Using Door Tools to Create Doors" on page 1004.

Managing Door Styles
To create, edit, copy, or purge door styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop in which to work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager."

Related Topics and Procedures

- Creating a Door Style
- Specifying the Dimensions of a Door Style
- Specifying the Design Rules of a Door Style
- Specifying the Standard Sizes of a Door Style
- Creating a Custom Door Shape
- Replacing the Door Shape in a Door Style
- Editing the Geometry of a Door Style
- About Door Display Components and Materials
- Assigning Materials to a Door Style
- Adding Classifications to a Door Style
- Specifying the Display Properties of a Door Style
- Creating Muntins in a Door Style

Creating a Door Style

Use this procedure to create a door style.

You can create a style with default style properties, or you can create a style by copying an existing one. After you create the style, you edit its properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door Styles.

3 Create a door style:

If you want to . . .	Then . . .
create a style with default properties	right-click Door Styles, and click New.
create a style from an existing style	right-click the door style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new door style, and press ENTER.

5 To edit the properties of your new door style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.
change dimension properties of the style	see "Specifying the Dimensions of a Door Style" on page 1038.
change design rules of the style	see "Specifying the Design Rules of a Door Style" on page 1039.
change the standard door sizes of the style	see "Specifying the Standard Sizes of a Door Style" on page 1040.
assign materials to the components of the door style	see "Assigning Materials to a Door Style" on page 1045 and "Turning on Materials for a Door Style" on page 1048.
add classifications to a door style	see "Adding Classifications to a Door Style" on page 1046.
specify the display properties of the style	see "Specifying the Display Properties of a Door Style" on page 1046.
change the appearance of the display components of the style	see "Changing the Layer, Color, and Linetype of Door Components" on page 1047.
add components to the style	see "Adding Components to a Door Style" on page 1049.
remove components from the style	see "Removing Custom Components from a Door Style" on page 1051.

If you want to . . .	Then . . .
turn off components in the style	see "Turning Off Custom Components in a Door Style" on page 1051.
display a straight door swing from the style	see "Displaying a Straight Door Swing" on page 1052.
override the opening percentage in the style	see "Specifying the Opening Percentage for Display Representations in a Door" on page 1052.
change the threshold in the style	see "Changing the Door Threshold in a Door Style" on page 1053.
add muntins to the style	see "Creating Muntins in a Door Style" on page 1055.
add notes, files, or documents to the style	see "Attaching Notes and Files to a Door Style" on page 1054.

6 If you want to assign the style to a door tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating a Door Tool" on page 1008.

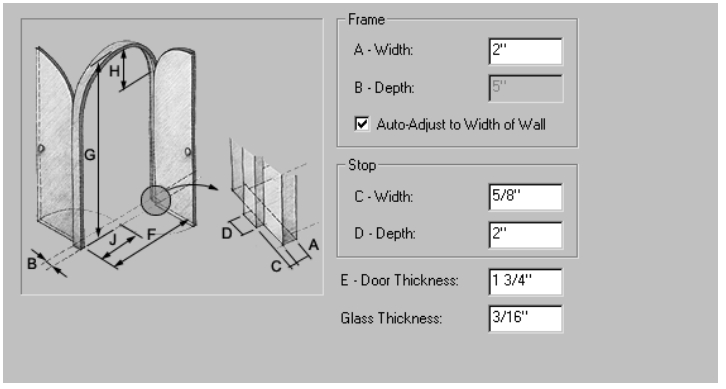
7 Click OK.

Specifying the Dimensions of a Door Style

Use this procedure to change the default dimensions of a door style.

1 Open a tool palette that has a door tool.
2 Right-click a door tool, and click Door Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Dimensions tab.

Changing door style dimensions



5 Change dimension values:

If you want to . . .	Then . . .
change the frame width and depth	under Frame, enter values for Width and Depth.
set the frame width to the wall thickness	under Frame, select Auto-Adjust to Width of Wall.
change the stop dimensions	under Stop, enter values for Width and Depth.
change the door thickness	enter a value for Door Thickness.
change the glass thickness	enter a value for Glass Thickness.

6 Click OK twice.

Specifying the Design Rules of a Door Style

Use this procedure to specify the shape and the type of door for a door style.

Door shapes are named geometrical descriptions of a door. You can select pre-defined and custom door shapes, or create your own shape from profiles. For more information, see "Creating a Custom Door Shape" on page 1041.

The door type describes the type of opening for the door, such as bifold or pocket.

1 Open a tool palette that has a door tool.

2 Right-click a door tool, and click Door Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Design Rules tab.
5 Select a door shape:

If you want to . . .	Then . . .
use a predefined door shape	under Shape, click Predefined, and select a shape.
use a custom door shape	under Shape, click Use Profile, and select a profile.

6 Select a door type.
7 Click OK twice.

Specifying the Standard Sizes of a Door Style

Use this procedure to create standard door sizes in a door style.

1 Open a tool palette that has a door tool.
2 Right-click a door tool, and click Door Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Standard Sizes tab, and add, change, or remove door-size values:

If you want to . . .	Then . . .
create standard sizes	click Add. Under Standard Sizes, enter values for Description, Width, Height, Rise, and Leaf.
change a size	select the size, and click Edit. Enter new values for Width, Height, Rise, and Leaf.
delete a size	select a size, and click Remove.

The description can be used to identify standard door sizes in door schedules. For example, you can specify a manufacturer's size or model code for Description.

Rise is available for Arch, Gothic, and Peak Pentagon door shapes. Leaf controls the width of Uneven, Uneven-Dhung, and Uneven-Opposing door types. For more information on door types and shapes, see "Specifying the Design Rules of a Door Style" on page 1039.

5 Click OK.

Creating a Custom Door Shape

Use this procedure to create a profile that you can use to define a custom door shape in a door style. To create a custom door shape that includes glazing, see "Creating a Void for Door Muntins" on page 1057.

1 Draw a closed polyline in the shape you want.

2 Select the polyline, right-click, and click Convert To ➤ Profile Definition.

3 Specify the insertion point of the profile.

The insertion point is not used for doors.

4 Enter **n** (New).

5 Enter a name for the profile, and click OK.

Replacing the Door Shape in a Door Style

Use this procedure to replace a predefined shape in a door style with a custom shape created from a profile.

1 Select a door that uses the style you want to modify, right-click, and click Add Profile.

2 Specify the profile to use for the custom shape:

If you want to . . .	Then . . .
use a predefined door shape	select a profile for Profile Definition, and click OK. For information about creating a profile, see "Creating a Custom Door Shape" on page 1041.
use a predefined door shape, but modify it	select a profile for Profile Definition, select Continue Editing, and click OK. For information about modifying the shape, see "Editing the Geometry of a Door Style" on page 1042.
create a custom shape	select Start from scratch for Profile Definition, enter a name for the new profile, and click OK. For information about modifying the default shape, see "Editing the Geometry of a Door Style" on page 1042.

Editing the Geometry of a Door Style

Use this procedure to edit the geometry of the profile used to define a door style. You can also add a profile to a door style that does not currently use a profile to define its shape.

1 Add a door that has the style you want to change.

2 Add or edit a profile:

If you want to . . .	Then . . .
add an existing profile to the style	select the door, right-click, and click Add Profile. Select the name of the profile, and click OK.
create a profile and add it to the style	select the door, right-click, and click Add Profile. Select Start from scratch for Profile Definition, enter a name for the new profile, and click OK. A rectangular profile is created for you to edit to define the required geometry.
edit the existing profile for the style	select the door, right-click, and click Edit Profile in Place.

3 If you receive a message that the profile is not drawn to size, click Yes.

The area of the door defined by the profile is selected and hatched in the drawing.

NOTE After you perform an editing task from the shortcut menu, you may need to select the profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select the profile, and right-click to display the shortcut menu.

4 Edit the profile as necessary:

If you want to . . .	Then . . .
change the shape of the perimeter of the profile or its rings	select the profile, and use grips to adjust the shape.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.

If you want to . . .	Then . . .
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace an existing ring of the profile with new geometry	select the profile, right-click, and click Replace Ring. Select the ring to replace, and select the new geometry. Press ENTER to keep the geometry, or enter **n** (No) to erase it.
add a ring to the profile	select the profile, right-click, and click Add Ring. Select the geometry to define the ring. Press ENTER to keep the geometry, or enter **n** (No) to erase it.
remove a ring from the profile	select the profile, right-click, and click Remove Ring. Select the ring to remove, and press ENTER.

5 Save or discard the changes:

If you want to . . .	Then . . .
restore the profile to its original shape	select the profile and click .
save the changes to the current profile	select the profile, and click . The door style uses the edited profile to define its geometry. Any other objects or styles that use this profile are also updated with the edited geometry.
save the changes to a new profile definition	select the profile, right-click, and click Save as New Profile. Enter a name for the new profile definition, and click OK. The door uses the new profile to define its geometry. Any doors of this style are updated with the new geometry. Other styles or objects that use the original profile are not affected.

About Door Display Components and Materials

A door object consists of a number of components whose display properties can be determined by the materials assigned to each component.

You assign one material to each display component of the door. For example, you assign a wood material to the frame and a glass material to the glass inset. You assign materials to door components in each display representation in which the materials are to be used.

To use the display properties of the door object or the door style, instead of using material display properties, you can turn off the material assignments in the display properties of the door or the door style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in 3D model views and elevations.

For a complete list of material components and their descriptions, see "Material Components and Display Properties" on page 498.

The following table lists door components that can be displayed using materials assigned to them, and identifies the material component of each.

Door Component	Material Component
Plan, Plan High Detail, Reflected	
Door Panel	LInework
Frame	LInework
Stop	Linework
Plan Low Detail	
Panel	Linework
Model	
Door Panel	3D Body
Frame	3D Body
Stop	3D Body
Glass	3D Body
Elevation	
Door Panel	2D Section/Elevation Linework
Frame	2D Section/Elevation Linework

Door Component	Material Component
Stop	2D Section/Elevation Linework
Glass	2D Section/Elevation Linework

Assigning Materials to a Door Style

Use this procedure to assign materials to the individual components of a door style. Components use the display properties of the material. For more information, see "About Door Display Components and Materials" on page 1043.

You can specify the materials used to display the following components of a door style:

- Frame
- Stop
- Panel
- Glass
- Muntin

NOTE If a material assignment does not determine the display properties of a door component, you can change the display properties of the door style as described in "Specifying the Display Properties of a Door Style" on page 1046.

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.

10 Click the component you want to change, and select a different material definition.

You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make apply to all objects that are assigned the material.

11 Click OK twice.

Adding Classifications to a Door Style

Use this procedure to specify classifications for definitions applied to a door style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1 Open a tool palette that has a door tool.

2 Right-click a door tool, and click Door Styles.

3 Right-click the style that you want to change, and click Edit.

4 Click the Classifications tab.

The default setting for classification definitions is Unspecified. If no classification definitions are listed, none are applied to door styles.

5 For each classification definition, select the classification you want to apply to the current door style.

6 Click OK twice.

Specifying the Display Properties of a Door Style

In most cases, you want the appearance of doors that belong to the same style to be consistent throughout a drawing. To achieve this, you specify the following display properties of the doors in each door style:

- The layer, color, and linetype of door components
- The hatching used with each component
- The cut plane height and the display of components relative to the cut plane
- Other specific door display information, such as the shape of the door swing

You can also use materials to control the display properties of the physical components of a door. Symbolic components, such as the door swing, are not controlled by materials. For more information about using materials in doors, see "About Door Display Components and Materials" on page 1043.

Related Procedures

- Changing the Layer, Color, and Linetype of Door Components
- Turning on Materials for a Door Style
- Using Custom Blocks to Create Door Components
- Adding Components to a Door Style
- Turning Off Custom Components in a Door Style
- Removing Custom Components from a Door Style
- Displaying a Straight Door Swing
- Specifying the Opening Percentage for Display Representations in a Door
- Changing the Door Threshold in a Door Style
- Changing the Door Threshold Symbol in a Door Style
- Attaching Notes and Files to a Door Style

Changing the Layer, Color, and Linetype of Door Components

Use this procedure to change the properties of the display components of a door style:

- Visibility (display component is on or off)
- By material (material assigned to the display component determines its layer properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE If a material assignment determines the properties of components in the door style, you can change the properties of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Assigning Materials to a Door Style" on page 1045.

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1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation in which to display the changes, and select Style Override.

6 If necessary, click .

7 Click the Layer/Color/Linetype tab.

8 Select the component to change, and select a different setting for the property.

9 Click OK.

Turning on Materials for a Door Style

Use this procedure to turn on material assignments for individual display representations in a door style.

For more information about using materials to control the display of door components, see "About Door Display Components and Materials" on page 1043.

1 Open a tool palette that has a door tool.

2 Right-click a door tool, and click Door Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation in which to display the changes, and select Style Override.

6 If necessary, click .

7 Click the Layer/Color/Linetype tab.

8 Select By Material for each component to be controlled by the material. The By Material checkbox is unavailable for components that cannot be assigned a material.

   When you select By Material for a display component, all other settings in the dialog are unavailable. Since the display properties are now taken from the material definition, you can no longer set them directly in the display properties of the door style.

9 Click OK twice.

Using Custom Blocks to Create Door Components

You can add custom blocks for components, such as door hardware, to the display components, or to replace the default display components. For example, you can replace a simple door leaf with a custom six-panel door leaf in

which the custom component is to appear. You can have a different custom block for each display representation.

When you add a custom block, you can specify rules for positioning and scaling the new component. Each custom block also appears in the display properties component list so that you can control its layer, color, and linetype. For more information on adding custom blocks, see "Adding Components to a Door Style" on page 1049.

If you create a custom block from mass elements, you can use the material assignments of the mass elements to determine the display properties of the custom block.

Be sure to set the properties of objects used to create your custom blocks to ByBlock. Otherwise, you cannot control these objects through the display properties. For more information about ByBlock, see "Work with Layers" in the online *AutoCAD® User's Guide*.

Adding Components to a Door Style

Use this procedure to add or edit custom block components in the display representation of door styles.

1. Create a block for the component to add to the door style.

   Create the block in the same plane as the door that you use to represent the style. For more information about custom blocks, see "Using Custom Blocks to Create Door Components" on page 1048.

2. Open a tool palette that has a door tool.
3. Right-click a door tool, and click Door Styles.
4. Right-click the style you want to edit, and click Edit.
5. Click the Display Properties tab.
6. Select the display representation in which to display the changes, and select Style Override.
7. If necessary, click .
8. Click the Other tab.
9. Specify whether to add or edit a block component:

If you want to . . .	Then . . .
add a new block component	click Add.

If you want to . . .	Then . . .
edit an existing block component	select the component to edit, and click Edit. Proceed to step 11.

10 Click Select Block.

11 Select the block to use, and click OK.

12 Specify whether to scale to fit the block component to the object by width, depth, or height, or to lock the *XY* ratio:

If you want to . . .	Then . . .
set the block scale to the width of the object	select Width.
set the block scale to the depth of the object	select Depth.
set the block scale to the height of the object	select Height.
scale the whole block equally, so that one direction is scaled to fit another of the scale criteria	select Lock to XY Ratio.
scale the block to its original size	clear all options under Scale to Fit.

13 Specify whether to mirror the block in the X,Y, or Z direction:

If you want to . . .	Then . . .
create a mirror of the block in the *X* direction	select Mirror X.
create a mirror of the block in the *Y* direction	select Mirror Y.
create a mirror of the block in the *Z* direction	select Mirror Z.

14 Specify the *X*, *Y*, and *Z* location of the insertion point.

15 Specify an insertion offset of the block in the *X*, *Y*, and *Z* directions.

16 Specify whether the component is for the door frame, leaf or glass:

If you want to . . .	Then . . .
add the block to the inside or outside of the frame	click Frame Component, and click either Outside or Inside.
add the block to all leaf components or to a single leaf component	click Leaf Component, and click either All or Single. If you select Single, enter the component number.
add the block to all glass components or to a single glass component	click Glass Component, and click either All or Single. If you select Single, enter the component number. **NOTE** If you specified Depth for Scale to Fit, the depth will be scaled to the glass thickness. You can scale to the door panel thickness instead by selecting Scale Depth to Panel Thickness.

Leaf and glass components are not available in some display representations.

17 Click OK four times.

Turning Off Custom Components in a Door Style

Use this procedure to turn off custom blocks in a door style.

You can turn off the display of component blocks without removing them from the style.

1 Open a tool palette that has a door tool.
2 Right-click a door tool, and click Door Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Display Properties tab.
5 Select the display representation in which to turn off the display of the door component, and select Style Override.
6 If necessary, click .
7 Click the Other tab.
8 Select Disable Custom Blocks.
9 Click OK twice.

Removing Custom Components from a Door Style

Use this procedure to remove components from a door style.

Removing component blocks from a door style deletes them from the style.

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation from which to remove the door component, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. Select the component to remove, and click Remove.
9. Click OK twice.

Displaying a Straight Door Swing

Use this procedure to display the door swing as a straight line in a door style.

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to display a straight door swing, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. Select Straight Swing.
9. Click OK twice.

Specifying the Opening Percentage for Display Representations in a Door

Use this procedure to override the opening percentage in the display representation of a door style. For example, you can specify that a door is displayed closed in model and elevation representations, but open in plan representations.

NOTE This setting overrides other door opening percent settings. If the opening percent is specified here, the opening percent entered on the Properties palette when you add or modify doors is ignored.

---

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to override the opening percent, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. Select Override Open Percent.
9. Enter a value for the opening percent.
10. Click OK twice.

Changing the Door Threshold in a Door Style

Use this procedure to display a door threshold and change its dimensions in threshold display representations.

You can turn on threshold display representations in addition to door display representations.

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select Threshold Plan, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. Under Threshold Dimensions, enter the threshold extension and depth dimensions.

   Component A is the swing side of the door. Component B is the other side.
9. Click the Layer/Color/Linetype tab.
10. Under Visible, click the icons to turn on visibility.
11. Click OK twice.

Changing the Door Threshold Symbol in a Door Style

Use this procedure to specify the symbol indicating a threshold that appears in a door opening for the door style.

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select Threshold Symbol Plan, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. Select the type of symbol you want to display in the door opening.
9. Click the Layer/Color/Linetype tab.
10. Under Visible, click the icon to turn on visibility.
11. Click OK twice.

Attaching Notes and Files to a Door Style

Use this procedure to enter notes and attach reference files to a door style. You can also edit reference files attached to the style.

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the General tab.
5. To add a description to the door, enter the description under Description.
6. Click Notes.
7. To add or edit a note, click the Notes tab, and enter the note.
8. To attach, edit, or detach a reference file, click the Reference Docs tab:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK when you finish editing.
detach a reference file	select the file name, click Delete, and click OK.

9. Click OK twice.

Creating Muntins in a Door Style

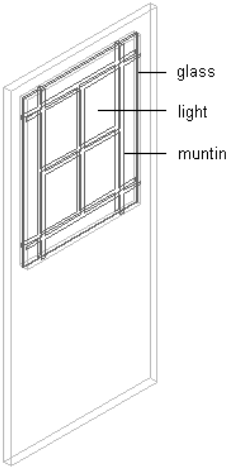
Door muntins are secondary framing members that hold multiple lights in door glass. Autodesk® Architectural Desktop provides an easy way to create muntins with different layout patterns.

Door muntins are available in the following patterns that you can customize into different styles:

- Rectangular
- Diamond
- Prairie 9 Lights
- Prairie 12 Lights
- Starburst
- Sunburst

Starburst and Sunburst patterns are a combined-rectangular pattern with a half-round or quarter-round spoked top. They can be used for half- and quarter-round door glass as well as rectangular door glass. The other patterns are primarily rectangular but fit into half-round glass. You can make up custom glass shapes by creating profiles from polylines and adding them to a new door style.

Door muntin components



Related Topics and Procedures

- Process Overview: Creating Door Muntins

- Creating a Void for Door Muntins
- Adding Glass to a Door Style
- Adding Rectangular or Diamond Muntins to a Door Style
- Adding Prairie-Lights Muntins to a Door Style
- Adding Starburst Muntins to a Door Style
- Adding Sunburst Muntins to a Door Style
- Editing a Door Muntins Block in a Door Style
- Turning Off the Display of Muntins in a Door Style
- Removing a Door Muntins Block from a Door Style

Process Overview: Creating Door Muntins

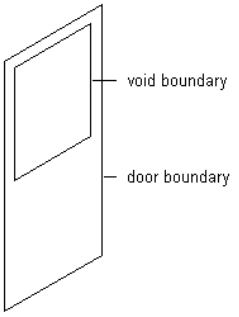
You must have a void for the glass in the door in order to add muntins. Sample content provided with the software includes several door styles that already have glass and can receive muntins. The door style description indicates whether the style has glass. You can create door styles with a glazing void to receive muntins.

The process of creating a door style with door glass and muntins has three steps:

Step 1: Create a void for door glass and muntins.

You create a profile from two concentric polylines that define the door shape and the door glass.

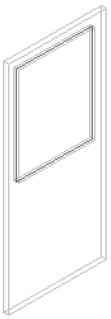
Concentric closed polylines for a door profile



Step 2: Add glass to a door style.

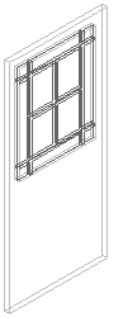
You apply the profile with a void to a door style so that the style has glass for doors to receive muntins.

Door style created from a profile



Step 3: Add muntins to the door style.

Door glass with muntins



Creating a Void for Door Muntins

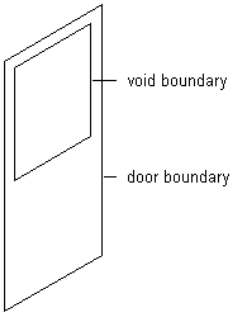
Use this procedure to create a profile of a door with a void for glass to receive muntins. This is the first step for adding muntins to door styles that do not have glass.

The profile is made up of concentric, closed polylines. The outer polyline, or ring, becomes the door shape, and the inner polyline becomes the void for the glass. You can create multiple voids by adding more inner polylines. Voids for glazing must be entirely within the polyline representing the door shape. The polylines are proportional in size and shape to each other and also to the individual doors created from the door style.

You can draw these polylines anywhere in the drawing and use any convenient scale relative to your final door and glass size. One method for sizing

the polylines relative to the door is to draw them by snapping to an existing door, and then move them to the side.

Concentric closed polylines for a door profile



1. Draw concentric, closed polylines representing the door and the glass that receives the muntin pattern.
2. Select the polylines, right-click, and click Convert To ➤ Profile Definition.
3. Select the outermost polyline.
4. Enter **a** (Add ring).
5. Select an inner polyline.
6. Repeat steps 3 and 4 as needed to add more voids to the profile.
7. Specify the insertion point of the profile.
8. Enter **n** (New), enter a name for the profile, and click OK.

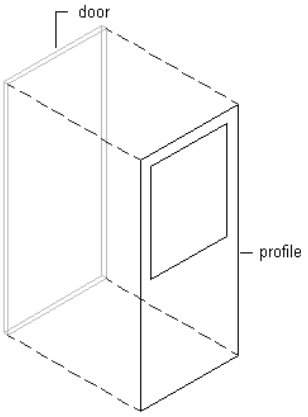
To add the profile to a door style, see "Adding Glass to a Door Style" on page 1058.

Adding Glass to a Door Style

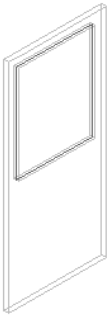
Use this procedure to create a door style with glass for doors to accept muntin patterns.

The drawing must contain a profile that defines the door style and the void for the door glass. For more information about creating such a profile, see "Creating a Void for Door Muntins" on page 1057.

Door profile with a void for glass



Door style created from the profile



1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Door Styles.

3 Create a door style:

If you want to . . .	Then . . .
create a style with default properties	right-click Door Styles, and click New.
create a style from an existing style	right-click the Door style you want to copy, and click Copy. Right-click, and click Paste.

4 Select the new door style, right-click, and click Rename.

5 Enter a name for the new door style, and press ENTER.

6 Right-click the new door style, and click Edit.

7 Click the Design Rules tab.

8 Under Shape, select Use Profile, and select a profile that defines a door style containing a void for door glass.

9 Click the Standard Sizes tab.

10 Add new sizes to the style.

For more information about adding standard sizes to a door style, see "Specifying the Standard Sizes of a Door Style" on page 1040.

11 Click OK twice.

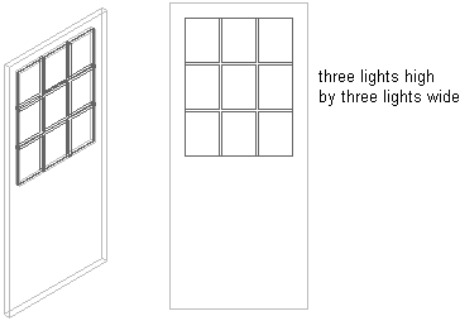
The door style now contains glass. You can now add muntins to a door style.

Adding Rectangular or Diamond Muntins to a Door Style

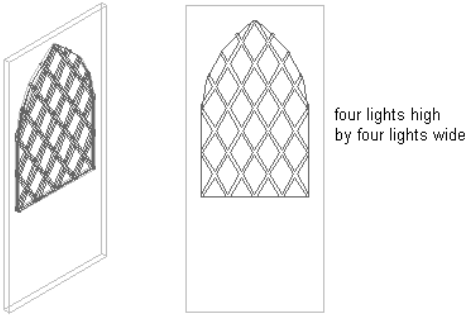
Use this procedure to add rectangular or diamond muntins to a door style that contains glass.

You add muntins by editing the display properties of the door style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and apply them to all display representations of that door style. You add the muntins block to glass components of the door style in display properties. Each muntins block becomes a display component of the door style.

Rectangular door glass with rectangular muntins



Gothic door glass with diamond muntins



1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.

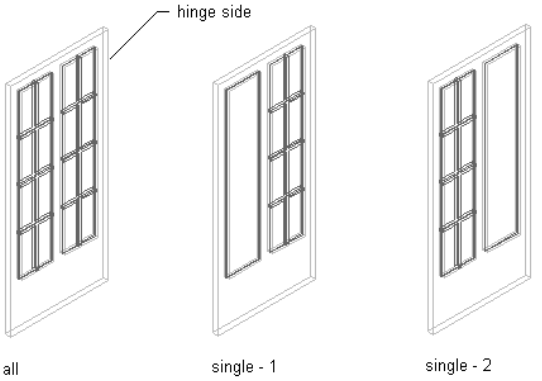
> **NOTE** A door style must contain glass to receive muntins. For more information about adding glass to a door style, see "Adding Glass to a Door Style" on page 1058.

4. Click the Display Properties tab.
5. Select the display representation in which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Muntins tab.
8. Click Add.
9. Enter a name for the muntins block.
10. If the door style contains multiple glass components, specify whether you want to apply muntins to all glass components or to one glass component in the door:

If you want to . . .	Then . . .
attach muntins to all glass components	under Glass Component, select All.

If you want to . . .	Then . . .
apply muntins to an individual glass component	under Glass Component, select Single, and specify the index number. Lights are indexed counterclockwise, starting from the lower-left corner.

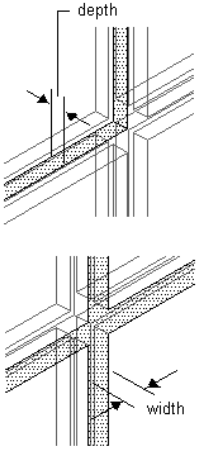
Muntins applied to all or one glass component



11 Enter a value for the width of all muntins.

12 Enter a value for the depth of all muntins.

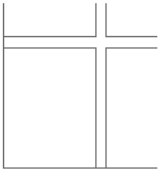
Specifying muntin width and depth



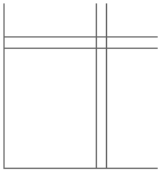
13 Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying muntin cleanup joints

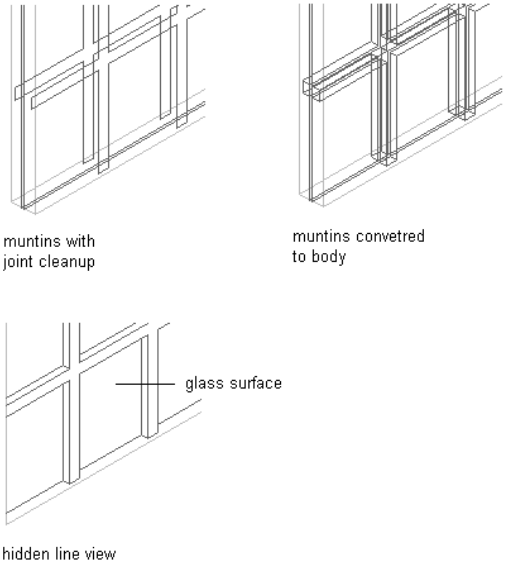


cleanup muntin joints on



cleanup muntin joints off

Converting muntins to a body



14 Under Lights, select a pattern:

If you want to . . .	Then . . .
use a rectangular pattern	select Rectangular for pattern.
use a diamond pattern	select Diamond for pattern.

15 Enter a value for Lights High to specify the number of light rows in the vertical direction.

16 Enter a value for Lights Wide to specify the number of light columns in the horizontal direction.

Values for lights high and lights wide

17 Click OK.

18 Add other muntins:

If you want to . . .	Then . . .
add muntins to another glass component in the door style	repeat this procedure from step 8.
add muntins to another display representation	click OK, and repeat this procedure from step 5.
add muntins to all display representations of the selected door style	select Automatically Apply to Other Display Representations and Object Overrides.

19 When you finish adding muntins to the door style, click OK four times.

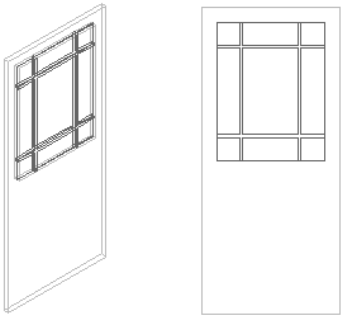
After you add a muntins block to a door style, you can assign a material, such as wood sash, and specify the display properties, such as color and linetype. For more information, see "Assigning Materials to a Door Style" on page 1045 and "Changing the Layer, Color, and Linetype of Door Components" on page 1047.

Adding Prairie-Lights Muntins to a Door Style

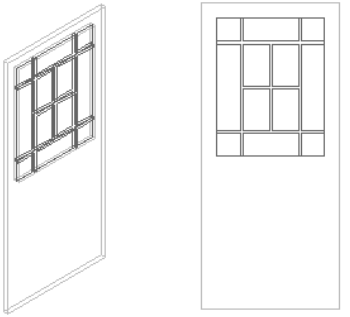
Use this procedure to add prairie-9-lights or prairie-12-lights muntins to a door style that contains glass.

You add muntins by editing the display properties of the door style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and apply them to all display representations of that door style. You add the muntins block to glass components of the door style in display properties. Each muntins block becomes a display component of the door style.

Rectangular door glass with prairie-9-lights muntins



Rectangular door glass with prairie-12-lights muntins



1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.

NOTE A door style must contain glass to receive muntins. For more information about adding glass to a door style, see "Adding Glass to a Door Style" on page 1058.

4 Click the Display Properties tab.

5 Select the display representation in which to display the changes, and select Style Override.

6 If necessary, click .

7 Click the Muntins tab.

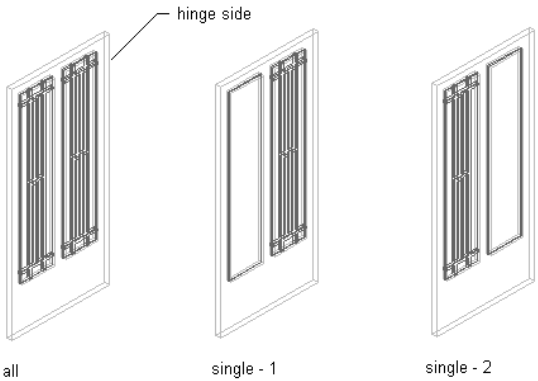
8 Click Add.

9 Enter a name for the muntins block.

10 If the door style contains multiple glass components, specify whether you want to apply muntins to all glass components or to one glass component in the door:

If you want to . . .	Then . . .
attach muntins to all glass components	under Glass Component, select All.
apply muntins to an individual glass component	under Glass Component, select Single, and specify the index number. Lights are indexed counterclockwise, starting from the lower-left corner.

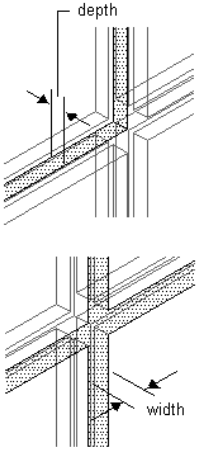
Muntins applied to all or one glass component



11 Enter a value for the width of all muntins.

12 Enter a value for the depth of all muntins.

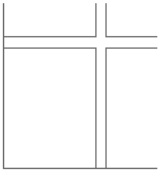
Specifying muntin width and depth



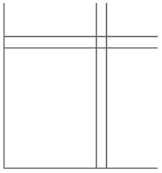
13 Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying muntin cleanup joints

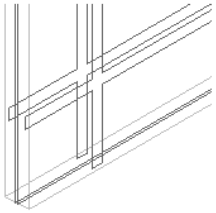


cleanup muntin joints on

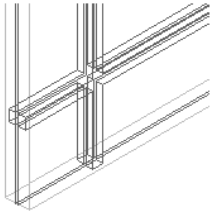


cleanup muntin joints off

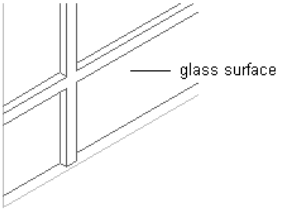
Converting muntins to a body



muntins with
joint cleanup



muntins convetred
to body



hidden line view

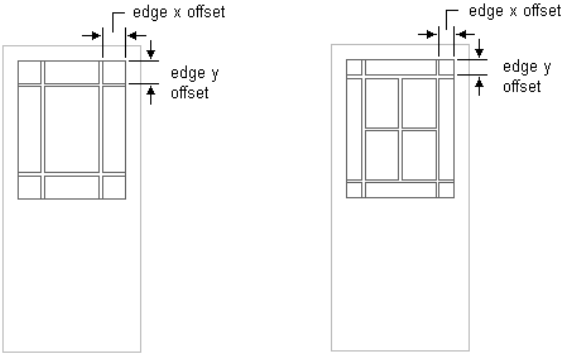
14 Under Lights, select a pattern:

If you want to . . .	Then . . .
use a nine-light prairie pattern	select Prairie-9-Lights for Pattern.
use a twelve-light prairie pattern	select Prairie-12-Lights for Pattern.

15 Enter a value for Edge X Offset to specify the horizontal distance of the muntins from the edges of the glass.

16 Enter a value for Edge Y Offset to specify the vertical distance of the muntins from the edges of the glass.

Specifying edge *X* and *Y* offsets



prairie 9 lights pattern

prairie 12 lights pattern

17 Click OK.

18 Add other muntins:

If you want to . . .	Then . . .
add muntins to another glass component in the door style	repeat this procedure from step 8.
add muntins to another display representation	click OK, and repeat this procedure from step 5.
add muntins to all display representations of the selected door style	select Automatically Apply to Other Display Representations and Object Overrides.

19 When you finish adding muntins to the door style, click OK four times.

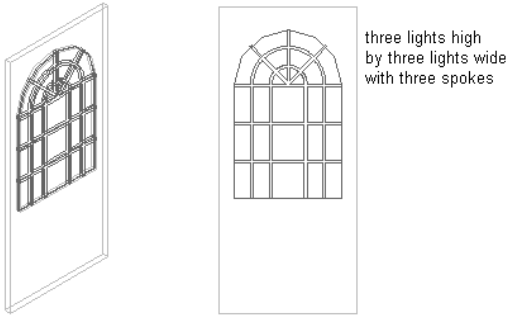
After you add a muntins block to a door style, you can assign a material, such as wood sash, and specify the display properties, such as color and linetype. For more information, see "Assigning Materials to a Door Style" on page 1045 and "Changing the Layer, Color, and Linetype of Door Components" on page 1047.

Adding Starburst Muntins to a Door Style

Use this procedure to add starburst muntins to a door style that contains glass.

You add muntins by editing the display properties of the door style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and apply them to all display representations of that door style. You add the muntins block to glass components of the door style in display properties. Each muntins block becomes a display component of the door style.

Half-round door glass with starburst muntins



1 Open a tool palette that has a door tool.

2 Right-click a door tool, and click Door Styles.

3 Right-click the style you want to edit, and click Edit.

NOTE A door style must contain glass to receive muntins. For more information about adding glass to a door style, see "Adding Glass to a Door Style" on page 1058.

---

4 Click the Display Properties tab.

5 Select the display representation in which to display the changes, and select Style Override.

6 If necessary, click .

7 Click the Muntins tab.

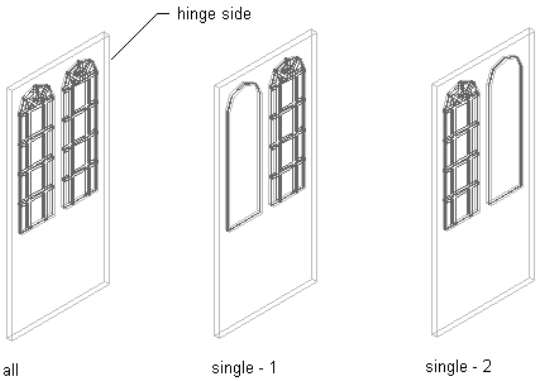
8 Click Add.

9 Enter a name for the muntins block.

10 If the door style contains multiple glass components, specify whether you want to apply muntins to all glass components or to one glass component in the door:

If you want to . . .	Then . . .
attach muntins to all glass components	under Glass Component, select All.
apply muntins to an individual glass component	under Glass Component, select Single, and specify the index number. Lights are indexed counterclockwise, starting from the lower-left corner.

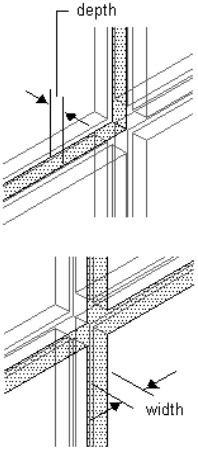
Muntins applied to all or one glass component



11 Enter a value for the width of all muntins.

12 Enter a value for the depth of all muntins.

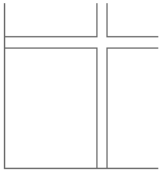
Specifying muntin width and depth



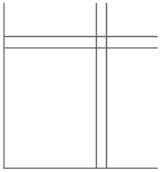
13 Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying muntin cleanup joints

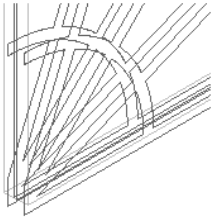


cleanup muntin joints on

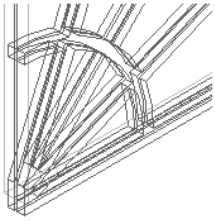


cleanup muntin joints off

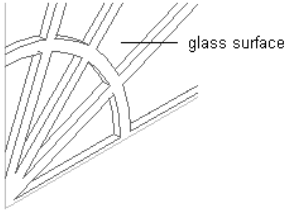
Converting muntins to a body



muntins with
joint cleanup



muntins convetred
to body



hidden line view

14 Under Lights, select Starburst for pattern.

15 Under Shape, select Half Round or Quarter Round.

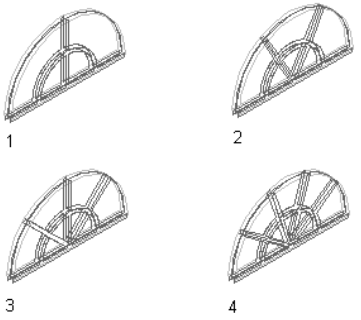
16 Enter a value for Lights High to specify the number of light rows in the vertical direction, exclusive of the spoked lights.

17 Enter a value for Lights Wide to specify the number of light columns in the horizontal direction.

Count the columns as though they continue around the hub. For a half-round starburst, five apparent columns are counted as three. For a quarter-round starburst, three apparent columns are also counted as three.

18 Enter a value for Spokes to specify the number of radial muntin spokes.

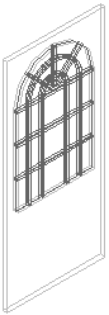
Specifying the number of radial muntin spokes



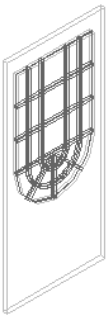
19 Specify where to place the hub:

If you want to . . .	Then . . .
place the hub at the bottom of a half-round shape	under Hub Center, select Bottom Center.
place the hub at the top of a half-round shape	under Hub Center, select Top Center.
place the hub at the bottom left of a quarter-round shape	under Hub Center, select Bottom Left.
place the hub at the bottom right of a quarter-round shape	under Hub Center, select Bottom Right.
place the hub at the top left of a quarter-round shape	under Hub Center, select Top Left.
place the hub at the top right of a quarter-round shape	under Hub Center, select Top Right.

Specifying hub placement of half-round shape

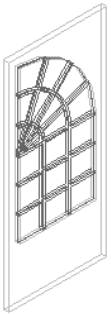


bottom center hub

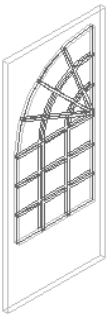


top center hub

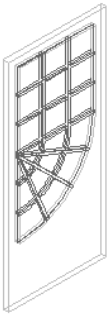
Specifying hub placement of quarter-round shape



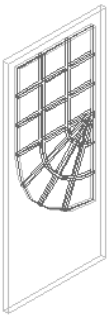
bottom left hub center



bottom right hub center



top left hub center



top right hub center

20 Click OK.

21 Add other muntins:

If you want to . . .	Then . . .
add muntins to another glass component in the door style	repeat this procedure from step 8.
add muntins to another display representation	click OK, and repeat this procedure from step 5.
add muntins to all display representations of the selected door style	select Automatically Apply to Other Display Representations and Object Overrides.

22 When you finish adding muntins to the door style, click OK four times.

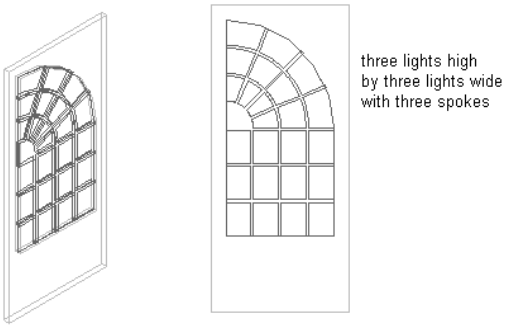
After you add a muntins block to a door style, you can assign a material, such as wood sash, and specify the display properties, such as color and linetype. For more information, see "Assigning Materials to a Door Style" on page 1045 and "Changing the Layer, Color, and Linetype of Door Components" on page 1047.

Adding Sunburst Muntins to a Door Style

Use this procedure to add sunburst muntins to a door style that contains glass.

You add muntins by editing the display properties of the door style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and apply them to all display representations of that door style. You add the muntins block to glass components of the door style in display properties. Each muntins block becomes a display component of the door style.

Quarter-round door glass with sunburst muntins and closed hub



1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.

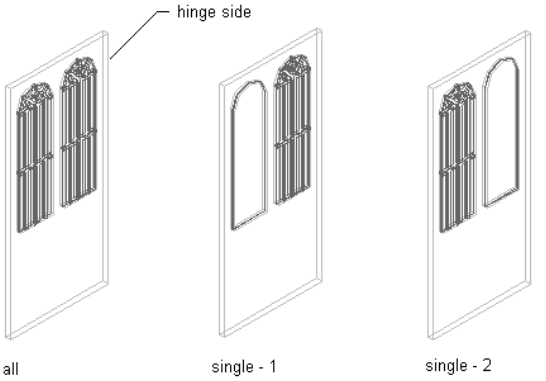
NOTE A door style must contain glass to receive muntins. For more information about adding glass to a door style, see "Adding Glass to a Door Style" on page 1058.

4. Click the Display Properties tab.
5. Select the display representation in which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Muntins tab.
8. Click Add.
9. Enter a name for the muntins block.
10. If the door style contains multiple glass components, specify whether you want to apply muntins to all glass components or to one glass component in the door:

If you want to . . .	Then . . .
attach muntins to all glass components	under Glass Component, select All.

If you want to . . .	Then . . .
apply muntins to an individual glass component	under Glass Component, select Single, and specify the index number. Lights are indexed counterclockwise, starting from the lower-left corner.

Muntins applied to all or one glass component

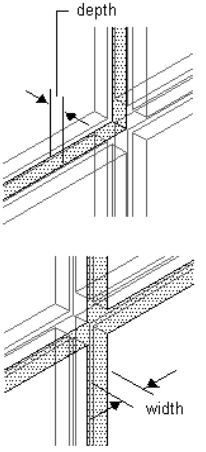


11 Under Shape, select Half Round or Quarter Round.

12 Enter a value for the width of all muntins.

13 Enter a value for the depth of all muntins.

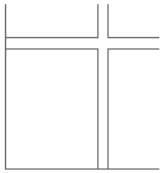
Specifying muntin width and depth



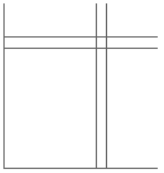
14 Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying muntin cleanup joints

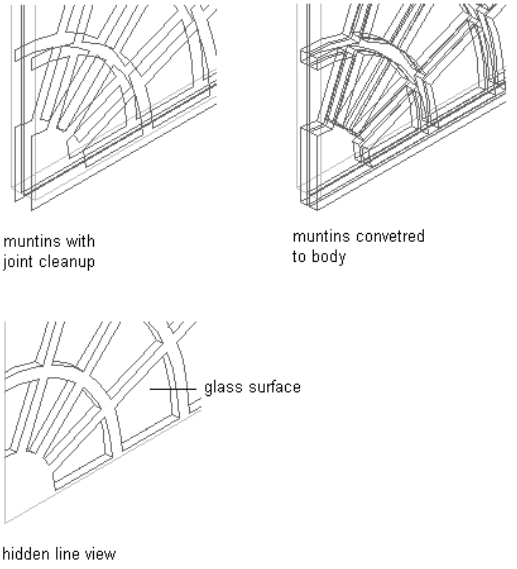


cleanup muntin joints on



cleanup muntin joints off

Converting muntins to a body



15 Under Lights, select Sunburst for pattern.

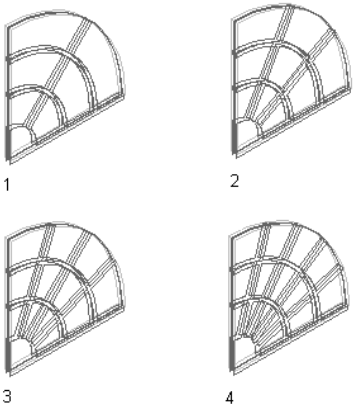
16 Enter a value for Lights High to specify the number of light rows in the vertical direction, exclusive of the spoked lights.

17 Enter a value for Lights Wide to specify the number of light columns in the horizontal direction.

Count the columns as though they continue around the hub. For a half-round sunburst, five apparent columns are counted as two. For a quarter-round sunburst, three apparent columns are also counted as two.

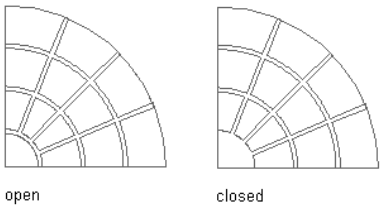
18 Enter a value for Spokes to specify the number of radial muntin spokes.

Specifying the number of radial muntin spokes



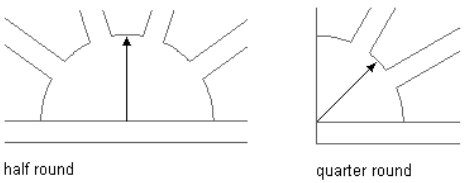
19 Under Hub Style, select Closed for no hub light, or select Open for a hub light.

Specifying closed and open hubs



20 Enter a value for Radius to specify the radius for the hub.

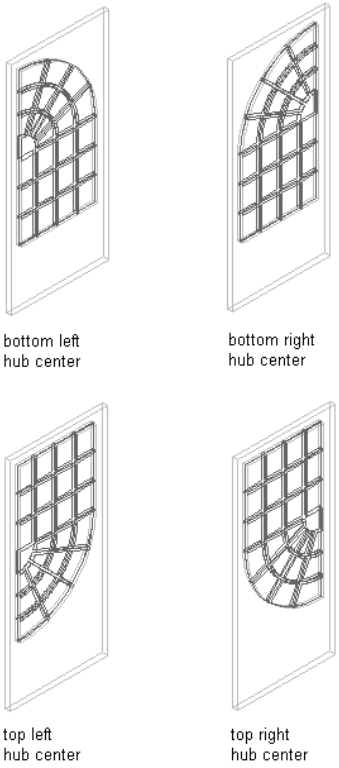
Specifying hub radius



21 Specify where to place the hub:

If you want to . . .	Then . . .
place the hub at the bottom of a half-round shape	under Hub Center, select Bottom Center.
place the hub at the top of a half-round shape	under Hub Center, select Top Center.
place the hub at the bottom left of a quarter-round shape	under Hub Center, select Bottom Left.
place the hub at the bottom right of a quarter-round shape	under Hub Center, select Bottom Right.
place the hub at the top left of a quarter-round shape	under Hub Center, select Top Left.
place the hub at the top right of a quarter-round shape	under Hub Center, select Top Right.

Specifying hub placement of quarter-round shape



22 Click OK.

23 Add other muntins:

If you want to . . .	Then . . .
add muntins to another glass component in the door style	repeat this procedure from step 8.
add muntins to another display representation	click OK, and repeat this procedure from step 5.
add muntins to all display representations of the selected door style	select Automatically Apply to Other Display Representations and Object Overrides.

24 When you finish adding muntins to the door style, click OK four times.

After you add a muntins block to a door style, you can assign a material, such as wood sash, and specify the display properties, such as color and linetype. For more information, see "Assigning Materials to a Door Style" on page 1045 and "Changing the Layer, Color, and Linetype of Door Components" on page 1047.

Editing a Door Muntins Block in a Door Style

Use this procedure to edit the muntins settings for a door style.

After you create a muntins block, you can change its settings by editing the display properties of the door style for each display representation, such as Model or Elevation. You can edit the muntins for display representations individually. You can also edit the muntins for a single display representation and apply the changes to all display representations of that door style.

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to display the changes, and click .
6. Click the Muntins tab.
7. Select the muntins block to edit.
8. Click Edit.
9. Edit any of the settings.

   For more information on settings, refer to the door muntins type in "Creating Muntins in a Door Style" on page 1055.
10. Select Automatically Apply to Other Display Representations and Object Overrides to apply edits to all display representations of the selected door style.

    Clear this setting to apply edits to only the selected display representation.
11. When you finish editing the door muntins block in the door style, click OK four times.

You can edit the display properties, such as color and linetype, for the muntins block. For more information, see "Changing the Layer, Color, and Linetype of Door Components" on page 1047.

You can also edit the material applied to the muntins. For more information, see "Assigning Materials to a Door Style" on page 1045.

Turning Off the Display of Muntins in a Door Style

Use this procedure to turn off the display of muntins in a door style. You can turn off the display of door muntins without removing them from the style.

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to turn off the display of door muntins, and click .
6. Click the Muntins tab.
7. Select Disable Muntins Blocks.
8. Select Automatically Apply to Other Display Representations and Object Overrides to turn off muntins block(s) for all display representations of the selected door style.

   Clear this setting to turn off muntins block(s) for only the selected display representation.
9. Click OK three times.

Removing a Door Muntins Block from a Door Style

Use this procedure to remove muntins from a door style.

When you remove muntins blocks from a door style, they are deleted. To turn off muntins without deleting them, see "Turning Off the Display of Muntins in a Door Style" on page 1086

1. Open a tool palette that has a door tool.
2. Right-click a door tool, and click Door Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation for which to remove door muntins, and click .
6. Click the Muntins tab.
7. Select the muntins block to remove.
8. Click Remove.
9. Repeat steps 7 and 8 to remove multiple muntins blocks.

10 Select Automatically Apply to Other Display Representations and Object Overrides to remove muntins block(s) from all display representations of the selected door style.

   Clear this setting to remove muntins block(s) from only the selected display representation.

11 When you finish removing muntins blocks from the door style, click OK three times.

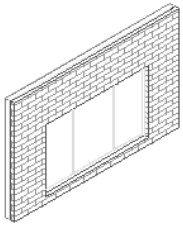
Door/Window Assemblies

16

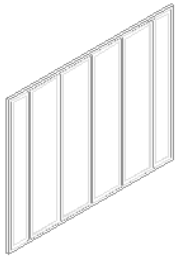
Door/window assemblies provide a grid or framework for inserting objects such as windows and doors. With this framework, you can create complex window and door assemblies and insert them in standard walls or use them as repeated elements in a curtain wall.

Like curtain walls, door/window assemblies are made up of one or more grids.

Adding Door/Wndow Assemblies to walls and curtain walls



door/window assembly in wall



door/window assembly as curtain wall infill

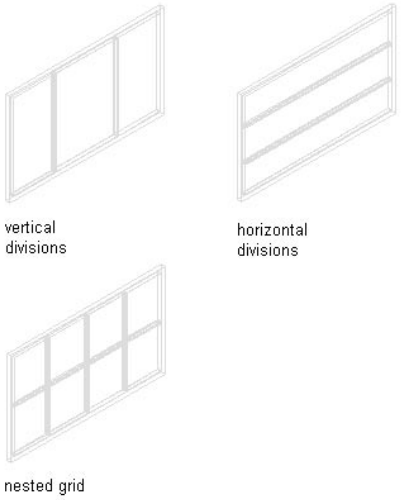
In this chapter

- Door/Window Assembly Grids
- Creating Door/Window Assemblies Using Door/Window Assembly Tools
- Door/Window Assembly Styles
- Using Overrides in Door/Window Assemblies
- Modifying Element Definitions for Door/Window Assembly Styles
- Editing Door/Window Assemblies
- Editing Objects Anchored in Door/Window Assemblies

Door/Window Assembly Grids

Like curtain walls, door/window assemblies are made up of one or more grids. Each grid has either a horizontal division or a vertical division, but you can nest the grids to create a variety of patterns from simple to complex.

Door/Window Assembly grid division examples



TIP Using a door/window assembly in a curtain wall can help you avoid the complexities of too many nested grids in the curtain wall.

Elements of Grids

Grids are the foundation of curtain walls, curtain wall units, and door/window assemblies. Every grid has four element types:

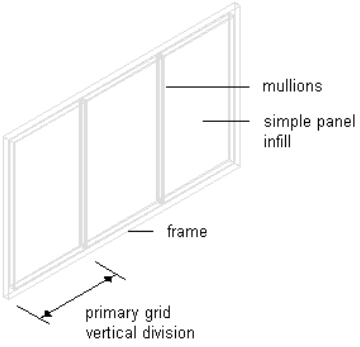
- **Divisions:** Define the direction of the grid (horizontal or vertical) and the number of cells
- **Cell Infills:** Contain another grid, a panel infill, or an object such as a window or a door
- **Frames:** Define the edge around the outside of the primary grid and nested grids
- **Mullions:** Define the edges between the cells

NOTE Division is an abstract element, in contrast to the other three element types that represent physical elements of the door/window assembly.

Each element type is assigned a default definition that describes what elements of that type look like.

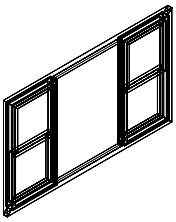
Element type	Default definitions
Divisions	Vertical divisions with a fixed cell dimension of 3'
Cell Infills	Cells containing simple panels with a 2" thickness
Frames	Outer edges of grid 3" wide and 3" deep
Mullions	Edges between cells 1" wide and 3" deep

Identifying Door/Window Assembly componets

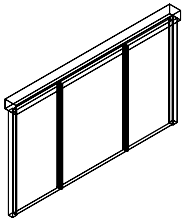


You can create new element definitions and assign those definitions within the door/window assembly. For example, you can create multiple infill definitions and then assign different infills to specific cells in the grid. Likewise, you can create multiple frame definitions and then assign a different definition to each frame edge (top, bottom, left, right). This is also true for mullion definitions.

Assigning different infills and frames to door/window assembly cells



window assembly with different assigned infill definitions



window assembly with different assigned frame definitions

Experimenting with Door/Window Assembly Designs

The templates provided with Autodesk® Architectural Desktop offer door/window assembly styles. Looking at these styles and experimenting with them makes it easier to understand door/window assembly behavior and create your own door/window assembly designs.

Related Procedures

- Creating Door/Window Assemblies Using Door/Window Assembly Tools
- Door/Window Assembly Styles
- Using Overrides in Door/Window Assemblies
- Modifying Element Definitions for Door/Window Assembly Styles
- Editing Door/Window Assemblies
- Editing Objects Anchored in Door/Window Assemblies

For more information about element definitions and assignments, see "Creating Element Definitions for a Door/Window Assembly Style" on page 1105 and "Assigning Definitions to Door/Window Assembly Elements" on page 1139.

Creating Door/Window Assemblies Using Door/Window Assembly Tools

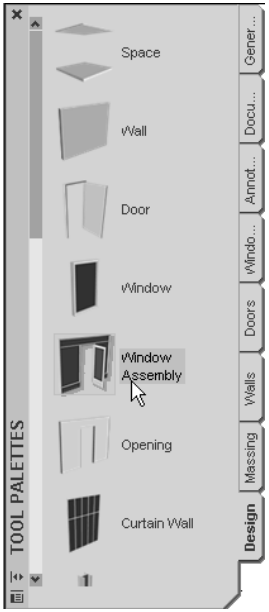
Door/window assemblies are like standard windows in that they are planar and defined by an insertion point, as opposed to curtain walls that have a baseline that can be curved or straight. You can create a door/window assembly based on a 2D layout grid or a combination of lines, arcs, and circles.

To create a door/window assembly for use in a standard wall, draw the wall first. You can insert the door/window assembly and modify the door/window assembly elements as needed.

To create a door/window assembly for use in a curtain wall, insert the door/window assembly in space. Modify the element definitions and assignments as needed. Save your changes as a new door/window assembly style, and then assign that style to cells in your curtain wall grid. For more information, see "Assigning Infills to Door/Window Assembly Cells" on page 1140.

Tool palettes provided with Autodesk Architectural Desktop let you quickly place door/window assemblies by selecting a door/window assembly tool with a specific door/window assembly style and other predefined properties. When you place door/window assemblies using door/window assembly tools, you can use the default settings of the tool, or you can change settings for the door/window assembly properties. You can also use door/window assembly tools to convert linework to door/window assemblies and to apply the settings of a door/window assembly tool to existing door/window assemblies.

Tool palettes containing window assembly tools



The following palettes contain one or more door/window assembly tools:

Tool Palette	Door/Window Assembly Tools
General Building Object palette in the Design Tools palette set	Standard door/window assembly style and default settings for other door/window assembly properties
custom tool palettes created by your CAD manager	door/window assembly styles and properties that your CAD manager customized for your projects or office standards

When you place door/window assemblies using door/window assembly tools, you can use the default settings of the tool, or you can change settings for any door/window assembly properties that are not controlled by the style.

Related Procedures

- Creating a Door/Window Assembly
- Creating a Door/Window Assembly with User-Specified Settings
- Converting a Layout Grid to a Door/Window Assembly
- Creating a Door/Window Assembly from an Elevation Sketch
- Creating a Door/Window Assembly Tool

Creating a Door/Window Assembly

Use this procedure to add a new door/window assembly that has the properties specified in the door/window assembly tool that you select. To specify settings when you add a door/window assembly, see "Creating a Door/Window Assembly with User-Specified Settings" on page 1095.

1. Open the tool palette that you want to use, and select a door/window assembly tool.

   If necessary, scroll to display the tool that you want to use.
2. Select a wall, or press ENTER and then specify the insertion point of the door/window assembly.

   You can move or hide the Properties palette to expose more of the drawing area.
3. Continue adding door/window assemblies, and then press ENTER.

Creating a Door/Window Assembly with User-Specified Settings

Use this procedure to add a door/window assembly with settings that you specify.

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a door/window assembly tool.

   If necessary, scroll to display the tool that you want to use.
2. On the Properties palette, expand Basic, and expand General.
3. Select a style.
4. Expand Dimensions.
5. Modify the dimensions of the door/window assembly:

If you want to specify . . .	Then . . .
the length of the door/window assembly	enter a value for Length.
the base height of the door/window assembly	enter a value for Base Height.
the rise of the door/window assembly	enter a value for Rise.
start and end miters	enter miter values for Start Miter and End Miter.

6. Expand Location.
7. Modify the location properties of the door/window assembly:

If you want to specify . . .	Then . . .
the position of the door/window assembly	select Unconstrained or Offset/Centered for Position along the wall.
the vertical alignment of the door/window assembly	select Head or Threshold for Vertical Alignment.

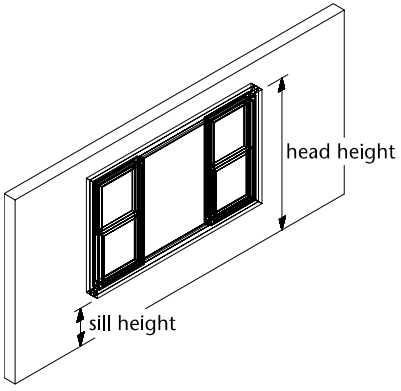
If you want to specify . . .	Then . . .
the head height of the door/window assembly	enter a value for Head height.
the sill height of the door/window assembly	enter a values for Sill height.
the rotation reference angle of the door/window assembly	enter a value for Rotation.

Vertical Alignment controls how you place the door/window assembly in the wall and how the door/window assembly responds to modifications in height. The Sill Height and Head Height options allow you to determine the working point on the door/window assembly. You can place the working point at the sill or at the head. The Vertical Alignment value determines the location of the working point vertically in the wall.

Modifications to the door/window assembly height respect the working point. For example, if you specify the working point of the window as sill, the vertical alignment as 0" and the door/window assembly height as 7'–0", the height in the wall where the top of the door/window assembly is placed is 7–0". If you modify the height of the window to 6'–8", the window sill remains at 0" and the top of the door/window assembly becomes 6–8". The sill working point is maintained.

If you specify the working point as the door/window assembly head, the Vertical Alignment value as 7'–0" and the door/window assembly height as 7'–0", the height in the wall where the top of the door/window assembly is placed is 7–0". If you modify the height of this door/window assembly to 6'–8", the door/window assembly head remains at 7'–0" and the window sill becomes 4". The head working point is maintained.

Specifying door/window assembly head sill heights



8 In the drawing area, select a wall, or press ENTER and then specify the insertion point of the door/window assembly.

You can move or hide the Properties palette to expose more of the drawing area.

9 Continue adding door/window assemblies, and press ENTER.

Converting a Layout Grid to a Door/Window Assembly

Use this procedure to create a door/window assembly that is based on a 2D layout grid. If you already have 2D layout grids in a drawing, you can easily convert them to door/window assemblies. Or, if you are already familiar with layout grids, it is an efficient way to create a door/window assembly and then experiment with the door/window assembly commands to learn more about them.

When you create a door/window assembly from a 2D layout grid, you also create a new door/window assembly style. The divisions in the new door/window assembly style are taken from the divisions in the layout grid.

1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a door/window assembly tool, and click Apply Tool Properties to ➤ Layout Grid.

3 Select the layout grid to convert.

4 When prompted to erase the original geometry, press ENTER to keep the layout grid, or enter **y** (Yes) to erase it.

5 Press ENTER to specify horizontal as the orientation for the primary division, or enter **v** to specify vertical.

6 Enter a name for the door/window assembly style, and click OK.

7 If necessary, edit the properties of the door/window assembly in the Properties palette.

Creating a Door/Window Assembly from an Elevation Sketch

Use this procedure to create a sketch of a custom grid with lines, arcs, and circles, and then convert that linework into a door/window assembly.

NOTE You cannot modify the division definition of a custom grid created from lines, arcs, and circles. You can, however, assign a different division definition to it. For more information, see "Assigning a Division to a Door/Window Assembly Grid" on page 1140.

NOTE Door/window assembly grids are either horizontal or vertical. To create a grid pattern with horizontal and vertical cells, nested grids are used. For more information about nested grids, see "Working with Nested Grids in Door/Window Assemblies" on page 1142.

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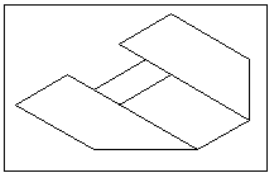
1 Use lines, arcs, and circles to draw a grid in the world coordinate system (WCS).

2 Right-click a door/window assembly tool, and click Apply Properties to ➤ Elevation Sketch.

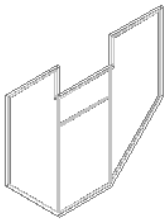
3 Select the linework of your sketch, and press ENTER.

4 Select one of the grid lines as the baseline for the door/window assembly, or press ENTER to use the line along the *X* axis as the default baseline.

Converting linework to a Door/Window Assembly using the default baseline option



select elevation linework



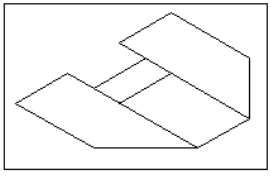
result

TIP If you draw your linework in the *XY* plane (in Plan view) and accept the default baseline, the resulting door/window assembly is displayed from the *Z* direction.

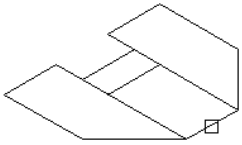
5 To erase the lines, enter **y** (Yes). To have the lines remain after the door/window assembly is created, enter **n** (No).

If there is a style applied to the curtain wall tool, the new custom style is based on the existing style. The infill, mullion, and frame definitions are those of the existing style. You can modify the style without having to create one from scratch. For more information, see "Assigning Definitions to Door/Window Assembly Elements" on page 1139.

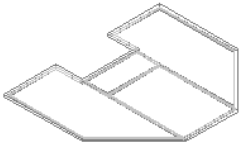
Converting linework to a door/window assembly using the specified baseline option



select elevation linework



specify baseline



result

6 Select the resulting custom door/window assembly, right-click, and click Design Rules ➤ Save to Style.

7 Click New to create a new door/window assembly style.

8 Enter a name for the new door/window assembly style.

9 Click OK twice.

Creating a Door/Window Assembly Tool

Use this procedure to create a door/window assembly tool and add it to a tool palette. You may want to create your own door/window assembly tools if you are placing multiple door/window assemblies of specific styles with additional door/window assembly properties that you want to be the same each time you add a door/window assembly of that type.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a door/window assembly in the drawing	select the door/window assembly, and drag it to the tool palette.
create a tool from a door/window assembly style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 Expand Basic, and expand General.

7 Click the setting for Description, enter a description of the door/window assembly created from this tool, and click OK.

8. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.
9. Select a style.
10. Select the drawing file containing the style used for this door/window assembly.
11. Expand Dimensions.
12. Modify the dimensions of the door/window assembly:

If you want to . . .	Then . . .
specify the length of the door/window assembly	enter a value for Length.
specify the base height of the door/window assembly	enter a value for Base Height.
specify the rise of the door/window assembly	enter a value for Rise.
specify start and end miter angles	enter miter values for Start Miter and End Miter.

13. Expand Location.
14. Modify the location properties of the door/window assembly:

If you want to . . .	Then . . .
specify the position of the door/window assembly	select Unconstrained or Offset/Center for Position along the wall.
specify the head height of the door/window assembly	enter a value for Head height.
specify the sill height of the door/window assembly	enter a values for Sill height.

15. Click OK.

Door/Window Assembly Styles

Door/window assemblies are style-based, meaning there are preset characteristics assigned to each door/window assembly that determine its appearance and function. By changing from one style of door/window assembly to another, you can quickly study several different design options. And any changes you make to the style are reflected throughout your building, updating all door/window assemblies of that particular style. You can also apply overrides to a single door/window assembly, without changing other door/window assemblies of the same style.

A door/window assembly style controls the following properties of a door/window assembly:

- Element definitions
- Definition assignments for each element
- Materials for each element
- Display properties for each element
- Default dimensions
- Notes about the style and any associated reference files

To create, edit, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Process Overview: Creating a Door/Window Assembly Style
- Tips for Working Efficiently with Door/Window Assembly Styles
- Creating Element Definitions for a Door/Window Assembly Style
- Creating a Door/Window Assembly Style
- Defining Divisions for Door/Window Assembly Grids
- Defining Infills for Door/Window Assembly Cells
- Defining Door/Window Assembly Frames
- Defining Door/Window Assembly Mullions
- Assigning Definitions to Door/Window Assembly Elements
- Assigning a Division to a Door/Window Assembly Grid
- Assigning Infills to Door/Window Assembly Cells
- Assigning Definitions to Door/Window Assembly Frames
- Assigning Definitions to the Mullions of a Door/Window Assembly

- Specifying the Materials of a Door/Window Assembly Style
- Specifying the Display of Door/Window Assemblies
- Attaching Notes and Files to a Door/Window Assembly Style

Process Overview: Creating a Door/Window Assembly Style

When you create a door/window assembly style, you assign characteristics to any or all elements of a door/window assembly and save them as a named style. In this way, you standardize the appearance of all door/window assemblies that use the style. When you modify a style, all door/window assemblies in your drawing that use the style are updated to reflect the changes. There are eight general steps for creating a door/window assembly style:

Step 1: Define divisions for the door/window assembly grid.

For information on defining door/window assembly grid definitions, see "Defining Divisions for Door/Window Assembly Grids" on page 1108.

Step 2: Define the infill for the cells of the door/window assembly.

For information on creating infills, see "Defining Infills for Door/Window Assembly Cells" on page 1117.

Step 3: Define the door/window assembly frame, including using profiles and specifying offsets.

For information on defining a frame for a door/window assembly, see "Defining Door/Window Assembly Frames" on page 1125.

Step 4: Define the mullions for the door/window assembly, including using profiles and specifying offsets.

For information on ways to define mullions, see "Defining Door/Window Assembly Mullions" on page 1132.

Step 5: Assign the element definitions you created:

If you want to assign . . .	Then see . . .
a division to a door/window assembly grid	"Assigning a Division to a Door/Window Assembly Grid" on page 1140.
infills to door/window assembly cells	"Assigning Infills to Door/Window Assembly Cells" on page 1140.

If you want to assign . . .	Then see . . .
definitions to door/window assembly frames	"Assigning Definitions to Door/Window Assembly Frames" on page 1151.
definitions to door/window assembly mullions	"Assigning Definitions to the Mullions of a Door/Window Assembly" on page 1154.

Step 6: Specify the materials of the door/window assembly style.

For information on specifying materials, see "Specifying the Materials of a Door/Window Assembly Style" on page 1157.

Step 7: Specify the display properties of the door/window assembly, including layer, color, linetype, and hatching.

For information on specifying the display properties of a door/window assembly, see "Specifying the Display of Door/Window Assemblies" on page 1160.

Step 8: Attach notes and reference documents to the door/window assembly style.

For information on attaching notes and files, see "Attaching Notes and Files to a Door/Window Assembly Style" on page 1166.

Tips for Working Efficiently with Door/Window Assembly Styles

Use these suggestions to work with door/window assembly styles efficiently and productively.

- Name grids and elements very clearly to identify where they are used and what they are. For example, use the name L3-FL1-H to represent a third-level grid used on the first floor and that is horizontally divided. Incorporating this suggestion makes it easier to ensure that you are using elements correctly.
- Use the element definition that is applied most often as the default element definition. For example, if most cells are stone panels, define the default infill as the stone panel. This panel is then used in every cell that is not specifically assigned to another infill. Apply this rule to the default frame, mullion, and division.
- Name the styles for doors, windows, curtain wall units, AEC polygons, and curtain walls to indicate where they are used and what they are.

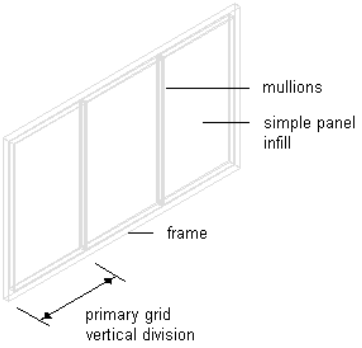
- Remember that you can use cell and edge overrides to define special conditions not accounted for in the door/window assembly style.

Creating Element Definitions for a Door/Window Assembly Style

Element definitions determine the appearance of the four basic door/window assembly elements. There is a different definition type for each element.

Definition	Sample definitions
Divisions	Horizontal grid with six cells
Cell Infills	Cells contain windows
Frames	Outer edge of grid is 6" wide
Mullions	Edges between cells are 4" wide

Identifying Door/Window Assembly components



Each type of element can have multiple definitions. For example, you can define the divisions to create a horizontal grid or a vertical grid and you can define the cells to contain a nested grid or a door/window assembly. To make reuse easier, you can save the element definitions and then assign them to grids, cells, frames, or mullions as needed.

Element definitions are style-specific. When you create element definitions for a specific door/window assembly style, those definitions are available only for door/window assemblies of that style. For example, if you define a door/window assembly infill for one door/window assembly style, that infill

is not available as an option when you edit a door/window assembly of a different style.

Creating a Door/Window Assembly Style

Use this procedure to create a door/window assembly style. You can create a style using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style. You can also create a door/window assembly tool based on the newly created door/window assembly style. When you use the tool to add door/window assemblies, each door/window assembly has the style specific to the tool.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Create a new door/window assembly style:

If you want to . . .	Then . . .
create a style with default properties	right-click Door/Window Assembly Styles, and click New.
create a style from an existing style	right-click the door/window assembly style you want to copy, and click Copy. Right-click, and click Paste.
create a style from a curtain wall, curtain wall unit, or door/window assembly in the drawing	right-click Door/Window Assembly Styles, and click New. Right-click the new style, click Set From, and then pick a curtain wall, a curtain wall unit, or a door/window assembly.

4. Enter a name for the new door/window assembly style, and press ENTER.
5. To edit the new door/window assembly style, right-click the style, and click Edit:

If you want to . . .	Then . . .
define the elements of a door/window assembly style	see "Defining Divisions for Door/Window Assembly Grids" on page 1108, "Defining Infills for Door/Window Assembly Cells" on page 1117, "Defining Door/Window Assembly Frames" on page 1125, and "Defining Door/Window Assembly Mullions" on page 1132.

If you want to . . .	Then . . .
assign element definitions to the door/window assembly style	see "Assigning Definitions to Door/Window Assembly Elements" on page 1139, "Assigning a Division to a Door/Window Assembly Grid" on page 1140, "Assigning Infills to Door/Window Assembly Cells" on page 1140, "Assigning Definitions to Door/Window Assembly Frames" on page 1151, and "Assigning Definitions to the Mullions of a Door/Window Assembly" on page 1154.
add door/window assembly element definitions as display components	see "Adding Door/Window Assembly Element Definitions as Display Components" on page 1161.
specify layer, color and linetype settings for the display components of a door/window assembly	see "Specifying the Layer, Color, and Linetype of a Door/Window Assembly Style" on page 1162.
specify door/window assembly hatching	see "Specifying the Hatching for Components of a Door/Window Assembly Style" on page 1162.
add custom graphics as display components of a door/window assembly style	see "Adding Custom Graphics as a Display Component of a Door/Window Assembly" on page 1163.
create individual cut planes for door/window assembly styles	see "Creating Cut Planes for a Door/Window Assembly" on page 1165.
specify the materials of the door/window assembly style	see "Specifying the Materials of a Door/Window Assembly Style" on page 1157.
add notes and files to the style	see "Attaching Notes and Files to a Door/Window Assembly Style" on page 1166.

6 When you finish specifying the properties of the door/window assembly style, click OK.

7 If you want to assign the style to a door/window assembly tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating a Door/Window Assembly Tool" on page 1100.

8 Click OK.

Defining Divisions for Door/Window Assembly Grids

The divisions of a grid define the orientation that determines the direction of the grid cells and mullions and they define a division type that determines the number and size of cells.

NOTE Creating a nested grid is not a division rule. To create a nested grid, add a cell assignment. For more information, see "Creating a Nested Grid for a Door/Window Assembly" on page 1145 and "Working with Nested Grids in Door/Window Assemblies" on page 1142.

You can create a variety of division definitions under different names and then assign different divisions to each grid in your door/window assembly. Although you can create multiple definitions, there can be only one division assignment per grid. You create division definitions for a specific door/window assembly style and those definitions can be assigned only to grids in door/window assemblies of that style. For more information about assigning divisions to a particular grid, see "Assigning a Division to a Door/Window Assembly Grid" on page 1140.

Related Procedures

- Division of Door/Window Assembly Grids
- Creating a Division Definition for a Door/Window Assembly
- Specifying a Fixed Size for Cells in a Door/Window Assembly Grid
- Using the Auto-Adjust Cells Option
- Specifying a Fixed Number of Cells for a Door/Window Assembly Grid
- Manually Defining the Number and Size of Cells in a Door/Window Assembly Grid
- Specifying an Offset for a Door/Window Assembly Grid
- Removing a Division Definition from a Door/Window Assembly Style
- Assigning a Division to a Door/Window Assembly Grid

Division of Door/Window Assembly Grids

A door/window assembly consists of one or more grids, which are the framework for placing design elements in the door/window assembly. The highest-level grid is the primary grid, which is also the outside edge of the door/window assembly.

Each grid in a door/window assembly has one division assignment that determines whether the grid is divided horizontally or vertically. The division also determines the number of cells, their size, and their placement.

Within the primary grid, you can define multiple levels of grids. These grids within the primary grid are called nested grids. Each subdivision of a grid is called a cell.

Creating a Division Definition for a Door/Window Assembly

Use this procedure to create divisions for a door/window assembly grid.

Because door/window assemblies can contain multiple nested grids, it is helpful to use a naming convention for grids that indicates the level of each grid and the grid location or the purpose within the door/window assembly. For example, L3-FL1-Stone Panels identifies a third level grid that provides a row of stone panels on Floor 1.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Click New Division.
7. Enter a name for this division definition.
8. Select either Vertical orientation or Horizontal orientation .
9. Select one of the following division types and specify offsets if needed:

Division Type	Description
Fixed Cell Dimension	Creates a grid where the size of the individual cells is predetermined. For more information, see "Specifying a Fixed Size for Cells in a Door/Window Assembly Grid" on page 1110.
Fixed Number of Cells	Creates a grid where the number of grid cells is predetermined. For more information, see "Specifying a Fixed Number of Cells for a Door/Window Assembly Grid" on page 1113.

Division Type	Description
Manual	Creates a grid where the size and number of individual cells is manually determined by the user. For more information, see "Manually Defining the Number and Size of Cells in a Door/Window Assembly Grid" on page 1114.

After you create a division definition, you can assign the definition to a specific grid in a door/window assembly. For more information, see "Assigning a Division to a Door/Window Assembly Grid" on page 1140.

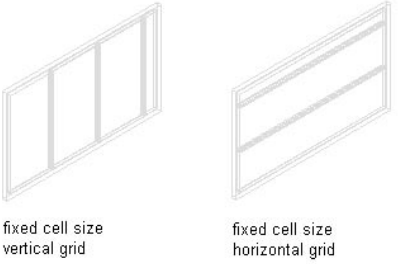
10 When you are finished creating division definitions, click OK.

Specifying a Fixed Size for Cells in a Door/Window Assembly Grid

Use this procedure to define a specific size for the cells in a grid. In this case, the number of cells is determined by the length or height of the grid, depending on how the grid is divided.

When you specify a fixed cell size in a grid, you can control how the cells of the grid adjust to accommodate any leftover space. This space occurs if the length (or the height) of the door/window assembly cannot be evenly divided by the fixed size of the cell. For more information, see "Using the Auto-Adjust Cells Option" on page 1112.

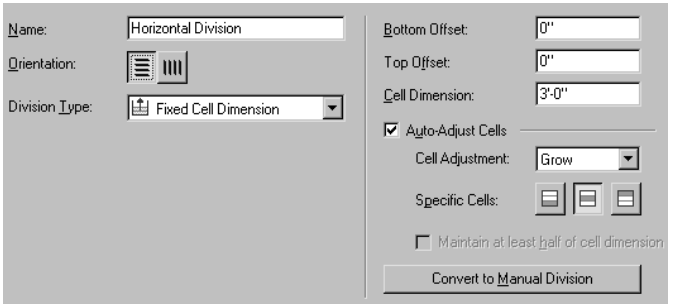
Specifying a fixed cell size for Door/Window Assembly grids



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.

6 Select a Division definition or create a new one.

7 Select Fixed Cell Dimension for Division Type.



8 Specify a size for the cells in Cell Dimension.

If you are defining a vertical grid, the cell dimension is the length of the cell from mullion to mullion. If you are defining a horizontal grid, the cell dimension is the height of the cell.

9 To specify an offset for the grid, specify an offset distance in Bottom Offset or Top Offset.

TIP The frame width is calculated as part of the cell size. Therefore, cells adjacent to the frame can appear to be a different size than the other cells. If you do not want the frame width included in the cell size, specify an offset for the grid that is equal to the frame width.

When you draw a door/window assembly using a fixed cell dimension, there is often extra space between the last full-size cell and the end of the door/window assembly.

For more information about grid offsets, see "Specifying an Offset for a Door/Window Assembly Grid" on page 1115.

10 Adjust the cells to accommodate this extra space:

If you want to . . .	Then . . .
add the space to grid cells	select Auto-Adjust Cells, select Grow for Cell Adjustment, and select the specific cells where the space is to be added. You can select any combination of Specific Cells.

If you want to . . .	Then . . .
remove the space from grid cells	select Auto-Adjust Cells, select Shrink for Cell Adjustment, and select the specific cells where the space is to be removed. You can select any combination of Specific Cells.

11 Click OK.

For information about assigning the division definition to a specific grid in your door/window assembly, see "Assigning a Division to a Door/Window Assembly Grid" on page 1140.

Using the Auto-Adjust Cells Option

Use this procedure to automatically resize cells in a grid when the result of dividing the grid by the specified cell dimension is not a whole number.

For example, if a vertical primary grid in a door/window assembly style is 17 feet in length and you specify a fixed cell dimension of 3 feet, the grid has five cells of 3 feet each with 2 feet remaining. Using the Auto-Adjust Cells option, you can specify how the grid distributes the remaining quantity.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Divisions definition or create a new one.
7. Select Fixed Cell Dimension as the division type.
8. Select Auto-Adjust Cells, and specify the cell adjustment:

If you want to . . .	Then . . .
add the remaining space to grid cells	select Grow, and select the specific cells to which you want the space added.
remove the remaining space from grid cells	select Shrink, and select the specific cells from which you want the space removed. You can then select Maintain at least half of cell dimension in order to control the cell shrinkage.

The cells that you do not select maintain the fixed value you specified for Cell Dimension.

Specifying a Fixed Number of Cells for a Door/Window Assembly Grid

Use this procedure to define a specific number of cells in a grid. In this case, the size of the cells is determined by the length or height of the grid, depending on how the grid is divided.

Specifying a fixed number of cells for Door/Window Assembly grids

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Fixed Number of Cells for Division Type.
8. Enter the desired number of cells in Number of Cells.
9. Specify an offset distance for Start Offset or End Offset.

For more information, see "Specifying an Offset for a Door/Window Assembly Grid" on page 1115.

TIP The frame width is calculated as part of the cell size. Therefore, cells adjacent to the frame can appear to be a different size than the other cells. If you do not want the frame width included in the cell size, specify an offset for the grid that is equal to the frame width.

For information about assigning the division definition to a specific grid in your door/window assembly, see "Assigning a Division to a Door/Window Assembly Grid" on page 1140.

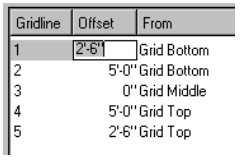
Manually Defining the Number and Size of Cells in a Door/Window Assembly Grid

Use this procedure to manually add gridlines and specify an offset for each one when you need to create a unique grid that does not fit into any of the other division types. You can also start with a fixed cell dimension grid or a fixed number of cells grid and then manually adjust the gridlines to suit your needs.

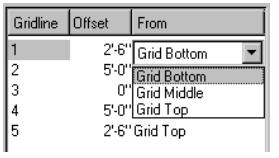
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select a Division definition or create a new one.
7. Select Manual for Division Type.
8. Click Add Gridline to insert a gridline.

   Insert as many grid lines as you need. If you need to remove a grid line, select it from the table, and then click Remove Gridline.

9. Under Offset in the grid line table, specify an offset distance for each grid line.



10. Under From in the grid line table, select the grid location from which the grid line is offset.



11. Specify an offset distance in Bottom Offset or Top Offset.

For more information, see "Specifying an Offset for a Door/Window Assembly Grid" on page 1115.

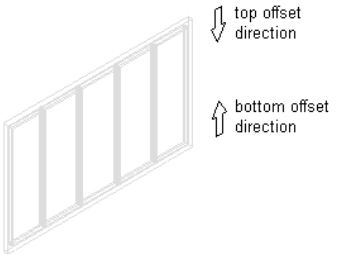
12 Click OK.

For information about assigning the division definition to a specific grid in your door/window assembly, see "Assigning a Division to a Door/Window Assembly Grid" on page 1140.

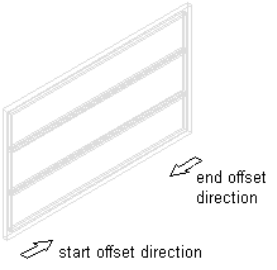
Specifying an Offset for a Door/Window Assembly Grid

By default, grids cells are measured from the start and end points of the door/window assembly baseline (for horizontal divisions) or in the baseline to the base height (for vertical divisions). The width of the grid frame is not considered in calculating the size of the cell. For example, if you draw a door/window assembly with a 14 ft. baseline and a 1 ft. frame on the left and right, and you specify a fixed number of vertical cells, the cells do not appear equal in size. The first and last cells appear smaller because they include the frame. To make the cells equal in size, offset the start and end of the grid by the width of the frame.

1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Door/Window Assembly Styles.
3 Select a door/window assembly style, right-click, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select Divisions under Element Definitions.
6 Select a Division definition or create a new one.
7 Specify an offset for the grid.



vertical grid



horizontal grid

If you want to specify the distance between . . .	Then . . .
the start point of the door/window assembly baseline and the start of the first cell in a horizontal grid	enter a value for Start Offset.
the end point of the door/window assembly baseline and the end of the last cell in a horizontal grid	enter a value for End Offset.
the baseline of the door/window assembly and the start of the bottom cell in a vertical grid	enter a value for Bottom Offset.
the base height of the door/window assembly and the end of the top cell in a vertical grid	enter a value for Top Offset.

8 Click OK twice.

Removing a Division Definition from a Door/Window Assembly Style

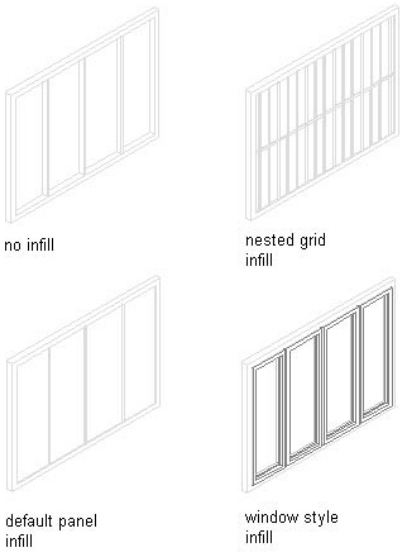
Use this procedure to remove a division definition that you no longer need. You cannot remove a division definition that is currently assigned to a grid. In addition, you cannot remove the default division definition, but you can modify it.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Divisions under Element Definitions.
6. Select the division definition that you want to remove.
7. Right-click and click Remove, or click .
8. Click OK twice.

Defining Infills for Door/Window Assembly Cells

An infill defines the contents of a door/window assembly cell. A door/window assembly cell can be empty (no infill), it can contain a grid (nested grid), or it can contain one of two infills: a panel or a style. Use the style infill for inserting doors, windows, and other objects into a door/window assembly. Panels typically represent glazing or other plain cladding, such as stone or concrete.

Specifying Door/Window Assembly Infill definitions



NOTE Nested grids and no infill are options you select when assigning an infill to a cell. They do not require infill definitions. For more information, see "Creating a Nested Grid for a Door/Window Assembly" on page 1145 and "Removing an Infill from a Door/Window Assembly" on page 1148.

You can define as many infills as you need and then use cell assignments to specify the cells that use each infill. A default infill, which you can modify, is used for all unassigned cells. For more information about cell assignments, see "Assigning Definitions to Door/Window Assembly Elements" on page 1139.

NOTE Create infill definitions for a specific door/window assembly style. Those definitions can be assigned only to grid cells in door/window assemblies of that style.

Materials

Styles use the materials of the object style assigned to each panel. For example, if you specify an infill to use the Standard door style, the materials of that infill are those designated in the door style.

Simple panels need materials assigned in the door/window assembly style.

Door/Window Assembly with assigned materials example detail

If you do not use materials to control the display properties of infills, you can specify their display properties in the door/window assembly style. The layer, color, linetype, and other display properties of the Default Infill are applied to all infills unless you create a custom display component for each infill definition. Then you can control the display of each infill definition independently. For more information, see "Specifying the Display of Door/Window Assemblies" on page 1160.

Related Procedures

- Creating a Panel Infill for a Door/Window Assembly
- Creating an Infill for Inserting an Object into a Door/Window Assembly
- Specifying an Alignment for a Door/Window Assembly Infill
- Specifying an Offset for a Door/Window Assembly Infill
- Removing an Infill Definition from a Door/Window Assembly Style
- Assigning Infills to Door/Window Assembly Cells

Creating a Panel Infill for a Door/Window Assembly

Use this procedure to create a simple panel infill to represent basic cladding materials in the door/window assembly, such as a stone wall panel, concrete panel, metal panel, or glazing infill.

Because door/window assemblies can contain multiple infills, it is helpful to use a naming convention for panel infills that indicates the infill location or purpose within the door/window assembly. For example, L3-FL1- Stone Panel identifies a stone panel in a third-level grid on Floor 1.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.

3 Select a door/window assembly style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select Infills under Element Definitions.

6 Click New Infill.

7 Enter a descriptive name for the infill.

8 Select Simple Panel for Infill Type.

9 Select an alignment for the infill.

For more information, see "Specifying an Alignment for a Door/Window Assembly Infill" on page 1121.

10 Specify an offset for the infill.

For more information, see "Specifying an Offset for a Door/Window Assembly Infill" on page 1122.

11 Specify a thickness for the panel.

12 Click OK twice.

After you create an infill definition, you can assign it to any cell in a door/window assembly grid. For more information, see "Assigning Infills to Door/Window Assembly Cells" on page 1140.

Creating an Infill for Inserting an Object into a Door/Window Assembly

Use this procedure to create a style infill to insert objects into a door/window assembly. You can insert doors, windows, curtain wall units, and AEC polygons by defining a specific style of that object as an infill.

TIP After you insert an object in a cell, you can select that object independent of the grid and access editing options for the object.

Because door/window assemblies can contain multiple infills, it is helpful to use a naming convention for panel infills that indicates the infill location or purpose within the door/window assembly. For example, L3-FL1-Stone Panel identifies a stone panel in a third-level grid on Floor 1.

NOTE The object styles you use in infills must exist in the current drawing to be added to an infill definition.

1 On the Format menu, click Style Manager.

2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Click New Infill.
7. Enter a descriptive name for the infill.
8. Select Style for Infill Type.

   The right side of the dialog box changes to display a tree view of the object styles available for insertion into a door/window assembly.

9. Select an object style.

   There is a unique icon for each type of style. For example, the door style icon and the curtain wall unit icon . These icons also are displayed next to the infill name at the top of the dialog box to help you identify the type of infill.

10. Select an alignment for the infill.

    For more information, see "Specifying an Alignment for a Door/Window Assembly Infill" on page 1121.

11. Specify an offset for the infill.

    For more information, see "Specifying an Offset for a Door/Window Assembly Infill" on page 1122.

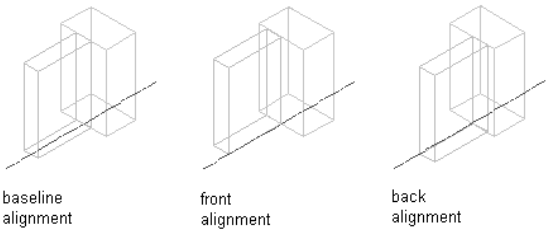
12. Click OK twice.

After you create an infill definition, you can assign it to any cell in a door/window assembly grid. For more information, see "Assigning Infills to Door/Window Assembly Cells" on page 1140.

Specifying an Alignment for a Door/Window Assembly Infill

Use this procedure to align an infill so that it is centered with the baseline of the door/window assembly, in front of the baseline, or behind the baseline. In Plan view, the front of a door/window assembly (drawn from left to right) is below the baseline and the back is above the baseline.

Specifying Door/Window Assembly panel infill alignments



NOTE To move the infill away from the baseline, see "Specifying an Offset for a Door/Window Assembly Infill" on page 1122.

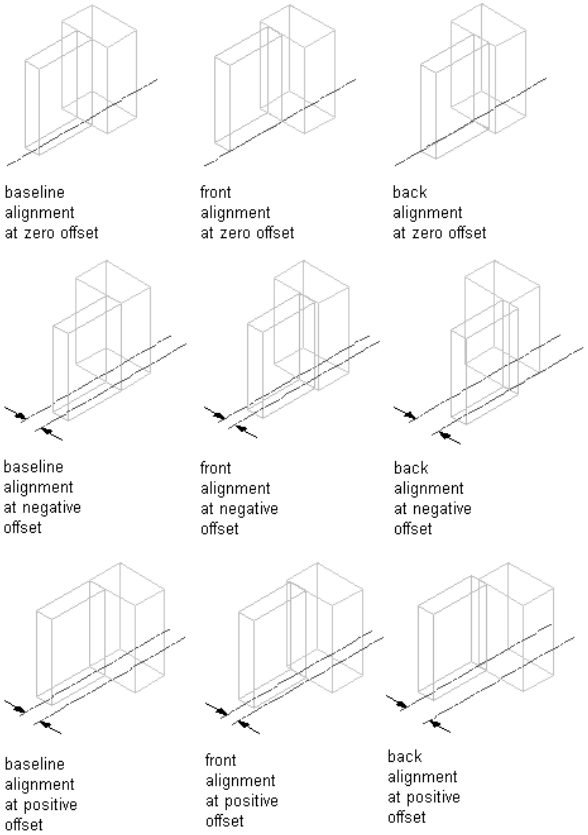
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Select an infill or create a new one.
7. Select an alignment: front, center, or back.
8. Click OK twice.

Specifying an Offset for a Door/Window Assembly Infill

Use this procedure to specify an offset for a door/window assembly infill. By default, infills are centered on the door/window assembly baseline. If your design requires that the infill be aligned with frame edges or some other part of the door/window assembly, you can specify an offset for the infill.

You can also edit individual style-based infills directly in the drawing. The selected infill has Flip grips in both the *X* and *Y* directions so that you can change the orientation of the infill.

Specify Door/Window Assembly infill panel offsets



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Infills under Element Definitions.
6. Select an infill or create a new one.
7. Enter an offset distance.

   In plan view, positive numbers offset the infill above the baseline and negative numbers offset the infill below the baseline. The offset is also affected by the selected alignment for the infill.

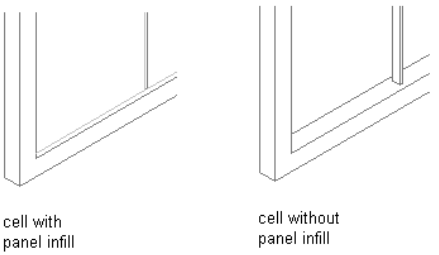
8 Click OK twice.

Removing an Infill Definition from a Door/Window Assembly Style

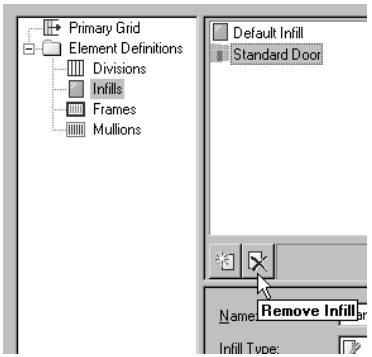
Use this procedure to delete an infill definition that you no longer need. However, you cannot remove an infill definition that is currently assigned to a cell in the primary grid or any nested grid. Also, you cannot remove the default infill definition, but you can modify it as needed.

NOTE For information about removing an infill from a cell, see "Removing an Infill from a Door/Window Assembly" on page 1148.

Removing panel infill from a Door/Window Assembly



1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Door/Window Assembly Styles.
3 Select a door/window assembly style, right-click, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select Infills under Element Definitions.
6 Select the unneeded infill definition, and click Remove Infill.

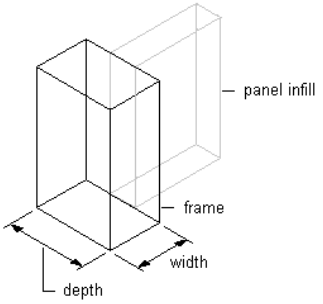


7 Click OK twice.

Defining Door/Window Assembly Frames

All door/window assembly grids, including the primary grid, can have frame definitions. The door/window assembly frame is represented by the outer edges of a grid. The overall frame size is determined by the length and height of the door/window assembly grid. You can define a frame by specifying a width and depth or by selecting a profile.

Specifying Door/Window Assembly frame width and depth



You create frame definitions for a specific door/window assembly style. Those definitions can be assigned only to frames in door/window assemblies of that style. You can create as many frame definitions as you want and then assign the definitions to the frame edges as needed. If you have nested grids, each grid has its own frame. There is a default frame definition that you can modify and assign as needed. Unassigned frame edges are not displayed. For more information, see "Assigning Definitions to Door/Window Assembly Frames" on page 1151.

TIP Using Style Manager, you can copy a mullion definition and use it as a frame definition. Select the mullion definition and drag it to Frames in the left pane.

Materials and Display Properties for Frames

If you do not use materials to control the display properties of frames, you can specify their display properties in the door/window assembly style. The layer, color, linetype, and other display properties of the default frame are applied to all frames unless you create a custom display component for each definition. You can then control the display of each frame definition independently. For more information, see Specifying the Display of Door/Window Assemblies.

NOTE You create frame definitions for a specific door/window assembly style and those definitions can be assigned only to frames in door/window assemblies of that style.

Related Procedures

- Defining a Door/Window Assembly Frame by Width and Depth
- Defining a Door/Window Assembly Frame Using a Profile
- Specifying Offsets for a Door/Window Assembly Frame
- Removing a Frame Definition from a Door/Window Assembly Style
- Assigning Definitions to Door/Window Assembly Frames

Defining a Door/Window Assembly Frame by Width and Depth

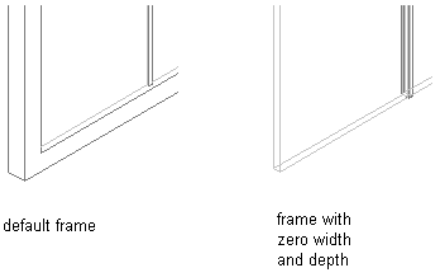
Use this procedure to define a frame by specifying its width and depth. The overall frame size is determined by the length and height of the door/window assembly grid.

Because door/window assemblies can contain multiple styles with different frames, it is helpful to use a naming convention for grid frames that indicates the grid location or purpose within the door/window assembly. For example, L3-FL1- Metal Frame identifies a metal frame in a third-level grid on Floor 1.

TIP To remove the frame edge and have the infill adjust to fill the space occupied by the frame, create a frame definition with both width and depth set to zero. Then assign that definition to the frame edge that you want to remove. This is necessary for the infill to be mitered as it would be for a butt-glazed con-

dition. For more information, see "Removing a Frame Edge from a Door/Window Assembly" on page 1153.

Specifying a Door/Window Assembly frame width and depth of zero



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Frames under Element Definitions.
6. Click to create a new frame definition.
7. Enter a descriptive name for the frame.
8. Specify a width and depth for the frame.
9. Specify any offsets.

   For more information, see "Specifying Offsets for a Door/Window Assembly Frame" on page 1130.
10. Click OK twice.

After you create a frame definition, you can assign it to any frame in a door/window assembly. For more information, see "Assigning Definitions to Door/Window Assembly Frames" on page 1151.

Creating a Profile for a Door/Window Assembly Frame

Use this procedure to create a profile that you can use to define the shape of a door/window assembly frame. You can then extrude the profile to create a door/window assembly frame.

The height and the width of the polyline you use to create the profile define the default height and width of the door/window assembly frame. The insertion point of the profile is aligned with the centroid of the frame.

1. Draw a closed polyline of the height and the depth needed for the resulting door/window assembly frame.
2. Select the polyline, right-click, and click Convert to ➤ Profile Definition.
3. Enter **c** (Centroid) for the insertion point of the profile.

   The insertion point of the profile is aligned with the centroid of the frame.
4. Enter a name for the profile, and click OK.

You can now use the profile as a door/window assembly frame. For more information, see "Defining a Door/Window Assembly Frame Using a Profile" on page 1128.

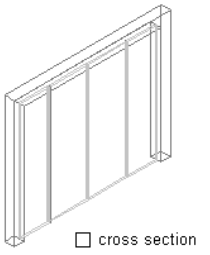
Defining a Door/Window Assembly Frame Using a Profile

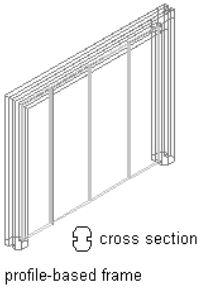
Use this procedure to create a frame element definition from a profile. If you do not want a straight edge to your frame, you can use a profile to define edges with curves, jags, or any other shape you require.

You can also use an edit in-place routine to create a frame from a profile. For more information, see "Creating a Frame or Mullion Edge from a Polyline or Profile using In-Place Editing" on page 1176.

It is helpful to use a naming convention for profiles that indicates the grid location or purpose within the door/window assembly. For example, L3-FL1-Metal Frame identifies a metal frame in a third-level grid on Floor 1.

Specifying default and profile-based Door/Window Assembly frames





NOTE The insertion point of the profile is aligned with the centroid of the frame.

1. Create the profile to use for the frame.

   For more information, see "Creating a Profile for a Door/Window Assembly Frame" on page 1127.

2. On the Format menu, click Style Manager.
3. Expand Architectural Objects, and expand Door/Window Assembly Styles.
4. Select a door/window assembly style, right-click, and click Edit.
5. Click the Design Rules tab.
6. In the left pane, select Frames under Element Definitions.
7. Create a new frame definition.
8. Enter a descriptive name for the frame.
9. Specify a width and depth for the frame edge.

   These dimensions are used to calculate the center point of the edge for aligning the profile and also to specify a boundary for the adjacent infill.

10 Select Use Profile.

NOTE The Profile options are available only when you have profiles in the current drawing.

11 Select a profile from the list.

By default, the profile is inserted using the same width and depth with which it was created.

12 To adjust the size of the profile to fit within the width or depth dimension of the frame edge, select Auto-Adjust Profile Width or Depth.

13 To mirror the profile along the *X* or *Y* axis, select X or Y for Mirror In.

14 To rotate the profile, specify a rotation angle.

15 Specify any offsets.

For more information, see the next section "Specifying Offsets for a Door/Window Assembly Frame" on page 1130.

16 Click OK twice.

After you create a frame definition, you can assign it to any frame in a door/window assembly. For more information, see "Assigning Definitions to Door/Window Assembly Frames" on page 1151.

Specifying Offsets for a Door/Window Assembly Frame

Use this procedure to define the distance that a door/window assembly frame is from the floor line, roof line, or baseline. By default, the outside edges of the frame align with start and end of the baseline and the start and end of the base height. When you adjust the width of the frame, the frame expands inward. However, you can use offsets to expand or contract the frame away from these default limits or to shift the frame away from the baseline in either the X or Y direction.

Offset	Description
X	Positive X offset moves the frame edge outward beyond the end of the door/window assembly, while a negative X offset moves the frame edge inward toward the center of the door/window assembly.
Y	In Plan view, a positive Y offset moves the frame edge above the baseline, while a negative Y offset moves the frame below the baseline.

Offset	Description
Start	Negative Start offset lengthens the frame beyond the start point, while a positive Start offset shortens the frame. The start point for vertical edges is the baseline, and the start point for horizontal edges (drawn left to right) is the left side.
End	Negative End offset lengthens the frame beyond the end point, while a positive End offset shortens the frame. The end point for vertical edges is the base height, and the end point for horizontal edges (drawn left to right) is the right side.

TIP To quickly identify the start and end of a door/window assembly, select the door/window assembly. The Reverse Direction grip is displayed near the center of the door/window assembly and points toward the end of the door/window assembly.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Frames under Element Definitions.
6. Select a frame definition from the list.
7. Specify an offset distance for the frame edge: X, Y, Start, or End.
8. Click OK twice.

Removing a Frame Definition from a Door/Window Assembly Style

Use this procedure to remove a frame definition that you no longer need. You cannot remove a frame definition if it is currently assigned to a frame edge, but you can remove it if it is assigned as an override to a frame edge. Also, you cannot remove the default frame definition, but you can modify it as needed.

NOTE For information about removing a frame edge, see "Removing a Frame Edge from a Door/Window Assembly" on page 1153.

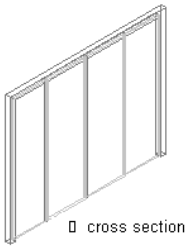
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Frames under Element Definitions.
6. Select the unneeded frame definition from the list.
7. Click Remove Frame.
8. Click OK twice.

Defining Door/Window Assembly Mullions

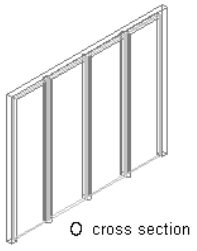
All door/window assembly grids, including the primary grid, can have mullion definitions. The mullions of a door/window assembly are the edges between the grid cells. You can define the mullions by specifying a width and depth or by selecting a profile from which the mullion is extruded.

Because door/window assemblies can contain multiple nested grids with different mullions, it is helpful to use a naming convention for grid mullions that indicates the grid location or purpose within the door/window assembly. For example, L3-FL1- Window Mullion identifies a mullion for a window in a third-level grid on Floor 1.

Specifying default and profile-based Door/Window Assembly mullions



default mullions



profile-based mullions

You create mullion definitions for a specific door/window assembly style and those definitions can be assigned only to mullions in door/window assemblies of that style. You can create as many mullion definitions as you want and then assign the definitions to mullions as needed. If you have nested grids, each grid has its own mullions. A default mullion definition, which you can modify and assign as needed, is used for any unassigned mullions. For more information, see "Assigning Definitions to the Mullions of a Door/Window Assembly" on page 1154.

TIP Using Style Manager, you can copy a frame definition and use it as a mullion definition. Select the frame definition and drag it to Mullions in the left pane.

Materials and Display Properties for Mullions

If you do not use materials to control the display properties of mullions, you can specify their display properties in the door/window assembly style. The layer, color, linetype, and other display properties of the default mullion are applied to all mullions unless you create a custom display component for each definition. You can then control the display of each mullion definition independently. For more information, see "Specifying the Display of Door/Window Assemblies" on page 1160.

Related Procedures

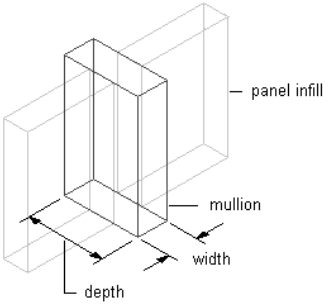
- Defining Door/Window Assembly Mullions by Width and Depth
- Defining the Mullions of a Door/Window Assembly Using a Profile
- Specifying Offsets for the Mullions of a Door/Window Assembly
- Removing a Mullion Definition from a Door/Window Assembly Style
- Assigning Definitions to the Mullions of a Door/Window Assembly

Defining Door/Window Assembly Mullions by Width and Depth

Use this procedure to define mullions by specifying a width and a depth.

Because door/window assemblies can contain multiple nested grids with different mullions, it is helpful to use a naming convention for grid mullions that indicates the grid location or purpose within the door/window assembly. For example, L3-FL1- Window Mullion identifies a mullion for a window in a third-level grid on Floor 1.

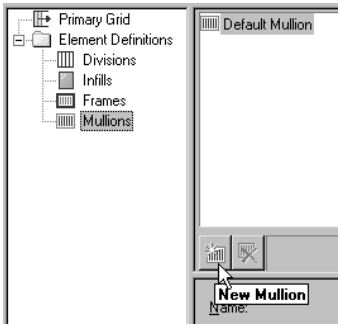
Specifying Door/Window Assembly mullion width and depth



TIP To remove mullions for butt glazing, create a definition with both width and depth set to zero. Then assign that definition to the mullions that you want to remove. For more information, see "Removing Mullions from a Door/Window Assembly Grid" on page 1156.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Mullions under Element Definitions.

6 Click New Mullion.



7 Enter a descriptive name for the mullion definition.

8 Specify a width and depth for the mullion definition.

9 Specify any offsets.

For more information, see "Specifying Offsets for the Mullions of a Door/Window Assembly" on page 1137.

10 Click OK twice.

After you create a mullion definition, you can assign it to any mullion in a door/window assembly. For more information, see "Assigning Definitions to the Mullions of a Door/Window Assembly" on page 1154.

Creating a Profile for Door/Window Assembly Mullions

Use this procedure to create a profile that you can use to define the shape of a door/window assembly mullion definition. You can then extrude the profile to create mullions from it.

The height and the width of the polyline you use to create the profile define the default height and width of the door/window assembly mullion. The insertion point of the profile is aligned with the centroid of the mullion.

1 Draw a closed polyline of the height and the depth needed for the resulting door/window assembly mullion.

2 Select the polyline, right-click, and click Convert to ➤ Profile Definition.

3 Enter **c** (Centroid) for the insertion point of the profile.

The insertion point of the profile is aligned with the centroid of the mullion.

4 Enter a name for the profile, and click OK.

You can now use the profile as a door/window assembly mullion. For more information, see "Defining the Mullions of a Door/Window Assembly Using a Profile" on page 1136.

Defining the Mullions of a Door/Window Assembly Using a Profile

Use this procedure to create a mullion element definition from a profile. If you do not want a straight edge to your mullions, you can use a profile to define mullions with curves, jags, or any other shape.

You can also use an edit in-place routine to create a mullion from a profile. For more information, see "Creating a Frame or Mullion Edge from a Polyline or Profile using In-Place Editing" on page 1176.

Because door/window assemblies can contain multiple nested grids with different mullions, it is helpful to use a naming convention for grid mullions that indicates the grid location or purpose within the door/window assembly. For example, L3-FL1- Window Mullion identifies a mullion for a window in a third-level grid on Floor 1.

NOTE The insertion point of the profile is aligned with the centroid of the mullion.

---

1. Create the profile to use for the mullion.

   For more information, see "Creating a Profile for Door/Window Assembly Mullions" on page 1135.
2. On the Format menu, click Style Manager.
3. Expand Architectural Objects, and expand Door/Window Assembly Styles.
4. Select a door/window assembly style, right-click, and click Edit.
5. Click the Design Rules tab.
6. In the left pane, select Mullions under Element Definitions.
7. Click New Mullion.
8. Enter a descriptive name for the mullion definition.
9. Specify a width and depth for the mullion definition.

   These dimensions are used to calculate the center point of the mullion for aligning the profile, and also to specify a boundary for the adjacent infill.
10. Select Use Profile.

NOTE The Profile options are available only when you have profiles in the current drawing.

11 Select a profile from the list.

By default, the profile is inserted using the same width and depth with which it was created.

12 To adjust the size of the profile to fit within the width or depth dimension of the mullion, select Auto-Adjust Profile Width or Depth.

13 To mirror the profile along the *X* or *Y* axis, select X or Y for Mirror In.

14 To rotate the profile, specify a rotation angle.

15 Specify any offsets.

For more information, see "Specifying Offsets for the Mullions of a Door/Window Assembly."

16 Click OK twice.

After you create a mullion definition, you can assign it to any mullion in a door/window assembly. For more information, see "Assigning Definitions to the Mullions of a Door/Window Assembly" on page 1154.

Specifying Offsets for the Mullions of a Door/Window Assembly

Use this procedure to define mullions that are offset from the start or end of the door/window assembly to lengthen or shorten the edge or offset in the X or Y direction to shift the edge. For example, you might want to represent butt glazing by offsetting the mullions to be behind glass panel infills.

Offset	Description
X	For vertical mullions, a positive X offset moves the mullions toward the end of the door/window assembly, while a negative X offset moves the mullions toward the start of the door/window assembly. For horizontal mullions, a positive X offset moves the mullions toward the top of the door/window assembly, while a negative X offset moves the mullions toward the bottom of the door/window assembly.
Y	In Plan view, a positive Y offset moves the mullions above the baseline, while a negative Y offset moves the mullions below the baseline.

Offset	Description
Start	Negative Start offset lengthens the mullions beyond the start point, while a positive Start offset shortens the mullions.
End	Negative End offset lengthens the mullions beyond the end point, while a positive End offset shortens the mullions.

TIP To quickly identify the start and end of a door/window assembly, select the door/window assembly. The Reverse Direction grip is displayed near the center of the door/window assembly and points toward the end of the door/window assembly.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select Mullions under Element Definitions.
6. Select a mullion definition from the list.
7. Specify an offset distance for the X, Y, Start, or End.
8. Click OK twice.

Removing a Mullion Definition from a Door/Window Assembly Style

Use this procedure to remove a mullion definition that you no longer need. You cannot remove a mullion definition if it is assigned to a mullion, but you can remove it if it is assigned as an override to a mullion. Also, you cannot remove the Default Mullion definition, but you can modify it as needed.

NOTE For information about removing mullions from between cells, see "Removing Mullions from a Door/Window Assembly Grid" on page 1156.

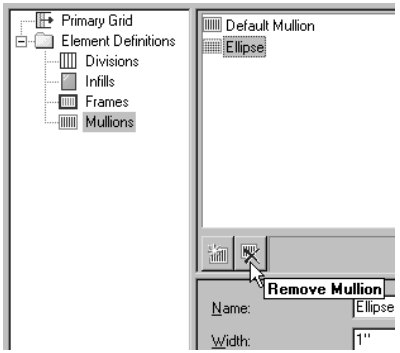
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select Mullions under Element Definitions.

6 Select the unneeded mullion definition from the list.

7 Click Remove Mullion.



8 Click OK twice.

Assigning Definitions to Door/Window Assembly Elements

After you've created element definitions for a door/window assembly style, you can assign those definitions to each of the door/window assembly element types: divisions, cell infills, frames, and mullions.

By default, one definition is assigned to all elements of a particular type. However, you can assign definitions to individual elements as well. For example, all cells in the grid are assigned the default infill. But you can create a new cell assignment, select a different infill, and then specify the cells to use that infill.

Assignment list

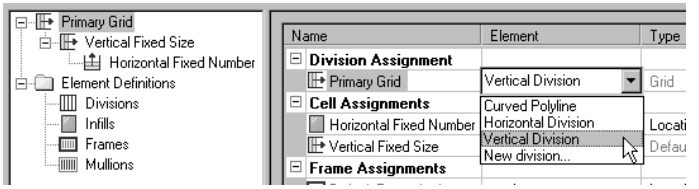
Name	Element	Type	Used In
Division Assignment			
Primary Grid	Default Division	Grid	This grid division
Cell Assignments			
Default Cell Assignment	*NONE*	Default	All unassigned cells
Doors	Standard Door	Location	Start, End
Frame Assignments			
Default Frame Assignm...	Default Frame	Location	Left, Right, Top, Bottom
Custom Corner	Profile	Location	Left, Right
Mullion Assignments			
Default Mullion Assign...	Default Mullion	Default	All unassigned mullions
Secondary Mullions	Ellipse	Index	2, 4

For more information about element definitions, see "Creating Element Definitions for a Door/Window Assembly Style" on page 1105.

Assigning a Division to a Door/Window Assembly Grid

Divisions define the grid orientation (whether the direction of the grid cells and mullions is horizontal or vertical) and the division type (number and size of cells).

After you define a division, you can assign it to the primary grid or to nested grids. Nested grids are created by selecting Nested Grid as the cell assignment. For more information, see "Working with Nested Grids in Door/Window Assemblies" on page 1142.



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid you want to assign rules to.

   The name of the grid you select is displayed in the table under the Division Assignment row.

   TIP To rename a grid, select it, click Rename, and enter a new name.

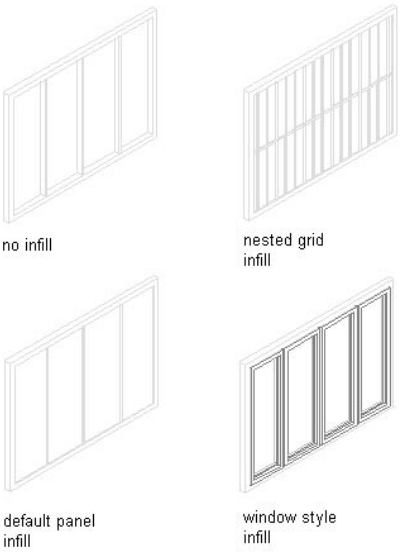
6. Click the Element column for that grid and select a division definition from the list.
7. Click OK twice.

Assigning Infills to Door/Window Assembly Cells

An infill defines the contents of a door/window assembly cell. A door/window assembly cell can be empty (none), can contain a grid (nested grid), or

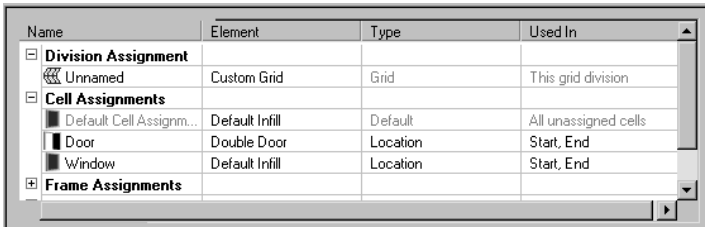
can contain one of two infills: a panel or a style. The style infill is for inserting doors, windows, and other objects into a door/window assembly.

Specifying Door/Window Assembly infill definitions



Cell Assignments

A cell assignment defines the infill definition used for cells. You can use one cell assignment to assign the same infill to all cells, or you can create multiple cell assignments to assign different infills to different cells.



Do not assign multiple definitions to the same cell. If you do, the last definition assigned to the cell is used.

Default Cell Assignment

The default cell assignment used by all unassigned cells. You can modify the default assignment to be any type of infill, but you cannot delete the default cell assignment.

You may want to modify the default cell assignment to use the infill definition that occurs most frequently in your design. Any cells not assigned to other infills then use this infill definition.

Materials and Display Properties of Infills

The layer, color, linetype, and other display properties of the default infill are applied to all infills unless you assign materials to the infills you created or you create a custom display component for each definition. Then you can control the display of each infill definition independently. For more information, see "Specifying the Display of Door/Window Assemblies" on page 1160.

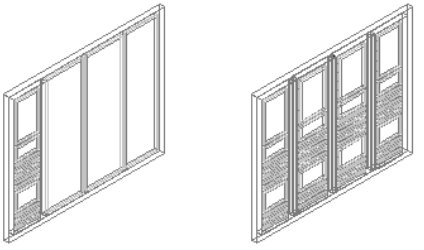
Related Procedures

- Working with Nested Grids in Door/Window Assemblies
- Creating a Nested Grid for a Door/Window Assembly
- Filling a Door/Window Assembly Cell with a Simple Panel
- Inserting an Object into a Door/Window Assembly Cell
- Removing an Infill from a Door/Window Assembly
- Specifying Which Door/Window Assembly Cells Use a Cell Assignment
- Removing an Assignment from a Door/Window Assembly Style

Working with Nested Grids in Door/Window Assemblies

Each door/window assembly grid is one dimensional with either a horizontal or vertical division. By nesting grids in the door/window assembly style, you can create a variety of patterns from simple to complex.

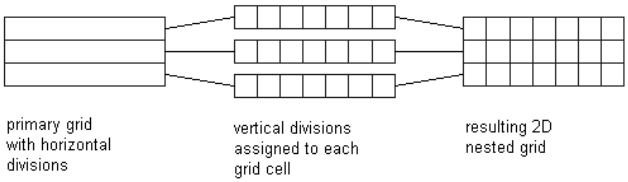
Specifying Door/Window Assembly nested grid locations



Simple Primary Grids

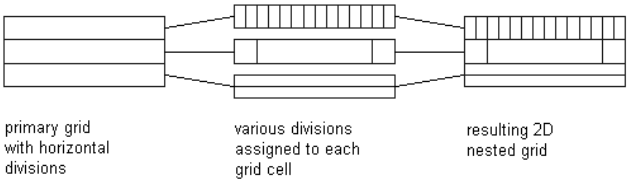
When you nest grids, you start with one primary grid. Then each cell in the primary grid can be filled with another grid. For example, the following illustration has a horizontal primary grid with four cells. You can nest a vertical grid in each horizontal cell to create a simple 2D grid.

Specifying Door/Window Assembly cell divisions 1



The previous illustration shows all cells in the grid with the same cell assignment—a vertical division. But each cell in a grid is independent and can have a separate assignment. For example, the following illustration shows one cell in the primary grid that contains another horizontal grid, the next cell contains a vertical grid with three divisions, and the next cell contains a vertical grid with six divisions.

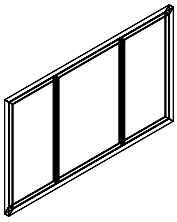
Specifying Door/Window Assembly cell divisions 2



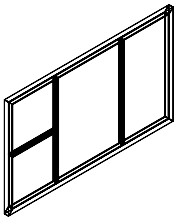
Multiple Nested Grids

You can continue to nest grids to create multiple levels. For example, the following illustrations show the Standard door/window assembly style grid, the same grid with a nested grid in one cell of the secondary grid, and the same grid again with nested grids in all cells of the secondary grid.

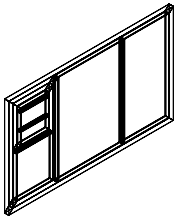
Specifying a nested grid in a door/window assembly



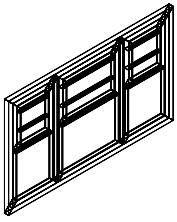
primary grid with vertical divisions



nested grid in cell 1 of secondary grid



nested grid in top of tertiary grid



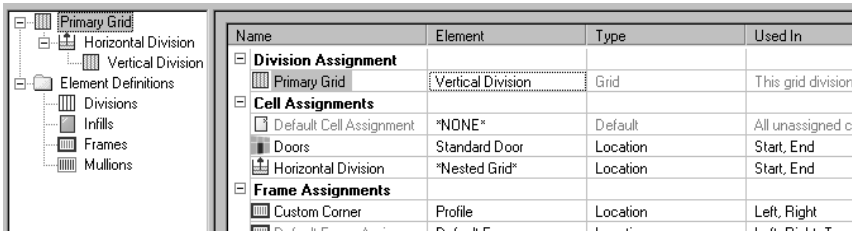
nested grids assigned to all cells

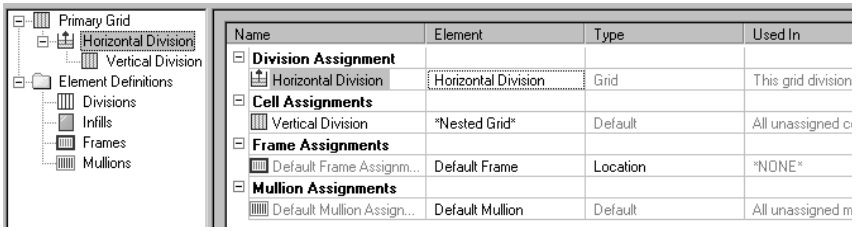
Defining Nested Grids

You can define nested grids on the Design Rules tab of the Door/Window Assembly Style Properties dialog box. The tree on the left side of the tab lists the grids. There is always one primary grid. The primary grid can have one or more secondary grids. Each secondary grid can have one or more tertiary grids and so on.

TIP To quickly create nested grids in all cells, change the default cell assignment to Nested Grid. If you want multiple levels of nesting, be sure to change the default cell assignment for each grid. For more information, see "Creating a Nested Grid for a Door/Window Assembly" on page 1145.

Each grid has its own cell assignments. You assign cells to contain another grid, a panel infill, or an object such as a door or window. For more information, see "Assigning Infills to Door/Window Assembly Cells" on page 1140.





Creating a Nested Grid for a Door/Window Assembly

Use this procedure to create a nested grid, which is a grid within a grid. Each nested grid has its own division rules, cell assignments, frame, and mullions. By default, the frame is off for nested grids.

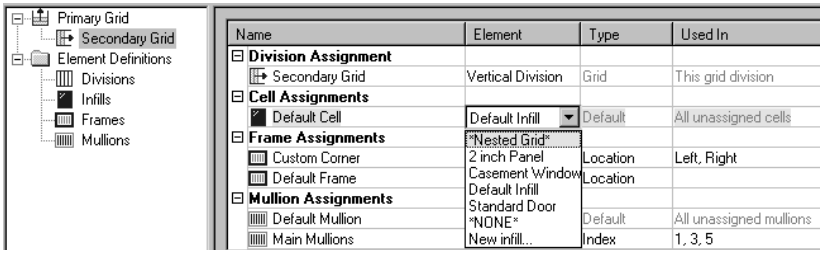
For more information, see "Working with Nested Grids in Door/Window Assemblies" on page 1142.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to create a nested grid.
6. In the left pane, select the grid in which you want to create a new cell assignment.
7. Click New Cell Assignment.

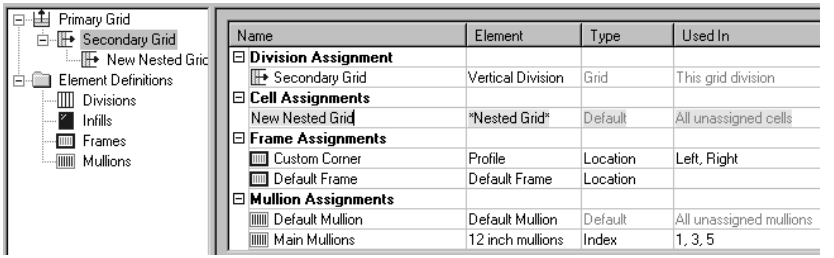
   A new cell assignment is displayed in the list of cell assignments.
8. Right-click the default name, click Rename, and enter a descriptive name for the assignment.
9. Select Nested Grid in the Element column.

   A new grid is added to the list of grids in the left pane of the dialog box. If you are editing the primary grid, the new grid is added at the secondary level. If you are editing a grid at the secondary level, the additional grid is placed at the tertiary level, and so on.

Creating a nested grid



New nested grid in tree



NOTE To rename a grid, select it in the right pane, right-click, and click Rename, and enter a new name.

10 Specify the cells to contain this nested grid.

For more information, see "Specifying Which Door/Window Assembly Cells Use a Cell Assignment" on page 1148.

11 Click OK twice.

Filling a Door/Window Assembly Cell with a Simple Panel

Use this procedure to fill a door/window assembly cell with a simple panel. Simple panels are generally used to represent basic cladding materials in the door/window assembly, such as a stone wall panel or a concrete panel.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Door/Window Assembly Styles.

3 Select a door/window assembly style, right-click, and click Edit.

4 Click the Design Rules tab.

5 In the left pane, select the grid in which you want to assign a simple panel.

6 Click New Cell Assignment.

A new cell assignment is displayed in the list of cell assignments.

7. Right-click the default name, click Rename, and enter a descriptive name for the assignment.
8. Select an infill that defines a simple panel.
9. Specify the cells to contain this simple panel.

   For more information, see "Specifying Which Door/Window Assembly Cells Use a Cell Assignment" on page 1148.
10. Click OK twice.

Inserting an Object into a Door/Window Assembly Cell

Use this procedure to insert objects, such as doors, windows, curtain wall units, and AEC Polygons, into a door/window assembly cell. Door/window assembly cells can contain these objects when you create infill definitions that use them. For more information, see "Creating an Infill for Inserting an Object into a Door/Window Assembly" on page 1120.

TIP After you insert an object in a cell, you can select that object independent of the grid, and access editing options for the object. For more information, see "Editing Objects Anchored in Door/Window Assemblies" on page 1197.

---

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to insert objects.
6. Click New Cell Assignment.

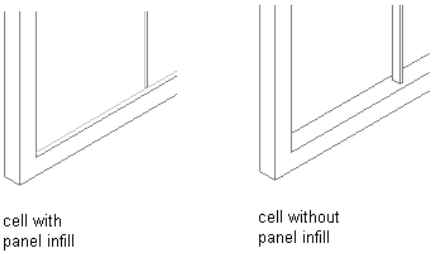
   A new cell assignment is displayed in the list of cell assignments.
7. Right-click the default name, click Rename, and then enter a descriptive name for the assignment.
8. Select an infill that uses an object style.
9. Specify the cells to contain this object.

   For more information, see "Specifying Which Door/Window Assembly Cells Use a Cell Assignment" on page 1148.
10. Click OK twice.

Removing an Infill from a Door/Window Assembly

Use this procedure to remove the infill of a cell and leave the cell empty. To do this, use None as the element definition. Using None also removes any frame edges that border the cell, but it does not affect the mullions.

Removing infill from a Door/Window Assembly cell



To remove the infill of a cell

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid that contains the cells you want to assign to None.
6. Select an existing cell assignment or create a new one.
7. Select None under the Element column.
8. Specify the cells to contain the None infill.

   For more information, see "Specifying Which Door/Window Assembly Cells Use a Cell Assignment" on page 1148.
9. Click OK twice.

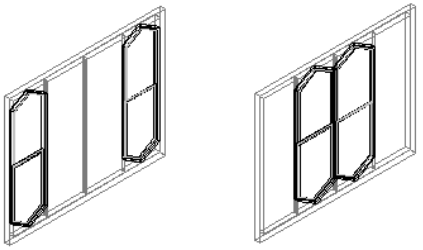
Specifying Which Door/Window Assembly Cells Use a Cell Assignment

When you create a cell assignment you need to specify the cells in the grid to use that assignment. There are two options for selecting cells:

- Use Location to insert the infill into the start, middle, or end cells of a vertical grid or into the bottom, middle, or top cells of a horizontal grid. If there is an even number of cells (four or more), Middle refers to the two

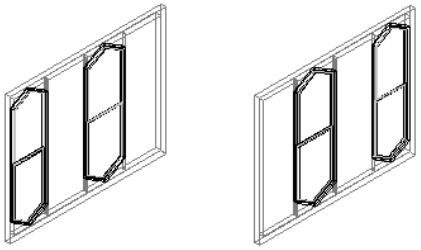
cells in the middle of the grid. If there is an odd number of cells (three or more), Middle refers to one cell in the middle of the grid.

Specifying Door/Window Assembly infill by location



- Use Index to insert the infill into specific cells based on cell numbers. Cells are numbered from start to end or bottom to top. For example, typing 1, 2, 3 would place the infill in the first, second and third cells.

Specifying Door/Window Assembly infill by index



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select a grid.

6 Select a cell assignment:

If you selected . . .	Then . . .
Location	click the Used In column, and click the button at the far right of the row. Select the cells you want to use this assignment, and click OK.
Index	enter the cell numbers separated by commas in the Used In column. For vertical grids, cells are numbered from start to end and for horizontal grids, cells are numbered from bottom to top.

NOTE Do not assign multiple definitions to a cell. If you do, the last definition assigned to the cell is used.

7 Click OK twice.

Any cells that are not assigned a specific cell assignment use the default infill.

Removing an Assignment from a Door/Window Assembly Style

Use this procedure to remove cell assignments, frame assignments, and mullion assignments from a door/window assembly style. You cannot remove default assignments, but you can modify them to suit your needs.

NOTE Each grid requires one division assignment, therefore you cannot remove the division assignment. You can change the division element used for the division assignment.

1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Door/Window Assembly Styles.
3 Select a door/window assembly style, right-click, and click Edit.
4 Click the Design Rules tab.
5 In the left pane, select the grid from which you want to remove an assignment.
6 Select a cell assignment, frame assignment, or a mullion assignment.
7 Click Remove Assignment.

8 Click OK twice.

Assigning Definitions to Door/Window Assembly Frames

The door/window assembly frame is represented by the outer edges of the primary grid. Each nested grid has its own frame that is defined separately from the primary grid frame. By default, the frames of nested grid are turned off. For more information about nested grids, see "Working with Nested Grids in Door/Window Assemblies" on page 1142.

Frame Assignments

A frame assignment defines the frame definition used by each frame edge. You can use one frame assignment to assign the same definition to all four edges of the frame, or you can create multiple frame assignments to assign different definitions to different edges of the frame. Unassigned edges are not displayed.

Default Frame Assignment

Do not assign multiple definitions to the frame edge. If you do, the last definition assigned to the edge is used.

There is a default frame assignment and you can select the frame edges it applies to. You can modify the default assignment to use any frame definition, but you cannot delete the default frame assignment.

Materials and Display Properties of Frames

The layer, color, linetype, and other display properties of the default frame are applied to all frame edges unless you assign materials to the frame definition or create a custom display component for each definition. Then you can control the display of each frame definition independently. For more information, see "Specifying the Display of Door/Window Assemblies" on page 1160.

Related Procedures

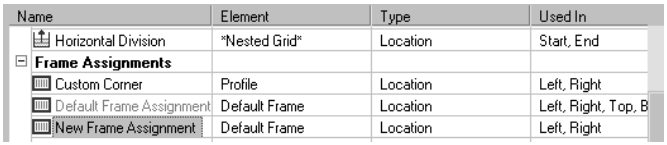
- Adding a New Frame Assignment to a Door/Window Assembly Grid
- Specifying Which Door/Window Assembly Edges Use a Frame Assignment
- Removing a Frame Edge from a Door/Window Assembly

Adding a New Frame Assignment to a Door/Window Assembly Grid

Use this procedure to add a frame assignment to a door/window assembly. To assign different definitions to different frame edges, you need multiple frame assignments.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to create a new frame assignment.
6. Click New Frame Assignment.

   A new frame assignment is displayed in the list of frame assignments.



7. Right-click the default name, click Rename, and then enter a descriptive name.
8. Under Element, select a frame definition.
9. Specify the sides of the frame to use this frame assignment.

   For more information, see "Specifying Which Door/Window Assembly Edges Use a Frame Assignment" on page 1152.
10. Click OK twice.

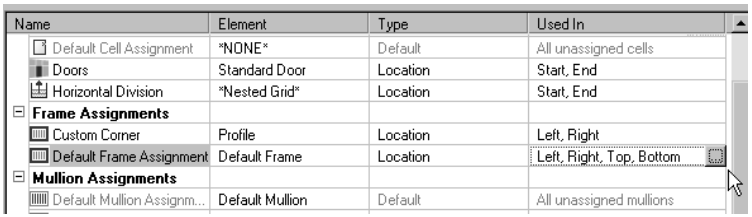
Specifying Which Door/Window Assembly Edges Use a Frame Assignment

When you create a frame assignment, you need to specify the edges of the frame to use that assignment.

Frame edges that are not assigned a frame definition are not displayed.

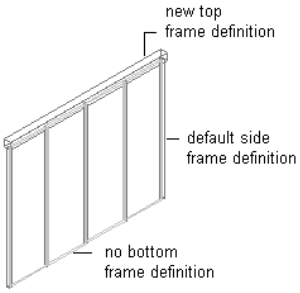
1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select a grid.
6. Select a frame assignment.

   Location is the only way to specify the frame edges.
7. Click the Used In column, and then click the [...] button at the far right of the row.



8 Select the edges that you want to use this assignment - Left, Right, Top, or Bottom - and click OK.

Specifying different Door/Window Assemblies frame definitions



NOTE Do not assign multiple definitions to the same frame edge because only the last definition assigned to the edge is used.

9 Click OK twice.

Removing a Frame Edge from a Door/Window Assembly

Use this procedure to remove a frame edge from a door/window assembly. There are three ways to remove a frame edge:

- Set the width and depth of the edge to zero.
- Leave the edge unassigned.
- Specify None as an override to the edge assignment.

The first two methods remove the frame edge and expand the adjacent infills into the space occupied by the edge.

By specifying None as an override, the frame edge is not displayed, but the adjacent infill is not expanded into the space the edge occupied.

For information about setting the width and depth to zero, see "Defining a Door/Window Assembly Frame by Width and Depth" on page 1126.

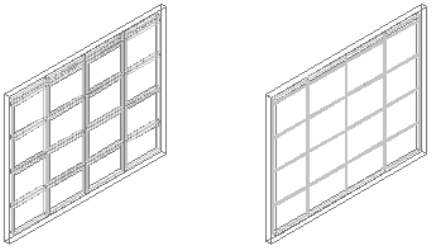
For information about leaving the edge unassigned, see "Specifying Which Door/Window Assembly Edges Use a Frame Assignment" on page 1152.

For information about overriding the edge, see "Creating a Frame or Mullion Override" on page 1174.

Assigning Definitions to the Mullions of a Door/Window Assembly

The mullions of a door/window assembly are the edges between the grid cells. The primary grid and each nested grid have mullions that are defined separately from the other grids. For more information about nested grids, see "Working with Nested Grids in Door/Window Assemblies" on page 1142.

Specifying mullions for Door/Window Assembly nested grids



nested grids without assigned mullions

nested grids with assigned mullions

Mullion Assignments

A mullion assignment defines the definition used by each mullion. You can use one assignment to define all mullions, or you can create multiple assignments and assign different definitions to different mullions in any grid.

Do not assign multiple definitions to the same mullion because only the last definition assigned to the mullion is used.

Default Mullion Assignment

There is a default mullion assignment used by all unassigned mullions. You can modify the default assignment to be any mullion definition, but you cannot delete the default mullion assignment.

Related Procedures

- Adding a New Mullion Assignment to a Door/Window Assembly Style
- Removing Mullions from a Door/Window Assembly Grid

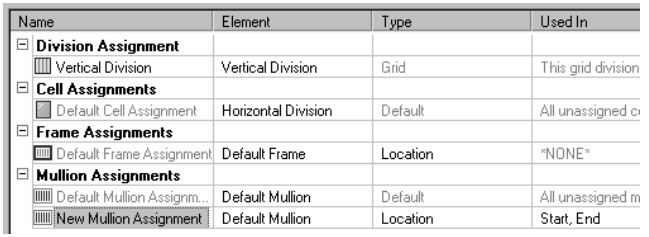
- Specifying Which Door/Window Assembly Mullions Use an Assignment
- Removing an Assignment from a Door/Window Assembly Style

Adding a New Mullion Assignment to a Door/Window Assembly Style

Use this procedure to add a new mullion assignment to a door/window assembly style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to create a new mullion assignment.
6. Click New Mullion Assignment.

   A new mullion assignment is displayed in the list of mullion assignments.



7. Right-click the default name, click Rename, and then enter a descriptive name.
8. Under Element, select a mullion definition.
9. Specify the mullions to use this assignment.

   For more information, see "Specifying Which Door/Window Assembly Mullions Use an Assignment" on page 1155.
10. Click OK twice.

Specifying Which Door/Window Assembly Mullions Use an Assignment

When you create a mullion assignment you need to specify the mullions in the grid to use that assignment. There are two options for selecting mullions:

- Use Location to assign a definition to the start, middle, or end mullions of a vertical grid or the bottom, middle, or top mullions of a horizontal grid.

If there is an even number of mullions (four or more), Middle refers to the two mullions in the middle of the grid. If there is an odd number of mullions (three or more), Middle refers to the one mullion in the middle of the grid.

- Use Index to assign a definition to specific mullions based on mullion numbers. Mullions are numbered from left to right or bottom to top. For example, typing 1, 2, 3 would assign the definition to the first, second, and third mullions.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select a grid.
6. Select an existing mullion assignment or create a new one.
7. Select a mullion assignment:

If you selected . . .	Then . . .
Location	click the Used In column, and click the button at the far right of the row. Select the mullions you want to use this assignment, and click OK.
Index	enter the mullion numbers separated by commas in the Used In column. For vertical grids, mullions are numbered from start to end and, for horizontal grids, mullions are numbered from bottom to top.

NOTE Do not assign multiple definitions to the same mullion because only the last definition assigned to the mullion is used.

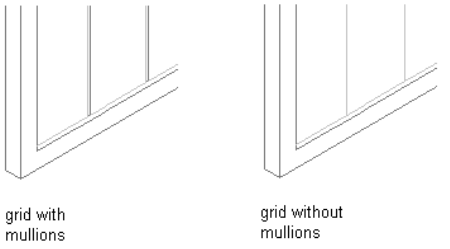
8. Click OK twice.

Any mullions that are not assigned a specific mullion assignment use the default mullion definition.

Removing Mullions from a Door/Window Assembly Grid

Use this procedure to remove a mullion from the door/window assembly. You can create a mullion definition whose edge width and depth are zero. Adjacent infills expand to fill in the space that was occupied by the mullion. This is an effective way to represent butt glazing.

Removing a mullion from Door/Window Assembly grid



1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Door/Window Assembly Styles.
3. Select a door/window assembly style, right-click, and click Edit.
4. Click the Design Rules tab.
5. In the left pane, select the grid in which you want to remove a mullion.
6. Create a new mullion assignment, and enter **0** (zero) for the width and depth.

   For more information, see "Defining Door/Window Assembly Mullions by Width and Depth" on page 1134.
7. Under Mullion Assignments, select the mullion definition you created for mullion edges of any mullion assignment where you want to remove the mullions.

   For more information, see "Specifying Which Door/Window Assembly Mullions Use an Assignment" on page 1155.
8. Click OK twice.

Specifying the Materials of a Door/Window Assembly Style

A door/window assembly consists of a number of components whose display properties can be determined by the materials assigned to each component.

When you assign materials to a door/window assembly style, you assign one material to each display component of the door/window assembly. For example, you assign a wood material to the frame and a glass material to the glass inset. You assign materials to components in each display representation where you want the materials to be used.

If you want to use the display properties of the door/window assembly style, instead of using material display properties, you can turn off the material assignments in the display properties of the door/window assembly style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in three dimensional (3D) model views and in elevations.

Related Topics and Procedure

- Door/Window Assembly Materials and Display Components
- Assigning Materials to a Door/Window Assembly Style

Door/Window Assembly Materials and Display Components

The following table identifies the material component that corresponds to each door/window assembly component in the specified views.

Door/Window Assembly Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Screened, Reflected Plan	
Default Infill	Linework
Default Frame	Linework
Default Mullion	Linework
Default Infill Hatch	Linework
Default Frame Hatch	Linework
Default Mullion Hatch	Linework
Model	
Default Infill	3D Body
Default Frame	3D Body
Default Mullion	3D Body

Assigning Materials to a Door/Window Assembly Style

Use this procedure to assign materials to the individual components of a door/window assembly style. When you assign a material to a door/window assembly component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the door/window assembly. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, the frame, mullion, and infill are physical components of a door/window assembly. The cell marker is a symbolic component.

NOTE If a material assignment does not determine the display properties of a door/window assembly component, you can change the display properties of the door/window assembly style as described in "Specifying the Display of Door/Window Assemblies" on page 1160.

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1. Open a tool palette that has a door/window assembly tool.
2. Right-click a door/window assembly tool, and click Door/Window Assembly Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Select the component you want to change, select the value for Material Definition, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

11 Click OK twice.

Specifying the Display of Door/Window Assemblies

The display of a door/window assembly depends on the direction from which you view the door/window assembly. In plan view, the door/window assembly object is displayed as parallel lines with vertices marking the grid lines, as an architect would typically draw a door/window assembly. In 3D view, the door/window assembly object is displayed as it would appear in the real world, with surfaces showing length, thickness, and height. You control what you want to display in each particular view.

Element Definitions and Custom Display Components

By default, the display of all infills, frames, and mullions is controlled by the display properties of the default infill, default frame, and default mullion. However, you can add individual element definitions as components with separate display properties. For example, if you define two infills called stone panel and glass panel, by default they are both controlled by the default infill display properties. But you can add each definition as a new display component and then control the display properties separately.

NOTE The component name in the Custom Display Component dialog box must match the name of element definition in the Design Rules tab. Otherwise, the element definition does not display properly.

For more information about the display system, see "Display System" on page 435.

Materials and Display Properties

You can use materials to control the display of both default and custom infills, frames, and mullions. When you assign materials to the element definitions you create, you do not need to define these definitions as custom display components. For more information, see "Specifying the Materials of a Door/Window Assembly Style" on page 1157.

Related Procedures

- Adding Door/Window Assembly Element Definitions as Display Components
- Specifying the Layer, Color, and Linetype of a Door/Window Assembly Style
- Specifying the Hatching for Components of a Door/Window Assembly Style
- Adding Custom Graphics as a Display Component of a Door/Window Assembly
- Creating Cut Planes for a Door/Window Assembly

Adding Door/Window Assembly Element Definitions as Display Components

Use this procedure to add door/window assembly element definitions. Before you can control the display properties of door/window assembly elements according to the definition assigned to the element, you must create display components for each element definition.

1. Select a door/window assembly, and click Edit Door/Window Assembly Style.
2. In the Door/Window Assembly Style Properties dialog box, click the Display Properties tab.
3. Click Edit Display Properties.
4. Click the Other tab, and then click Add.

NOTE If you click the Custom Plan Component tab, the Custom Display Component dialog box is similar, except that you do not specify the Z insertion point and Z offset for the custom graphic.

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5. Select Infill, Frame, or Mullion for Component Type.
6. Enter a name for Component Name, or click Select Element and select an element from the list.
7. Click OK.
8. Click the Layer/Color/Linetype tab.

   The element definition that you added is displayed in the list of components.
9. Click the Other tab to continue adding element definitions, or click OK twice.

Specifying the Layer, Color, and Linetype of a Door/Window Assembly Style

Use this procedure to change the following display properties of the components of an individual door/window assembly:

- Visibility (component is on or off)
- By Material
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1. Select the door/window assembly you want to change, right-click, and click Edit Door/Window Assembly Style.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and click Style Override.
4. Click the Layer/Color/Linetype tab.
5. Select the component to change, and select a different setting for the property.
6. Click OK twice.

Specifying the Hatching for Components of a Door/Window Assembly Style

Use this procedure to specify the hatching of the components of an individual door/window assembly. Door/window assembly hatching is displayed only in display representations, such as Plan, that are used in the Top view (Plan view) of a drawing.

1. Select the door/window assembly you want to change, right-click, and click Edit Door/Window Assembly Style.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and click Style Override.
4. Click the Hatching tab.
5. Select a component, and click the setting for Pattern.

6 Select the hatching for the component:

If you want to select . . .	Then . . .
a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
single hatching	select User-defined for Type, and clear Double Hatch.
double hatching	select User-defined for Type, and select Double Hatch.
solid fill	select Solid Fill for Type.

7 Click OK.

8 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

9 Click Angle, and enter the angle for the selected pattern.

10 Click Orientation, and specify how the hatching is oriented:

If you want to orient the hatching . . .	Then . . .
to the object, regardless of the object rotation	select Object.
to the World Coordinate System	select Global.

11 Click OK twice.

Adding Custom Graphics as a Display Component of a Door/Window Assembly

There may be instances where an infill, frame, or mullion requires a custom 2D or 3D graphic. For example, you might need a highly detailed three-dimensional truss as the mullions or a decorative light fixture applied to an infill. In cases like these, you can create a custom block, add a display component with the block attached, and associate that component with an element definition. When you assign that definition to an element, the block is also displayed.

1. Draw your custom component, and save it as a block.
2. Select a door/window assembly, right-click, and click Edit Door/Window Assembly Style.
3. Click the Display Properties tab.
4. Click .
5. Click the Custom Plan Components tab.

   If Model, Sill Plan, or Sill Plan Screened is the current display representation, the tab is called Other.
6. Click Add.
7. Select Infill, Frame, or Mullion as the element type.
8. Select the specific element from the list.
9. Select Draw Custom Graphics.
10. Specify the display of the element:

If you want to . . .	Then . . .
display the block instead of the associated door/window assembly element	select Replace Graphics.
superimpose the block over the door/window assembly element so that both are displayed	clear Replace Graphics.

11. Click Select Block and select the custom block that you created.
12. Click OK.
13. Specify further settings for the custom display block:

If you want to . . .	Then . . .
scale the block to fit a particular dimension	select Width, Height, or Depth. To prevent the block from losing its proportions, select Lock XY Ratio.
mirror the block	determine if it should mirror in the X, Y, or Z direction.
specify how the block is inserted into the grid in the X, Y, and Z directions	specify an insertion point on the X, Y, and Z planes.

If you want to . . .	Then . . .
offset the block from the grid	specify the offset in the X, Y, or Z direction.

14 Click OK three times.

Creating Cut Planes for a Door/Window Assembly

Use this procedure to specify the properties of one or more cut planes for a door/window assembly style. Cut plane display properties apply only to display representations, such as Plan, that are used in Top view (Plan view) of a drawing.

To better visualize the elements of a door/window assembly in plan view, you can create cut planes. The main cut plane is where the shrinkwrap and hatching are applied. The plan display shows the components of the door/window assembly as they are displayed at the height of each cut plane.

1 Select a door/window assembly, right-click, and click Edit Door/Window Assembly Style.

2 Click the Display Properties tab.

3 Select Plan, and click .

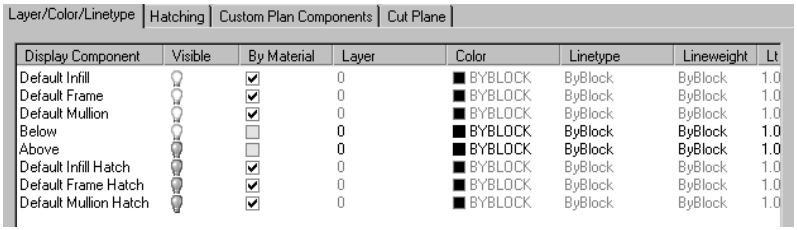
NOTE The Cut Plane tab is displayed only in some display representations, such as Plan.

4 Click the Cut Plane tab to set the cut plane to be displayed in each display representation for the door/window assembly style.

5 Enter a value for Cut Plane Height to specify the cut plane at which hatching takes effect.

6 To specifically define a cut plane, click Add, and enter the height of the new cut plane:

If you add a cut plane . . .	Then . . .
at a height that is lower than the value for Cut Plane Height	objects are displayed using the properties specified for the Below Cut Plane component on the Layer/Color/Linetype tab.
at a height that is higher than the value for Cut Plane Height	objects are displayed using the properties specified for the Above Cut Plane component on the Layer/Color/Linetype tab.



7 Click OK twice.

Attaching Notes and Files to a Door/Window Assembly Style

Use this procedure to enter notes and attach reference files to a door/window assembly. You can also edit notes and edit or detach reference files from a door/window assembly.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Door/Window Assembly Styles.

3 Select a door/window assembly style, right-click, and click Edit.

4 Click the General tab.

5 To add a description to the door/window assembly, enter it for Description.

6 Click Notes.

7 To add a note, click the Text Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK twice.

Using Overrides in Door/Window Assemblies

Door/window assemblies are geometrically complex objects that often have a large number of different elements, such as frames, panels, and window infills. The settings for these elements are defined in the door/window assembly style and can be modified using Style Manager. However, there are cases when modifying a door/window assembly directly on screen is more suitable:

- You want to add custom frame or mullion edges to a door/window assembly and need direct visual feedback.
- You want to create an override, like a merged infill or an irregular panel shape in only one specific place in the door/window assembly.
- You want to experiment with different visuals without having to change the door/window assembly style for each idea immediately.

When you have finished your onscreen edits, you can decide if you want to

- apply the overrides to the door/window assembly you have edited.
- save the overrides to the current door/window assembly style.
- create a new style for the overrides.

NOTE You cannot modify a definition using the Override method. For information about modifying definitions, see "Modifying Element Definitions for Door/Window Assembly Styles" on page 1185.

Overrides do not affect the door/window assembly design rules. However, you can transfer overrides to a door/window assembly style when you want all door/window assemblies of that style to have the same overrides.

You can view a list of overrides that are currently assigned to a door/window assembly from the Overrides tab of the Door/Window Assembly Properties dialog box. For more information, see "Creating a Division Override" on page 1180.

NOTE Overrides are also listed on the Overrides tab in the Door/Window Assembly Style Properties dialog box.

Related Topics

- Overriding Door/Window Assembly Infills
- Overriding Door/Window Assembly Frames and Mullions
- Creating a Division Override

Overriding Door/Window Assembly Infills

The cell infills of a door/window assembly are set in the door/window assembly style. You can, however, create overrides for these infills in cells. For example, you might want a row of glider windows for a first floor facade. In one specific position, however, you want a frosted glass window. In this case, you would set the row of glider windows in the door/window assembly style, and then override the infill style in one specific cell with a frosted glass window.

Door/window assembly infills can consist of simple panels, objects like windows or doors, or nested grids. You can change one infill for another, merge cells, or remove the frame from an infill altogether. This would be useful if you add a door into a grid cell and want to remove the bottom frame from that cell.

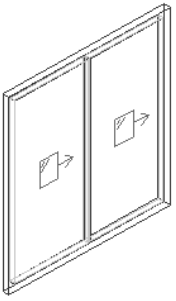
Related Procedures

- Turning on Cell Markers
- Merging Door/Window Assembly Cells
- Creating a Door/Window Assembly Infill Override
- Creating a Division Override

Turning on Cell Markers

Use this procedure to turn on the cell markers for each grid cell in a door/window assembly. The cell markers must be on in order to select individual cells and make changes to them.

Viewing Door/Window Assembly cell markers



1. Select the door/window assembly for which you want to create an infill override.
2. Right-click, and click Infill ➤ Show Markers.

Merging Door/Window Assembly Cells

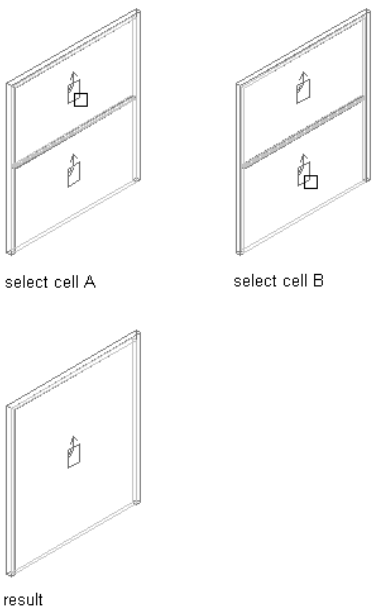
Use this procedure to merge two door/window assembly cells.

NOTE To merge door/window assembly cells, the cell markers need to be visible. For information on turning on cell markers, see "Turning on Cell Markers" on page 1168.

You can only merge cells that are adjacent to each other.

In most cases, you merge cells with the same infill type. The merged cell is then of the same type as the original cells. For example, if you merge two solid panel infills, the resulting merged cell also has a solid panel infill. In some cases however, you might want to merge two cells that have different infill types. In that case, the infill type of the first selected cell is used for the merged cell. For example, if you want to merge a cell with a simple panel infill and a cell with a window infill, and you select the cell with the simple panel first during the merge command, the merged cell contains a simple panel infill, not a window. If you select the two cells in the opposite order, the merged cell contains a window and no simple panel infill.

Merging two Door/Window Assembly cells



1 Select the door/window assembly on which you want to merge two cells.

2. Right-click, and click Infill ➤ Merge.
3. Select the first cell to be merged.
4. Select the second cell to be merged.

   The cells are merged into one.
5. Specify where you want to save the door/window assembly override:

If you want to save the override . . .	Then . . .
only on this specific door/window assembly	no further steps are necessary. The override is saved to the door/window assembly. For information about how to remove an override from a door/window assembly, see "Creating a Division Override" on page 1180.
save the override to a door/window assembly style	select the door/window assembly, right-click, and select Design Rules ➤ Transfer to Object.

6. If you chose to save the override to a door/window assembly style, select the door/window assembly again, right-click, and click Design Rules ➤ Save to Style. Then choose the door/window assembly style in which to save the override.

If you want to . . .	Then . . .
save the override to the current door/window assembly style	select Transfer Merge Operations to Style, and click OK. **NOTE** If you have created only a cell merge, only the Transfer Merge Operations to Style checkbox is active. If you have also created other overrides, such as a new cell assignment or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

If you want to . . .	Then . . .
save the override to a new door/window assembly style	select Transfer Merge Operations to Style, and click New. Then, enter a name for the new door/window assembly style, and click OK. **NOTE** If you have created only a cell merge, only the Transfer Merge Operations to Style checkbox is active. If you have also created other overrides, such as a new cell assignment or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

NOTE If you do not want to save the override back to a style at all, right-click, and click Design Rules ➤ Revert to Style Design Rules. The overrides still remain on the door/window assembly, where they can be removed as described in "Creating a Division Override" on page 1180, but they are not saved back to a door/window assembly style.

Creating a Door/Window Assembly Infill Override

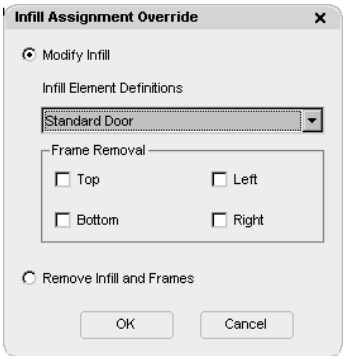
Use this procedure to override the infill of a door/window assembly cell.

For example, you might have a row of simple concrete panels in your door/window assembly, but want in one location a round window instead of the concrete panel. In that case, it might be simpler to use an infill override, instead of creating complex door/window assembly definitions.

NOTE To override an infill assignment, the cell markers must be visible. For information on turning on cell markers, see "Turning on Cell Markers" on page 1168.

To exchange an infill definition, the new infill definition must already be defined in the curtain wall style. For information on creating infill definitions, see "Defining Infills for Door/Window Assembly Cells" on page 1117.

1. Select the door/window assembly on which you want to override an infill.
2. Right-click, and click Infill ➤ Override Assignment.
3. Select the marker of the cell(s) where you want to create an override, and press ENTER.



4 Create the override:

If you want to . . .	Then . . .
exchange the existing infill for another	select a new infill definition from the list.
remove one or more of the frames around the infill	select the frame component to be removed. You could, for example, override a cell to contain a door infill instead of a panel infill; in this case, you would want to remove the bottom frame of the cell.
remove the complete infill and its frame	select Remove Infill and Frames. **NOTE** This works only for infills that border the exterior of the door/window assembly.

5 Click OK.

6 Specify where you want to save the door/window assembly override:

If you want to . . .	Then . . .
save the override only on this specific door/window assembly	no further steps are necessary. The override is saved to the door/window assembly. For information about how to remove an override from a door/window assembly, see "Creating a Division Override" on page 1180.
save the override to a door/window assembly style	select the door/window assembly, right-click, and select Design Rules ➤ Transfer to Object.

7 If you have chosen to save the override to a door/window assembly style, select the door/window assembly again, right-click, and click Design

Rules ➤ Save to Style and decide to which door/window assembly style you want to save the override.

If you want to . . .	Then . . .
save the override to the current door/window assembly style	select Transfer Cell Overrides to Style, and click OK. **NOTE** If you have created only an infill override, only the Transfer Cell Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.
save the override to a new door/window assembly style	select Transfer Cell Overrides to Style, and click New. Then, enter a name for the new door/window assembly style, and click OK. **NOTE** If you have created only an infill override, only the Transfer Cell Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a frame or mullion edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

NOTE If you do not want to save the override back to a style at all, right-click, and click Design Rules ➤ Revert to Style Design Rules. The overrides remain on the door/window assembly, where they can be removed as described in "Creating a Division Override" on page 1180, but they are not saved back to a door/window assembly style.

Overriding Door/Window Assembly Frames and Mullions

You can change a selected frame edge or mullion edge by using an edge assignment override.

NOTE To exchange a frame edge or mullion edge, the new edge definition must already be defined in the door/window assembly style.

Removing the edge does not affect the width of the cell. To remove the edge and have the adjacent cell resize, create an edge definition with a width and depth of zero. For more information, see "Defining a Door/Window Assem-

bly Frame by Width and Depth" on page 1126 or "Defining Door/Window Assembly Mullions by Width and Depth" on page 1134.

You can also create a new edge profile by drawing a polyline or using an existing profile in the drawing. This edge profile can be interactively edited onscreen by in-place editing.

Related Topics

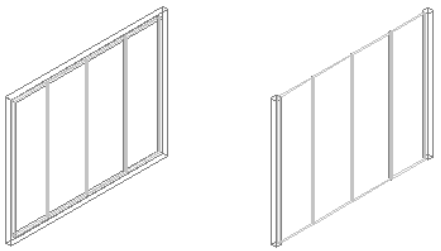
- Creating a Frame or Mullion Override
- Creating a Frame or Mullion Edge from a Polyline or Profile using In-Place Editing
- In-Place Editing of Edge Profiles

Creating a Frame or Mullion Override

Use this procedure to select a different element definition for a selected frame edge or mullion by using an edge assignment override.

To exchange a frame or mullion, the new definition must already be defined in the door/window assembly style. For information on creating frames and mullions, see "Defining Door/Window Assembly Frames" on page 1125 and "Defining Door/Window Assembly Mullions" on page 1132.

Overriding a Door/Window Assembly frame definition



1. Select the door/window assembly on which you want to override an edge.
2. Right-click, and click Frame/Mullion ➤ Override Assignment.
3. Select the frame or mullion edge you want to override.

4 Create the override:

If you want to . . .	Then . . .
exchange the existing edge for another	select a new edge definition from the list.
remove the frame or mullion edge	select Remove.

5 Click OK.

6 Specify where you want to save the door/window assembly override:

If you want to . . .	Then . . .
save the override only on this specific door/window assembly	no further steps are necessary. The override is saved to the door/window assembly. For information about how to remove an override from a door/window assembly, see "Creating a Division Override" on page 1180.
save the override to a door/window assembly style	select the door/window assembly, right-click, and select Design Rules ➤ Transfer to Object.

7 If you have chosen to save the override to a door/window assembly style, select the door/window assembly again, right-click, and click Design Rules ➤ Save to Style and decide to which door/window assembly style you want to save the override.

If you want to . . .	Then . . .
save the override to the current door/window assembly style	select Transfer Edge Overrides to Style, and click OK. **NOTE** If you have created only a frame or mullion edge override, only the Transfer Edge Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a division override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

If you want to . . .	Then . . .
save the override to a new door/window assembly style	select Transfer Edge Overrides to Style, and click New. Then, enter a name for the new door/window assembly style, and click OK. **NOTE** If you have created only a frame or mullion edge override, only the Transfer Edge Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a division override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

NOTE If you do not want to save the override back to a style at all, right-click, and click Design Rules ➤ Revert to Style Design Rules. The overrides remain on the door/window assembly, where they can be removed as described in "Creating a Division Override" on page 1180, but they are not saved back to a door/window assembly style.

Creating a Frame or Mullion Edge from a Polyline or Profile using In-Place Editing

Use this procedure to assign a profile to a vertical edge of a frame or mullion. The profile can be any profile or any closed polyline that you specify. You can use a profile edge to create a unique corner in situations where a simple miter is not sufficient.

NOTE Adjacent infills are not trimmed or expanded to accommodate the new edge. To adjust the infill, change the width of the frame edge. For more information, see "Defining a Door/Window Assembly Frame by Width and Depth" on page 1126.

1. Draw a closed polyline in the location where you want it to display in the door/window assembly.

   NOTE For best results, it is recommended to draw the polyline in Plan view.

2. Select the door/window assembly for which you want to create a frame or mullion edge profile override.
3. Right-click, and click Frame/Mullion ➤ Add Profile.

4 Specify the mode in which to edit the door/window assembly:

If you want to edit . . .	Then . . .
this instance of the door/window assembly	right-click, and click Design Rules ➤ Transfer to Object.
the door/window assembly style	right-click, and click Design Rules ➤ Revert to Style Design Rules. If this option is not available, the design rules are already style-based for the door/window assembly.

5 Right-click, and click Frame/Mullion ➤ Add Profile.

6 Select a vertical frame or a mullion edge.

7 Select a profile for the override:

If you want to create the edge profile from . . .	Then . . .
the polyline drawn in step 1	select Start from scratch for Profile Definition, and enter a name for New Profile Name.
an existing profile in the drawing	select the existing profile for Profile Definition.

8 Select whether to apply the profile to the shared edge element definition or as an edge profile override.

9 Click OK.

You are now in in-place edit mode, and can edit the profile.

10 On the In-Place Edit toolbar, click to zoom to the profile.

11 Select the profile and edit it using Edge and Vertex grips, or by using the right-click shortcut menu.

12 Save or discard changes to the door/window assembly grid:

If you want to exit the in-place editing session . . .	Then . . .
without saving your changes	click on the In-Place Edit toolbar.
after saving your changes	click on the In-Place Edit toolbar.

In-Place Editing of Edge Profiles

Use this procedure to edit profile edges using in-place editing.

With in-place editing, you can edit the profile directly and interactively on screen, and later save the changes to the profile definition.

1 Select the door/window assembly that has the edge profile you want to edit onscreen with in-place editing.

2 Right-click, and click Frame/Mullion ➤ Edit Profile in Place.

This command is only available if you have profile-based edges in the door/window assembly.

NOTE If the profile is not drawn to size, it must be converted in order for you to begin the in-place editing session. Click Yes if prompted to convert the profile to its actual size.

3 Select the edge you want to edit.

NOTE You have entered the in-place editing session now. You can see this from the magenta-colored grips and light blue hatch of the temporary in-place editing profile, as well as the faded color of all other objects in the drawing. Note that while you are in the in-place editing session, you have only limited editing access to other commands in the drawing. Before working on other objects, you should first end the in-place editing session.

4 Edit the profile:

If you want to . . .	Then . . .
use grips to edit the profile	move the grips as needed.
add a vertex to the profile	select the profile, right-click, and click Add Vertex. Then, add new vertices as needed. Press ENTER.
remove a vertex from the profile	select the profile, right-click, and click Remove Vertex. Then, remove vertices as needed. Press ENTER.
add a ring to the profile	select the profile, right-click, and click Add Ring. Then, select a closed polyline, spline, ellipse, or circle for an additional ring. Specify if you want to erase the source linework, and press ENTER.
remove a ring from a profile	select the profile, right-click, and click Remove Ring. Then select the ring you want to remove. **NOTE** You cannot remove the last ring from a profile.
replace a ring on a profile	select the profile, right-click, and click Replace Ring. Then, select a closed polyline, spline, ellipse, or circle for the replaced ring. Specify if you want to erase the source linework, and press ENTER.

5 Save the changes to the profile:

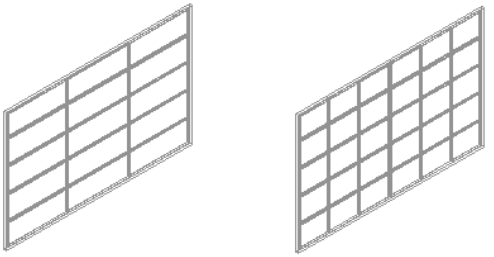
If you want to . . .	Then . . .
change the existing profile definition to reflect the new shape	select the profile, right-click, and click Save. The in-place edit session is exited and the profile definition is updated.
create a new profile definition with the shape you have created	select the profile, right-click, and click Save As New Profile. Then, enter a name for the new profile and click OK. The in-place edit session is exited and the new profile definition is available in the Style Manager.
discard all changes on the profile and revert back to the previous shape	select the profile, right-click, and click Discard all Changes. The in-place edit session is exited and all changes you have made to the profile are purged.

Overriding Door/Window Assembly Divisions

The grid of a door/window assembly is made up of one or more divisions that define how the door/window assembly is partitioned. Divisions can be horizontal or vertical, and can be nested in each other. For detailed information on door/window assembly divisions, see "Defining Divisions for Door/Window Assembly Grids" on page 1108.

You can override a division in a door/window assembly, thereby changing the grid of the door/window assembly.

Overriding a Door/Window Assembly cell division definition



five cell horizontal grid and three cell vertical grid before override

five cell horizontal grid and six cell vertical grid after override

Related Topics

- Creating a Division Override
- In-Place Editing of Door/Window Assembly Divisions

Creating a Division Override

Use this procedure to create a division override on a door/window assembly.

NOTE To exchange a door/window assembly division, the new division definition must already be defined in the door/window assembly style. For information on door/window assembly divisions, see "Defining Divisions for Door/Window Assembly Grids" on page 1108.

---

1. Select the door/window assembly for which you want to create a division override.
2. Right-click, and click Division ➤ Override Assignment.
3. Select an edge of the door/window assembly to determine if a horizontal or vertical division is overridden.

For example, if you want to override the primary horizontal division, you could select the bottom horizontal frame of the door/window assembly.

TIP The Division Assignment Override dialog box shows you which grid type and which grid division you have selected, e.g. Selected Nested Grid: Secondary Grid, Division Element Definition: Vertical 3 Cells. If you have accidentally selected the wrong division, click Cancel and reselect the correct grid.

4 Select the division to override, and click OK.

5 Specify where you want to save the door/window assembly override:

If you want to save the override . . .	Then . . .
only on this specific door/window assembly	no further steps are necessary. The override is saved to the door/window assembly. For information about how to remove an override from a door/window assembly, see "Removing Door/Window Assembly Overrides" on page 1185.
to a door/window assembly style	select the door/window assembly, right-click, and select Design Rules ➤ Transfer to Object.

6 If you have chosen to save the override to a door/window assembly style, select the door/window assembly again, right-click, and click Design Rules ➤ Save to Style and decide to which door/window assembly style you want to save the override.

If you want to . . .	Then . . .
save the override to the current door/window assembly style	select Transfer Division Overrides to Style, and click OK. **NOTE** If you have created only a profile edge override, only the Transfer Division Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

If you want to . . .	Then . . .
save the override to a new door/window assembly style	select Transfer Division Overrides to Style, and click New. Then, enter a name for the new door/window assembly style, and click OK. **NOTE** If you have created only a profile edge override, only the Transfer Division Overrides to Style checkbox is active. If you have also created other overrides, such as a cell merge or a edge override, these checkboxes are available as well. If you also want to save these overrides to the style, select their checkboxes too.

NOTE If you do not want to save the override back to a style at all, right-click, and click Design Rules ➤ Revert to Style Design Rules. The overrides remain on the door/window assembly, where they can be removed as described in "Removing Door/Window Assembly Overrides" on page 1185, but they are not saved back to a door/window assembly style.

In-Place Editing of Door/Window Assembly Divisions

Use this procedure to edit divisions using in-place editing.

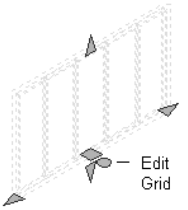
With in-place editing, you can edit the door/window assembly directly and interactively on screen, and later save the changes to the door/window assembly or door/window assembly style.

1. Select a door/window assembly on which you want to edit divisions onscreen with in-place editing.
2. Specify the mode in which to edit the door/window assembly:

If you want to . . .	Then . . .
edit this instance of the door/window assembly	right-click, and click Design Rules ➤ Transfer to Object.
edit the door/window assembly style	right-click, and click Design Rules ➤ Revert to Style Design Rules. If this option is not available, the design rules are already style-based for the door/window assembly.

3. Click the Edit Grid grip.

Viewing the Edit Grid grip

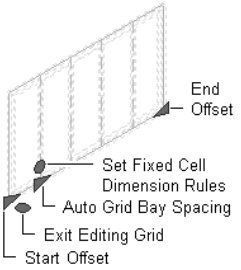


4 Select an edge on the division you want to edit.

For example, if you want to edit the primary grid, select an edge on the outer door/window assembly frame.

NOTE You have entered the in-place editing session now. You can see this from the faded color of all objects in the drawing, as well as from the different grips at your disposal. Note that while you are in the in-place editing session, you have only limited editing access to other commands in the drawing. Before working on other objects, you should first end the in-place editing session.

Viewing Edit In Place grips



5 Edit the division:

If you want to . . .	Then . . .
add a bay to the grid	click the Add Bay grip.
remove a bay from the grid	click the Remove Bay grip.
change the start offset of the grid	select the Start Offset grip and move it to the appropriate position.

If you want to . . .	Then . . .
change the end offset of the grid	select the End Offset grip and move it to the appropriate position.
change the spacing of bays	click the Auto Grid Bay Spacing grip and move it to the appropriate position.
manually edit the grid	right-click, and click Convert To Manual. You can manually add and remove gridlines, change the offsets, and change the position of individual gridlines.
use a worksheet to edit the cell dimensions	click the Set Fixed Cell Dimension Rules command grip, and edit the values in the worksheet.

6 Save or discard changes to the door/window assembly grid:

If you want to . . .	Then . . .
exit the in-place editing session without saving your changes	click on the In-Place Edit toolbar.
exit the in-place editing session after saving your changes	click on the In-Place Edit toolbar. If you edited the grid by instance, the changes are saved to the design rules for the individual grid. If you edited the door/window assembly style, the Save Changes dialog box is displayed.

7 In the Save Changes dialog box, specify to which division to save the changes:

If you want to . . .	Then . . .
save the changes to the style in the current door/window assembly division	verify the current division is selected for Save Changes to Existing Division, and click Save. The changes are made in the style and affect all door/window assemblies of that style in the drawing.

If you want to . . .	Then . . .
create an override to the style by saving the changes in a new door/window assembly division	click New, enter a name for the new division override, and click OK. Click Save. The changes are saved as an override to the style, and affect only the door/window assemblies to which the override is applied.

Removing Door/Window Assembly Overrides

Use this procedure to remove door/window assembly overrides either from the door/window assembly or the door/window assembly style.

1 Select the door/window assembly:

If you want to . . .	Then . . .
remove an override from a door/window assembly	select the door/window assembly, expand Advanced in the Properties palette, and click Overrides.
remove an override from the door/window assembly style	select the door/window assembly, right-click, and click Edit Door/Window Assembly Style. Then click the Overrides tab.

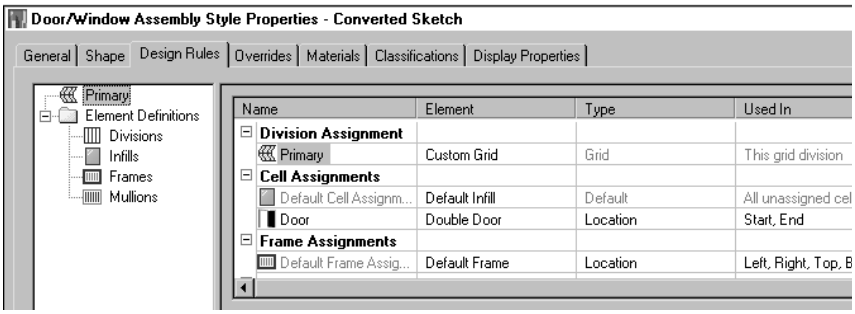
2 Select an override from the list and click Remove.

3 Click OK.

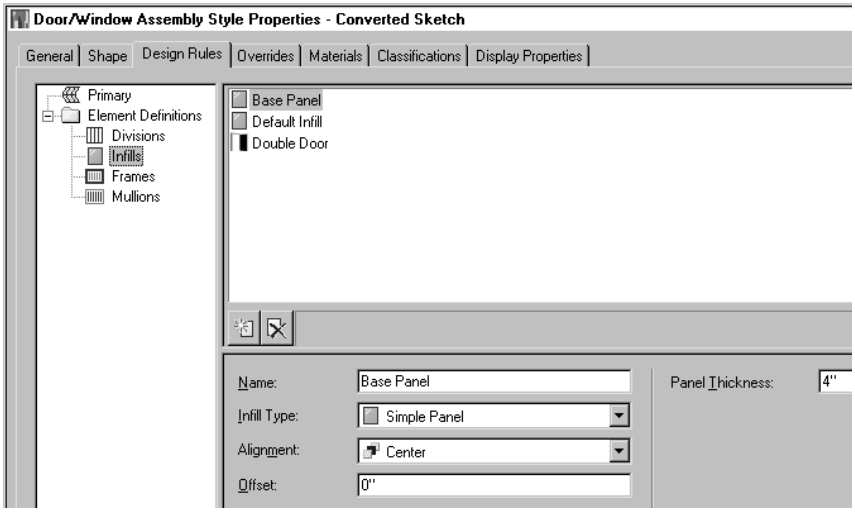
Modifying Element Definitions for Door/Window Assembly Styles

You can modify element definitions using the Design Rules tab of the Door/Window Assembly Style Properties dialog box. You can access these definitions from the assignments list and from the definitions list:

- **From the assignments list:** Select a grid from the tree view to display the assignments list. Then select an assignment that uses that definition. Make your changes below the assignment list.



- **From the definitions list:** Select an element type from the tree view to display all definitions for that element type. Select a definition and make your changes below the definitions list.



Any changes you make, including changes to the definition name, overwrite the existing definition. To create a new definition from the assignments list, select New from the Element list. To create a new definition from the definitions list, click the New Division icon, the New Infill icon, the New Frame icon, or the New Mullion icon.

Editing Door/Window Assemblies

Most relevant settings for a door/window assembly are defined in the door/window assembly style. These settings include divisions, infills, frames, and

mullions. For information on modifying a door/window assembly style, see "Door/Window Assembly Styles" on page 1102.

You can make other changes directly to individual door/window assemblies, which affect only the door/window assembly you select:

- The dimensions of a door/window assembly
- Interference conditions
- Cleanup settings

Methods of Editing Door/Window Assemblies

Autodesk Architectural Desktop offers several methods for editing door/window assemblies:

- You can directly edit door/window assemblies using grips for dimensions and other physical characteristics.
- You can change door/window assembly settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected door/window assembly.

NOTE For information about changing the elements within a door/window assembly, see "Using Overrides in Door/Window Assemblies" on page 1167. For information about changing the display of the door/window assemblies, see "Specifying the Display of Door/Window Assemblies" on page 1160.

Related Procedures

- Using Grips to Edit Door/Window Assemblies
- Changing the Width of a Door/Window Assembly
- Changing the Height of a Door/Window Assembly
- Changing the Location Properties of a Door/Window Assembly
- Selecting a Different Door/Window Assembly Style
- Matching the Properties of an Existing Door/Window Assembly
- Changing the Door/Window Assembly Dimensions
- Changing the Shape of a Door/Window Assembly
- Changing the Location of a Freestanding Door/Window Assembly
- Adding an Interference Condition to a Door/Window Assembly
- Removing an Interference Condition from a Door/Window Assembly
- Mitering Door/Window Assemblies
- Specifying a Miter Angle for a Door/Window Assembly Adjacent to Another Object
- Attaching Hyperlinks, Notes, or Files to a Door/Window Assembly

Using Grips to Edit Door/Window Assemblies

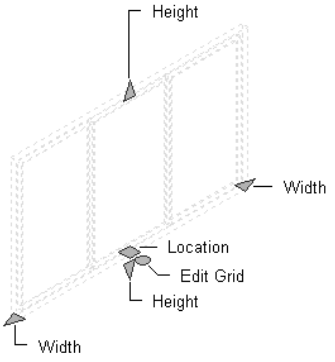
Refer to the illustrations and steps in this topic to use door/window assembly grips to edit door/window assemblies.

Editing Door/Window Assembly Dimensions

1. Select the door/window assembly.
2. Select the grip for the dimension you want to change.

   You can modify the dimensions of the base height and width for a door/window assembly.

   Viewing Door/Window Assembly Grips



3. Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Changing the Location of a Door/Window Assembly

1. Select the door/window assembly.
2. Select and hold the Location grip:

If you want to move the door/window assembly . . .	Then . . .
along the length of the wall	drag the cursor to the new location.
within the width of the wall	press CTRL, and drag the cursor to the new location.

If you want to move the door/window assembly . . .	Then . . .
vertically	press CTRL twice, and drag the cursor to the new location.

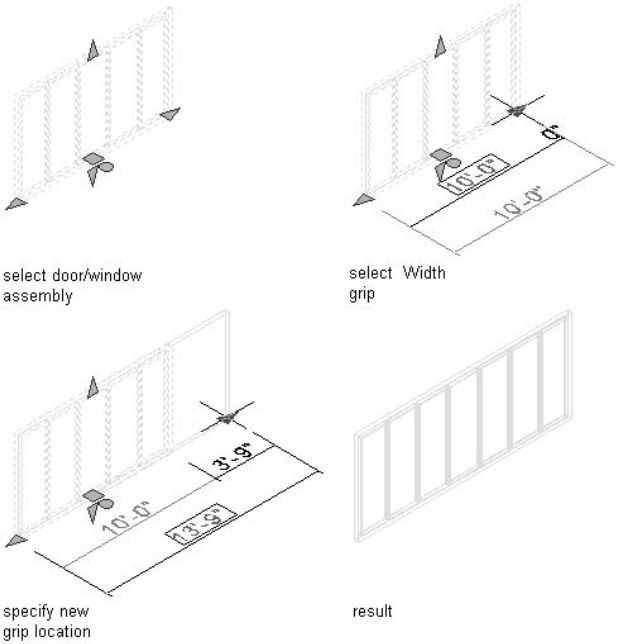
Changing the Width of a Door/Window Assembly

Use this procedure to change the width of a door/window assembly. You can also change the width on the Properties palette.

1. Select the door/window assembly.
2. Select the Width grip, move the grip until the width value you want is displayed, and click once.

NOTE As you move the grip, the original width value is displayed in addition to the new width and the difference between the two values.

Using grips the change the width of a Door/Window Assembly



After selecting the grip, you can also enter a value to be added to or subtracted from the width of the door/window assembly, depending on the direction in which you move the grip.

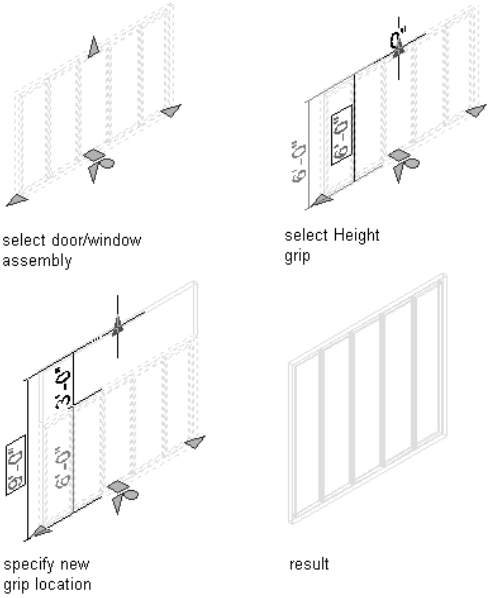
Changing the Height of a Door/Window Assembly

Use this procedure to change the height of a door/window assembly. You can also change the height on the Properties palette.

1. Select the door/window assembly.
2. Select the Height grip, move the grip until the height value you want is displayed, and click once.

NOTE As you move the grip, the original height value is displayed in addition to the new height and the difference between the two values.

Using grips to change the height of a Door/Window Assembly



After selecting the grip, you can also enter a value to be added to or subtracted from the height of the door/window assembly, depending on the direction in which you move the grip.

Changing the Location Properties of a Door/Window Assembly

Use this procedure to change the location properties of a door/window assembly. Location properties include vertical alignment, head height, sill height, and rotation.

Location Property	Description
Vertical alignment	Specifies whether to measure the vertical height of the window to the sill or head
Head height	The head height of the window
Sill height	The sill height of the window
Rotation	Reference angle for the object

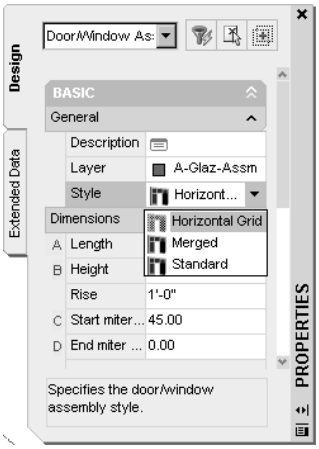
1. Double-click the door/window assembly.
2. Expand Location.
3. Change the location properties.
4. Select Additional information to display the Location worksheet, where you can change additional location properties, such as coordinate system, insertion point, and normal.

Selecting a Different Door/Window Assembly Style

Use this procedure to select a different style for a door/window assembly.

1. Double-click the door/window assembly for which you want to change the styles.

   You can select multiple door/window assemblies and change the style for all at the same time.
2. Expand General.
3. Select a different style.



Matching the Properties of an Existing Door/Window Assembly

Use this procedure to apply the properties of a door/window assembly tool to one or more existing door/window assemblies. The properties include the door/window assembly style and any other settings specified in the tool you select.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.
2. Right-click a door/window assembly tool, and click Apply Tool Properties to ➤ Door/Window Assembly.
3. Select the door/window assemblies, and press ENTER.

   The properties of the selected door/window assemblies match the properties of the door/window assembly tool.

Changing the Door/Window Assembly Dimensions

Use this procedure to change the dimensions of a door/window assembly.

1. Double-click a door/window assembly.
2. Expand Dimensions.

3 Change the dimensions:

Dimension	Description
Length	The distance from the start point to the end point of the door/window assembly baseline
Height	The distance from the baseline to the top of the door/window assembly, including any rise
Rise	The distance from the base height to the top of the door/window assembly
Start Miter	Angle of all infills and horizontal edges (frame or mullion) at the start of the door/window assembly. For more information about miter angles, see "Mitering Door/Window Assemblies" on page 1195
End Miter	Angle of all infills and horizontal edges (frame or mullion) at the end of the door/window assembly

Changing the Shape of a Door/Window Assembly

Use this procedure to change the shape of a door/window assembly. There are several predefined shapes for door/window assemblies. You can use any of these shapes or use an AEC profile as the shape. For more information about profiles, see "Creating a Profile for a Door/Window Assembly Frame".

1 Select a door/window assembly, right-click, and click Edit Door/Window Assembly Style.
2 Click the Shape tab.
3 Select a shape from the Predefined list or select Use Profile, and select an existing AEC Profile as the shape.
4 Click OK.

Changing the Location of a Freestanding Door/Window Assembly

You can relocate an existing door/window assembly by changing the coordinate values of its insertion point. The door/window assembly also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the door/window assembly are parallel to the XY plane, its normal is parallel to the Z axis. You can change the orientation of the door/window assembly by

aligning its normal with another axis. You can also rotate the door/window assembly on its plane by changing the rotation angle.

For more information about the world coordinate system, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Double-click the door/window assembly.
2. Expand Location.
3. Click Additional information.
4. Specify the location of the curtain wall:

If you want to . . .	Then . . .
relocate the door/window assembly	enter new coordinate values under Insertion Point.
locate the door/window assembly on the *XY* plane	make the normal of the door/window assembly parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the door/window assembly on the *YZ* plane	make the normal of the door/window assembly parallel to the *X* axis: under Normal, enter **1** for X, and enter **0** for Y and Z.
locate the door/window assembly on the *XZ* plane	make the normal of the door/window assembly parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the door/window assembly	enter a new value for Rotation Angle.

5. Click OK.

Adding an Interference Condition to a Door/Window Assembly

Use this procedure to add an interference condition to a door/window assembly. Interference conditions use the geometry of 3D objects to create custom openings or cutouts in door/window assemblies. You can specify how the interference condition is applied to the door/window assembly: added to the door/window assembly, subtracted from the door/window assembly, or ignored.

1. Place the object in the location where you want to specify the interference condition.

2 Select the door/window assembly to which you want to add an interference condition, right-click, and click Interference ➤ Add.

3 Select the object intersecting the door/window assembly, and press ENTER.

4 Specify to which door/window assembly component the interference should be added:

If you want to add the interference condition . . .	Then . . .
to the infill	enter **y** (Yes) when prompted for the infill component.
to the frame	enter **y** (Yes) when prompted for the frame component.
to the mullion	enter **y** (Yes) when prompted for the mullion component.

5 Press ENTER.

Removing an Interference Condition from a Door/Window Assembly

Use this procedure to remove an object, such as a mass element, from a door/window assembly that the object was added to as an interference condition.

1 Select the door/window assembly from which you want to remove an interference object, right-click, and click Interference ➤ Remove.

2 Select the object intersecting the door/window assembly, and press ENTER.

Mitering Door/Window Assemblies

Use this procedure to miter the corners where door/window assemblies meet. The corner where adjacent door/window assemblies meet is not mitered by default. However, you can automatically determine the necessary angles.

The miter angle applies to all infills and horizontal edges (frame or mullion) that are adjacent to the corner. Vertical edges are not affected.

TIP If you want to create a custom corner condition between two door/window assemblies, you can replace the edge of one door/window assembly with an AEC profile and remove the edge of the other door/window assembly by using the frame override Remove Edge option.
For more information, see "Overriding Door/Window Assembly Frames and Mul-

lions" on page 1173 and "Defining Door/Window Assembly Frames" on page 1125.

1. Select one of the door/window assemblies, right-click, and click Set Miter Angles.
2. Select the other door/window assembly.

   If you change the angle of either door/window assembly, use Set Miter Angles again to recalculate the angles.

Specifying a Miter Angle for a Door/Window Assembly Adjacent to Another Object

Use this procedure to manually create a mitered corner between a door/window assembly and another object, such as a standard wall or a mass element. For example, if your door/window assembly connects with a standard wall that is at a 60-degree angle from the door/window assembly, you would set the miter angle to 30.

The miter angle is applied to all infills and horizontal edges that are adjacent to the corner. Vertical edges are not affected.

1. Double-click the door/window assembly.
2. Expand Dimensions.
3. Miter the door/window assembly on the start or the end point:

If you want to miter the door/window assembly . . .	Then . . .
at its start point	enter an angle for Start Miter, and press ENTER.
at its end point	enter an angle for End Miter, and press ENTER.

Attaching Hyperlinks, Notes, or Files to a Door/Window Assembly

Use this procedure to enter notes and attach reference files to a door/window assembly. You can also edit notes and edit or detach reference files from a door/window assembly.

1. Double-click the door/window assembly.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 To add a note, click the setting for Notes, and enter the text.

5 Click OK.

6 To attach a reference file, click under Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click Open.
edit the description of a reference file	select the file, and click the description. Enter the new text, and press ENTER.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

7 Click OK twice.

Editing Objects Anchored in Door/Window Assemblies

When you fill a door/window assembly cell with an infill that contains an object, such as a door or window, you can edit that object independently from the door/window assembly. For example, you can select a door from a door/window assembly and edit its properties. You can edit the anchor settings for the door to change the orientation of the door and the alignment or offset of the door in relation to the door/window assembly.

You can also move objects from one cell to another or release the object anchor so that the object moves independently of the door/window assembly.

When you move or release an object or edit its properties, you are creating a variation from the infill cell assignment for the door/window assembly style. By default, these variations (except release) are allowed to persist in the drawing when you reapply the style to a door/window assembly. However, if you

want these variations to be overridden when you reapply a door/window assembly style, turn off the Allow Variation from Infill Element Definition option on the Anchor worksheet of the object's Properties palette. This option is set on a per object basis.

Related Procedures

- Changing the Orientation of an Object Anchored in a Door/Window Assembly
- Changing the Alignment of an Object Anchored in a Door/Window Assembly
- Changing the Offset of an Object Anchored in a Door/Window Assembly
- Swapping Two Objects Anchored in a Door/Window Assembly
- Releasing an Object Anchored in a Door/Window Assembly

Changing the Orientation of an Object Anchored in a Door/Window Assembly

Use this procedure to change the orientation of an object anchored in a door/window assembly using grips.

1. Click the object in the door/window assembly for which you want to change the orientation.
2. Click the appropriate Flip grip to change the *X* or *Y* direction of the object.

   You can also change the orientation of an object, including the *Z* direction, using the Anchor worksheet found on the object's Properties palette.

Changing the Alignment of an Object Anchored in a Door/Window Assembly

Use this procedure to modify the alignment of an object that is anchored in a door/window assembly.

1. Double-click the object in the door/window assembly.
2. Expand Location, and click Anchor.
3. Click Allow Variation from Infill Element Definition.
4. Select a new alignment for the object.

   For more information, see "Specifying an Alignment for a Door/Window Assembly Infill" on page 1121.
5. Click OK.

Changing the Offset of an Object Anchored in a Door/Window Assembly

Use this procedure to change the offset of an object anchored in a door/window assembly.

1. Double-click the object in the door/window assembly.
2. Expand Location, and click Anchor.
3. Click Allow Variation from Infill Element Definition.
4. Specify a new offset for the object.

   For more information, see "Specifying an Offset for a Door/Window Assembly Infill" on page 1122.
5. Click OK.

Swapping Two Objects Anchored in a Door/Window Assembly

When you fill a door/window assembly cell with an object, such as a door or window, you can swap that object with another object in the door/window assembly.

1. Select one of the objects from the door/window assembly and click Infill Anchor ➤ Swap Objects.
2. Select the object you want to swap with.

Releasing an Object Anchored in a Door/Window Assembly

When you fill a door/window assembly cell with an object, such as a door or window, that object is anchored to the door/window assembly. While the anchor is in place, the object moves when you move the door/window assembly and is removed when you erase the door/window assembly. If you want to move or erase an object independently from the door/window assembly, you can release the anchor.

NOTE You can also move or erase the object by changing the element definition for the cell that contains the object. For more information, see "Defining Infills for Door/Window Assembly Cells" on page 1117.

- Select one of the objects from the door/window assembly and click Infill Anchor ➤ Release.

Grids

17

In this chapter

- Using Column Grid Tools to Create Column Grids
- Working with Column Grids
- Editing Column Grids
- Using Ceiling Grid Tools to Create Ceiling Grids
- Editing Ceiling Grids

Grids are AEC objects on which you can anchor other objects, such as columns, and constrain their locations.

Grids are useful in the design and documentation phases of the planning.

Types of grids

There are several types of grid, each with its own purpose. You can use *layout grids* to help lay out a building. For information on layout grids, see "Layout Curves and Grids" on page 1245. *Column grids* are layout grids to which you can specify a column to be placed at each intersection of the grid as you add it to your drawing. For information on columns, see "Creating a Freestanding Column" on page 1572 or "Creating a Column Anchored to a Grid" on page 1576. Column grids are unique also in that they have automatic labelling tools.

Ceiling grids are a specialized layout grid to represent suspended ceiling systems or cassette ceilings. They can be anchored to a space object at ceiling height.

Regardless of the type, all grids share some common features.

Layout Modes for Grids

A grid can have one of three different spacing modes for the lines which comprise it. These modes are specified separately for the *X* and *Y* planes.

- In Manual mode, you specify the position of each line on the layout grid.

- In Fixed Baysize mode, you specify equidistant spacing between lines on the layout grid. The number of lines is determined by the size of the grid. As the size of the grid changes, lines are added or subtracted accordingly. The distance between the lines remains fixed.
- In Space Lines Evenly mode, you specify the number of lines on the grid. The space between the lines is determined by the size of the layout grid. As the size of the grid changes, the spacing between the lines is lengthened or shortened accordingly. The number of lines remains fixed.

NOTE As a default, grids are inserted with evenly spaced lines.

Anchoring Objects to Grids

Grids can be used to anchor other objects. This is most visible in column grids, where special functionality allows you to anchor columns to the grid during insertion. However, after the grid is finished, you can add other objects to it, as well.

There are two anchoring mechanisms for grids:

- Anchoring objects to a grid cell (Cell Anchor)
- Anchoring objects to a grid intersection (Node Anchor)

For information on anchoring objects, see "Anchors" on page 753.

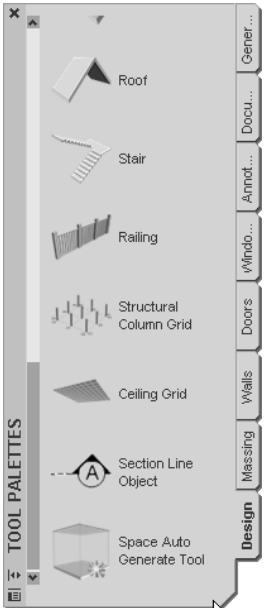
Related Procedures

- Using Column Grid Tools to Create Column Grids
- Working with Column Grids
- Dimensioning Column Grids
- Editing Column Grids
- Attaching Clipping Profiles to Column Grids
- Changing the Display of Column Grids
- Using Ceiling Grid Tools to Create Ceiling Grids
- Editing Ceiling Grids
- Changing the Dimensions of a Ceiling Grid
- Changing the Lines of a Ceiling Grid
- Attaching Clipping Profiles to Ceiling Grids
- Changing the Display of Ceiling Grids

Using Column Grid Tools to Create Column Grids

Tools provided with Autodesk® Architectural Desktop let you quickly place column grids by selecting a structural column grid tool with specific predefined properties. When you place column grids using structural column grid tools, you can use the default settings of the tool, or you can change settings for the column grid properties. You can also use structural column grid tools to convert linework to column grids and to apply the settings of a structural column grid tool to existing column grids.

Tool palettes containing structural column grid tools



The default tool palettes in the workspace contain sample structural column grid tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain structural column grid tools that you can add to your tool palettes:

- Autodesk Architectural Desktop Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- My Tool catalog

Custom palettes created by your CAD manager or other users may also contain structural column grid tools with column grid properties that are customized for your projects or office standards.

Related Procedures

- Creating a Column Grid
- Creating a Column Grid with User-Specified Settings
- Creating a Column Grid from a Layout Grid
- Creating a Column Grid from Linework
- Creating a Column Grid Dynamically
- Creating a Structural Column Grid Tool

Creating a Column Grid

Use this procedure to add a new column grid that has the properties specified in the structural column grid tool that you select. To specify settings when you add a column grid, see "Creating a Column Grid with User-Specified Settings" on page 1204

1. Open the tool palette that you want to use, and select a structural column grid tool.

   If necessary, scroll to display the tool that you want to use.

2. Specify the insertion point of the column grid.

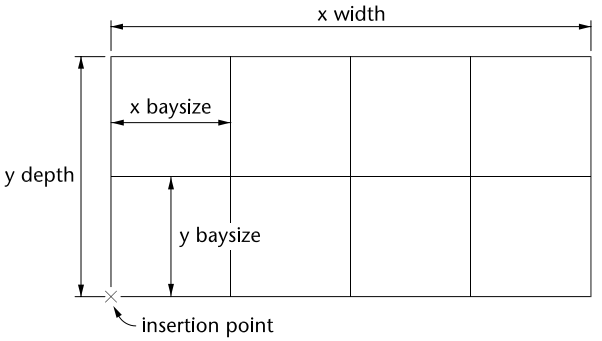
   You can move or hide the Properties palette to expose more of the drawing area.

3. Specify the rotation of the column grid.
4. Continue adding column grids, and press ENTER.

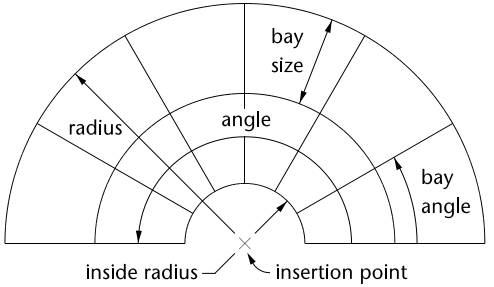
Creating a Column Grid with User-Specified Settings

Use this procedure to add a column grid with settings that you specify. Column grids can be either rectangular or radial.

Rectangular grid



Radial grid



1 Open the tool palette that you want to use, and select a structural column grid tool.

   If necessary, scroll to display the tool that you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Select a shape, either Rectangular or Radial.

4 Expand Dimensions.

5 If you have selected a rectangular grid shape, specify the settings:

If you want to . . .	Then . . .
define the width of the grid	expand Dimensions, and enter a value for X - Width.
define the depth of the grid	expand Dimensions, and enter a value for Y - Depth.

If you want to . . .	Then . . .
lay out the grid with evenly spaced bays along the X direction	expand X Axis, select Space evenly for Layout type, and enter a value for Number of bays.
lay out the grid with a fixed bay size along the X direction	expand X Axis, select Repeat for Layout type, and enter a value for Bay size.
specify the offset distance from the start point along the X direction of the grid	expand X Axis, and enter a value for Start offset. The offset distance may be used to reduce the effective grid size.
specify the offset distance from the end point along the X direction of the grid	expand X Axis, and enter a value for End offset. The offset distance may be used to reduce the effective grid size.
lay out the grid with evenly spaced bays along the Y direction	expand Y Axis, select Space evenly for Layout type, and enter a value for Number of bays.
lay out the grid with a fixed bay size along the Y direction	expand Y Axis, select Repeat for Layout type, and enter a value for Bay size.
specify the offset distance from the start point along the Y direction of the grid	expand Y Axis, and enter a value for Start offset. The offset distance may be used to reduce the effective grid size.
specify the offset distance from the end point along the Y direction of the grid	expand Y Axis, and enter a value for End offset. The offset distance may be used to reduce the effective grid size.

6 If you have selected a radial grid shape, specify the settings:

If you want to . . .	Then . . .
define the width of the grid	expand Dimensions, and enter a value for X - Width.
define the angle of the grid	expand Dimensions, and enter a value for A - Angle.
lay out the grid with evenly spaced bays along the X direction	expand X Axis, select Space evenly for Layout type, and enter a value for Number of bays.

If you want to . . .	Then . . .
lay out the grid with a fixed bay size along the X direction	expand X Axis, select Repeat for Layout type, and enter a value for Bay size.
specify the inside radius of the grid	expand X Axis, and enter a value for Inside radius.
specify the offset distance from the end point along the X direction of the grid	expand X Axis, and enter a value for End offset. The offset distance may be used to reduce the effective grid size.
lay out the grid with evenly spaced bays along the Y direction	expand Y Axis, select Space evenly for Layout type, and enter a value for Number of bays.
lay out the grid with a fixed bay angle along the Y direction	expand Y Axis, select Repeat for Layout type, and enter a value for Bay angle.
specify the offset angle from the start angle along the X direction grid curve	expand Y Axis, and enter a value for Start angle offset. The offset angle may be used to reduce the grid size.
specify the offset angle from the end angle along the X direction grid curve	expand Y Axis, and enter a value for End angle offset. The offset distance may be used to reduce the grid size.

7 To add columns to the grid intersection during insertion, expand Column, and specify a style for the structural member.

If you choose to add columns, you can specify the dimensions of the column:

- Start offset
- End offset
- Logical length
- Justify
- Justify using overall extents

8 In the drawing area, specify the insertion point of the column grid.

You can move or hide the Properties palette to expose more of the drawing area.

9 Specify the rotation angle of the grid.

10 Continue adding column grids, and press ENTER.

Creating a Column Grid from a Layout Grid

Use this procedure to convert a two-dimensional (2D) layout grid to a column grid that has the properties of the structural column grid tool you select. You can edit these properties after creating the column grid.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.
2. Right-click a structural column grid tool, and click Apply Tool Properties to ➤ Layout Grid 2D.
3. Select the layout grid to convert, and press ENTER.
4. When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.
5. Edit the properties of the column grid in the Properties palette, if needed.

Creating a Column Grid from Linework

Use this procedure to convert custom linework to a column grid that has the properties of the structural column grid tool you select. You can edit these properties after creating the column grid.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.
2. Right-click a structural column grid tool, and click Apply Tool Properties to ➤ Linework.
3. Select the linework to convert, and press ENTER.
4. When prompted to erase the original linework, press ENTER to keep the linework, or enter **y** (Yes) to erase it.
5. Edit the properties of the column grid in the Properties palette, if needed.

Creating a Column Grid Dynamically

Use this procedure to create column grids dynamically by specifying their dimensions on screen as you draw them.

1. Open the tool palette that you want to use, and select a structural column grid tool.

   If necessary, scroll to display the tool that you want to use.
2. In the Properties palette, expand Dimensions and select Yes for Specify on screen.

3 To add columns to the grid during insertion, expand Column and select the desired column style.

4 Specify the insertion point for the grid in the drawing.

5 Specify the overall size of the grid by dragging the cursor to the desired size and clicking once.

6 Drag the crosshairs inside the resulting shape vertically and horizontally to define the correct the number of bays in the column grid.

NOTE The closer the crosshairs go to the left and bottom of the grid, the more spaces are created.

7 Click once to confirm the number of vertical and horizontal bays.

8 Specify the rotation angle of the grid.

9 Press ENTER.

The column grid is inserted into the drawing according to your on-screen specifications.

Creating a Structural Column Grid Tool

Use this procedure to create a structural column grid tool and add it to a tool palette. You may want to create your own structural column grid tools if you are placing multiple column grids with specific column grid properties that you want to be the same each time you add a column grid of that type.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a column grid in the drawing	select the object, and drag it to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	open the other tool palette. Right-click the tool, and click Copy. Open the other palette, and click Paste.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 Expand Basic, and expand General.

7 Click the setting for Description, enter a description of the column grid created from this tool, and click OK.

8 Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.

9 Select a column grid shape.

10 Specify the settings for the dimensions of the grid.

For more information, see "Creating a Column Grid with User-Specified Settings" on page 1204.

11 Click OK.

Working with Column Grids

After you have created column grids in your drawing, you can work with them to customize them for your project. You can add labels, extend grid lines, and add dimensions to the grids.

Related procedures

- Labeling Column Grids
- Extending Column Grid Lines beyond the Grid Boundary or Limits
- Dimensioning Column Grids

Labeling Column Grids

You can label existing column grids in the X direction and the Y direction.

1 Select the column grid you want to label, right-click, and click Label.

2 Specify the grid location for labels:

If you want to . . .	Then . . .
add labels to the X-axis of the grid	click the X - Labeling tab.
add labels to the Y-axis of the grid	click the Y - Labeling tab.

3 Enter a starting number or letter for the label under Number in the table.

Each grid line in the X direction or the Y direction is listed in the table. If Automatically Calculate Values for Labels is selected, numbers or letters for the remaining grid lines are filled in consecutively, either in ascending or descending order, depending upon which is selected for Ordering.

NOTE To renumber a grid, enter a new value in the first location. The rest of the values are updated automatically if Automatically Calculate Values for Labels is selected.

4 If there are characters that you do *not* want to use in the sequence, select Never Use Characters, and enter the characters, separated by commas.

5 To change the label symbol, click Bubble.

6 Select a new label symbol from the MvBlockDef Select dialog box and click OK.

Any multi-view block currently defined in the drawing can be used.

7 Click Generate New Bubbles On Exit to update the bubbles.

8 Specify the location of bubbles:

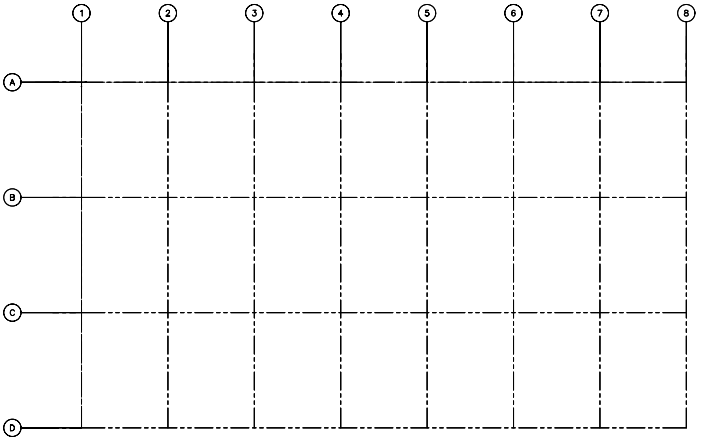
If you want to . . .	Then . . .
place bubbles in the X direction of the grid	select Top and/or Bottom.
place bubbles in the Y direction of the grid	select Left and/or Right.

9 Enter a value for Extension.

Extension is the length of the bubble lines from the grid to the bubble.

10 Click OK.

Labeling a column grid



Extending Column Grid Lines beyond the Grid Boundary or Limits

Use this procedure to label two sides of a column grid and have the lines of the other two sides extend beyond the edge of the column grid rectangle.

1. Label the sides of the column grid you need labeled.

   For more information, see "Labeling Column Grids" on page 1210.

2. Create a multi-view block definition that has no view blocks.

   For more information, see Creating a New Multi-View Block Definition.

3. Select the column grid, right-click, and click Label.
4. Click the Labeling tab for the axis you wish to extend.
5. Select the Bubble Parameter that has not been labeled (Left or Right, or Top or Bottom), but do not deselect the sides already labeled, or the bubbles will be removed from those sides.
6. Click Bubble, select the new multi-view block you created, and then click OK.
7. Clear Generate New Bubbles On Exit.
8. Click OK.

Dimensioning Column Grids

Use this procedure to dimension column grids and set the distance the dimensions are from the grid. For this, you can use the automatic AEC Dimension.

Related Procedures

- Dimensioning Column Grids with Automatic AEC Dimension

Dimensioning Column Grids with Automatic AEC Dimension

When you dimension your column grid with an automatic AEC dimension, your resulting dimension is associative. When you update the grid, the dimension is updated accordingly. Also, you can choose an AEC dimension style. For information on AEC Dimensions, see "AEC Dimensions" on page 2357.

With an AEC dimension, you cannot display angle dimensions or edit individual dimension chains.

1. Select the column grid you want to dimension.
2. Right-click, and click AEC Dimension.
3. On the Properties palette, expand Basic, and expand General.
4. Select a style.

NOTE Be sure to select an AEC dimension style that contains dimensioning points for grids. For more information on AEC dimension contents, see "Logical Dimension Points of AEC and AutoCAD Objects" on page 2363.

5. Click to specify the position of the AEC dimension.

   The dimension can, for example, be placed above or below the column grid.

   - Drag the mouse to set the direction of the dimension. The extension lines are drawn in the opposite direction.
   - If you want to align the dimension, enter **a**on the command line, and select the geometry to align to.
   - If you want a user-defined angle for the dimension, enter **r** and enter the rotation angle on the command line.

NOTE The angle you specify here is calculated in relation to the UCS, not to the dimensioned grid.

Editing Column Grids

You can change column grids by modifying the overall dimensions of the grid, the number and position of grid lines, as well as the location of the grid within the drawing. You can also set a clipping boundary for the grid and use that to mask the grid or insert a hole into the grid.

NOTE You cannot change the shape of an existing column grid. You cannot change a radial grid to a rectangular grid, or vice versa.

Related Procedures

- Changing the Dimensions of a Column Grid
- Changing the Lines of a Column Grid
- Attaching Clipping Profiles to Column Grids
- Attaching Hyperlinks, Notes, or Files to a Column Grid
- Changing the Location of Column Grids
- Changing the Display of Column Grids

Changing the Dimensions of a Column Grid

Use this procedure to change the overall dimensions of a column grid. A rectangular grid is defined by its width and depth. A radial grid is defined by its radius, angle, and optionally, its inner radius.

1. Double-click the column grid to which you want to make changes.
2. Expand General, and expand Dimensions.
3. Modify the desired settings:

If you want to . . .	Then . . .
change the dimensions of a rectangular column grid	enter new values for X - Width and Y - Depth.
change the dimensions of a radial column grid	enter new values for X - Width and A - Angle.

TIP You can also change the size of a grid by dragging its grip points. Note that when you have a manual grid, you are dragging the individual lines, not the grid.

Changing the Lines of a Column Grid

Apart from the overall dimensions of the grid, you can also change the number and position of grid lines on the X-axis and the Y-axis.

To do this, it is necessary to understand the different modes in which grids can be designed. Each of these modes can be set separately for the X-axis and the Y-axis.

- **Manual:** You specify the position of each line on the layout grid.
- **Repeat:** You specify equidistant spacing between lines on the layout grid. The number of lines is determined by the size of the grid. As the size of the grid changes, lines are added or subtracted accordingly. The distance between the lines remains fixed.
- **Space Evenly:** You specify the number of lines on the grid. The space between the lines is determined by the size of the layout grid. As the size of the grid changes, the spacing between the lines is lengthened or shortened accordingly. The number of lines remains fixed.

NOTE As a default, grids are inserted with evenly spaced lines.

Related Procedures

- Adding Lines to a Column Grid
- Removing Lines from a Column Grid
- Changing the Position of Column Grid Lines

Adding Lines to a Column Grid

In some cases, you need to add lines to an existing grid. Depending on the grid mode, you do this in different ways.

Related Procedures

- Adding Lines to a Column Grid with Evenly Spaced Lines
- Adding Grid Lines to a Manual Column Grid
- Adding Grid Lines to a Column Grid with Fixed Bay Size

Adding Lines to a Column Grid with Evenly Spaced Lines

Use this procedure to add lines to a grid with evenly spaced lines. The lines will always be distributed evenly along the grid axis. If you need non-regular lines with different spacing between them, you need to convert your grid to a manual grid.

1. Double-click the column grid to which you want to add lines.
2. Expand Dimensions.
3. Add grid lines:

If you want to . . .	Then . . .
add grid lines to the X axis of the grid	expand X Axis, and enter a value for Number of bays. The number of grid lines increases to create the specified number of bays, while the overall size of the grid remains the same.
add grid lines to the Y axis of the grid	expand Y Axis, and enter a value for Number of bays. The number of grid lines increases to create the specified number of bays, while the overall size of the grid remains the same.

Adding Grid Lines to a Manual Column Grid

Use this procedure to add lines to manual grids. A manual grid allows you the maximum control over your grid, but requires that you define the exact line number and line position of each grid line.

1. Double-click the column grid to which you want to add lines.
2. Expand Dimensions.
3. Add grid lines:

If you want to . . .	Then . . .
add grid lines to the X axis of the grid	expand X Axis, select Manual for Layout type, and click on the value for Bays.
add grid lines to the Y axis of the grid	expand Y Axis, select Manual for Layout type, and click on the value for Bays.

The Bays worksheets list all of the bays currently on the respective axis, their distance from the start point of the grid, and the spacing between the grid lines that define the bays.

4 To add a line, click under the last number in the Bays list.

A new line is inserted automatically, with default values for distance and spacing. You can edit these values by clicking on them and entering new values.

NOTE Note that you cannot enter a line number for the new line. The line number is given automatically by the application after you close the worksheet.

---

5 Click OK.

Adding Grid Lines to a Column Grid with Fixed Bay Size

Use this procedure to add lines to a grid with fixed bays. Normally in a grid with fixed bays, the distance between the grid lines is the important factor, not the number of grid lines.

To add lines to a grid with a fixed baysize, you have two options:

- Enlarging the overall grid size

  For information on how to do this, see "Changing the Dimensions of a Column Grid" on page 1214.

- Decreasing the size of the bays

TIP In cases where the number of lines is important for the grid, you would change the layout mode of the grid from fixed bays to an evenly spaced or manual grid.

---

1 Double-click the column grid to which you want to add lines.

2 Expand Dimensions.

3 Add grid lines:

If you want to . . .	Then . . .
add grid lines to the X axis of the grid	expand X Axis, and enter a value for Bay size.
add grid lines to the Y axis of the grid	expand Y Axis, and enter a value for Bay size.

If you enter a value that reduces the size of the bays, the number of grid lines increases as the extra bays are added to the grid.

Removing Lines from a Column Grid

You can remove individual grid lines from column grids. The method used will depend on the layout type of the specific column grid.

Removing Lines from a Column Grid with Evenly Spaced Lines

Use this procedure to remove lines from a grid with evenly spaced lines. The lines will always be distributed evenly along the grid axis. To remove one particular line and have all the other lines stay in their original place, you need to convert your grid to a manual grid.

1. Double-click the column grid from which you want to remove lines.
2. Expand Dimensions.
3. Remove grid lines:

If you want to . . .	Then . . .
remove grid lines from the X axis of the grid	expand X Axis, and enter a smaller value for Number of bays. The number of grid lines decreases to create the specified number of bays, while the overall size of the grid remains the same.
remove grid lines from the Y axis of the grid	expand Y Axis, and enter a smaller value for Number of bays. The number of grid lines decreases to create the specified number of bays, while the overall size of the grid remains the same.

Removing Grid Lines from a Manual Column Grid

Use this procedure to remove grid lines from a manual grid. On a manual grid, you can remove every line individually.

1. Double-click the column grid from which you want to remove lines.
2. Expand Dimensions.

3 Remove grid lines:

If you want to . . .	Then . . .
remove grid lines from the X axis of the grid	expand X Axis, select Manual for Layout type, and click on the value for Bays.
remove grid lines from the Y axis of the grid	expand Y Axis, select Manual for Layout type, and click on the value for Bays.

The Bays worksheets list all of the bays currently on the respective axis, their distance from the start point of the grid, and the spacing between the grid lines that define the bays.

4 To remove a line, click on the bay number in the Bays list, and click Remove.

5 Click OK.

The bay is deleted from the grid, and the grid size is reduced accordingly.

Removing Lines from a Column Grid with Fixed Bay Size

Use this procedure to remove lines from a grid with fixed bays. Normally in a grid with fixed bays, the distance between the grid lines is the important factor, not the number of grid lines.

To remove lines from a grid with a fixed bay size, you have two options:

- Decreasing the overall grid size

  For information on how to do this, see "Changing the Dimensions of a Column Grid" on page 1214.

- Increasing the size of the bays

TIP In most cases where the number of lines is important for the grid, you would change the layout mode of the grid from fixed bays to an evenly spaced or manual grid.

1 Double-click the column grid from which you want to remove lines.

2 Expand Dimensions.

3 Remove grid lines:

If you want to . . .	Then . . .
remove grid lines from the X axis of the grid	expand X Axis, and enter a value for Bay size.
remove grid lines from the Y axis of the grid	expand Y Axis, and enter a value for Bay size.

If you enter a value that increases the size of the bays, the number of grid lines decreases as the extra bays are removed from the grid.

Changing the Position of Column Grid Lines

You can change the position of individual grid lines. This functionality is available only for manual grids. Grids with automatic spacing use their own parameters - the number of bays or the size of the grid bays - to calculate their line positions.

A manual grids has grip points for every line. You can use either the grip points or the Bays worksheet to change the position of a grid line.

Using Grip Points to Move Column Grid Lines

Use this procedure to move a column grid line by dragging the grip points of the line. Manual grids have a pair of grip points for the start and end points of each line.

1 Select the grid where you want to move grid lines.

For each line in the grid, a pair of grip points (start point and end point) are displayed.

TIP If your grid displays only four lines for the corners of the grid, the grid is not in manual mode. For information on how to check the grid mode and convert it, see "Changing the Lines of a Column Grid" on page 1215.

2 Use the grip points to drag the lines in either horizontal or vertical direction.

- If you move a grid line beyond the grid border, the grid is enlarged accordingly.
- If you move one of the border lines of the grid to the inside of the grid, the grid is decreased accordingly.

Changing the Position of Column Grid Lines by Editing Grid Bays

Use this procedure to reposition grid lines by editing the number and spacing of grid bays using the Bays worksheet.

1. Double-click the column grid where you want to move lines.
2. Expand Dimensions.
3. Edit grid bays:

If you want to . . .	Then . . .
edit grid bays along the X axis	expand X Axis, and click the value for Bays.
edit grid bays along the Y axis	expand Y Axis, and click the value for Bays.

   The Bays worksheet lists all currently existing bays on the respective axis, their distance from the start point of the grid, and the spacing of each bay.

4. To change a bay, click on one of its measuring values in the list and edit the value.
5. Click OK.

The line positions have changed according to your specifications.

Attaching Clipping Profiles to Column Grids

You can attach a clipping profile to define a mask around a column grid or to make a hole in a column grid. You could, for example, create a mask to define a column grid for an irregularly shaped room, or exclude parts of a room from the column grid.

NOTE To attach a clipping profile, you must first draw a closed polyline with the desired boundary or hole shape.

Related Procedures

- Masking Column Grids
- Creating Holes in Column Grids
- Removing Holes from Column Grids

Masking Column Grids

Use this procedure to mask a column grid. A mask is a polyline shape which defines the boundaries of a column grid. Those parts of the grid which are outside of the boundary are not displayed.

1. Draw a closed polyline with the boundary or hole shape you want.
2. Select the grid you want to mask.
3. On the Properties palette, expand General.
4. Choose Select object for Boundary.
5. Select the closed polyline you want to use as a mask.
6. Right-click and click Deselect All to turn off the grid grips.

The parts of the column grid that are outside of the masking polyline are no longer displayed.

TIP If there are columns connected to the invisible part of the grid, they are still displayed after masking. If necessary, you can delete them.

TIP If you want to restore the original grid shape, select None for Boundary in the Properties palette.

Creating Holes in Column Grids

Use this procedure to "cut" a hole into an existing column grid. The parts of the grid that are inside the hole are not displayed.

1. Select the grid you want to mask, right-click, and click Clip.
2. Enter **a** (Add Hole), and press ENTER.
3. Select the desired column grid, and press ENTER.
4. Select a closed polyline for the hole, and press ENTER.

A hole is cut in the column grid.

TIP If there are columns connected to the hole in the grid, they are still displayed. If necessary, you can delete them.

Removing Holes from Column Grids

Use this procedure to remove holes you have created in column grids.

1. Select the grid you want to mask, right-click, and click Clip.

2 Enter **r** (Remove Hole) and press ENTER.

3 Select the desired column grid, and press ENTER.

4 Select the closed polyline of the hole.

The hole is removed from the layout grid. The polyline, however, remains in the drawing. If necessary, you can delete it manually.

Attaching Hyperlinks, Notes, or Files to a Column Grid

Use this procedure to attach hyperlinks, notes, or files to a column grid. You can also edit hyperlinks and notes, and edit or detach reference files from a column grid.

1 Select the column grid you want to attach information to.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 Click OK.

5 To add a note, click the setting for Notes, and enter the note.

6 Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK twice.

Changing the Location of Column Grids

Use this procedure to change the location of column grids. You can relocate a column grid by changing the coordinate values of its insertion point. The column grid also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the column grid are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the column grid by aligning its normal with another axis. You can also rotate the column grid on its plane by changing the rotation angle.

For information about the world coordinate system, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Select the column grid that you want to change.
2. On the Properties palette, expand Basic, and expand Location.
3. Select Additional information.
4. Specify the location of the column grid:

If you want to . . .	Then . . .
relocate the column grid	enter new coordinate values under Insertion Point.
locate the column grid on the *XY* plane	make the normal of the column grid parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the column grid on the *YZ* plane	make the normal of the column grid parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the column grid on the *XZ* plane	make the normal of the column grid parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the column grid	enter a new value for Rotation Angle.

5. Click OK.

Changing the Display of Column Grids

Use this procedure to change the properties of the display components of an individual column grid. Display components that can be changed include grid lines and node and cell markers.

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1. Select the column grid you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

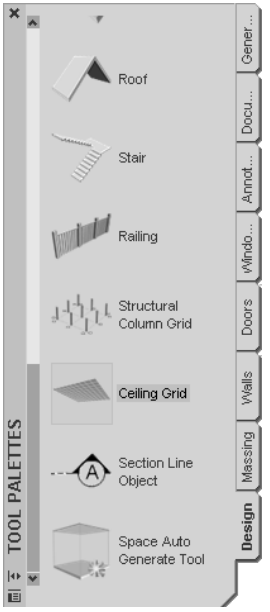
   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Using Ceiling Grid Tools to Create Ceiling Grids

Tools provided with Autodesk® Architectural Desktop let you quickly place ceiling grids by selecting a ceiling grid tool with a specific ceiling grid style and other predefined properties. When you place ceiling grids using ceiling grid tools, you can use the default settings of the tool, or you can change settings for the ceiling grid properties. You can also use ceiling grid tools to convert linework to ceiling grids and to apply the settings of a ceiling grid tool to existing ceiling grids.

Tool palettes containing ceiling grid tools



The default tool palettes in the workspace contain sample ceiling grid tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain ceiling grid tools that you can add to your tool palettes:

- Autodesk Architectural Desktop Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- My Tool catalog

Custom palettes created by your CAD manager or other users may also contain ceiling grid tools with ceiling grid properties that are customized for your projects or office standards.

Related Procedures

- Creating a Ceiling Grid
- Creating a Ceiling Grid with User-Specified Settings
- Creating a Ceiling Grid from a Layout Grid
- Creating a Ceiling Grid from Linework
- Creating a Ceiling Grid Dynamically
- Creating a Ceiling Grid with a Clipping Boundary

Creating a Ceiling Grid

Use this procedure to add a new ceiling grid that has the properties specified in the ceiling grid tool that you select. To specify settings when you add a ceiling grid, see "Creating a Column Grid with User-Specified Settings" on page 1204.

1. Open the tool palette that you want to use, and select a ceiling grid tool.

   If necessary, scroll to display the tool that you want to use.

2. Specify the insertion point of the ceiling grid.

   You can move or hide the Properties palette to expose more of the drawing area.

3. Specify the rotation of the ceiling grid.
4. Continue adding ceiling grids, and press ENTER.

Creating a Ceiling Grid with User-Specified Settings

Use this procedure to add a ceiling grid with settings that you specify.

1. Open the tool palette that you want to use, and select a ceiling grid tool.

   If necessary, scroll to display the tool that you want to use.

2. On the Properties palette, expand Basic, and expand General.
3. Select a boundary.
4. Expand Dimensions.
5. Specify the settings:

If you want to . . .	Then . . .
define the width of the grid	expand Dimensions, and enter a value for X - Width.
define the depth of the grid	expand Dimensions, and enter a value for Y - Depth.
lay out the grid with evenly spaced bays along the X direction	expand X Axis, select Space evenly for Layout type, and enter a value for Number of bays.

If you want to . . .	Then . . .
lay out the grid with a fixed bay size along the X direction	expand X Axis, select Repeat for Layout type, and enter a value for Bay size.
specify the offset distance from the start point along the X direction of the grid	expand X Axis, and enter a value for Start offset. The offset distance may be used to reduce the effective grid size.
specify the offset distance from the end point along the X direction of the grid	expand X Axis, and enter a value for End offset. The offset distance may be used to reduce the effective grid size.
lay out the grid with evenly spaced bays along the Y direction	expand Y Axis, select Space evenly for Layout type, and enter a value for Number of bays.
lay out the grid with a fixed bay size along the Y direction	expand Y Axis, select Repeat for Layout type, and enter a value for Bay size.
specify the offset distance from the start point along the Y direction of the grid	expand Y Axis, and enter a value for Start offset. The offset distance may be used to reduce the effective grid size.
specify the offset distance from the end point along the Y direction of the grid	expand Y Axis, and enter a value for End offset. The offset distance may be used to reduce the effective grid size.

6 In the drawing area, specify the insertion point of the ceiling grid.

You can move or hide the Properties palette to expose more of the drawing area.

7 Specify the rotation angle of the grid.

8 Continue adding ceiling grids, and press ENTER.

Creating a Ceiling Grid from a Layout Grid

Use this procedure to convert a two-dimensional (2D) layout grid to a ceiling grid that has the properties of the ceiling grid tool you select. You can edit these properties after creating the ceiling grid.

1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a ceiling grid tool, and click Apply Tool Properties to ➤ Layout Grids.

3 Select the layout grid to convert, and press ENTER.

4 When prompted to erase the original geometry, press ENTER to erase the linework, or enter **n** (No) to keep it.

5 Edit the properties of the ceiling grid in the Properties palette, if needed.

Creating a Ceiling Grid from Linework

Use this procedure to convert custom linework to a ceiling grid that has the properties of the ceiling grid tool you select. You can edit these properties after creating the ceiling grid.

1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a ceiling grid tool, and click Apply Tool Properties to ➤ Linework.

3 Select the linework to convert, and press ENTER.

4 When prompted to erase the original linework, press ENTER to keep the linework, or enter **y** (Yes) to erase it.

5 Edit the properties of the ceiling grid in the Properties palette, if needed.

Creating a Ceiling Grid Dynamically

Use this procedure to create ceiling grids dynamically by specifying their dimensions on screen as you draw them.

1 Open the tool palette that you want to use, and select a ceiling grid tool.

If necessary, scroll to display the tool that you want to use.

2 In the Properties palette, expand Dimensions, and expand X Axis and Y Axis:

If you want to . . .	Then . . .
lay out the grid with evenly spaced bays along the X direction	expand X Axis, select Space evenly for Layout type, and enter a value for Number of bays.
lay out the grid with a fixed bay size along the X direction	expand X Axis, select Repeat for Layout type, and enter a value for Bay size.

If you want to . . .	Then . . .
specify the offset distance from the start point along the X direction of the grid	expand X Axis, and enter a value for Start offset. The offset distance may be used to reduce the effective grid size.
specify the offset distance from the end point along the X direction of the grid	expand X Axis, and enter a value for End offset. The offset distance may be used to reduce the effective grid size.
lay out the grid with evenly spaced bays along the Y direction	expand Y Axis, select Space evenly for Layout type, and enter a value for Number of bays.
lay out the grid with a fixed bay size along the Y direction	expand Y Axis, select Repeat for Layout type, and enter a value for Bay size.
specify the offset distance from the start point along the Y direction of the grid	expand Y Axis, and enter a value for Start offset. The offset distance may be used to reduce the effective grid size.
specify the offset distance from the end point along the Y direction of the grid	expand Y Axis, and enter a value for End offset. The offset distance may be used to reduce the effective grid size.

3 Under Dimensions, select Yes for Specify on screen.

4 Specify an insertion point in the drawing.

5 Specify the overall size of the grid by dragging the cursor to the desired size and clicking once.

6 Specify the rotation angle for the grid.

7 Press ENTER.

Creating a Ceiling Grid with a Clipping Boundary

Use this procedure to create a ceiling grid within a polyline or a space object. If the ceiling grid is within a space, the grid is automatically created at the ceiling height of the space.

1 Open the tool palette that you want to use, and select a ceiling grid tool.

If necessary, scroll to display the tool that you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Click the setting for Boundary.

4 Click Select object, and then select an existing space or a closed polyline in the drawing.

5 Specify an insertion point in the drawing.

NOTE Note that the insertion point of the ceiling grid is the lower left corner of the ceiling grid if the rotation is set to 0 degrees.

6 Specify the overall size of the grid by dragging the cursor to the desired size and clicking once.

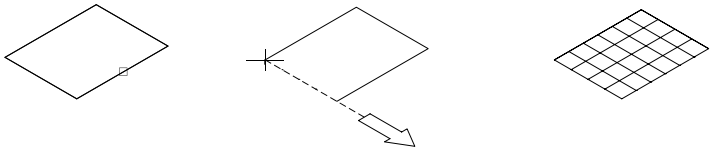
Drag the cursor along the X axis to specify the number of bays along the X direction, and drag the cursor along the Y axis to specify the number of bays along the Y direction.

7 Specify the rotation angle of the grid.

8 Press ENTER.

The grid is displayed only within the space or closed polyline.

Creating a ceiling grid from a polyline



select polyline | specify insertion point and rotation angle | resulting ceiling grid

NOTE In some templates, the ceiling grid object is turned off in a number of plan views. It is displayed in most model views, however, so if you cannot see your grid in top view, you can switch to a model view to make sure that it is there. For information on turning on the display of ceiling grids in plan view, see "Display System" on page 435.

Creating a Ceiling Grid Tool

Use this procedure to create a ceiling grid tool and add it to a tool palette. You may want to create your own ceiling grid tools if you are placing multiple ceiling grids with specific ceiling grid properties that you want to be the same each time you add a ceiling grid of that type.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a ceiling grid in the drawing	select the object, and drag it to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 Expand Basic, and expand General.

7 Click the setting for Description, enter a description of the ceiling grid created from this tool, and click OK.

8 Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.

9 Specify the settings for the dimensions of the grid.

For more information, see "Creating a Ceiling Grid with User-Specified Settings" on page 1227.

10 Click OK.

Editing Ceiling Grids

You can change existing ceiling grids in different ways. You can change the overall dimensions of the grid, number and position of grid lines, and the location of the grid within the drawing. You can also specify a clipping boundary for the grid and use that to mask the grid or insert a hole into the grid.

Related Procedures

- Changing the Dimensions of a Ceiling Grid
- Changing the Lines of a Ceiling Grid
- Attaching Clipping Profiles to Ceiling Grids
- Attaching Hyperlinks, Notes, or Files to a Ceiling Grid
- Changing the Location of Ceiling Grids
- Changing the Display of Ceiling Grids

Changing the Dimensions of a Ceiling Grid

Use this procedure to change the overall dimensions of a ceiling grid. A ceiling grid is defined by its width and depth.

1. Double-click the ceiling grid to which you want to make changes.
2. Expand General, and expand Dimensions.
3. Modify the values for X - Width or Y - Depth.

TIP You can also change the size of a grid by dragging its grip points. Note that when you have a manual grid, you are dragging the individual lines, not the grid.

Changing the Lines of a Ceiling Grid

Apart from the overall dimensions of the ceiling grid, you can also change the number and position of grid lines on the X-axis and the Y-axis.

To do this, it is necessary to understand the different modes in which grids can be designed. Each of these modes can be specified separately for the X-axis and the Y-axis.

- **Manual:** You specify the position of each line on the ceiling grid.
- **Repeat:** You specify equidistant spacing between lines on the ceiling grid. The number of lines is determined by the size of the grid. As the size of the grid changes, lines are added or subtracted accordingly. The distance between the lines remains fixed.
- **Space Evenly:** You specify the number of lines on the grid. The space between the lines is determined by the size of the ceiling grid. As the size of the grid changes, the spacing between the lines is lengthened or shortened accordingly. The number of lines remains fixed.

NOTE As a default, grids are inserted with evenly spaced lines.

Related Procedures

- Adding Lines to a Ceiling Grid
- Removing Lines from a Ceiling Grid
- Changing the Position of Ceiling Grid Lines

Adding Lines to a Ceiling Grid

In some cases, you need to add lines to an existing grid. Depending on the grid mode, you do this in different ways.

Adding Lines to a Ceiling Grid with Evenly Spaced Lines

Use this procedure to add lines to a grid with evenly spaced lines. The lines will always be distributed evenly along the grid axis. If you need non-regular lines with different spacing between them, you need to convert your grid to a manual grid.

1. Double-click the ceiling grid to which you want to add lines.
2. Expand Dimensions.
3. Add grid lines:

If you want to . . .	Then . . .
add grid lines to the X axis of the grid	expand X Axis, and enter a value for Number of bays. The number of grid lines increases to create the specified number of bays, while the overall size of the grid remains the same.
add grid lines to the Y axis of the grid	expand Y Axis, and enter a value for Number of bays. The number of grid lines increases to create the specified number of bays, while the overall size of the grid remains the same.

Your grid has been updated accordingly, with the new number of grid lines distributed evenly along the grid axis.

TIP To add lines to the ceiling grid, you can also use the ceiling grid context menu. Right-click on the grid and select X Axis/Y Axis ➤ Add Grid Line.

Adding Lines to a Manual Ceiling Grid

Use this procedure to add lines to a manual grid. A manual grid allows you the maximum control over your grid, but requires that you specify the exact line number and line position.

1. Double-click the ceiling grid to which you want to add lines.
2. On the Properties palette, expand Dimensions.
3. Add grid lines:

If you want to . . .	Then . . .
add grid lines to the X axis of the grid	expand X Axis, select Manual for Layout type, and click on the value for Bays.
add grid lines to the Y axis of the grid	expand Y Axis, select Manual for Layout type, and click on the value for Bays.

   The Bays worksheet lists all of the bays currently on the respective axis, their distance from the start point of the grid, and the spacing between the grid lines that define the bays.

4. To add a line, click under the last number in the Bays list.

   A new line is inserted automatically, with default values for distance and spacing. You can edit these values by clicking on them and entering new values.

   NOTE Note that you cannot enter a line number for the new line. The line number is given automatically by the application after you close the worksheet.

5. Click OK.

TIP To add lines to the ceiling grid, you can also use the ceiling grid context menu. Right-click on the grid and select X Axis/Y Axis ➤ Add Grid Line.

Adding Lines to a Ceiling Grid with Fixed Bay Size

Use this procedure to add lines to a grid with fixed bays. Normally in a grid with fixed bays, the distance between the grid lines is the important factor, not the number of grid lines.

To add lines to a grid with a fixed baysize, you have two options:

- Enlarging the overall grid size

  For information on how to do this, see "Changing the Dimensions of a Ceiling Grid" on page 1233.

- Decreasing the size of the bays

TIP In most cases, where the number of lines is important for the grid, you would change the layout mode of the grid from fixed bays to an evenly spaced or manual grid.

1. Double-click the ceiling grid to which you want to add lines.
2. Expand Dimensions.
3. Add grid lines:

If you want to . . .	Then . . .
add grid lines to the X axis of the grid	expand X Axis, and enter a value for Bay size.
add grid lines to the Y axis of the grid	expand Y Axis, and enter a value for Bay size.

   If you enter a value that reduces the size of the bays, the number of grid lines increases as the extra bays are added to the grid.

A number of new lines have been added by decreasing the size of the individual bays.

Removing Lines from a Ceiling Grid

In the same way that lines can be added to a ceiling grid, they can also be removed.

Removing Lines from a Ceiling Grid with Evenly Spaced Lines

Use this procedure to remove lines from a grid with evenly spaced lines. The lines will always be distributed evenly along the grid axis. To remove one particular line and have all the other lines stay in their original place, you need to convert your grid to a manual grid.

1. Double-click the ceiling grid from which you want to remove lines.
2. Expand Dimensions.

3 Remove grid lines:

If you want to . . .	Then . . .
remove grid lines from the X axis of the grid	expand X Axis, and enter a smaller value for Number of bays. The number of grid lines decreases to create the specified number of bays, while the overall size of the grid remains the same.
remove grid lines from the Y axis of the grid	expand Y Axis, and enter a smaller value for Number of bays. The number of grid lines decreases to create the specified number of bays, while the overall size of the grid remains the same.

Your grid has been updated accordingly, with the new number of grid lines distributed evenly along the grid axis.

TIP To remove lines from a ceiling grid, you can also use the ceiling grid context menu. Right-click on the grid and select X Axis/Y Axis ➤ Remove Grid Line.

Removing Lines from a Manual Ceiling Grid

Use this procedure to remove grid lines from a manual grid. On a manual grid, you can remove every line individually.

1 Double-click the ceiling grid from which you want to remove lines.

2 Expand Dimensions.

3 Remove grid lines:

If you want to . . .	Then . . .
remove grid lines from the X axis of the grid	expand X Axis, select Manual for Layout type, and click on the value for Bays.
remove grid lines from the Y axis of the grid	expand Y Axis, select Manual for Layout type, and click on the value for Bays.

The Bays worksheets list all of the bays currently on the respective axis, their distance from the start point of the grid, and the spacing between the grid lines that define the bays.

4 To remove a line, click on the bay number in the Bays list, and click Remove.

5 Click OK.

The bay is deleted from the grid, and the grid size is reduced accordingly.

TIP To remove lines from a ceiling grid, you can also use the ceiling grid context menu. Right-click on the grid and select X Axis/Y Axis ➤ Remove Grid Line.

Removing Lines from a Ceiling Grid with Fixed Bay Size

Use this procedure to remove lines from a grid with fixed bays. Normally in a grid with fixed bays, the distance between the grid lines is the important factor, not the number of grid lines.

To remove lines from a grid with a fixed baysize, you have two options:

- Decreasing the overall grid size

  For information on how to do this, see "Changing the Dimensions of a Ceiling Grid" on page 1233.

- Increasing the size of the bays

TIP In most cases where the number of lines is important for the grid, you would change the layout mode of the grid from fixed bays to an evenly spaced or manual grid.

---

1 Double-click the ceiling grid from which you want to remove lines.

2 Expand Dimensions.

3 Remove grid lines:

If you want to . . .	Then . . .
remove grid lines from the X axis of the grid	expand X Axis, and enter a value for Bay size.
remove grid lines from the Y axis of the grid	expand Y Axis, and enter a value for Bay size.

If you enter a value that increases the size of the bays, the number of grid lines decreases as the extra bays are removed from the grid.

A number of lines have been removed by increasing the size of the individual bays.

Changing the Position of Ceiling Grid Lines

You can change the position of individual grid lines. This functionality is available only for manual grids. Grids with automatic spacing use their own parameters - the number of lines or the size of the grid bays - to calculate their line positions.

A manual grid has grip points for every single line. You can use either these grip points or the Bays worksheet to change the position of a grid line.

Using Grip Points to Move Ceiling Grid Lines

Use this procedure to move a ceiling grid line by dragging the grip points of the line. Manual grids have a pair of grip points for the start and end points of each line.

1. Select the grid where you want to move grid lines.

   For each line in the grid, a pair of grip points (start point and end point) is displayed.

TIP If your grid displays only four lines for the corners of the grid, the grid is not in manual mode. For information on how to check the grid mode and convert it, see "Changing the Lines of a Ceiling Grid" on page 1233.

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2. Use the grip points to drag the lines in either horizontal or vertical direction.

   - If you move a grid line beyond the grid border, the grid is enlarged accordingly.
   - If you move one of the border lines of the grid to the inside of the grid, the grid is decreased accordingly.

Changing the Position of Ceiling Grid Lines by Editing Grid Bays

Use this procedure to reposition grid lines by editing the number and spacing of grid bays using the Bays worksheet.

1. Double-click the ceiling grid where you want to move lines.
2. On the Properties palette, expand Dimensions.

3 Edit grid bays:

If you want to . . .	Then . . .
edit grid bays along the X axis	expand X Axis, and click the value for Bays.
edit grid bays along the Y axis	expand Y Axis, and click the value for Bays.

The Bays worksheet lists all currently existing bays on the respective axis, their distance from the start point of the grid, and the spacing of each bay.

4 To change a bay, click on one of its measuring values in the list and edit the value.

5 Click OK.

The line positions have changed according to your settings.

Attaching Clipping Profiles to Ceiling Grids

You can attach a clipping profile to define a mask around a ceiling grid or to make a hole in a ceiling grid. You could, for example, create a mask to define a ceiling grid for an irregularly shaped room, or exclude parts of a room from the ceiling grid.

For a mask, you can use closed polylines and spaces. For more information, see "Creating a Ceiling Grid with a Clipping Boundary" on page 1230.

NOTE To attach a clipping profile, you must first draw a closed polyline or space with the desired boundary or hole shape.

Related Procedures

- Masking Ceiling Grids
- Creating Holes in Ceiling Grids
- Removing Holes from Ceiling Grids

Masking Ceiling Grids

Use this procedure to mask a ceiling grid. A mask is a polyline shape or space that defines the boundaries of a ceiling grid. Those parts of the grid which are outside of the boundary are not displayed.

1. Draw a closed polyline with the boundary or hole shape you want.
2. Select the grid you want to mask.
3. On the Properties palette, expand General.
4. Choose Select object for Boundary.
5. Select the closed polyline or space you want to use as a mask.
6. Right-click and click Deselect All to turn off the grid grips.

The parts of the ceiling grid that are outside of the masking polyline or space are no longer displayed.

TIP If you want to restore the original grid shape, select None for Boundary on the Properties palette.

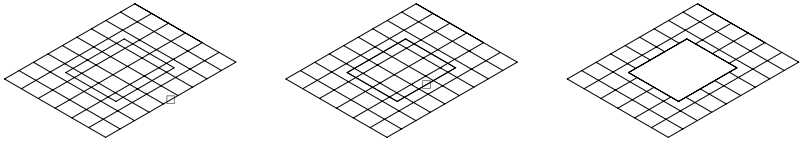
Creating Holes in Ceiling Grids

Use this procedure to "cut" a hole into an existing ceiling grid. The parts of the grid that are inside the hole are not displayed.

1. Select the grid in which you want to create holes, right-click, and click Clip.
2. Enter **a** (Add Hole), and press ENTER.
3. Select the layout grid, and press ENTER.
4. Select a closed polyline or AEC object for the hole.
5. Press ENTER.

A hole is cut in the ceiling grid.

Adding a hole to a ceiling grid



select ceiling grid | select polyline | added ceiling grid hole

Removing Holes from Ceiling Grids

Use this procedure to remove holes you have created in ceiling grids.

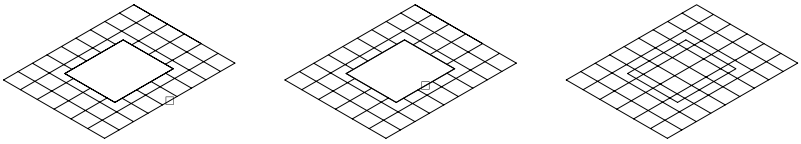
1. Select the grid from which you want to remove holes, right-click, and click Clip.
2. Enter **r** (Remove Hole) and press ENTER.

3 Select the desired ceiling grid, and press ENTER.

4 Select the closed polyline of the hole.

The hole is removed from the ceiling grid. The polyline, however, remains in the drawing. If necessary, you can delete it manually.

Removing a hole from a ceiling grid



Attaching Hyperlinks, Notes, or Files to a Ceiling Grid

Use this procedure to attach hyperlinks, notes, or files to a ceiling grid. You can also edit hyperlinks and notes, and edit or detach reference files from a ceiling grid.

1 Select the ceiling grid you want to attach information to.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 Click OK.

5 To add a note, click the setting for Notes, and enter the note.

6 Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.

If you want to . . .	Then . . .
detach a reference file	select the file name, and click Delete.

8 Click OK twice.

Changing the Location of Ceiling Grids

Use this procedure to change the location of ceiling grids. You can relocate an existing ceiling grid by changing the coordinate values of its insertion point. The ceiling grid also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the ceiling grid are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the ceiling grid by aligning its normal with another axis. You can also rotate the ceiling grid on its plane by changing the rotation angle.

For information about the world coordinate system, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1 Select the ceiling grid that you want to change.

2 On the Properties palette, expand Basic, and expand Location.

3 Select Additional information.

4 Specify the location of the ceiling grid:

If you want to . . .	Then . . .
relocate the ceiling grid	enter new coordinate values under Insertion Point.
locate the ceiling grid on the *XY* plane	make the normal of the ceiling grid parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the ceiling grid on the *YZ* plane	make the normal of the ceiling grid parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the ceiling grid on the *XZ* plane	make the normal of the ceiling grid parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the ceiling grid	enter a new value for Rotation Angle.

5 Click OK.

Changing the Display of Ceiling Grids

Use this procedure to change the properties of the display components of an individual column grid. Display components that can be changed include grid lines and node and cell markers.

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1. Select the ceiling grid you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Layout Curves and Grids

18

Three types of layout objects help you to position objects relative to each other: layout curves, two-dimensional (2D) layout grids, and three-dimensional (3D) layout volumes (also called volume grids). Each type of layout object has anchors to which you can attach objects. All use nodes as anchor points. Layout grids and layout volumes also provide cells as anchoring points for cell anchors and volume anchors. For more information, see "Anchors" on page 753.

Layout Curve
A layout curve attaches nodes to objects. You can layout curves to position objects along a path. Anchoring objects to a layout curve might be useful for positioning wash basins along a wall or joists along a roof.

Layout Grid
A layout grid is an arrangement of rectangular or radial spaces, called *bays*, that are delineated with parallel or radial lines. Use a two-dimensional (2D) layout grid to position objects in a grid pattern. Anchoring objects to layout grids might help you to position planters in a sidewalk grid, or tile accents in a floor tile grid.

Layout Volume
A layout volume (also called a volume grid) is a three-dimensional (3D) arrangement of rectangular spaces. Use three-dimensional (3D) layout volumes to position objects on a multilevel grid. Changing the size of a layout volume changes the spacing of objects attached to that grid and can also change the size and height of objects attached to that grid.

In this chapter

- Using Layout Curves
- Using Layout Grids
- Layout Volumes
- Changing the Location of Layout Volumes
- Attaching Hyperlinks, Notes, or Files to a Layout Volume

Related Topics

- Using Layout Curves
- Using Layout Grids
- Layout Volumes

Using Layout Curves

Use a layout curve to anchor objects along a path. You can define the following objects as layout curves:

- Walls
- Curtain walls
- Window assemblies
- Spaces
- Mass elements
- Roofs
- Lines
- Arcs
- Circles
- Ellipses
- Polygons
- Polylines
- Splines

Layout curves are best suited for objects with linear geometry, such as polylines, walls or splines. If you need nodes on a two-dimensional (2D) object, consider using a layout grid instead.

Related Procedures

- Creating a Layout Curve Tool
- Adding Layout Curves
- Adding Nodes to Layout Curves
- Removing Nodes from Layout Curves
- Changing the Spacing Mode of Layout Curves
- Switching Layout Curves
- Changing the Display Properties of Layout Curves
- Attaching Hyperlinks, Notes, or Files to a Layout Curve

Creating a Layout Curve Tool

Use this procedure to create a layout curve tool and add it to a tool palette. You may want to create your own layout curve tools if you are placing multiple layout curves of a specific style and they have the same properties.

You can use any of the following methods to create a layout curve tool:

- Drag a layout curve that has the desired properties to a tool palette.
- Drag a copy of a tool from another palette to the current palette, and then customize the properties of the new tool.
- Copy an existing tool in the current palette, and then customize the properties of the new tool.
- Drag a tool from the Content Browser to a tool palette, and then customize the properties of the new tool.

1. Open the tool palette on which to create the tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a layout curve in the drawing	select the object, and drag it to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Expand Basic, and expand General.
6. Click the setting for Description, enter a description of the tool, and click OK.
7. Click the setting for Layer key, select a layer key, and click OK.
8. Click the setting for Layer overrides, select a layer key override, and click OK.

9 Expand Dimensions.

10 Specify a Layout type.

11 Specify number of nodes, or enter a spacing value.

12 Click OK.

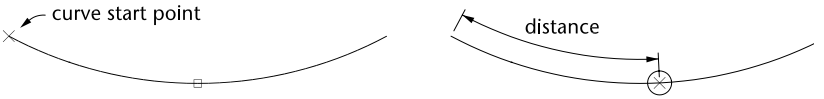
Adding Layout Curves

Use this procedure to define an object as a layout curve. The spacing between anchor nodes determines the spacing between objects that you attach to the layout curve, even if you change the geometry of the layout curve.

The following spacing options are available:

- **Manual**: You specify the position of each node along the layout curve.

Manually placing nodes on a layout curve

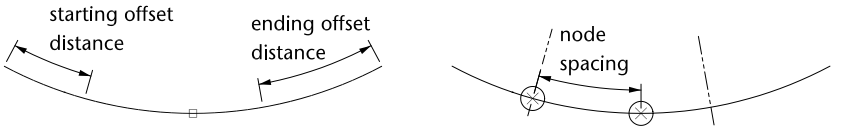


select layout curve

specify distance along layout curve

- **Repeat**: You specify equidistant spacing between nodes along the layout curve. The number of anchor nodes is determined by the length of the layout curve. As the length of the curve changes, nodes are added or subtracted accordingly. The spacing of the nodes remains fixed.

Placing nodes at repeat spacing on a layout curve

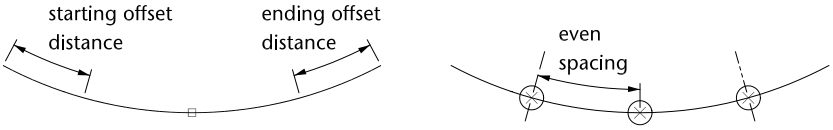


select layout curve and specify offsets

specify node spacing

- **Space Evenly**: You specify the number of nodes along the curve. The space between nodes is determined by the length of the layout curve. As the length of the curve changes, the spacing between nodes is lengthened or shortened accordingly. The number of nodes remains fixed.

Placing nodes at even spacing on a layout curve



select layout curve and specify offsets

specify node spacing

1 Open the tool palette that you want to use, and select a layout curve tool.

If necessary, scroll to display the tool that you want to use.

A layout curve tool is located in the Stock Tool catalog in General Purpose Tools, under Parametric Layout and Anchoring. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Select the object to define as a layout curve:

If you want to...	Then...
Place nodes at locations that you specify	press ENTER. Enter the number of nodes, and specify the locations of nodes by selecting them or by entering distances from the start point of the curve.
Repeat nodes at fixed intervals along the curve	enter **r** (Repeat). Specify the start and end offsets of the first and last nodes, and specify the spacing between nodes.
Space a fixed number of nodes along the curve	enter **s** (Space evenly). Specify the start and end offsets of the first and last nodes, and specify the number of nodes.

Adding Nodes to Layout Curves

Use this procedure to add nodes to layout curves.

You can add nodes to only those layout curves that have manually spaced or evenly spaced nodes. Layout curves with nodes at fixed repeated spacing cannot be changed without changing the length of the curve. For more information, see "Changing the Spacing Mode of Layout Curves" on page 1250.

1 Select the layout curve by selecting one of the node anchors.

2 Right-click, and click Add Node.

3 Specify the distance of the new layout node from the start of the curve.

- If you have added a node to a layout curve with manually spaced nodes, the new node is inserted at the specified position. The position of the other nodes remains unchanged.
- If you have added a node to a layout curve with evenly spaced nodes, the new node is inserted at the specified position and the remaining nodes are recalculated, so that they are evenly spaced again.

Removing Nodes from Layout Curves

Use this procedure to remove nodes from layout curves.

You can remove nodes from only those layout curves that have manually spaced or evenly spaced nodes. Layout curves with nodes at fixed repeated spacing cannot be changed without changing the length of the curve. For information about spacing options, see "Adding Layout Curves" on page 1248.

1 Select the layout curve by selecting one of the node anchors.

2 Right-click, and click Remove Node.

3 Specify the distance of the layout node to be removed from the start of the curve.

- If you have removed a node from a layout curve with manual nodes, the node is removed from the specified position. The position of the other nodes remains unchanged.
- If you have removed a node from a layout curve with evenly spaced nodes, the node is removed from the specified position and the remaining nodes are recalculated, so that they are evenly spaced again.

Changing the Spacing Mode of Layout Curves

Use this procedure to change how modes are positioned along a layout curve. For more information, see "Adding Layout Curves" on page 1248.

For example, you can change the mode so that a curve with manually spaced nodes becomes a curve with evenly spaced nodes. If you want to add nodes to a layout curve with a fixed number of nodes, you must first convert the layout curve to manually spaced or evenly spaced mode.

You can also change the layout mode on the Properties palette.

1 Select the layout curve by selecting one of the node anchors.

2 Right-click, and click Layout Mode.

3 Select the desired mode, and press ENTER.

- If you are changing a layout curve with manually spaced nodes to a curve with nodes at fixed repeated spacing, you are prompted to type start and end offsets, and the distance between nodes. If there are too few nodes on the curve to fill it, new nodes are created at the specified distance.
- If you are changing a layout curve with manually spaced nodes to a curve with evenly spaced nodes, you are prompted to type start and end offsets for the curve. The existing nodes are distributed evenly on the curve.
- If you are changing a curve with nodes placed at a fixed repeated spacing value to a curve with manually spaced nodes, there is no visible change. The nodes have, however, been converted to manual nodes, so that you now can add nodes to and remove nodes from the curve.
- If you are changing a curve with nodes placed at a fixed repeated spacing value to a curve with evenly spaced nodes, you are prompted for a start offset and an end offset. The existing nodes are then recalculated and distributed evenly. You can now add nodes to and remove nodes from the curve.
- If you are changing a curve with evenly spaced nodes to a curve with manually spaced nodes, there is no visible change. If you change the curve, however, the nodes remain fixed and are no longer redistributed evenly.
- If you are changing a curve with evenly spaced nodes to a curve with nodes placed at fixed repeated spacing, you are prompted to type start and end offsets, and the distance between nodes. If there are too few nodes on the curve to fill it, new nodes are created at the specified distance.

Switching Layout Curves

Use this procedure to move a layout curve from one object to another object. The layout mode is retained in this action. If the layout curve was inserted originally with evenly spaced nodes, the nodes remain spaced evenly on the new object.

If you switch the curve to an object that already contains a layout curve, the two curves are not merged. They are still separate objects and can be edited separately.

1 Select the layout curve by selecting one of the node anchors.

2 Right-click, and click Switch Curve.

3 Select the object to which to attach the layout curve.

The layout curve is moved to the new object.

Changing the Display Properties of Layout Curves

You can change the display properties of the nodes on a layout curve. Display properties you can change include layer, color and linetype information, and the node size.

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1. Select the layout curve that you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Attaching Hyperlinks, Notes, or Files to a Layout Curve

Use this procedure to attach hyperlinks, notes, or files to a layout curve. You can also edit hyperlinks and notes, and edit or detach reference files from a layout curve.

1. Select the layout curve you want to attach information to.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® 2004 User's Guide*.

4 Click OK.

5 To add a note, click the setting for Notes, and enter the note.

6 Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK.

Using Layout Grids

Use a layout grid to arrange objects in a 2D grid pattern. You can create a radial or rectangular layout grid. You can anchor objects to the intersection of the grid lines (node anchors) or to the center of the grid bays (cell anchors).

NOTE By default, the markers for node anchors and cell anchors are not displayed when you insert a grid. To display them, turn these components on in the Entity Display. For information about turning on display components, see "Changing the Display Properties of Layout Curves" on page 1252.

Changing the size of a grid changes the spacing of objects anchored to that grid and can also change the size of objects anchored to that grid. You can use a clipping profile to define a boundary around a layout grid or to make a hole in a layout grid. The layout grid is not displayed outside a boundary or inside a hole. Use closed polylines to define the boundary or hole. For example, you can use a clipping profile to cut a hole in a reflected ceiling grid.

Related Procedures

- Creating a Layout Grid Tool
- Adding Radial Layout Grids
- Changing Radial Layout Grids
- Adding Rectangular Layout Grids
- Changing Rectangular Layout Grids
- Adding Grid Lines to Layout Grids
- Removing Grid Lines from Layout Grids
- Changing the Spacing Mode of Layout Grids
- Changing the Display Properties of Layout Grids
- Creating and Removing Boundaries for Layout Grids
- Creating Holes in Layout Grids
- Removing Holes from Layout Grids
- Changing the Location of Layout Grids
- Attaching Hyperlinks, Notes, or Files to a Layout Grid

Creating a Layout Grid Tool

Use this procedure to create a 2D layout grid tool and add it to a tool palette. You may want to create your own layout grid tools if you are placing multiple layout grids of a specific style and they all have the same properties.

You can use any of the following methods to create a layout curve tool:

- Drag a layout curve that has the properties you want to a tool palette.
- Drag a copy of a tool from another palette to the current palette, and then customize the properties of the new tool.
- Copy an existing tool in the current palette, and then customize the properties of the new tool.
- Drag a tool from the Content Browser to a tool palette, and then customize the properties of the new tool.

1. Open the tool palette on which to create the tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a layout grid in the drawing	select the object, and drag it to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.

If you want to . . .	Then . . .
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Expand Basic, and expand General.

6 Click the setting for Description, enter a description of the tool, and click OK.

7 Click the setting for Layer key, select a layer key, and click OK.

8 Click the setting for Layer overrides, select a layer key override, and click OK.

9 Expand Dimensions.

10 Click Yes to specify the dimension of the grid on the drawing screen as you are creating it.

11 Click No to specify numerical values for the Width, Depth, and Height of the grid.

12 Expand X Axis, and specify a Layout type, Bay size, and a Start and End offset.

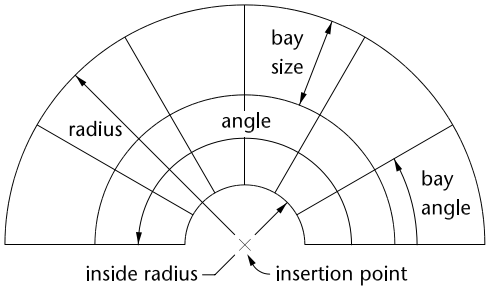
13 Expand Y Axis, and specify a Layout type, Bay size, and a Start and End offset.

14 Click OK.

Adding Radial Layout Grids

Use this procedure to create a 2D radial layout grid.

Creating a radial layout grid



1. Open the tool palette that you want to use, and select a layout grid 2D tool.

   If necessary, scroll to display the tool that you want to use.

   A layout grid 2D tool is located in the Stock Tool catalog, General Purpose Tools, under Parametric Layout and Anchoring. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Select the layout grid 2D tool.
3. In the Properties palette, expand Basic, and expand General.
4. Click the setting for Description, enter a description of the grid, and click OK.
5. Select Radial for Shape.
6. Specify the boundary object attached to the grid.
7. Expand Dimensions.
8. Select Yes to specify dimensions on the drawing screen.
9. Select No to specify dimensions on the Properties palette.

   - Enter the width of the grid.
   - Enter the angular dimension of the grid.

10. Expand X Axis.
11. Select Space evenly for Layout type and enter a value for Number of bays.
12. Select Repeat for Layout type and enter a value for Bay size.
13. Enter a value for Inside radius.
14. Enter a value for End offset.
15. Expand Y Axis.
16. Select Space evenly for Layout type and enter a value for Number of bays.

17 Select Repeat for Layout type and enter a value for Bay angle.

18 Enter a value for Start angle offset.

19 Enter a value for End angle offset.

20 Specify an insertion point in the drawing for the center of the radial layout grid.

21 Specify the rotation of the radial grid about the insertion point.

Changing Radial Layout Grids

Use this procedure to change the angle or size of a radial layout grid. You can also change the number and size of the grid bays.

If you use grips to stretch a radial layout grid, the behavior of the radial layout grid depends on the spacing type of each axis. The overall size of the grid "jumps" in directions that are specified to use a specific bay size with repeat spacing because the exact bay size is maintained. The overall size changes in directions that are specified to be evenly spaced or manually spaced.

1 Select one or more 2D layout grids, right-click, and click Modify Layout Grid (2D).

2 In the Properties palette, expand Basic, and expand General.

3 Enter a new value for the radius, angle, and inside radius.

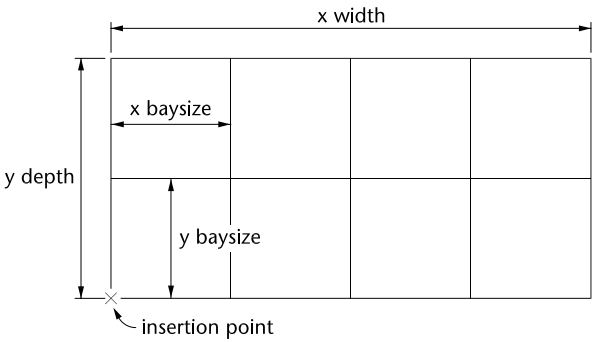
4 Enter a new value for the X bay size.

5 Change the repeat spacing value, or enter a new value for the bay angle.

Adding Rectangular Layout Grids

Use this procedure to add rectangular layout grids.

Creating a rectangular layout grid



1. Open the tool palette that you want to use, and select a layout grid 2D tool.

   If necessary, scroll to display the tool that you want to use.

   A layout grid 2D tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Select the layout grid 2D tool.
3. In the Properties palette, expand Basic, and expand General.
4. Select Rectangular for Shape.
5. Enter a value for the X width and the Y depth.
6. Select the repeat spacing option and enter a value, or enter a value for the X and Y bay size.
7. Specify an insertion point in the drawing for the lower-left corner of the rectangular layout grid.
8. Specify the rotation of the rectangular grid about the insertion point.

Changing Rectangular Layout Grids

Use this procedure to change the angle or size of a rectangular layout grid. You can also change the number and size of the grid bays.

If you use grips to stretch a rectangular layout grid, the behavior of the rectangular layout grid depends on the spacing type of each axis. The overall size of the grid "jumps" in directions that are specified to use a specific bay size with repeat spacing because the exact bay size is maintained. The overall size changes in directions that are specified to be evenly spaced or manually spaced.

1. Select one or more 2D layout grids, right-click, and click Modify Layout Grid (2D).
2. In the Properties palette, expand Basic, and expand General.
3. Enter a new X width and Y depth value.
4. Select the repeat spacing option and enter a value, or enter a new X and Y bay size value.

Adding Grid Lines to Layout Grids

Use this procedure to manually add grid lines to a grid. You can separately add grid lines on the *X* plane and on the *Y* plane.

NOTE You can add lines only to grids inserted with manually spaced lines or evenly spaced lines. Layout grids with lines placed at a fixed repeated spacing value cannot be changed manually. For information about grid modes, see "Changing the Spacing Mode of Layout Grids" on page 1260.

1 Select the layout grid, right-click, and add a grid line:

If you want to add. . .	Then . . .
a grid line to the *X* plane of the grid	select X-axis on the shortcut menu, and then click Add Grid Line.
a grid line to the *Y* plane of the grid	select Y-axis on the shortcut menu, and then click Add Grid Line.

2 Specify the distance of the new grid line from the start of the grid.

- If you have added a line to a layout grid with manually spaced lines, the new line is inserted on the specified position. The position of the other lines remains unchanged. The grid size changes accordingly.
- If you have added a line to a layout grid with evenly spaced lines, the new line is inserted and all lines are recalculated, so that they are evenly distributed again. The grid size remains unchanged.

Removing Grid Lines from Layout Grids

Use this procedure to manually remove individual grid lines from a grid. You can separately remove grid lines from the *X* plane and the *Y* plane.

NOTE You can remove lines only from grids which have been inserted with manually spaced lines or evenly spaced lines. Layout grids with lines placed at a fixed repeated spacing value cannot be changed manually. For information about grid modes, see "Changing the Spacing Mode of Layout Grids" on page 1260.

1 Select the layout grid, right-click and remove a grid line:

If you want to remove. . .	Then . . .
a grid line from the *X* plane of the grid	select X-axis on the shortcut menu, and then click Remove Grid Line.

If you want to remove. . .	Then . . .
a grid line from the *Y* plane of the grid	select Y-axis on the shortcut menu, and then click Remove Grid Line.

2 Click the grid line to be removed from the grid.

- If you have removed a line from a layout grid with manually spaced lines, the specified line is removed from the grid. The position of the other lines remains unchanged.
- If you have removed a line from a layout grid with evenly spaced lines, the specified line is removed from the grid. All remaining lines are recalculated, so that they are evenly distributed again.

Changing the Spacing Mode of Layout Grids

Use this procedure to change the spacing mode of a radius or rectangular layout grid. Layout grids can have three different spacing modes. These modes are set separately for the *X* and *Y* planes:

- **Manual:** You specify the position of each line on the layout grid.
- **Repeat:** You specify equidistant spacing between lines on the layout grid. The number of lines is determined by the size of the layout grid. As the size of the grid changes, lines are added or subtracted accordingly. The distance between the lines remains fixed.
- **Space Evenly:** You specify the number of lines on the grid. The space between the lines is determined by the size of the layout grid. As the size of the grid changes, the spacing between the lines is lengthened or shortened accordingly. The number of lines remains fixed.

By default, layout grids are inserted with evenly spaced lines.

1 Select the layout grid, right-click, and specify a spacing mode:

If you want to change. . .	Then . . .
the spacing mode of the *X* plane of the grid	select X-axis on the shortcut menu, and then click Layout Mode.
the spacing mode of the *Y* plane of the grid	select Y-axis on the shortcut menu, and then click Layout Mode.

2 Select the desired mode, and press ENTER.

- If you are changing a layout grid with manually spaced lines to a a grid with lines placed at a fixed repeated spacing value, you are prompted to type start and end offsets, and the distance between the lines. If there are too few lines on the grid to fill it according to your specifications, new lines are created.
- If you are changing a layout grid with manually spaced lines to a grid with evenly spaced lines, you are prompted to type start and end offsets for the grid. The existing lines are distributed evenly on the grid.
- If you are changing a layout grid with lines placed at a fixed repeated spacing value to a grid with manually spaced lines, there is no visible change, but the lines have been converted to manual lines, so that you now can add lines to and remove lines from the grid.
- If you are changing a layout grid with lines placed at a fixed repeated spacing value to a grid with evenly spaced lines, you are prompted for a start offset and an end offset. The existing lines are than recalculated and distributed evenly. You can now add lines to and remove lines from the grid.
- If you are changing a grid with evenly spaced lines to a grid with manually spaced lines, there is no visible change. If you change the grid however, the lines now remain fixed and are not distributed evenly anymore.
- If you are changing a grid with evenly spaced lines to a grid with lines placed at a fixed repeated spacing value, you are prompted to type start and end offsets, and the distance between the lines. If there are too few lines on the grid to fill the grid according to your specifications, new lines are created.

Changing the Display Properties of Layout Grids

You can change the display properties of the nodes on a layout grid. Display properties you can change include layer, color and linetype information, and the node size.

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1. Select the layout grid that you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.

3 Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4 If necessary, click .

5 Click the Layer/Color/Linetype tab.

6 Select the component to change, and select a different setting for the property.

7 Click OK twice.

Creating and Removing Boundaries for Layout Grids

Use this procedure to create a boundary around a 2D layout grid. Areas of the grid outside of the boundary are not shown. However, objects anchored to the grid outside the boundary are still displayed. Boundaries are useful when you need to create a grid in an irregularly shaped area.

You can also remove a boundary to re-display the entire grid.

1 Draw a closed polyline to define the grid boundary.

2 Select a layout grid, right-click, and click Clip.

3 Enter **s** (Set boundary), and select the layout grid and press ENTER.

4 Select the closed polyline for the boundary of the layout grid and press ENTER.

5 To remove a grid boundary, erase the polyline that defines the boundary.

Creating Holes in Layout Grids

Use this procedure to create a hole in a layout grid. The area of the grid within the hole is not displayed.

1 Draw a closed polyline to define the hole.

2 Select a layout grid, right-click, and click Clip.

3 Enter **a** (Add hole), and select the layout grid, and press ENTER.

4 Select the closed polyline for the hole and press ENTER.

A hole is cut in the layout grid.

Removing Holes from Layout Grids

Use this procedure to remove holes that you have created in layout grids.

1. Select a layout grid, right-click, and click Clip.
2. Enter **r** (Remove hole), and select a layout grid, and press ENTER.
3. Select the closed polyline of the hole.

Changing the Location of Layout Grids

Use this procedure to change the location of layout grids. You can relocate a layout grid by changing the coordinate values of its insertion point. The layout grid also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the layout grid are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the layout grid by aligning its normal with another axis. You can also rotate the layout grid on its plane by changing the rotation angle.

For information about WCS and UCS, see "Use Coordinates and Coordinate Systems" in the *AutoCAD® 2004 User's Guide*.

1. Select the layout grid that you want to change.
2. On the Properties palette, expand Basic, and expand Location.
3. Select Additional information.
4. Specify the location of the layout grid:

If you want to . . .	**Then . . .**
relocate the layout grid	enter new coordinate values under Insertion Point.
locate the layout grid on the *XY* plane	make the normal of the layout curve parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the layout grid on the *YZ* plane	make the normal of the layout grid parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the layout grid on the *XZ* plane	make the normal of the layout grid parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the layout grid	enter a new value for Rotation Angle.

5 Click OK.

Attaching Hyperlinks, Notes, or Files to a Layout Grid

Use this procedure to attach hyperlinks, notes, or files to a layout grid. You can also edit hyperlinks and notes, and edit or detach reference files from a layout grid.

1 Select the layout grid to which to attach information.
2 On the Properties palette, click the Extended Data tab.
3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® 2004 User's Guide*.

4 Click OK.
5 To add a note, click the setting for Notes, and enter the note.
6 Click OK.
7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK.

Layout Volumes

Use a layout volume to arrange objects in a 3D grid. Changing the size of a layout volume changes the spacing of objects attached to that volume and can also change the size and height of objects attached to that volume.

Related Procedures

- Creating a Layout Volume Tool
- Adding Layout Volumes
- Changing Layout Volumes
- Adding Grid Lines to Layout Volumes
- Removing Grid Lines from Layout Volumes
- Changing the Spacing Mode of Layout Volumes
- Changing the Display Properties of Layout Volumes
- Changing the Location of Layout Volumes
- Attaching Hyperlinks, Notes, or Files to a Layout Volume

Creating a Layout Volume Tool

Use this procedure to create a layout volume tool and add it to a tool palette. You may want to create your own layout volume tools if you are placing multiple layout volumes of a specific style and they all have the same properties.

You can use any of the following methods to create a layout volume tool:

- Drag a layout volume that has the properties you want to a tool palette.
- Drag a copy of a tool from another palette to the current palette, and then customize the properties of the new tool.
- Copy an existing tool in the current palette, and then customize the properties of the new tool.
- Drag a tool from the Content Browser to a tool palette, and then customize the properties of the new tool.

1. Open the tool palette on which to create the tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a layout volume in the drawing	select the object, and drag it to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.

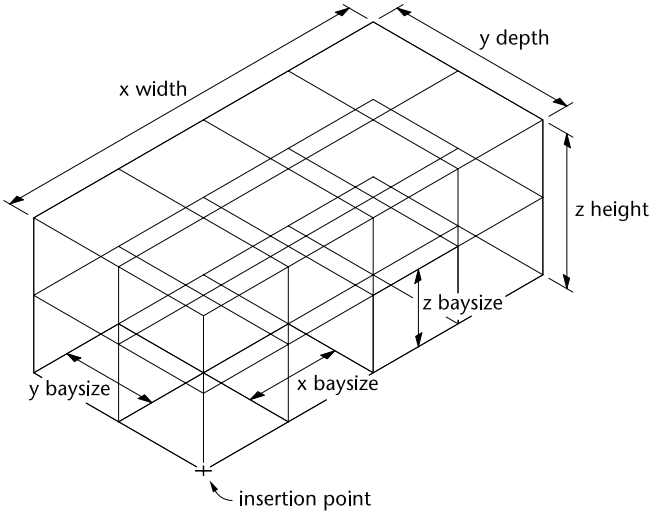
If you want to . . .	Then . . .
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Expand Basic, and expand General.
6. Click the setting for Description, enter a description of the tool, and click OK.
7. Click the setting for Layer key, select a layer key, and click OK.
8. Click the setting for Layer overrides, select a layer key override, and click OK.
9. Expand Dimensions.
10. Click Yes to specify the dimension of the grid on the drawing screen as you are creating it.
11. Click No to specify numerical values on the Properties palette, and enter values for Width, Depth, and Height
12. Expand X Axis.
13. Select Space evenly for Layout type and enter a value for Number of bays.
14. Select Repeat for Layout type and enter a value for Bay size.
15. Enter a value for Start offset.
16. Enter a value for End offset.
17. Expand Y Axis.
18. Select Space evenly for Layout type and enter a value for Number of bays.
19. Select Repeat for Layout type and enter a value for Bay angle.
20. Enter a value for Start offset.
21. Enter a value for End offset.
22. Expand Z Axis.
23. Select Space evenly or Repeat for Layout type.
24. Enter a value for Start offset.
25. Enter a value for End offset.
26. Click OK.

Adding Layout Volumes

Use this procedure to add a layout volume, which is a three-dimensional layout grid.

Creating a layout grid volume



1. Open the tool palette that you want to use, and select a volume layout tool.

   If necessary, scroll to display the tool that you want to use.

   A volume layout tool is located within the General Purpose Tools under Parametric Layout and Anchoring in the Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Select the volume layout tool.
3. In the Properties palette, expand Basic, and expand General.
4. Enter a value for the X width, Y depth and the Z height.
5. Select the repeat spacing option and enter a value, or enter a value for the X, Y, and Z bay size.
6. Specify an insertion point in the drawing for the lower-left corner of the rectangular layout grid.
7. Specify the rotation of the rectangular grid about the insertion point.

Changing Layout Volumes

Use this procedure to change the angle or size of three-dimensional (3D) layout volumes. You can also change the number and size of the grid bays.

If you use grips to stretch a layout volume, the behavior of the layout volume depends on the spacing type of each axis. The overall size of the grid "jumps" in directions that are specified to use a specific bay size with repeat spacing because the exact bay size is maintained. The overall size changes in directions that are specified to be evenly spaced or manually spaced.

1. Select one or more 3D volume grids, right-click, and click Modify Layout Volume (3D).
2. In the Properties palette, expand Basic, and expand General.
3. Enter a new X width, Y depth, and Z height value.
4. Select the repeat spacing option and enter a value, or enter a new X, Y, and Z bay size value.

Adding Grid Lines to Layout Volumes

Use this procedure to manually add grid lines to a layout volume. You can separately add grid lines on the *X, Y* plane and on the *Z* plane.

NOTE You can add lines only to volumes inserted with manually spaced lines or evenly spaced lines. Layout volumes with lines placed at a fixed repeated spacing value cannot be changed manually. For information about grid modes, see "Changing the Spacing Mode of Layout Grids" on page 1260.

1. Select the layout volume, right-click, and add a grid line:

If you want to add. . .	Then . . .
a grid line to the *X* plane of the volume	select X axis on the shortcut menu, and then click Add Grid Line.
a grid line to the *Y* plane of the volume	select Y axis on the shortcut menu, and then click Add Grid Line.
a grid line to the *Z* plane of the volume	select Z axis on the shortcut menu, and then click Add Grid Line.

2. Specify the distance of the new grid line from the start of the grid.

- If you have added a line to a layout volume with manually spaced lines, the new line is inserted at the specified position. The position of the other lines remains unchanged. The grid size changes accordingly.
- If you have added a line to a layout volume with evenly spaced lines, the new line is inserted and all lines are recalculated, so that they are evenly distributed again. The grid size remains unchanged.

Removing Grid Lines from Layout Volumes

Use this procedure to manually remove individual grid lines from a volume. You can separately remove grid lines from the *X, Y* plane and the *Z* plane.

NOTE You can remove lines only from volumes which have been inserted with manually spaced lines or evenly spaced lines. Layout volumes with lines placed at a fixed repeated spacing value cannot be changed manually. For information about grid modes, see "Changing the Spacing Mode of Layout Grids" on page 1260.

1 Select the layout volume, right-click and remove a grid line:

If you want to remove. . .	Then . . .
a grid line from the *X* plane of the volume	select X axis on the shortcut menu, and then Remove Grid Line.
a grid line from the *Y* plane of the volume	select Y axis on the shortcut menu, and then Remove Grid Line.
a grid line from the *Z* plane of the volume	select Z axis on the shortcut menu, and then Remove Grid Line.

2 Click on the grid line to be removed from the volume.

- If you have removed a line from a layout volume with manually spaced lines, the specified line is removed from the volume. The position of the other lines remains unchanged.
- If you have removed a line from a layout volume with evenly spaced lines, the specified line is removed from the volume. All remaining lines are recalculated, so that they are evenly distributed again.

Changing the Spacing Mode of Layout Volumes

Use this procedure to change how modes are positioned along a layout volume. For more information, see "Adding Layout Volumes" on page 1267.

For example, you can change the mode so that a volume with manually spaced nodes becomes a volume with evenly spaced nodes. If you want to add nodes to a layout volume with a fixed number of nodes, you must first convert the layout volume to the manually spaced or evenly spaced mode.

You can also change the layout mode on the Properties palette.

1. Select the layout volume by selecting one of the node anchors.
2. Right-click, and click Layout Mode.
3. Select the desired mode, and press ENTER.

- If you are changing a layout volume with manually spaced nodes to a volume with nodes placed at a fixed repeated spacing value, you are prompted to type start and end offsets, and the distance between the nodes. If there are too few nodes on the curve to fill it, new nodes are created at the specified distance.
- If you are changing a layout volume with manually spaced nodes to a volume with evenly spaced nodes, you are prompted to type start and end offsets for the volume. The existing nodes are distributed evenly on the volume.
- If you are changing a volume with nodes placed at a fixed repeated spacing value to a volume with manually spaced nodes, there is no visible change. The nodes have, however, been converted to manual nodes, so that you now can add nodes to and remove nodes from the volume.
- If you are changing a volume with nodes placed at a fixed repeated spacing value to a volume with evenly spaced nodes, you are prompted for a start offset and an end offset. The existing nodes are than recalculated and distributed evenly. You can now add nodes to and remove nodes from the volume.
- If you are changing a volume with evenly spaced nodes to a volume with manually spaced nodes, there is no visible change. If you change the volume, however, the nodes remain fixed and are no longer redistributed evenly.
- If you are changing a volume with evenly spaced nodes to a volume with nodes placed at a fixed repeated spacing value, you are prompted to type start and end offsets, and the distance between the nodes. If there are too few nodes on the curve to fill it, new nodes are created at the specified distance.

Changing the Display Properties of Layout Volumes

You can change the display properties of the nodes on a layout volume. Display properties you can change include layer, color and linetype information, and the node size.

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1. Select the layout volume that you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Changing the Location of Layout Volumes

Use this procedure to change the location of layout volumes. You can relocate a layout volume by changing the coordinate values of its insertion point. The layout volume also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the layout volume are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the layout volume by aligning its normal with another axis. You can also rotate the layout volume on its plane by changing the rotation angle.

For information about WCS and UCS, see "Use Coordinates and Coordinate Systems" in the *AutoCAD® 2004 User's Guide*.

1 Select the layout volume that you want to change.
2 On the Properties palette, expand Basic, and expand Location.
3 Select Additional information.
4 Specify the location of the layout volume:

If you want to . . .	Then . . .
relocate the layout volume	enter new coordinate values under Insertion Point.
locate the layout volume on the *XY* plane	make the normal of the layout volume parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the layout volume on the *YZ* plane	make the normal of the layout volume parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the layout volume on the *XZ* plane	make the normal of the layout volume parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the layout volume	enter a new value for Rotation Angle.

5 Click OK.

Attaching Hyperlinks, Notes, or Files to a Layout Volume

Use this procedure to attach hyperlinks, notes, or files to a layout volume. You can also edit hyperlinks and notes, and edit or detach reference files from a layout volume.

1 Select the layout volume to which to attach information.
2 On the Properties palette, click the Extended Data tab.
3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® 2004 User's Guide*.

4 Click OK.
5 To add a note, click the setting for Notes, and enter the note.

6 Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK.

Openings

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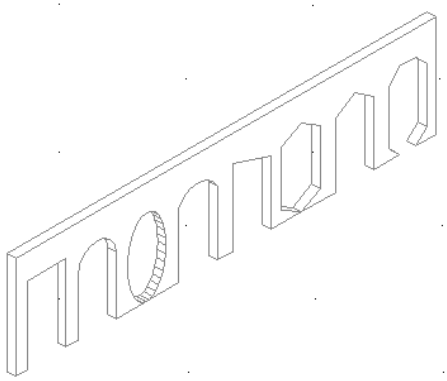
An opening is an AEC object that interacts with walls and space boundaries to represent an opening of any size at any elevation. You can also add openings as freestanding objects.

Opening Shapes

When you add an opening to a drawing, you can select from a number of predefined shapes, such as rectangular, half-round, oval, or arch. You can also create openings with custom shapes using profiles to define the geometry of the opening.

Examples of predefined shapes for openings



Anchoring Openings

After you place an opening in a wall or space boundary, the opening is constrained to the object and cannot move outside it.

Openings can also be anchored to specific locations in walls or space boundaries, so that when

In this chapter

- Using Opening Tools to Create Openings
- Creating an Opening
- Creating an Opening with User-specified Settings
- Creating and Editing Custom Openings
- Creating an Opening Tool
- Editing Openings
- Changing the Display Properties of Openings

the wall or space boundary moves or changes size, the location of the opening in that object remains constant.

Opening Dimensions
All openings have height and width. The rise dimension depends on the opening shape. Rise is the height from the top of the rectangular portion of an opening to the peak of the opening for gothic, arch, peak pentagon, and trapezoid shapes.

Vertical Alignment of Openings
Use the vertical alignment settings to control how to place an opening in the wall, the location of the working point vertically in the wall, and how the opening responds to modifications in height. Use the sill and head height settings to determine the working point on the opening. You can place the working point at the sill or at the head. For example, if you specify the vertical alignment as 0" and the opening height as 7'–0", the opening height is 7'–0". If you next specify the height of the opening as 6'–8", the sill remains at 0" and the opening height becomes 6'–8".

For the opening head working point, if you specify the vertical alignment as 7'–0" and the opening height as 7'–0", the opening height is 7–0". If you specify the opening height as 6'–8", the head remains at 7'–0" and the sill becomes 4".

Related Topics and Procedures

- Using Opening Tools to Create Openings
- Creating an Opening
- Creating an Opening with User-specified Settings
- Creating and Editing Custom Openings
- Editing Openings
- Changing the Display Properties of Openings

Using Opening Tools to Create Openings

Tools provided with Autodesk® Architectural Desktop let you quickly place openings by selecting an opening tool with predefined properties. You can use the default settings of the tool as is, or you can change them to suit your needs. You can also apply the settings of an opening tool to existing openings.

The default tool palettes in the workspace contain a sample opening tool that you can use and customize as needed. In addition, the following catalogs pro-

vided with the software contain opening tools that you can add to your tool palettes:

- Autodesk Architectural Desktop Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog

Custom palettes created by your CAD manager or other users may also contain opening tools with properties that are customized for your projects or office standards.

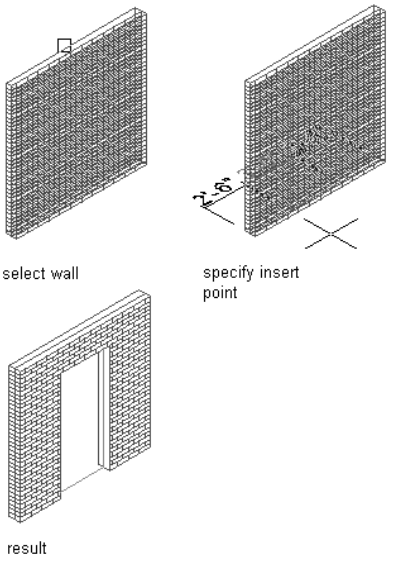
Related Procedures

- Creating an Opening
- Creating an Opening with User-specified Settings
- Creating and Editing Custom Openings
- Creating an Opening Tool

Creating an Opening

Use this procedure to add an opening that has the properties specified in the opening tool that you select. To specify settings when you add an opening, see "Creating an Opening with User-specified Settings" on page 1278.

Adding an opening to a wall



1. Open the tool palette that you want to use, and select an opening tool.

   If necessary, scroll to display the desired tool.

2. Select a wall or space boundary in which to insert the opening, or press ENTER to add a freestanding opening.

   You can move or hide the Properties palette to expose more of the drawing area.

3. Specify the insertion point of the opening.

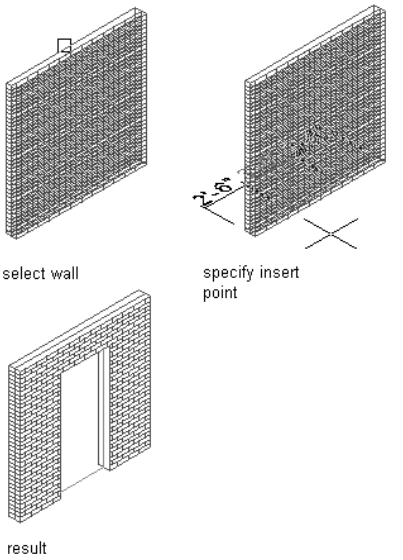
   If you are adding a freestanding opening, specify the rotation of the opening after you specify the insertion point.

4. Continue adding openings, and press ENTER.

Creating an Opening with User-specified Settings

Use this procedure to create an opening with settings that you specify.

Adding an opening to a wall



1. Open the tool palette that you want to use, and select an opening tool.

   If necessary, scroll to display the desired tool.

2. On the Properties palette, expand Basic, and expand General.
3. Select a shape for the opening.

   To specify a custom shape, select Custom for Shape, and select the profile that provides the geometry of the shape for Profile.

4. Expand Dimensions.
5. Enter values for Width, Height, and Rise.

   Rise is available only for arch, gothic, peak pentagon, and trapezoid shapes.

6. Expand Location.

7 If you are placing the opening in a wall or a space boundary, specify the opening position:

If you want to . . .	Then . . .
position the edge of the opening at a specific distance from the end of a wall segment or space boundary	select Offset/Center for Position along wall, and enter a value for Automatic offset.
center the opening on a wall segment or space boundary	select Offset/Center for Position along wall, and specify a point near the center of the wall segment or space boundary.
position the opening anywhere along the wall or space boundary	select Unconstrained for Position along wall.

8 Specify whether you want the opening to be aligned vertically by sill height or by head height:

If you want to . . .	Then . . .
align the opening by sill height	select Sill for Vertical alignment, and enter a value for Sill height.
align the opening by head height	select Head for Vertical alignment, and enter a value for Head height.

9 Specify the insertion point for an opening in a wall or space boundary, or for a freestanding opening:

If you want to . . .	Then . . .
place an opening in a wall	select the wall, and specify an insertion point along the wall.
place an opening in a space boundary	select the space boundary, and specify an insertion point in the space boundary.
place a freestanding opening	press ENTER, and specify an insertion point and rotation angle for the opening.

10 Continue to place openings, and press ENTER.

Creating and Editing Custom Openings

In addition to using predefined shapes for openings, you can create openings with custom shapes. You create a profile from a closed polyline to define the two-dimensional (2D) geometry of the shape. The profile is then extruded when it is applied to an opening. You can edit the profile to change the shape of the opening. You can then save the changes to the current profile or to a new profile. You can apply the profiles you create to any openings.

Related Procedures

- Creating a Profile for a Custom Opening
- Creating an Opening with a Custom Shape
- Editing the Geometry of a Custom Opening

Creating a Profile for a Custom Opening

Use this procedure to create a profile that provides the geometry for an opening with a custom shape.

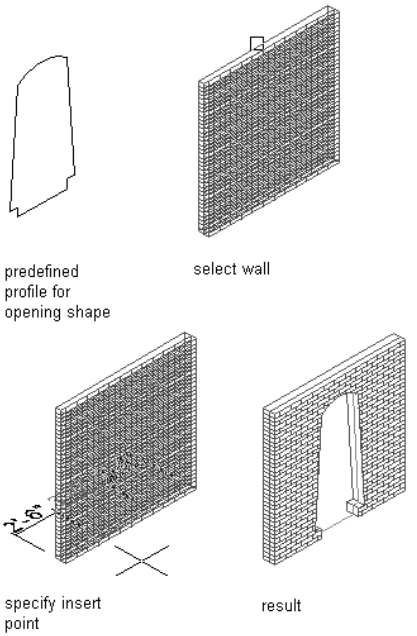
You can create the profile as you add it to an opening. However, if the shape you need is elaborate and has curved segments, you may find it easier to create the profile from a polyline first. You can then add the profile to the opening.

1. Draw concentric, closed polylines representing the opening and any insets.
2. Select the polylines, right-click, and click Convert to ➤ Profile Definition.
3. Select the outermost polyline.
4. Enter **a** (Add ring).
5. Select an inner polyline.
6. Repeat steps 4 and 5 as needed to add more rings to the profile.
7. Specify the insertion point of the profile.
8. Enter **n** (New), enter a name for the profile, and click OK.

Creating an Opening with a Custom Shape

Use this procedure to create an opening with a custom shape and other settings that you specify.

Adding an opening with a custom shape



1. Open the tool palette that you want to use, and select an opening tool. If necessary, scroll to display the desired tool.
2. On the Properties palette, expand Basic, and expand General.
3. Select Custom for Shape.
4. Select the profile that provides the geometry of the shape for Profile.
5. Expand Dimensions.
6. Enter values for Width and Height.
7. Expand Location.
8. If you are placing the opening in a wall or a space boundary, specify the opening position:

If you want to . . .	Then . . .
position the edge of the opening at a specific distance from the end of a wall segment or space boundary	select Offset/Center for Position along wall, and enter a value for Automatic offset.

If you want to . . .	Then . . .
center the opening on a wall segment or space boundary	select Offset/Center for Position along wall, and specify a point near the center of the wall segment or space boundary.
position the opening anywhere along the wall or space boundary	select Unconstrained for Position along wall.

9 Specify whether you want the opening to be aligned vertically by sill height or by head height:

If you want to . . .	Then . . .
align the opening by sill height	select Sill for Vertical alignment, and enter a value for Sill height.
align the opening by head height	select Head for Vertical alignment, and enter a value for Head height.

10 Specify the insertion point for an opening in a wall or space boundary, or for a freestanding opening:

If you want to . . .	Then . . .
place an opening in a wall	select the wall, and specify an insertion point along the wall.
place an opening in a space boundary	select the space boundary, and specify an insertion point in the space boundary.
place a freestanding opening	press ENTER, and specify an insertion point and a rotation angle for the opening.

11 Continue to place openings, and press ENTER.

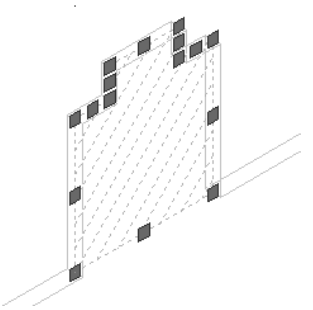
Editing the Geometry of a Custom Opening

Use this procedure to edit the geometry of a profile that determines the shape of a custom opening. You can save the changes to the existing profile or to a new profile.

1 Select the opening that has the shape you want to change, right-click, and click Edit Profile In Place.

A temporary profile is created for you to edit the geometry of the custom opening.

A temporary profile for editing a custom opening



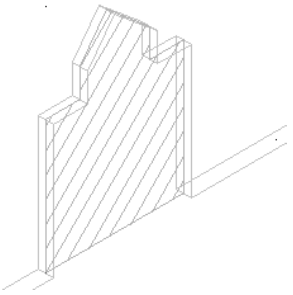
NOTE After you perform an editing task from the shortcut menu, you may need to select the profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select the profile, and right-click to display the shortcut menu.

2 Edit the profile:

If you want to . . .	Then . . .
change the shape of the perimeter of the profile or its rings	select the profile, and use grips to adjust the shape.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace an existing ring of the profile with new geometry	select the profile, right-click, and click Replace Ring. Select the ring to replace, and select the new geometry. Press ENTER to keep the geometry, or enter **y** (Yes) to erase it.

If you want to . . .	Then . . .
add a ring to the profile	draw the linework in place on the temporary profile. Select the profile, right-click, and click Add Ring. Select the geometry to define the ring. Press ENTER to keep the geometry, or enter **y** (Yes) to erase it.
remove a ring from the profile	select the profile, right-click, and click Remove Ring. Select the ring to remove, and press ENTER. This option does not appear if the profile has only one ring.

Profile for custom opening after editing



3 Save or discard the changes:

If you want to . . .	Then . . .
restore the opening to its original shape	click .
save the changes to the current profile	click . The opening uses the edited profile to define its geometry. Any other objects or styles that use this profile are also updated with the edited geometry.
save the changes to a new profile	select the profile, right-click, and click Save as New Profile. Enter a name for the new profile, and click OK. The opening uses the new profile to define its geometry. Other styles or objects that use the original profile are not affected.

Creating an Opening Tool

Use this procedure to create an opening tool and add it to a tool palette. You may want to create your own opening tools if you are placing multiple openings that have the same properties.

For example, you are creating a restaurant floor plan that contains openings of various sizes. To work efficiently, you can create an opening tool for each size. You can then select the appropriate tool to place openings in the floor plan.

1. Open the tool palette where you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from an opening in the drawing	select the opening, and drag it to the tool palette.
copy a tool in the current palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	open the other tool palette. Right-click the tool, and click Copy. Open the other palette, and click Paste.
copy a tool from a tool catalog	open the tool catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.

   This description is used as the tooltip on the tool palette, and to describe the tool if it is stored in a tool catalog.

6. Expand Basic, and expand General.
7. Enter a description of the opening that you can create using this opening tool.
8. If you do not want to use the default layer key for openings, select a layer key.

9 If you want to override the default layer name for openings, select a layer override.

10 Select a shape for the opening.

To specify a custom shape, select Custom for Shape, and select the profile that provides the geometry of the shape for Profile.

11 Expand Dimensions.

12 Enter values for Width, Height, and Rise.

Rise is available only for arch, gothic, peak pentagon, and trapezoid shapes.

13 Expand Location.

14 If you are placing the opening in a wall or a space boundary, specify the opening position:

If you want to . . .	Then . . .
position the edge of the opening at a specific distance from the end of a wall segment or space boundary	select Offset/Center for Position along wall, and enter a value for Automatic offset.
center the opening on a wall segment or space boundary	select Offset/Center for Position along wall, and specify a point near the center of the wall segment or space boundary.
position the opening anywhere along the wall or space boundary	select Unconstrained for Position along wall.

15 Specify whether you want the opening to be aligned vertically by sill height or by head height:

If you want to . . .	Then . . .
align the opening by sill height	select Sill for Vertical alignment, and enter a value for Sill height.
align the opening by head height	select Head for Vertical alignment, and enter a value for Head height.

16 Click OK.

Editing Openings

After you create an opening, you can change the height, width, and rise. You can also change the endcap conditions applied to the opening. You can move the opening within the wall or space boundary.

Autodesk®Architectural Desktop offers several methods for editing openings:

- Edit openings directly using grips for dimensions and other physical characteristics.
- Change settings on the Properties palette.
- Select editing commands from the shortcut menu for a selected opening.

Related Procedures

- Using Grips to Edit Openings
- Changing the Shape and Dimensions of an Opening
- Flipping an Opening along the X or Y Axis
- Changing Endcap Style for an Opening
- Applying Tool Properties to an Existing Opening
- Repositioning an Opening
- Using Anchors to Change the Horizontal Position of an Opening
- Using Anchors to Change the Vertical Position of an Opening
- Changing the Position of an Opening Within a Wall or Space Boundary
- Changing the Orientation of an Opening to a Wall or Space Boundary
- Specifying the Display of Sills for an Opening
- Changing the Location of an Opening
- Attaching Hyperlinks, Notes, and Files to an Opening

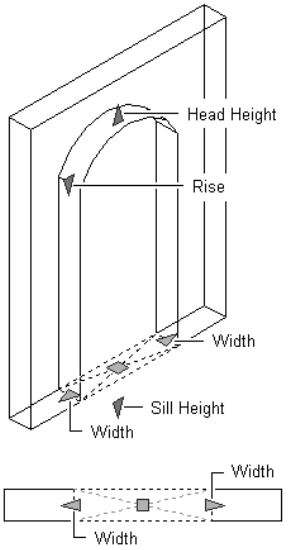
Using Grips to Edit Openings

Refer to the illustrations and steps in this topic to use opening grips to edit an opening.

Editing Opening Dimensions

1. Select the opening.
2. Select the grip for the dimension you want to change.

Opening dimension grips



3 Move the grip until the desired dimension value is displayed and click once, or enter a value.

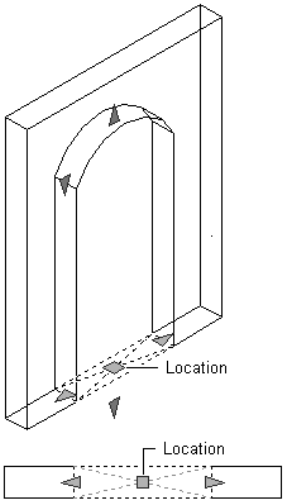
Changing the Location of an Opening

1 Select the opening.

2 Move the Location grip to change the location of the opening.

Press CTRL to select the direction of movement: along the wall or space boundary, within the wall or boundary, or vertically within the wall or boundary.

Opening location grip



Changing the Shape and Dimensions of an Opening

Use this procedure to change the shape and size of an opening.

1. Double-click the opening you want to change.
2. On the Properties palette, expand Basic, and expand General.
3. Select a shape.

   To specify a custom shape, select Custom for Shape, and select the profile that provides the geometry of the shape for Profile.

4. Expand Dimensions.
5. Change the width, height, or rise for the opening.

Flipping an Opening along the X or Y Axis

Use this procedure to reorient an opening along its *X* or *Y* axis.

TIP You can also flip an opening along its *X* axis using the Flip grip that is displayed when you select an opening.

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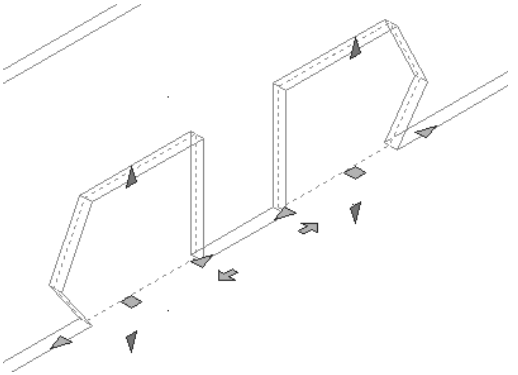
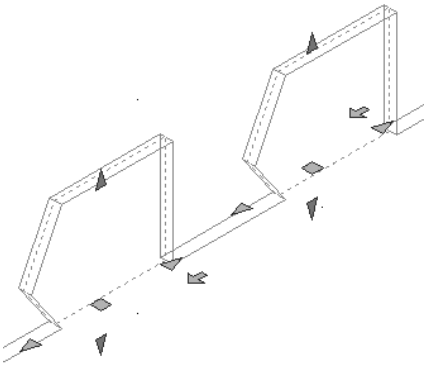
1 To flip an opening along the *X* axis, select the openings you want to change, right-click, and click Wall Anchor ➤ Flip X.

Opening in original position, and flipped along its *X* axis



2 To flip an opening along the *Y* axis, select the openings, right-click, and click Wall Anchor ➤ Flip Y.

Opening in original position, and flipped along its *Y* axis



Changing Endcap Style for an Opening

Use this procedure to change the opening endcap style used at each side of an opening. An endcap is a user-definable condition for the edges of an opening. For more information about opening endcap styles, see "Opening Endcap Styles" on page 1894.

1 Double-click the opening you want to change.

2 On the Properties palette, expand Basic, expand Location, and expand Endcaps.

3 Select an opening endcap style.

Applying Tool Properties to an Existing Opening

Use this procedure to apply the properties of an opening tool to one or more openings.

1 Open the tool palette that you want to use.

If necessary, scroll to display the desired tool.

2 Right-click an opening tool, and click Apply Tool Properties to Opening.

3 Select the openings, and press ENTER.

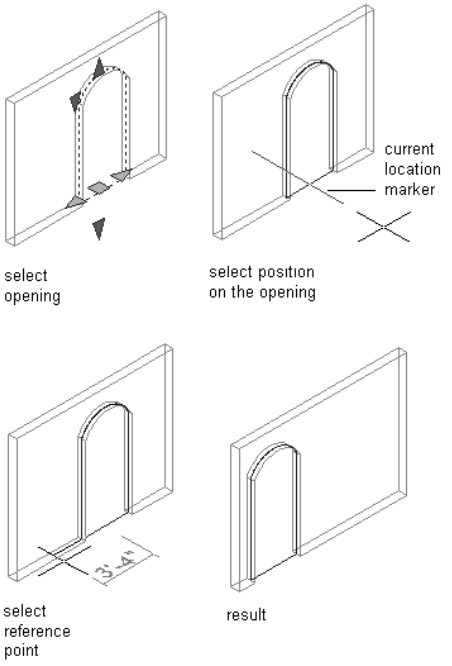
4 Edit the properties of the openings in the Properties palette, if necessary.

Repositioning an Opening

Use this procedure to change the location of an opening along the wall or space boundary by offsetting the opening from a reference location.

This feature is useful when you want to position an opening at a specified distance from another object. For example, you may want to specify an exact distance between a series of openings along a wall.

Repositioning an opening by offsetting points



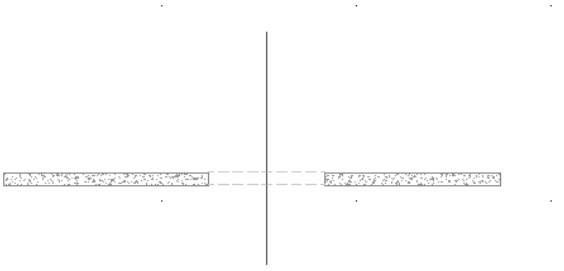
1 Select the opening you want to move, right-click, and click Reposition Along Wall.

A marker indicates the current location within the opening: left jamb, center of opening, or right jamb.

2 Specify how to measure the offset:

If you want to . . .	Then . . .
measure the offset from the center of the opening	select a point near the center of the opening.
measure the offset from the left or right jamb	select a point on the jamb of the opening from which you want to measure.

Selecting the center of the opening for measuring the offset



3 Select a point to measure to (the reference point).

You can select a point along the wall.

Specifying a reference point

4 Specify the distance between the points you selected:

If you want to . . .	Then . . .
move the opening to the reference point	enter **0** (zero).
move the opening a specified distance from the reference point	enter a value for the offset distance.
specify the distance as a measurement between two points, such as the distance between the centers of two openings that are correctly positioned	specify the two points measuring the distance.

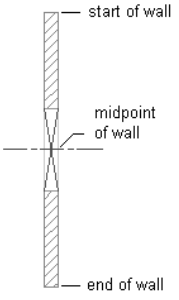
Opening repositioned along the wall

Using Anchors to Change the Horizontal Position of an Opening

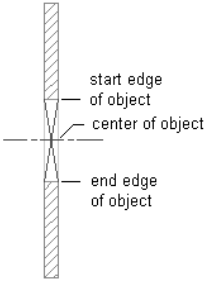
Use this procedure to change the horizontal position of openings along a wall or space boundary to which the openings are anchored.

You can also change the horizontal position of the opening using the Location grip. For more information, see "Using Grips to Edit Openings" on page 1288.

Positioning an opening horizontally



x-axis wall parameters



x-axis opening parameters

1. Select the openings you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand Location.
3. Click Anchor.

4 Select the reference point for the anchor along the *X* axis:

If you want to . . .	Then . . .
use the start of the wall as the reference point	under Position Along (X), select Start of wall for From.
use the start of the space boundary as the reference point	under Position Along (X), select Start of curve for From.
use the midpoint of the wall as the reference point	under Position Along (X), select Midpoint of wall for From.
use the midpoint of the space boundary as the reference point	under Position Along (X), select Midpoint of curve for From.
use the end of the wall as the reference point	under Position Along (X), select End of wall for From.
use the end of the space boundary as the reference point	under Position Along (X), select End of curve for From.

5 Enter the distance from the reference point at which to place the openings.

Use a negative value to measure from endpoint to start point.

6 Select the position of the openings to measure to:

If you want to measure . . .	Then . . .
to the start edge of the opening	select Start edge of object for To.
to the center of the opening	select Center of object for To.
to the end edge of the opening	select End edge of object for To.

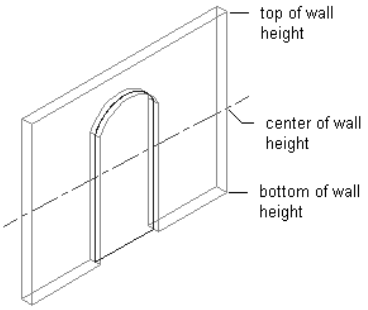
7 Click OK.

Using Anchors to Change the Vertical Position of an Opening

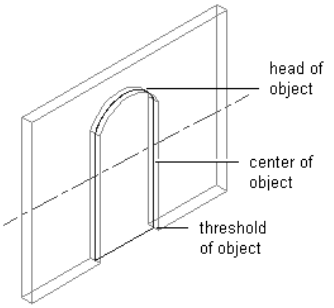
Use this procedure to change the vertical position of openings in a wall or space boundary to which the openings are anchored.

You can also change the vertical position of the opening using the Location grip. For more information, see "Using Grips to Edit Openings" on page 1288.

Changing the vertical position of an opening



z-axis wall parameters



z-axis opening parameters

1. Select the openings you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand Location.
3. Click Anchor.
4. Select the reference point for the anchor along the *Z* axis:

If you want to . . .	Then . . .
use the bottom of the wall height as the reference point	under Position Along (Z), select Bottom of wall height for From.
use the bottom of the space boundary height as the reference point	under Position Along (Z), select Bottom of curve height for From.

If you want to . . .	Then . . .
use the center of the wall height as the reference point	under Position Along (Z), select Center of wall height for From.
use the center of the space boundary height as the reference point	under Position Along (Z), select Center of curve height for From.
use the top of the wall height as the reference point	under Position Along (Z), select Top of wall height for From.
use the top of the space boundary height as the reference point	under Position Along (Z), select Top of curve height for From.

5 Enter the distance from the reference point at which to place the openings.

Use a negative value to measure from endpoint to start point.

6 Select the position of the openings to measure to:

If you want to . . .	Then . . .
measure to the bottom of the openings in wall	select Sill of object for To.
measure to the bottom of the openings in space boundaries	select Bottom of object for To.
measure to the center of the openings in walls	select Center of object for To.
measure to the center of the openings in space boundaries	select Center of object for To.
measure to the top of the openings in walls	select Head of object for To.
measure to the top of the openings in space boundaries	select Top of object for To.

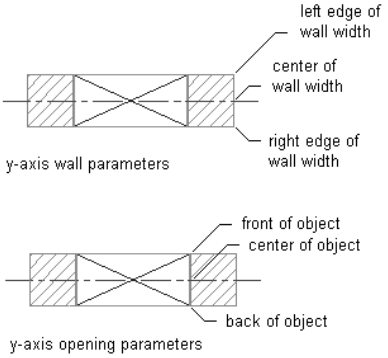
7 Click OK.

Changing the Position of an Opening Within a Wall or Space Boundary

Use this procedure to change the horizontal position of openings within a wall or space boundary to which the openings are anchored.

You can also change the position of the opening within a wall or space boundary using the Location grip. For more information, see "Using Grips to Edit Openings" on page 1288.

Changing the position of an opening within a wall



1 Select the openings you want to change, and double-click one of them.

2 On the Properties palette, expand Basic, and expand Location.

3 Click Anchor.

4 Select the reference point for the anchor along the Y axis:

If you want to . . .	Then . . .
use the left edge of the wall as your reference point	select Left edge of wall width for From.
use the left edge of the space boundary as your reference point	select Left edge of curve width for From.
use the center of the wall as your reference point	select Center of wall width for From.
use the center of the space boundary as your reference point	select Center of curve width for From.

If you want to . . .	Then . . .
use the right edge of the wall as your reference point	select Right edge of wall width for From.
use the right edge of the space boundary as your reference point	select Right edge of curve width for From.

5 Enter the distance from the reference point at which to place the openings.

Use a negative value to measure from endpoint to start point.

6 Select the position of the openings to measure to:

If you want to . . .	Then . . .
measure to the front of the opening	select Front of object for To.
measure to the center of the opening	select Center of object for To.
measure to the back of the opening	select Back of object for To.

7 Click OK.

Changing the Orientation of an Opening to a Wall or Space Boundary

Use this procedure to change the vertical orientation of an opening in a wall or space boundary to which the openings are anchored.

1 Select the openings you want to change, and double-click one of them.
2 On the Properties palette, expand Basic, and expand Location.
3 Click Anchor.
4 Enter the *X* and *Z* rotation angles of the openings.

5 Indicate if you want to reverse the flip direction of the opening in the *X* and *Z* axes:

If you want to . . .	Then . . .
reverse the direction of the opening	select Flip X.
reverse the top and bottom of the opening	select Flip Z.
reverse the position of the opening in the side of the wall	select Flip Y.

6 Click OK.

Specifying the Display of Sills for an Opening

Use this procedure to change the sill dimensions for an opening in the Sill Plan display representation.

You must use a display representation for an opening that has a sill. You can turn on the Sill Plan display representation in addition to the Plan display representation.

1 Right-click an existing opening, and click Edit Object Display.

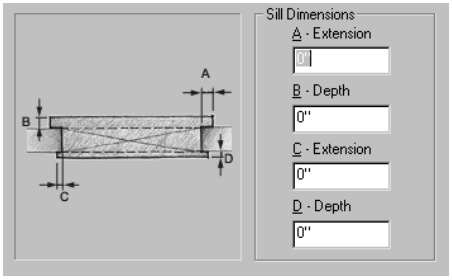
2 Click the Display Properties tab.

3 Select Sill Plan for Display Representations, and select Style Override.

4 If necessary, click .

5 Click the Other tab.

Opening Sill Dimensions



6 Under Sill Dimensions, enter the sill extension and depth dimensions.

Sill components A and B are for the outside of the opening. Sill components C and D are for the interior side.

7 Click the Layer/Color/Linetype tab.

8 Under Visible, click the icons to turn on visibility.

9 Click OK three times.

Changing the Location of an Opening

Use this procedure to relocate a freestanding opening by changing the coordinate values of its insertion point. The opening also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the opening are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the opening by aligning its normal with another axis. You can also rotate the opening on its plane by changing the rotation angle.

1 Double-click the opening.

2 On the Properties palette, expand Basic, and expand Location.

3 Click Additional information.

4 Specify a new location, orientation, or rotation angle:

If you want to . . .	**Then . . .**
relocate the opening	enter new coordinate values under Insertion Point.
locate the opening on the *XY* plane	make the normal of the opening parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the opening on the *YZ* plane	make the normal of the opening parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the opening on the *XZ* plane	make the normal of the opening parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the opening	enter a new value for Rotation Angle.

5 Click OK.

Attaching Hyperlinks, Notes, and Files to an Opening

Use this procedure to enter notes and attach hyperlinks or reference files to an opening. You can also edit reference files attached to the style.

1. Double-click the opening to which you want to attach information.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.
4. To add a note, click the setting for Notes, enter the note, and click OK.
5. Click the setting for Reference Docs.
6. Attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click OPEN.
edit the description of a reference file	select the description of the file, and edit the description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

7. Click OK.

Changing the Display Properties of Openings

You use the display properties of openings to control their appearance in a drawing. In addition, you can create custom components for openings by adding custom blocks to any display representation where you want the components to appear.

Related Topics and Procedures

- Specifying the Display Properties of an Opening

- Specifying the Hatching of an Opening
- Adding Components to an Opening
- Turning Off Custom Components in an Opening
- Removing Custom Components from an Opening

Specifying the Display Properties of an Opening

Use this procedure to change the properties of the following display components of an individual opening:

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE Openings do not have material assignments.

---

1. Select the opening you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation in which to display changes, and select Object Override.

   The display representation in bold is the current one.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Specifying the Hatching of an Opening

Use this procedure to specify the hatching of the components of an opening. Hatching is displayed only in display representations used in the Top view (plan view) of a drawing.

1. Select the opening you want to change, right-click, and click Edit Object Display.

2 Click the Display Properties tab.

3 Select the display representation in which to display the changes.

4 Specify whether changes apply to all openings, or only to the selected opening:

If you want to . . .	Then . . .
apply the hatching to all openings in the drawing	verify that Object Override is cleared, and click .
apply the hatching only to the selected opening	select Object Override. If necessary, click .

The display representation in bold is the current one.

5 Click the Layer/Color/Linetype tab.

6 Verify that the Hatch display component is turned on.

7 Click the Hatching tab.

8 Click the setting for Pattern.

9 Select the hatching:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-Defined for Type, and clear Double Hatch.
select double hatching	select User-Defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

10 Click OK.

11 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

12 Click Angle, and enter the angle for the selected pattern.

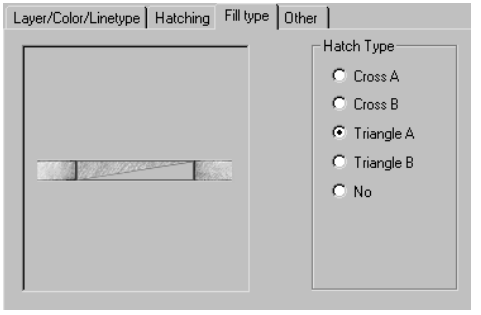
13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

14 Click the Fill type tab.

15 Select a graphic representation to use for hatching the opening.

Specifying hatching graphics for openings



16 Click OK twice.

Using Custom Blocks to Create Opening Components

You can add custom blocks for components, such as hardware, to the display components or to replace the default display components. You can have a different custom block for each display representation.

You can specify several rules for positioning and scaling the new component. Each custom block also appears in the display properties component list so that you can control its layer, color, and linetype.

If you create a custom block from mass elements, you can use the material assignments of the mass elements to determine the display properties of the custom block.

Be sure to set the properties of the objects used to create your custom blocks to ByBlock. Otherwise, you cannot control these objects through the display properties. For more information about ByBlock, see "Working with Layers and Properties" in the online *AutoCAD® 2004 User's Guide*.

Adding Components to an Opening

Use this procedure to add or edit custom block components in the display representation of openings.

1. Create a block for the component to add to the opening.

   Create the block in the same plane as the opening.

2. Select the opening you want to change, right-click, and click Edit Object Display.
3. Click the Display Properties tab.
4. Select the display representation in which to display the changes, and select Object Override.
5. If necessary, click .
6. Click the Other tab.
7. Specify whether to add or edit a block component:

If you want to . . .	Then . . .
add a new block component	click Add.
edit an existing block component	select the component to edit, and click Edit. Proceed to step 10.

8. Click Select Block.
9. Select the block to use, and click OK.
10. Specify whether you want to scale to fit the block component to the object by width, depth, and height, or to lock the *XY* ratio:

If you want to . . .	Then . . .
set the block scale to the width of the object	select Width.

If you want to . . .	Then . . .
set the block scale to the depth of the object	select Depth.
set the block scale to the height of the object	select Height.
scale the whole block equally, so that one direction is scaled to fit another of the scale criteria	select Lock XY Ratio.
scale the block to its original size	clear all options under Scale to Fit.

11 Specify whether to mirror the block in the *X*,*Y*, or *Z* direction:

If you want to . . .	Then . . .
create a mirror of the block in the *X* direction	select Mirror X.
create a mirror of the block in the *Y* direction	select Mirror Y.
create a mirror of the block in the *Z* direction	select Mirror Z.

12 Specify the *X*, *Y*, and *Z* location of the insertion point.

13 Specify an insertion offset of the block in the *X*, *Y*, and *Z* directions.

14 Click OK three times.

Turning Off Custom Components in an Opening

Use this procedure to turn off custom blocks in an opening.

You can turn off the display of component blocks without removing them from the opening.

1 Select the opening you want to change, right-click, and click Edit Object Display.

2 Click the Display Properties tab.

3 Select the display representation in which to turn off the display of the custom component, and select Object Override.

4 If necessary, click .

5 Click the Other tab.

6 Select Disable Custom Blocks.

7 Click OK twice.

Removing Custom Components from an Opening

Use this procedure to remove components from an opening.

Removing custom blocks deletes them from the opening.

1 Select the opening you want to change, right-click, and click Edit Object Display.

2 Click the Display Properties tab.

3 Select the display representation in which to remove the component, and select Object Override.

4 If necessary, click .

5 Click the Other tab.

6 Select the component to remove, and click Remove.

7 Click OK twice.

Roofs

20

Roofs are AEC objects that model an entire roof surface. You can create roofs "on the fly" or select a polyline shape and place a roof on that shape. You can also select closed walls and place a roof on the walls, change the slope of a roof, and edit its edges and faces.

To customize a roof, you convert it to individual roof slabs, offering tight control of the detail of the roof edges. You can customize the soffit and fascia of the roof slab edge as well as the angle and overhang of the edge.

Roof Slabs

A roof slab models a single face of a roof. Roof slab objects differ from roof objects because each slab is a separate entity with no direct connection to other entities. You can use multiple roof slabs to model an entire roof surface, but the combined topology (3D geometry) of the roof is not calculated automatically. For this reason, it is recommended that when you design complex roofs, you initially use the roof object. When the design is substantially complete, but more flexibility and detail are needed in the model, you can convert the roof to individual roof slabs.

While roof slabs do not dynamically interact with each other, they do allow significant control over the roof geometry. For example, you can trim roof slabs individually, extend them, and miter them with other slabs. You can cut holes in them, add or subtract mass elements, and apply detailed fascia and soffit profiles to any edge at any angle and orientation. Roof

In this chapter

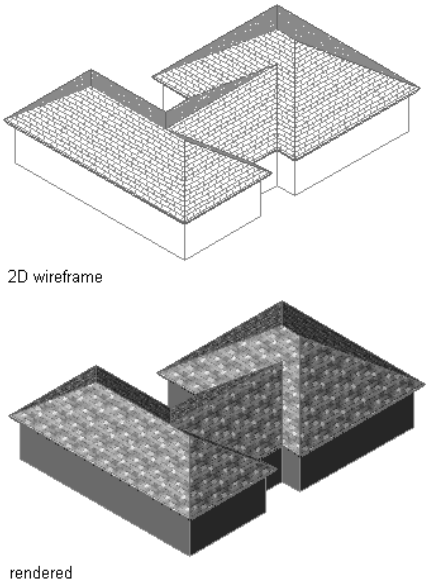
- Using Roof Tools to Create a Roof
- Creating a Slope Roof
- Creating a Gable Roof
- Creating a Roof from Walls or a Polyline
- Creating a Slope Roof with User-specified Settings
- Creating a Gable Roof with User-specified Settings
- Creating a Roof Tool
- Editing Roofs
- Creating Roof Slabs
- Using Roof Slab Tools to Create a Roof Slab
- Creating a Roof Slab
- Creating a Roof Slab with User-Specified Settings
- Creating a Roof Slab Tool
- Editing Roof Slabs
- Roof Slab Styles
- Roof Slab Edge Styles

slabs are also style-based, so you can apply design changes globally.

Materials in Roofs

You can assign materials to a roof. Materials are displayed in wireframe and working shade views, or when linked into Autodesk VIZ® Render. Materials have specific settings for the physical components of a roof, such as slab. For more information see, "Material Components and Display Properties" on page 498.

Viewing roofs in 2D wireframe and rendered views



Autodesk® Architectural Desktop provides predefined materials for common design purposes. These materials contain settings for roof components. You can use the predefined materials "as is," or modify them for your designs. You can also create your own materials. Object styles provided with the software have appropriate materials already assigned to them. For more information, see "Roof Slab Materials and Display Components" on page 1386 and "Material Components and Display Properties" on page 498.

Related Procedures

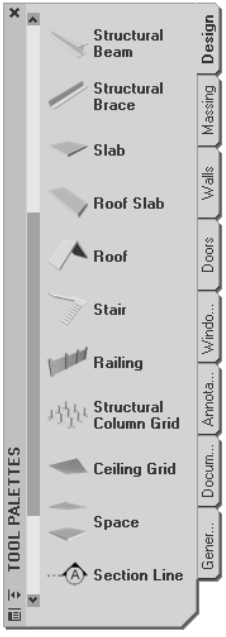
- Using Roof Tools to Create a Roof
- Creating a Slope Roof
- Creating a Gable Roof

- Creating a Roof from Walls
- Creating a Roof from a Polyline
- Creating a Slope Roof with User-specified Settings
- Creating a Gable Roof with User-specified Settings
- Creating a Roof Tool
- Editing Roofs
- Creating Roof Slabs
- Roof Slab Styles
- Roof Slab Edge Styles

Using Roof Tools to Create a Roof

Tools provided with Autodesk® Architectural Desktop let you quickly place roofs. You can use the default settings of the tool, or you can change the settings for roof properties. You can create roofs with single or double slopes and gable roofs. You can also use roof tools to convert linework and walls to roofs, and to apply the settings of a roof tool to existing roofs.

Tool palette containing roof tools



The default tool palettes in the workspace contain sample roof tools that you can use and customize as necessary. In addition, the following catalogs provided with the software contain roof tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- My Tool catalog

Custom palettes created by your CAD manager or other users may also contain roof tools with properties customized for your projects or office standards.

Related Procedures

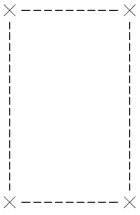
- Creating a Slope Roof
- Creating a Gable Roof
- Creating a Roof from Walls
- Creating a Roof from a Polyline
- Creating a Slope Roof with User-specified Settings
- Creating a Gable Roof with User-specified Settings
- Creating a Roof Tool

Creating a Slope Roof

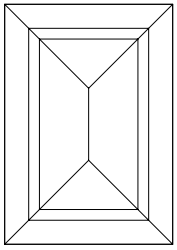
Use this procedure to add a slope roof that has the properties specified in the roof tool that you select. You can create a single slope or a double slope roof object. To specify settings when you add a roof, see "Creating a Slope Roof with User-specified Settings" on page 1319.

NOTE To add additional slopes to a roof face, right-click a roof object and click Edit Edges/Faces.

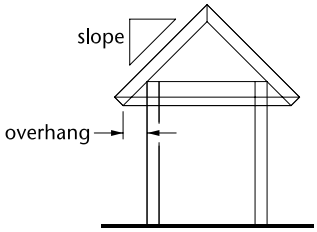
Creating a single slope roof



specify roof
corner points



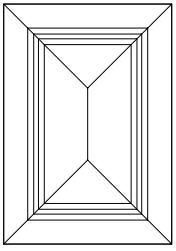
single slope roof



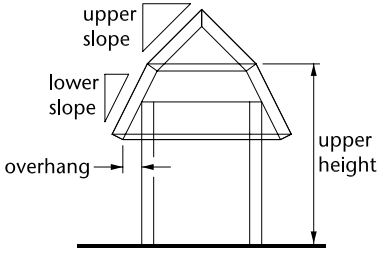
end elevation view

Creating a double slope roof

specify roof
corner points



double slope roof



end elevation view

1 Open the tool palette that you want to use, and select a roof tool.

   If necessary, scroll to display the tool that you want to use.

   A roof tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 On the Properties palette, select Single slope or Double slope for Shape.

3 In the drawing area, specify points for the corners of the roof.

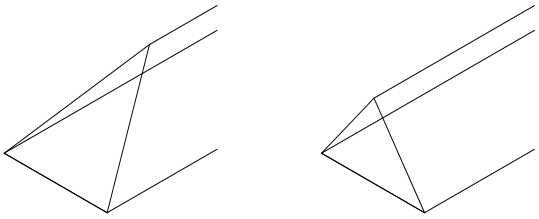
   You can move or hide the Properties palette to expose more of the drawing area.

4 When you are finished specifying points, press ENTER.

Creating a Gable Roof

Use this procedure to add a gable roof that has the properties specified in the roof tool that you select. You can create a single sloped roof and set each edge to gable as needed. You can specify a slope for the gable ends to create a hip. To specify settings when you add a roof, see "Creating a Gable Roof with User-specified Settings" on page 1320.

Viewing a gable roof end



sloped roof end gable roof end

NOTE You can create a gable on an existing roof by gripping any ridge line point and stretching it past the roof edge.

1. Open the tool palette that you want to use, and select a roof tool.

   If necessary, scroll to display the tool that you want to use.

   A roof tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. On the Properties palette, select Single slope for Shape.
3. In the drawing area, specify the first point for the first roof edge.

   You can move or hide the Properties palette to expose more of the drawing area.

4. Specify the second point to complete the first sloped roof edge.
5. On the Properties palette, select Gable for Shape.
6. In the drawing area, specify the next point to create a gable roof edge.
7. Select Single slope for Shape.
8. Specify the next point to create a sloped roof edge.
9. Select Gable slope for Shape.

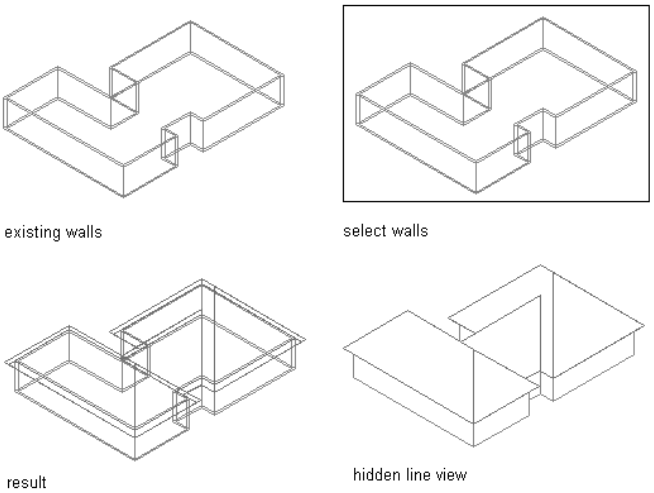
10 Specify additional points as needed to define the roof, and press ENTER.

Creating a Roof from Walls

Use this procedure to convert walls or a roof that has the properties of the roof tool that you select. You can edit these properties after creating the roof. The roof takes its plate height from the top of each wall segment.

NOTE If your walls are not properly "cleaned up," the roof conversion is unpredictable. For more information, see "Cleanup Group Definitions" on page 1826.

Creating a roof from walls



1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

A roof tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Right-click a roof tool, and click Apply Tool Properties to ➤ Linework and Walls.

3 Select the walls to convert, and press ENTER.

NOTE If the walls you select are not closed, a roof is added to the top of each wall segment.

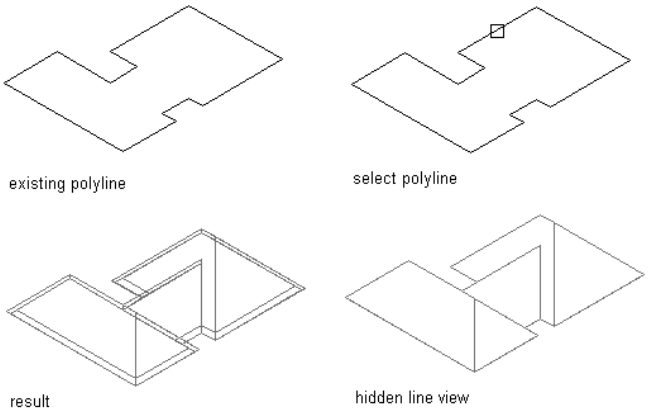
4 When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.

5 Edit the properties of the roof on the Properties palette, if needed.

Creating a Roof from a Polyline

Use this procedure to convert a two-dimensional (2D) polyline to a roof that has the properties of the roof tool you select. You can edit these properties after creating the roof.

Creating a roof from a polyline



1 Draw a closed 2D polyline in the shape of the intended roof, in the location where you want to place the roof.

2 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

A roof tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

3 Right-click a roof tool, and click Apply Tool Properties to ➤ Linework and Walls.

4 Select the polyline to convert, and press ENTER.

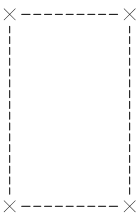
5 When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.

6 Edit the properties of the roof on the Properties palette, if needed.

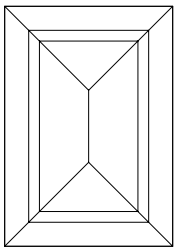
Creating a Slope Roof with User-specified Settings

Use this procedure to add a slope roof with settings that you specify. You can create a single slope or a double slope roof object.

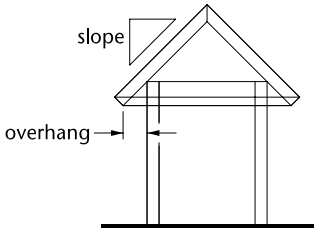
Creating a single slope roof



specify roof corner points

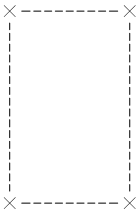


single slope roof

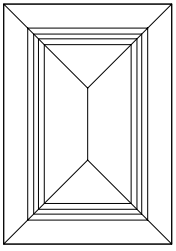


end elevation view

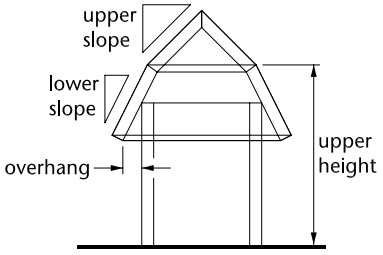
Creating a double slope roof



specify roof corner points



double slope roof



end elevation view

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1 Open the tool palette that you want to use, and select a roof tool.

If necessary, scroll to display the tool that you want to use.

A roof tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. On the Properties palette, expand Basic, and expand Next Edge.
3. Select Single slope or Double slope for Shape.
4. Enter a value for Overhang.
5. Expand Lower Slope, and enter values for Plate Height, Rise, and Slope.

   Plate height is the height of the bottom surface of the roof at its lowest edge (where the overhang begins). This is usually the height of the top plate of the wall that the roof sits on.

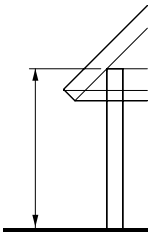


plate height

6. For a double slope roof, expand Upper Slope, and enter values for Upper Height, Rise, and Slope.
7. In the drawing area, specify points for the corners of the roof.

   You can move or hide the Properties palette to expose more of the drawing.

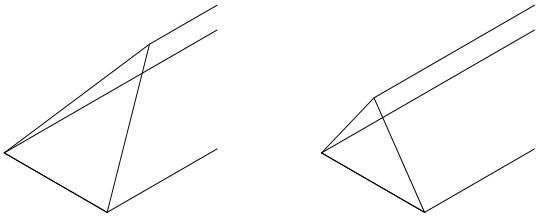
8. When you are finished specifying points, press ENTER.

Creating a Gable Roof with User-specified Settings

Use this procedure to add a gable roof with settings that you specify. You create a single sloped roof and set each edge to gable as needed. You can specify a slope for the gable ends to create a hip.

TIP You can create a gable on an existing roof by gripping any ridge line point and stretching it past the roof edge.

Viewing a gable roof end



sloped roof end gable roof end

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a roof tool.

   If necessary, scroll to display the tool that you want to use.

   A roof tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. On the Properties palette, expand Basic, and expand Next Edge.
3. Select Single slope for Shape.
4. In the drawing area, specify the first point for the first roof edge.

   You can move or hide the Properties palette to expose more of the drawing area.

5. Specify the second point to complete the first sloped roof edge.
6. On the Properties palette, select Gable for Shape.
7. In the drawing area, specify the next point to create a gable roof edge.
8. Select Single slope for Shape.
9. Specify the next point to create a sloped roof edge.
10. Select Gable slope for Shape.
11. Specify additional points as needed to define the roof, and press ENTER.

Creating a Roof Tool

Use this procedure to create a roof tool and add it to a tool palette. You may want to create your own roof tools if you are placing multiple roofs that have the same properties.

For example, you are creating an office building that has a multi-peaked roof. Although the entire roof is single sloped, each peak has a different slope. To work efficiently, you can create a roof tool for each slope, and select the appropriate tool to place the roofs with the correct slope on each area of the building.

1. Open the tool palette on which to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a roof in the drawing	select the object, and drag it to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from the Content Browser	open the Content Browser and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.
6. Expand Basic, and expand General.
7. Click the setting for Description, enter a description of the roof created from this tool, and click OK.
8. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.

9 Specify roof settings:

If you want to . . .	Then . . .
change the thickness value	expand Dimensions, and enter a value for Thickness.
change the type of edge	expand Dimensions, and select a new setting for Edge cut.
change the roof shape	expand Next Edge, and select a new setting for Shape.
add or remove the overhang, or change the overhang value	expand Next Edge, and enter a value for Overhang.
change the plate height	expand Lower Slope, and enter a value for Plate Height.
change the upper height for a double slope roof	expand Upper Slope, and enter a value for Upper Height.
change the rise or slope angle for each slope	expand Lower Slope, or Upper Slope for a double slope roof, and enter a value for Rise or Slope.

10 Click OK.

Editing Roofs

After placing roofs, you can edit any characteristics of the roof that you specified when you drew the roof. You can change the basic geometry of a roof, apply a different roof shape, and change the roof edge or overhang conditions.

Autodesk® Architectural Desktop offers several methods for editing roofs:

- Edit roofs directly using grips for dimensions and other physical characteristics.
- Change roof settings on the Properties palette.
- Select editing commands from the shortcut menu for a selected roof.

Related Procedures

- Using Grips to Edit Roofs

- Applying Tool Properties to an Existing Roof
- Changing the Dimensions of a Roof
- Changing the Edges and Faces of a Roof
- Converting a Roof to Roof Slabs
- Specifying the Material of a Roof
- Specifying the Display Properties of a Roof
- Specifying the Hatching of a Roof
- Changing the Location of a Roof
- Attaching Hyperlinks, Notes, or Files to a Roof

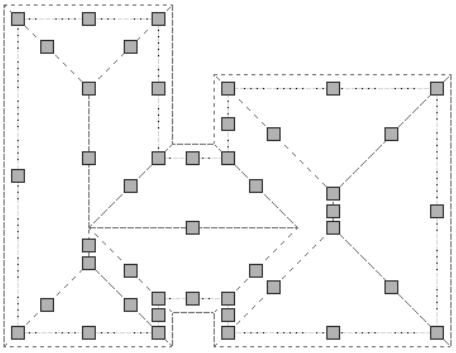
Using Grips to Edit Roofs

Refer to the illustrations and steps in this topic to use roof grips to edit roofs.

Editing Roof Dimensions

1. Select the roof.
2. Select the grip for the dimension you want to change.

   Roof grips



3. Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Applying Tool Properties to an Existing Roof

Use this procedure to apply the properties of a roof tool to one or more roofs. The properties include any settings specified in the tool you select.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

A roof tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Right-click a roof tool, and click Apply Tool Properties to ➤ Roof.
3. Select the roof, and press ENTER.
4. When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.
5. Edit the properties of the roof on the Properties palette, if necessary.

Changing the Dimensions of a Roof

Use this procedure to change the dimensions of a roof, including the plate height, the upper height for a double slope (gambrel) roof, the slope, and the depth of the overhang. You can also change the thickness of the roof slabs and the type of roof edge.

NOTE You can create a gable end on a roof by gripping any ridge line point and stretching it past the roof edge.

1. Select the roof.
2. On the Properties palette, specify roof settings:

If you want to . . .	Then . . .
change the thickness value	under Dimensions, enter a value for Thickness.
change the type of edge	under Dimensions, select a new setting for Edge cut.
change the number of slopes	under Dimensions, select a new setting for Shape.
add or remove the overhang, or change the overhang value	under Dimensions, enter a value for Overhang.
change the plate height	under Lower Slope, enter a value for Plate Height.
change the upper height for a double slope roof	under Upper Slope, enter a value for Upper Height.

If you want to . . .	Then . . .
change the rise or slope angle for each slope	under Lower Slope, or Upper Slope for a double slope roof, enter a value for Rise or Slope.

Changing the Edges and Faces of a Roof

Use this procedure to edit the edges and faces of a roof. You can edit:

- the height and overhang of individual edges
- the number of segments and the radius for curved segments
- the height and slope of individual roof faces

1 Select the roof you want to change, right-click, and click Edit Edges/Faces.

2 Select roof edges that you want to change and press ENTER.

As you select edges, they are numbered consecutively, beginning with zero, for display in the dialog box.

3 Specify new values for each roof edge:

If you want to . . .	Then . . .
change the height of a roof edge	select Height for the roof edge, and enter the height value.

If you want to . . .	Then . . .
change the overhang of a roof edge	select Overhang for the roof edge, and enter the overhang value.
change the number of segments in a curved roof for a roof edge	select Segments for the roof edge, and enter the number of segments.
change the radius of the curved roof edge	select Radius for the roof edge, and enter the radius.

4 Specify new dimensions for the roof faces of the selected edges:

If you want to . . .	Then . . .
change the height of a roof face	select Height for the roof face, and enter the height value.
change the slope of a roof face	select Slope for the roof face, and enter the slope value.
add a face to the selected edge	click the blank space under the last number in the Face column, and enter values for Height and Slope.
remove a roof face	select the Face column number, and press DELETE.

5 Click OK.

Converting a Roof to Roof Slabs

Use this procedure to convert a roof to roof slabs. Roof slabs are beneficial when you need additional flexibility and detail. Roof slab objects differ from roof objects because each slab is a separate entity, defined by its perimeter, edge conditions, and style. Roof slabs are also style based, so you can apply design changes globally.

For more information about working with roof slabs, see "Creating Roof Slabs" on page 1332.

1 Select the roof you want to convert, right-click, and click Convert to Roof Slabs.

2 When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.

3 When prompted to specify a roof slab style name, press ENTER to specify the Standard style, or enter a style name.

   Enter **?** for a list of defined roof slab styles in the drawing.

4 Edit the properties of the roof on the Properties palette, if necessary.

Specifying the Material of a Roof

Use this procedure to select a different material for the components of an individual roof.

NOTE If a material assignment does not determine the display properties of the roof component, you can change the properties of the display component as described in "Specifying the Display Properties of a Roof" on page 1328.

---

1 Select the roof you want to change, right-click, and click Edit Object Display.

2 To verify that the material assignment determines the display properties of the component, click the Display Properties tab, select the display representation in which to display the changes, and click .

3 Click the Layer/Color/Linetype tab, verify that By Material is selected for the component, and click OK.

4 Click the Materials tab.

5 Select the component you want to change, and select a different material definition.

   You can select any material definition in the current drawing,

   or click to create a new one and assign it to a component.

   WARNING! Although you can edit a material definition from this dialog box, any changes you make apply to all objects that are assigned the material.

   ---

6 Click OK.

Specifying the Display Properties of a Roof

Use this procedure to change the following properties of the display components of an individual roof:

- Visibility (display component is on or off)

- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE If a material assignment determines the properties of a roof display component, you can change the properties of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Specifying the Material of a Roof" on page 1328.

1. Select the roof you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation in which to display the changes, and select Object Override.

   The display representation in bold is the current one.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Specifying the Hatching of a Roof

Use this procedure to specify the hatching of the components of an individual roof. Hatching is displayed only in the section display representation.

NOTE If a material assignment determines the hatching properties of a roof display component, you can change the hatching of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Specifying the Material of a Roof" on page 1328.

1. Select the roof you want to change, right-click, and click Edit Object Display.

2. Click the Display Properties tab.
3. Select the Section display representation, and select Style Override.
4. If necessary, click .
5. Click the Hatching tab.
6. Select the display component, and click the setting for Pattern.
7. Select the hatching for the display component:

If you want to . . .	Then . . .
specify a hatching pattern that is available in the software	select Predefined for Type, and select a pattern.
specify a custom pattern	select Custom for Type, and enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder that contains the custom pattern file.
specify single hatching	select User-Defined for Type, and clear Double Hatch.
specify double hatching	select User-Defined for Type, and select Double Hatch.
specify solid fill	select Solid Fill for Type.

8. Click OK.
9. Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.
10. Click Angle, and enter the angle for the selected pattern.
11. Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the roof slab, regardless of the roof slab rotation	select Object.
orient the hatching to the world coordinate system	select Global.

12. Click X Offset and Y Offset, and enter offset values.
13. Click OK twice.

Changing the Location of a Roof

Use this procedure to relocate a roof by changing the coordinate values of its insertion point. The roof also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the roof are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the roof by aligning its normal with another axis. You can also rotate the roof on its plane by changing the rotation angle.

For information about the WCS and UCS, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Select the roof you want to change.
2. On the Properties palette, expand Basic, and expand Location.
3. Select Additional information.
4. Specify the location of the roof:

If you want to . . .	Then . . .
relocate the roof	enter new coordinate values under Insertion Point.
locate the roof on the *XY* plane	make the normal of the roof parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the roof on the *YZ* plane	make the normal of the roof parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the roof on the *XZ* plane	make the normal of the roof parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the roof	enter a new value for Rotation Angle.

5. Click OK.

Attaching Hyperlinks, Notes, or Files to a Roof

Use this procedure to attach hyperlinks, notes, or files to a roof. You can also edit hyperlinks and notes, and edit or detach reference files from a roof.

1. Select the roof to which you want to attach information.
2. On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 Click OK.

5 To add a note, click the setting for Notes, and enter the note.

6 Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK twice.

Creating Roof Slabs

A roof slab models a single face of a roof. A slab is a three-dimensional (3D) body, bounded by a planar polygon (perimeter), of any shape, and with multiple edges. Each roof slab is defined by its perimeter, edge conditions, and style.

Roof slab objects differ from roof objects because each slab is a separate entity with no direct connection to other entities. You can use multiple roof slabs to model an entire roof surface, but the combined topology (3D geometry) of the roof is not calculated automatically. For this reason, it is recommended that when you design complex roofs, you initially use the roof object. When the design is substantially complete, but more flexibility and detail are needed in the model, you can convert the roof to individual roof slabs.

While roof slabs do not dynamically interact with each other, they do allow significant control over the roof geometry. For example, you can trim roof slabs individually, extend them, and miter them with other slabs. You can cut

holes in them, add or subtract mass elements, and apply detailed fascia and soffit profiles to any edge at any angle and orientation. Roof slabs are also style based, so you can apply design changes globally.

Methods of Creating Roof Slabs

You can create roof slabs independently, convert them from existing roofs, or create them from existing objects such as walls and polylines. Roof slabs created from roofs do not maintain a link to the original roof object, but roof slabs give you greater control over their geometry and detail.

Pitched roofs are usually designed by specifying a plate line and a slope angle. Roof slabs are designed so that you can use the same approach in laying them out. To add a roof slab, you simply specify two points and an angle.

If you have a traditionally designed roof created from a two-dimensional (2D) plan showing ridge, hip, and valley lines, you can simply "trace" over that plan with roof slabs, specifying the desired height and slope. From these values and the specified points, the software creates the correct three-dimensional (3D) model.

Roof Slab Body

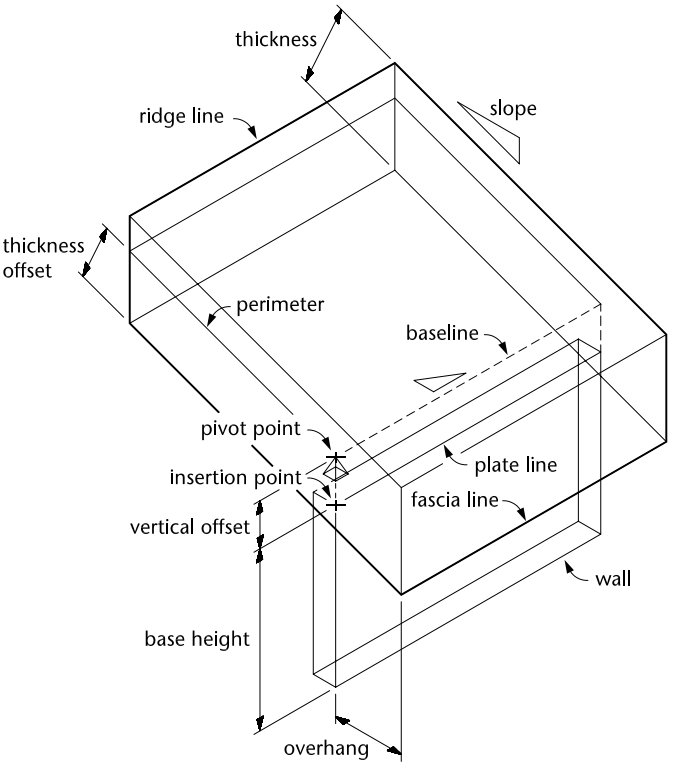
The body of a roof slab is an extrusion perpendicular to the plane of the perimeter and is defined by the following geometry:

- The *perimeter* of a roof slab is a planar polygon defined by the *X,Y,Z* coordinates of its vertices.
- A roof slab has three or more *vertices*, with the ability to add or remove vertices. Each pair of vertices defines an edge.
- The *thickness* of a roof slab extrusion is specified either in the roof slab style, when it has a fixed thickness, or for each roof slab.
- The *position* of the slab bottom, relative to its perimeter plane, is controlled by the thickness offset value in the roof slab style.
- The *baseline* of a roof slab is defined by the first two points you select when defining the roof slab vertices.
- The roof slab *insertion point*, by default, is the first point on the baseline. You can offset the baseline either horizontally or vertically from the insertion point to allow for precise alignment with walls or structural elements.
- A roof slab has a *slope* (pitch), which you can specify either as an angle or as a rise-to-run ratio. If you change the slope, the roof slab rotates around the slope pivot point.
- The *pivot point* is initially the first vertex of the baseline, but you can move it to any other point, either on or off the slab. A small pyramid-shaped marker represents the pivot point.
- An imaginary line passing through a roof slab at the perimeter line (in section) is called the *slopeline*. The slopeline aligns the roof slab with the wall base height. The slopeline is the position of the roof slab baseline relative

to its bottom face. The value you enter for the thickness offset in the roof slab style determines the distance between the roof slab baseline and the bottom face of the slab.

The following illustration shows a roof slab.

Geometry of a roof slab



Roof Slab Edge

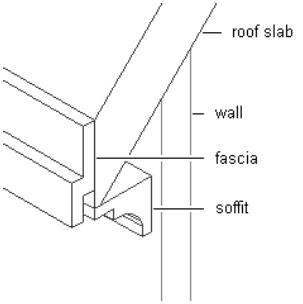
The following parameters define a roof slab edge:

- orientation (plumb or square)
- angle (relative to the orientation)
- edge style (fascia and soffit)
- overhang (defines the point at which the fascia begins)

You apply fascia and soffits to roof slab edges through roof slab edge styles:

- The *fascia* is defined by a profile, with its insertion point located at the top of the roof slab edge. The local *Y* axis of the profile polyline aligns with the roof slab edge angle.
- The *soffit* is also defined by a profile, with its insertion point positioned at the *X* and *Y* offsets from the fascia insertion point.

Viewing roof slab fascia and soffit components



Edge Control

You can customize each roof slab edge individually, applying styles and making other adjustments as required by your design. A roof slab edge style defines the fascia and soffit design from profiles that you create for these components. You can specify whether the style uses a fascia, a soffit, both, or neither. You also specify how the fascia and soffit are positioned relative to the roof slab.

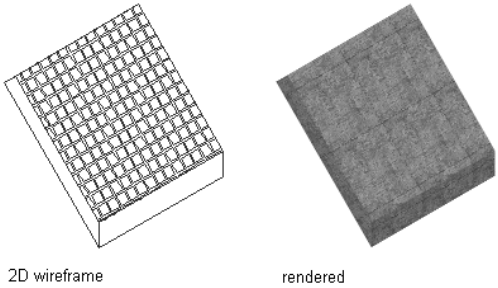
Roof Slab Styles

Roof slabs are style based. Use roof slab styles to create default properties for dimensions, edge styles for fascias and soffits, and entity properties for layer, color, and linetype. Roof slab styles allow you to use a different style for each edge of the roof and to apply design changes globally. For example, you can update all roof edges of the same style with a different fascia.

Materials in Roof Slabs

You can assign materials to a roof slab. Materials are displayed in wireframe and working shade views, or when linked into VIZ®Render. Materials have specific settings for the physical components of a roof slab, such as fascia and soffits.

Viewing roof slab in 2D wireframe and rendered views



Autodesk® Architectural Desktop provides predefined materials for common design purposes. These materials contain settings for roof slab components. You can use the predefined materials "as is", or modify them for your designs. You can also create your own materials. Object styles provided with the software have appropriate materials already assigned to them. For more information, see "Roof Slab Materials and Display Components" on page 1386 and "Roof Slab Edge Materials and Display Components" on page 1405.

Editing Roof Slabs

In addition to the control that roof slab styles and roof edge styles provide, roof slab tools let you edit roof slabs to fit unique conditions. You can add holes to roof slabs for structures such as chimneys and vent pipes. You can also use roof slabs to create dormers.

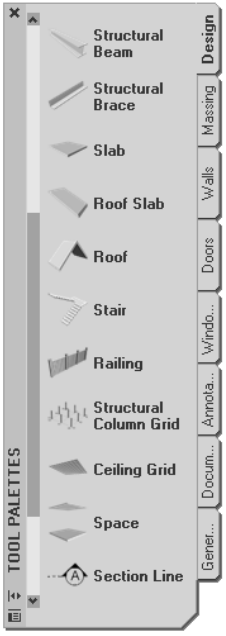
Related Procedures

- Using Roof Slab Tools to Create a Roof Slab
- Creating a Roof Slab
- Creating a Roof Slab from a Roof
- Creating a Roof Slab from Walls
- Creating a Roof Slab from a Polyline
- Creating a Roof Slab with User-Specified Settings
- Creating a Roof Slab Tool
- Editing Roof Slabs
- Roof Slab Styles
- Roof Slab Edge Styles

Using Roof Slab Tools to Create a Roof Slab

Tools provided with Autodesk® Architectural Desktop let you quickly place roof slabs. You can use the default settings of the tool, or you can change the settings for roof slab properties. You can also use roof slab tools to convert linework, walls, and roofs to roof slabs, and to apply the settings of a roof slab tool to existing roof slabs.

Tool palette containing roof slab tools



The default tool palettes in the workspace contain sample roof slab tools that you can use and customize as necessary. In addition, the following catalogs provided with the software contain roof tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- My Tool catalog

Custom palettes created by your CAD manager or other users may also contain roof slab tools with styles and properties customized for your projects or office standards.

Related Procedures

- Using Roof Slab Tools to Create a Roof Slab
- Creating a Roof Slab
- Creating a Roof Slab from a Roof
- Creating a Roof Slab from Walls
- Creating a Roof Slab from a Polyline
- Creating a Roof Slab with User-Specified Settings
- Creating a Roof Slab Tool

Creating a Roof Slab

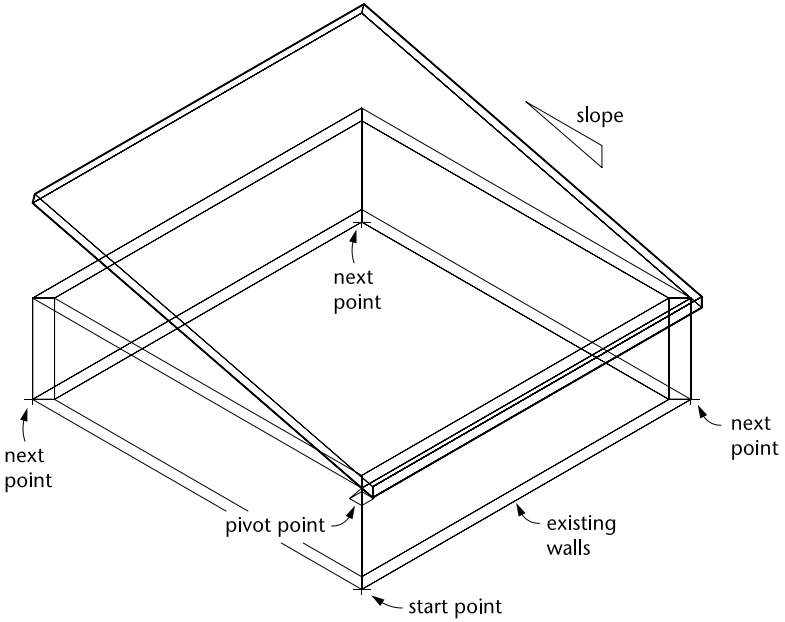
Use this procedure to add a roof slab that has the properties specified in the roof slab tool that you select. To specify settings when you add a roof slab, see "Creating a Roof Slab with User-Specified Settings" on page 1345.

You add the roof slab by specifying points to define the perimeter of a roof slab

- The first point determines the insertion point of the slab and locates the default pivot point.
- The second point determines the endpoint of the roof slab baseline.
- Subsequent points establish the vertices of the roof slab perimeter.

The baseline is always the first edge of the slab perimeter.

Creating a roof slab



1 Open the tool palette that you want to use, and select a roof slab tool.

   If necessary, scroll to display the tool that you want to use.

   A roof slab tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Specify points to define the perimeter of the roof slab.

   You can move or hide the Properties palette to expose more of the drawing area.

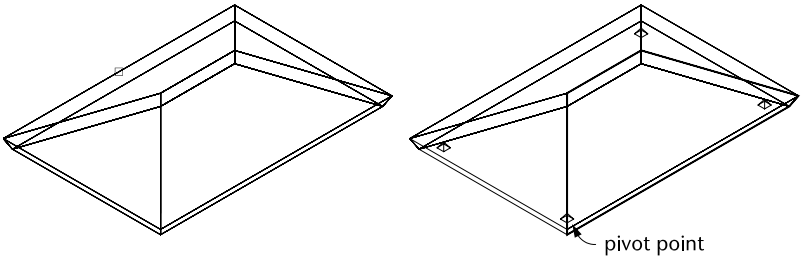
3 When you have finished specifying points, press ENTER.

Creating a Roof Slab from a Roof

Use this procedure to convert a roof to individual roof slabs that have the properties of the roof slab tool you select. You can edit these properties after creating the roof slabs. You can also edit the edges of the slabs to add a fascia and soffit.

When you convert a roof, multiple roof slabs are created. These slabs reproduce the original roof as closely as possible, using the properties of the roof slab tool you select.

Converting a roof to roof slabs



select roof to convert

resulting individual roof slabs

TIP To create roof slabs with the same overhang as the roof, use a roof slab tool defined with a roof slab edge style that has the same default overhang as the roof.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

   A roof slab tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Right-click a roof slab tool, and click Apply Tool Properties to ➤ Linework, Walls and Roof.
3. Select the roof to convert, and press ENTER.
4. When prompted to erase the original geometry, press ENTER to keep the existing roof, or enter **y** (Yes) to erase it.
5. Edit the properties of the roof slabs on the Properties palette, if needed.

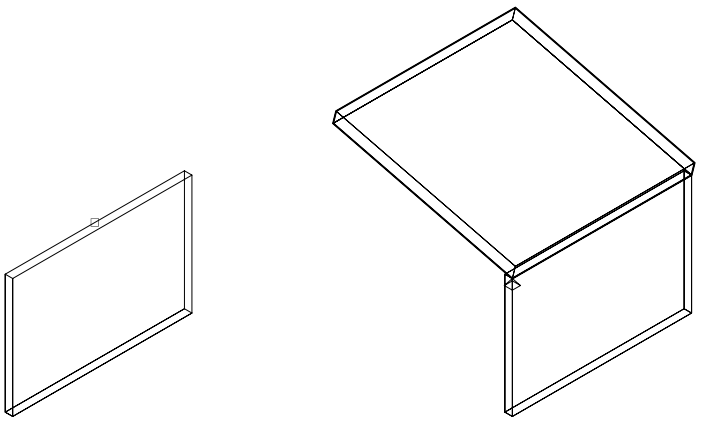
Creating a Roof Slab from Walls

Use this procedure to convert one or more walls to a roof slab that has the properties of the roof slab tool you select. You can edit these properties after creating the roof slab.

When creating a roof slab from a single wall, the baseline edge of the roof slab is defined as the base height of the wall. When creating a roof slab from multiple walls, the baseline edge is defined by the top of the first selected wall.

TIP Use this conversion command to place roof slabs on top of existing walls. The Convert to Roof Slabs command, accessed by right-clicking an existing roof object, is useful when you want a specific alignment between the slab baseline and the wall baseline.

Creating a roof slab from a wall



select wall to convert

resulting roof slab

NOTE When selecting multiple walls, if your walls are not properly "cleaned up," the roof slab conversion is unpredictable. For more information, see "Cleanup Group Definitions" on page 1826.

1 Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

   A roof slab tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Right-click a roof slab tool, and click Apply Tool Properties to ➤ Linework, Walls and Roof.

3 Select the walls you want to convert, and press ENTER.

NOTE When selecting multiple walls, if the walls are not closed, a roof slab is added to the top of each wall segment.

4 When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.

5 Specify a justification method:

If you want to . . .	Then . . .
align the top of the slab with the wall base height	enter **t** (Top), and press ENTER.
align the center of the slab with the wall base height	enter **c** (Center), and press ENTER.
align the bottom of the slab with the wall base height	enter **b** (Bottom), and press ENTER.
align the slopeline of the slab with the wall base height	enter **s** (Slopeline), and press ENTER.

NOTE This justification is used only for the insertion of a roof slab. It is not retained as a setting of the roof slab object.

The slopeline is the position of the slab baseline relative to its bottom face. The thickness offset in the slab style determines the distance between the slab baseline and the bottom face of the slab.

6 Specify the justification for edge alignment:

If you want to . . .	Then . . .
align the baseline edge of the roof slab to the left side of the wall, based on the direction the wall was drawn	enter **l** (Left), and press ENTER.
align the baseline edge of the roof slab to the center of the wall	enter **c** (Center), and press ENTER.
align the baseline edge of the roof slab to the right side of the wall, based on the direction the wall was drawn	enter **r** (Right), and press ENTER.

If you want to . . .	Then . . .
align the baseline edge of the roof slab to the baseline of the wall	enter **b** (Baseline), and press ENTER.

7 When prompted to specify the slope direction, press ENTER for left, or enter **r** (Right) for right.

This is based on the direction the wall was drawn.

8 Edit the properties of the roof slabs on the Properties palette, if necessary.

Creating a Roof Slab from a Polyline

Use this procedure to convert a two-dimensional (2D) polyline to a roof slab that has the properties of the roof slab tool you select. You can edit these properties after creating the roof slab. The first line drawn in the polyline becomes the baseline edge of the roof slab.

Converting a polyline to a roof slab is useful when you need to create a complex roof slab, or a roof slab with curved edges.

The smoothness (tessellation) of curved edges is controlled by the FACETDEV variable. For more information about FACETDEV, see "AEC Facet Deviation" on page 1409.

1 Draw a closed 2D polyline in the shape of the intended roof slab, in the location where you want to place the roof slab.

2 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

A roof slab tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

3 Right-click a roof slab tool, and click Apply Tool Properties to ➤ Linework, Walls and Roof.

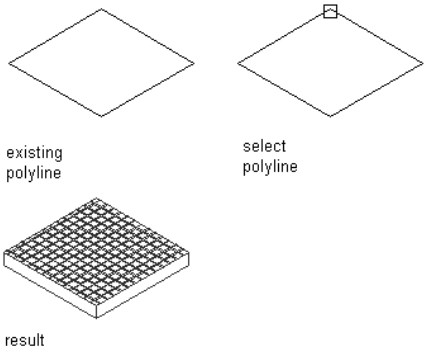
4 Select the polyline you want to convert, and press ENTER.

5 When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.

6 Specify a mode:

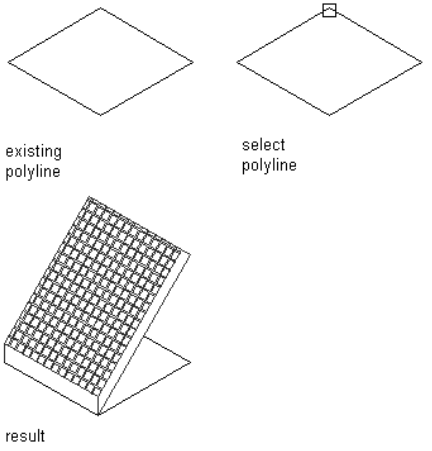
If you enter **d** (Direct), the polyline vertices become the vertices of the roof slab perimeter. Any slope value for the roof slab is ignored.

Converting a polyline to a roof slab using direct mode



If you enter **p** (Projected), you are prompted for the base height of the roof slab. The *X,Y* coordinates of the first polyline vertex are projected to a Z value of the base height. This establishes the insertion point. The offset values determine the start point of the baseline.

Converting a polyline to a roof slab using projected mode



7 Enter a value for Base Height.

This is available only if you selected Projected mode.

8 Specify a justification method:

If you want to . . .	Then . . .
align the slab top with the polyline (or base height, when using projected mode)	enter **t** (Top), and press ENTER.
align the slab center with the polyline (or base height, when using projected mode)	enter **c** (Center), and press ENTER.
align the slab bottom with the polyline (or base height, when using projected mode)	enter **b** (Bottom), and press ENTER.
align the slab slopeline with the polyline (or base height, when using projected mode)	enter **s** (Slopeline), and press ENTER.

NOTE This justification is used only for the insertion of a roof slab. It is not retained as a parameter of the roof slab object.

The slopeline is the position of the slab baseline relative to its bottom face. The thickness offset in the slab style determines the distance between the slab baseline and the bottom face of the slab.

9 Edit the properties of the roof slab on the Properties palette, if necessary.

Creating a Roof Slab with User-Specified Settings

Use this procedure to add a roof slab with settings that you specify. You can create a flat roof slab that follows the outline of multiple walls by specifying a zero slope. If you select multiple walls and a non-zero slope, multiple roof slabs are created.

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1 Open the tool palette that you want to use, and select a roof slab tool. If necessary, scroll to display the tool that you want to use.

A roof slab tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 On the Properties palette, expand Basic, and expand General.

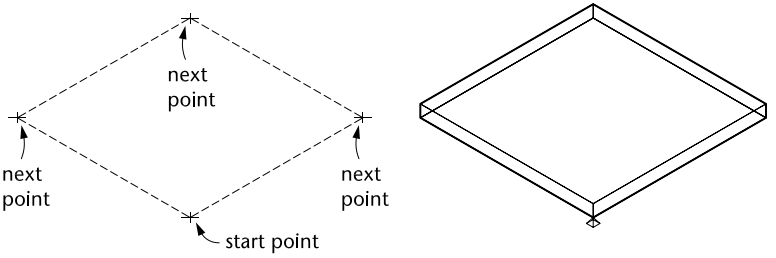
3 Select a roof slab style.

4 Select Projected or Direct for Mode.

If you select Projected, the *X,Y* coordinates of the first point are projected to a *Z* value of the current base height. This establishes the insertion point. The second point establishes the baseline. All subsequent points are projected to a plane established by the baseline and the specified slope angle. This mode is provided for architects who wish to lay out a roof by tracing over a plan drawing.

If you select Direct, the points specified become the vertices of the roof slab perimeter.

Adding a roof slab using direct mode



specify corner points

resulting roof slab

5 Expand Dimensions.

6 Enter a value for Thickness.

7 Enter a value for the vertical offset distance from the insertion point for Vertical Offset.

8 Enter a value for the horizontal offset distance from the insertion point for Horizontal Offset.

9 Select the justification:

If you want to . . .	Then . . .
align the top of the added roof slab with the first specified point	select Top.

If you want to . . .	Then . . .
align the center of the added roof slab with the first specified point	select Center.
align the bottom of the added roof slab with the first specified point	select Bottom.
align the slopeline of the added roof slab with the first specified point	select Slopeline.

NOTE This justification is used only for inserting a roof slab. It is not retained as a setting of the roof slab. Justification is intended primarily for Direct mode.

The slopeline is the position of the roof slab baseline relative to its bottom face. The thickness offset in the slab style determines the distance between the slab baseline and the bottom face of the slab.

10 Enter a value for the height of the roof slab insertion point for Base Height.

This is available only when you select Projected mode.

11 Select a direction to specify how the slab is drawn relative to the baseline.

12 Enter a value for the depth of the overhang for Overhang.

13 Select a style for Baseline edge.

14 Select a style for Perimeter edge.

15 Expand Slope, and enter values for Rise, Run, and Angle.

This is available only when you select Projected mode.

16 In the drawing area, specify a point for the start point of the roof slab.

You can move or hide the Properties palette to expose more of the drawing area.

17 Specify a second point for the first edge (baseline) of the roof slab.

18 Specify further points to define the roof slab:

If you want to . . .	Then . . .
close the roof slab by drawing two edges that meet at a right angle	click Ortho Close, and then specify a point in the direction you want the roof slab to close. The edge is extended until it meets a roof slab edge perpendicular to the first roof slab edge.
close the slab by adding an edge from the previous point to the start point of the slab	enter **Close**.

For more information, see "Ortho Close and Close" on page 1408.

19 Continue adding roof slabs, and press ENTER.

Creating a Roof Slab Tool

Use this procedure to create a roof slab tool and add it to a tool palette. You may want to create your own roof slab tools if you are placing multiple roof slabs of specific styles that have the same properties.

For example, you are creating an office building that has a complex roof system. Although all sections of pitched roof use the same roof slab and edge style, each roof slab has a different slope. To work efficiently, you can create a roof slab tool for each slope, and select the appropriate tool to place the roof slabs with the correct slope for each section of the roof.

1 Open the tool palette on which to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a roof slab in the drawing	select the object, and drag it to the tool palette.
copy a tool from a roof slab style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.

If you want to . . .	Then . . .
copy a tool from another tool palette	right-click the tool, and click Copy. Open the other palette, and click Paste.
copy a tool from a tool catalog	open the catalog in the Content Browser and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.
6. Expand Basic, and expand General.
7. Click the setting for Description, enter a description of the roof slab created from this tool, and click OK.
8. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.
9. Select a roof slab style.
10. Select the drawing file containing the style used for this roof slab.
11. Select Projected or Direct for Mode.

    If you select Projected, the *X,Y* coordinates of the first point are projected to a *Z* value of the current base height. This establishes the insertion point. The second point establishes the baseline. All subsequent points are projected to a plane established by the baseline and the specified slope angle. This mode is provided for architects who wish to lay out a roof by tracing over a plan drawing.

    If you select Direct, the points specified become the vertices of the roof slab perimeter.

12. Expand Dimensions, and specify roof slab settings:

If you want to . . .	Then . . .
change the thickness value	enter a value for Thickness.
change the offset in the vertical direction	enter a value for Vertical offset.
change the offset in the horizontal direction	enter a value for Horizontal offset.

If you want to . . .	Then . . .
change the justification method	select a method for Justify. Justification is intended primarily for Direct Mode.
change the height of the roof slab insertion point	enter a value for Base height. This is available only when you select Projected mode.
change the direction that the slab is drawn relative to the baseline	select Left or Right for Direction.
add or remove the overhang, or change the overhang value	enter a value for the depth of the overhang for Overhang.
change the baseline edge style	select a style for Baseline edge.
change the perimeter edge style	select a style for Perimeter edge.
change the location of the edge style	select a drawing that contains the edge style.
change the slope	enter values for Rise, Run, or Angle. These values are available only when you select Projected mode.

13 Click OK.

Editing Roof Slabs

After placing roof slabs, you can edit any characteristics of the roof slab that you specified when you drew the roof slab. You can trim, extend, miter, and cut roof slabs into the shape you need. You can use other editing functions, such as adding a vertex, adding a hole, adding a dormer, or adding objects to the roof slab. You can change the style, dimensions, edge properties and location of the roof slab. You can also edit each roof slab edge individually.

Autodesk®Architectural Desktop offers several methods for editing roof slabs:

- Edit roof slabs directly using grips for dimensions and other physical characteristics.
- Change roof slab settings on the Properties palette.

- Select editing commands from the shortcut menu for a selected roof slab.

Related Procedures

- Using Grips to Edit Roof Slabs
- Applying Tool Properties to an Existing Roof Slab
- Changing the Thickness and Offsets of a Roof Slab
- Changing the Slope of a Roof Slab
- Changing the Style of a Roof Slab
- Changing the Edges of a Roof Slab
- Trimming a Roof Slab
- Extending a Roof Slab
- Mitering Roof Slabs by Intersection
- Mitering Roof Slabs Using Edges
- Cutting a Roof Slab
- Adding a Vertex to a Roof Slab
- Deleting a Vertex from a Roof Slab
- Adding a Hole to a Roof Slab
- Removing a Hole from a Roof Slab
- Creating a Clipped Gable Roof
- Adding Objects to a Roof Slab (Boolean)
- Subtracting Objects from a Roof Slab (Boolean)
- Removing Objects from a Roof Slab (Boolean)
- Creating a Dormer in a Roof Slab
- Specifying the Material of a Roof Slab
- Specifying the Display Properties of a Roof Slab
- Specifying the Hatching of a Roof Slab
- Specifying the Cut Plane Height of a Roof Slab
- Changing the Location of a Roof Slab
- Attaching Hyperlinks, Notes, or Files to a Roof Slab

Using Grips to Edit Roof Slabs

Refer to the illustrations and steps in this topic to use roof slab grips to edit roof slabs. Additional grips are available depending on the view direction. For example, in a three-dimensional (3D) isometric view, grips are available for editing the roof angle, vertical and horizontal offsets, and the roof thickness.

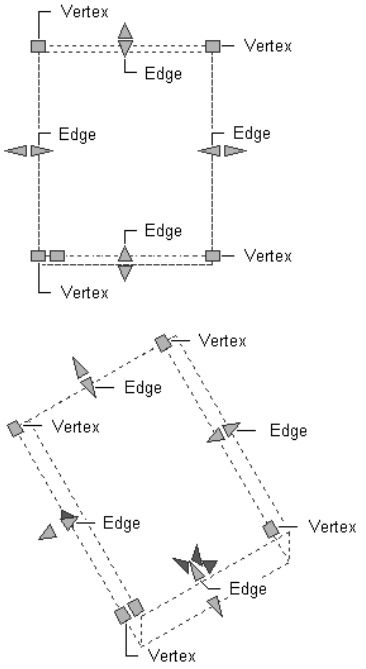
Normal grip editing of roof slabs maintains the slope angle of the slab regardless of the *Z* value of the specified point.

NOTE The pivot point is unaffected by editing the roof slab edges with grips.

Editing Roof Slab Dimensions

1. Select the roof slab.
2. Select an Edge grip for the dimension you want to change.

   Viewing Roof Slab Edge and Vertex Grips



3. Move the grip until the dimension value you want is displayed, and click once, or enter a value.

   When you select and grip edit an edge grip of a roof slab, moving the grip point maintains the plane and the angles of the adjacent sides of the roof slab.

Changing the Location or Position of a Roof Slab

1. Select the roof slab.
2. Press SHIFT and select two or more Vertex grips.

3 Select a highlighted grips, move the grip to change the location of the roof slab, and click once.

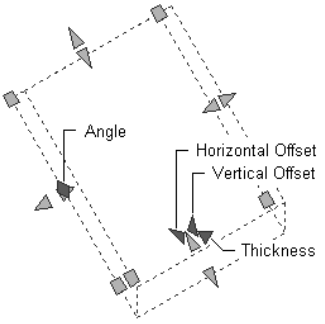
After selecting a grip, you can also enter a value for the total distance to move the roof slab.

Changing the Location or Position of the Pivot Point

1 Select the roof slab.

2 Select the Pivot Point grip.

Viewing Roof Slab Pivot point, Horizontal and Vertical Offset, and Angle grips



3 Move the grip to change the location, or enter *X, Y,* and *Z* values.

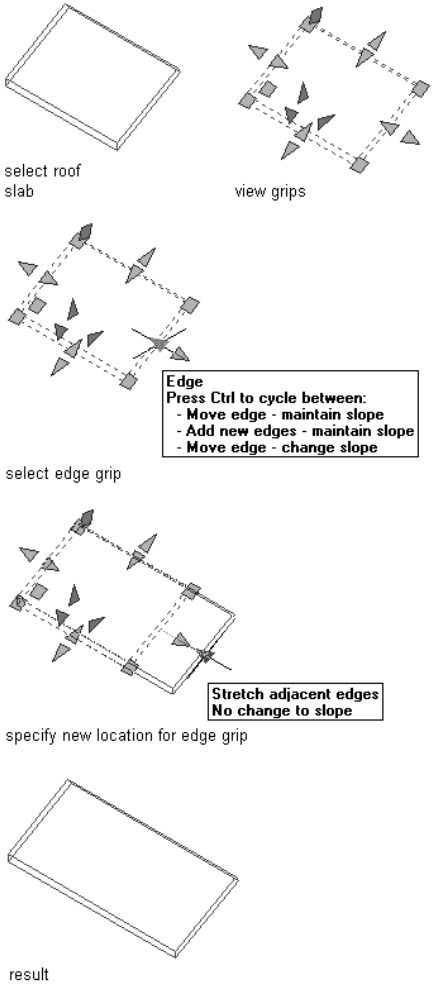
If you specified Yes for Hold Fascia Elevation on the Properties palette, the pivot point is ignored.

Creating Roof Slab Edges

1 Select the roof slab.

2 Press CTRL and select an Edge grip.

Editing a Roof Slab with its Edge grip

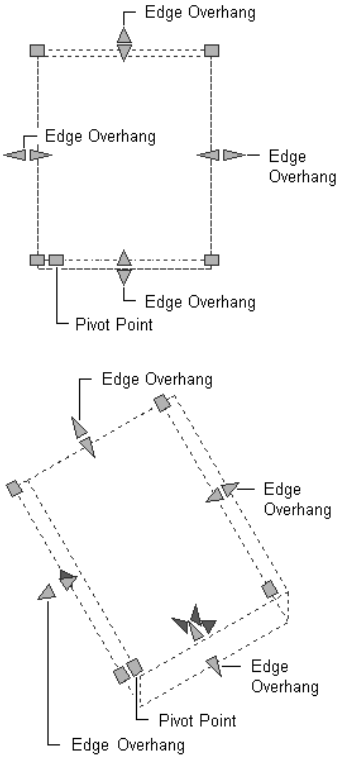


3 Move the grip to accommodate the new edges, and click once, or enter a value.

Changing the Overhang of Roof Slab Edges

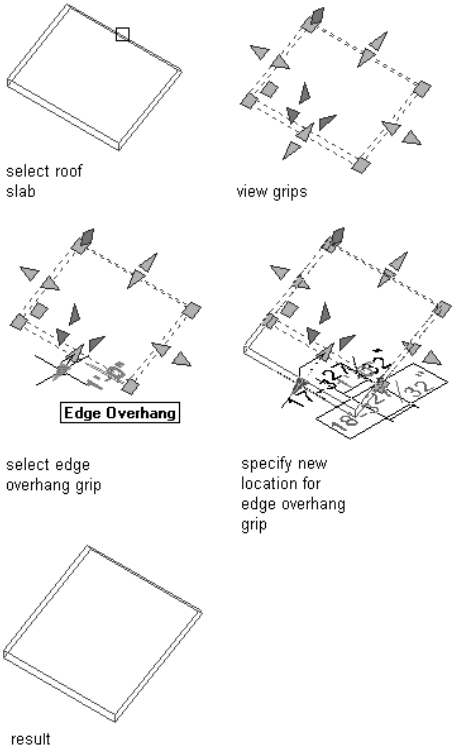
1 Select the roof slab.

Viewing Roof Slab Edge Overhang grips



2 Select an Edge Overhang grip for the edge you want to change.

Editing a Roof Slab with its Edge Overhang grips



3 Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Changing the Slope of a Roof Slab

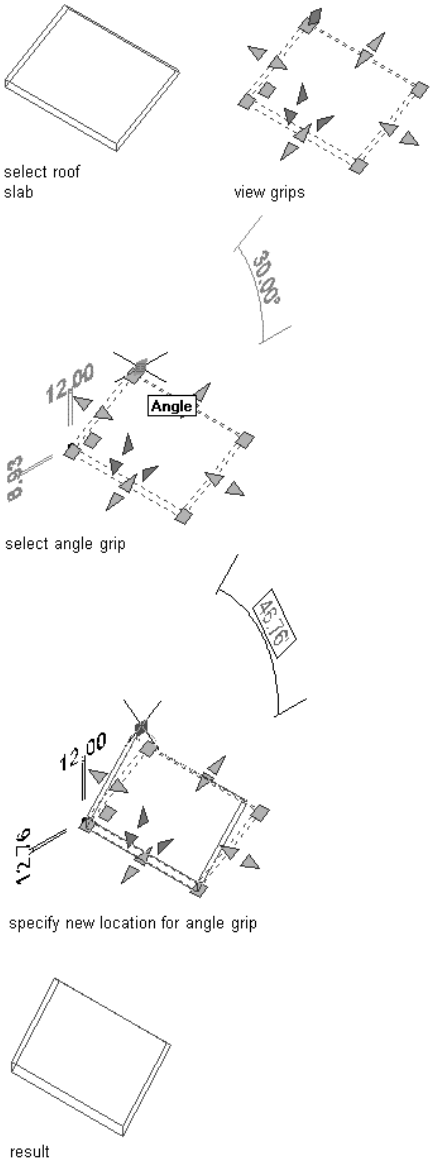
1 Select the roof slab.

IMPORTANT The Angle grip is available only when you select a roof slab in a 3D isometric view.

---

2 Select the Angle grip you want to change.

Editing a Roof Slab slope with its Angle grip



3 Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Changing the Vertical or Horizontal Offset of a Roof Slab

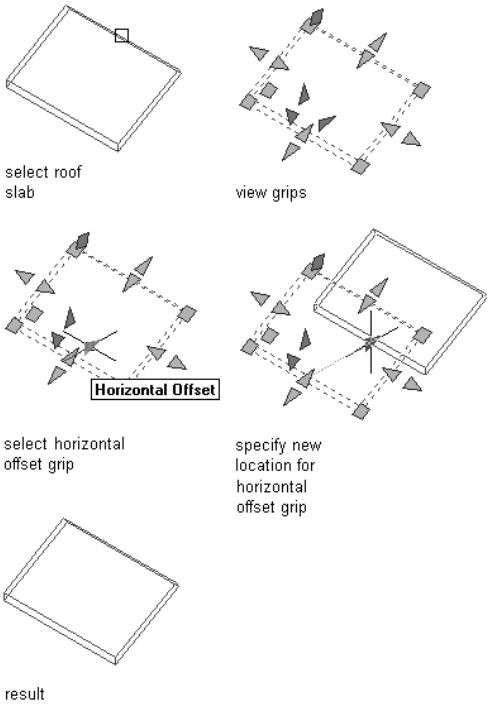
1 Select the roof slab.

IMPORTANT The Vertical Offset and Horizontal Offset grips are available only when you select a roof slab in a 3D isometric view.

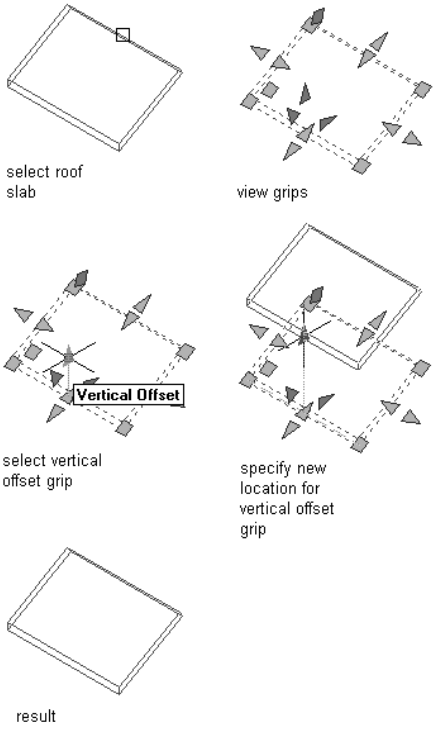
---

2 Select the Vertical Offset or Horizontal Offset grip you want to change.

Editing a Roof Slab with its Horizontal Offset grip



Editing a Roof Slab with its Vertical Offset grip



3 Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Changing the Thickness of a Roof Slab

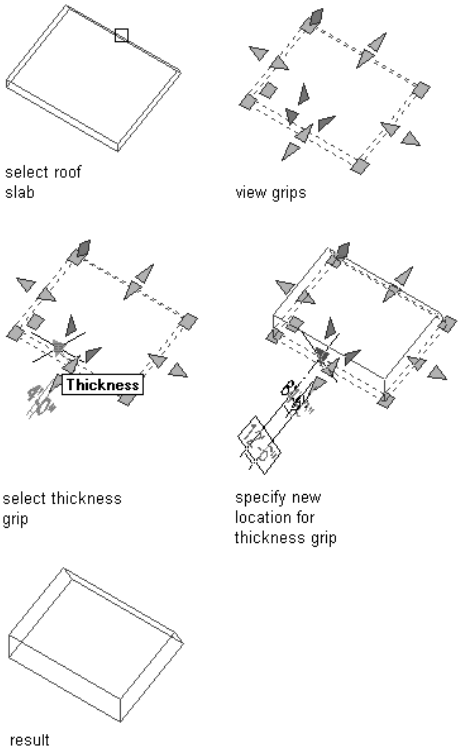
1 Select the roof slab.

IMPORTANT The Thickness grip is available only when you select a roof slab in a 3D isometric view.

---

2 Select the Thickness grip you want to change.

Editing a Roof Slab with its Thickness grip



3 Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Applying Tool Properties to an Existing Roof Slab

Use this procedure to apply the properties of a roof slab tool to one or more roof slabs. The properties include the roof slab style and any other settings specified in the tool you select.

1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

A roof slab tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Right-click a roof slab tool, and click Apply Tool Properties to ➤ Roof Slab.

3 Select the roof slab, and press ENTER.

4 Edit the properties of the roof slab on the Properties palette, if necessary.

Changing the Thickness and Offsets of a Roof Slab

Use this procedure to change the thickness and the vertical and horizontal offsets of a roof slab. The offsets are the vertical and horizontal distances from the insertion point of the roof slab.

1 Select the roof slab you want to change.

2 On the Properties palette, expand Basic, and expand Dimensions.

3 Specify the thickness and offsets of the roof slab:

If you want to . . .	Then . . .
change the thickness of the roof slab	enter a value for Thickness.
change the vertical distance from the roof slab insertion point	enter a value for Vertical Offset.
change the horizontal distance from the roof slab insertion point	enter a value for Horizontal Offset.

Changing the Slope of a Roof Slab

Use this procedure to change the slope of a roof slab by changing the rise, run, or angle values. You can control the alignment of the fascia and the location of the pivot point when changing the slope of a roof slab.

1 Select the roof slab you want to change.

2 On the Properties palette, expand Basic, and expand Dimensions.

3 Enter values for Rise, Run, or Angle to define the slope.

4 Specify a fascia elevation:

If you want to . . .	Then . . .
change the slope to force the fascia to align with other slab fascias	select Yes for Hold fascia elevation.
ignore the fascia elevation	select No for Hold fascia elevation.

5 Specify a pivot point location:

If you want to . . .	Then . . .
change the *X* coordinate value	enter a value for Pivot Point X.
change the *Y* coordinate value	enter a value for Pivot Point Y.
change the *Z* coordinate value	enter a value for Pivot Point Z.

Changing the Style of a Roof Slab

Use this procedure to change the style of a roof slab.

1 Select a roof slab.
2 On the Properties palette, expand Basic, and expand General.
3 Select a new style.

If you select multiple roof slabs that have different styles, *VARIES* is selected. When you select a new roof slab style, all selected roof slabs are assigned that style.

Changing the Edges of a Roof Slab

Use this procedure to edit an individual edge of a roof slab. You can change the overhang, edge style, edge orientation, and the angle for the edge. A viewer shows you which edge of the selected slab you are editing.

1 Select a roof slab.
2 On the Properties palette, expand Basic, and expand Dimensions.
3 Click Edges.
4 Select the edge you want to edit.

The edge is highlighted in the viewer. You can select multiple edges by using SHIFT or CTRL.

5 Enter a value for Overhang.

6 Select a roof slab edge style for Edge Style.

7 Specify Square or Plumb for Edge Cut.

8 Enter a value for Angle relative to the orientation.

NOTE To reset Angle to the roof slab style defaults, right-click an edge number and click Reset to Style Defaults. (Reset to Style Defaults is available only if an edge style has been assigned and the value for Angle is different than the default.)

9 Click OK.

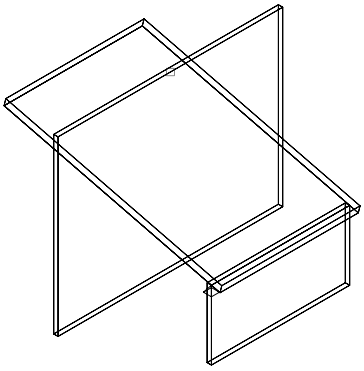
Trimming a Roof Slab

Use this procedure to trim a roof slab using a polyline, wall, roof slab or slab that defines a trim plane through the roof slab. The trimming object does not need to intersect the slab, as long as it provides an intersection in the current user coordinate system (UCS). However, the trim line must intersect the slab perimeter line. You cannot trim only the overhang.

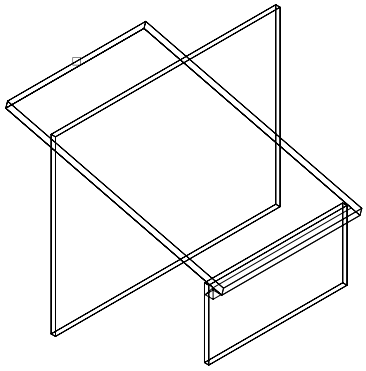
Any fascia or soffit profile that intersects the trim plane is trimmed at the same angle as the roof slab.

If the trimming object is a wall or slab, the trim plane is at the closest surface. The new slab edge at the trim plane has its edge angle defined by the trim plane.

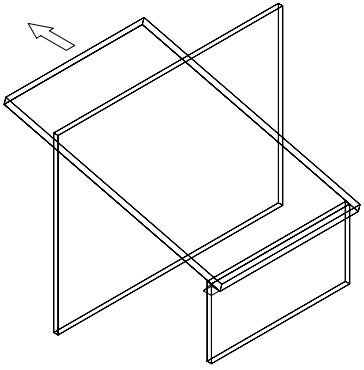
Trimming a roof slab to a wall



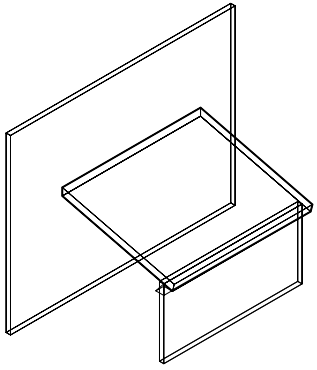
select trimming object



select slab to trim



specify side to be trimmed



resulting slab trimmed to wall

1. Select the roof slab you want to trim, right-click, and select Trim.
2. Select a wall, another roof slab, a slab, or a polyline for the trimming object.
3. Specify the side of the slab to be trimmed.

Extending a Roof Slab

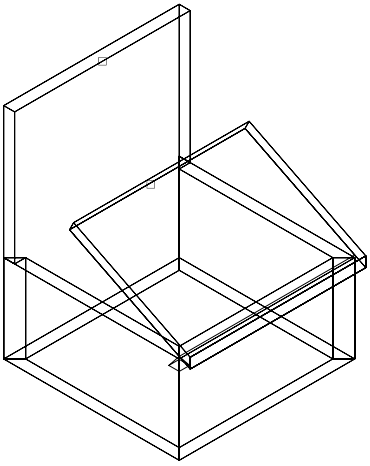
Use this procedure to extend a roof slab to another roof slab or to a wall. The object the roof slab projects to does not need to intersect the plane of the roof slab, as long as it projects an intersection in the current user coordinate system (UCS).

Because multiple edges may need to move in an extend operation, you are prompted to select the adjacent edges to lengthen, rather than the specific edges to move. These selected edges retain their current vector (angle) and are stretched until they intersect the plane of the target object.

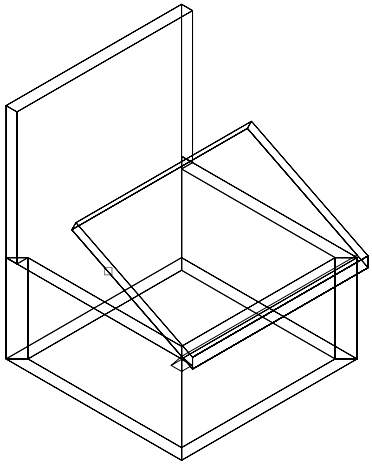
If multiple edges exist between the selected edges, they are joined to form a single edge. The new edge is set to the angle of the target surface.

Any fascia or soffit profile on the adjacent edges is extended to the target surface and trimmed to its angle.

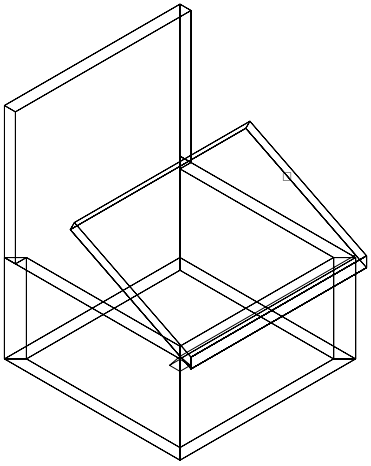
Extending a roof slab to a wall



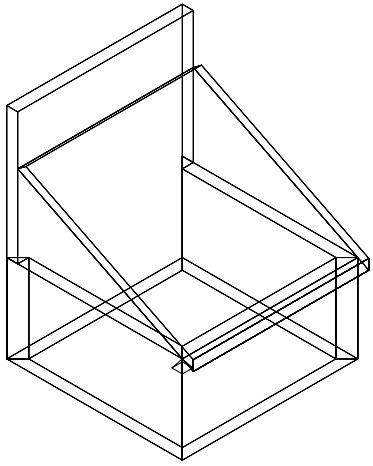
select wall and slab to extend



select first edge to lengthen



select second edge to lengthen



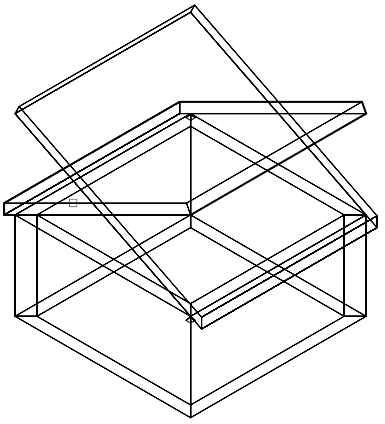
resulting slab extended to wall

1. Select the roof slab you want to extend, right-click, and click Extend.
2. Select a wall or another roof slab for the object to extend to.
3. Select the first edge to lengthen.
4. Select the second edge to lengthen.

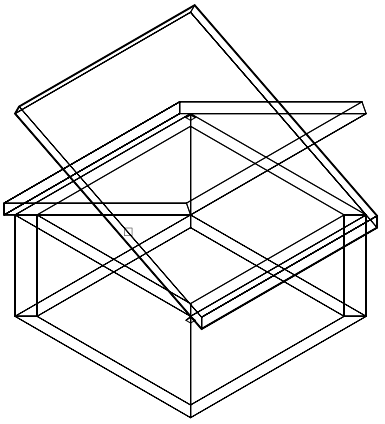
Mitering Roof Slabs by Intersection

Use this procedure to miter two intersecting roof slabs. Both roof slabs are trimmed along the intersection of their perimeter lines. Vertices are added or removed as required. The new edges of the roof slabs are set to angles required for a true miter cut. If the slab thicknesses of the two edges are different, the angles are different.

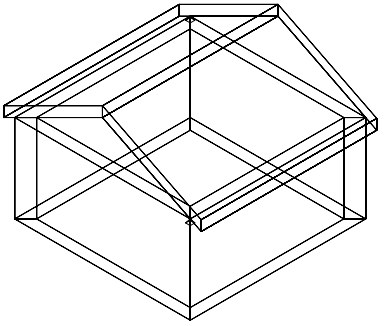
Mitering roof slabs by intersection



select first roof slab at side to keep



select second roof slab at side to keep



resulting roof slabs mitered at intersection

1. Select one of the two roof slabs you want to miter, right-click, and click Miter.
2. Enter **i** (Intersection) to miter at the intersection of the two roof slabs.
3. Select the first roof slab at the side of that slab to keep.

The opposite side is trimmed.

4 Select the second roof slab at the side of that slab to keep.

The opposite side is trimmed.

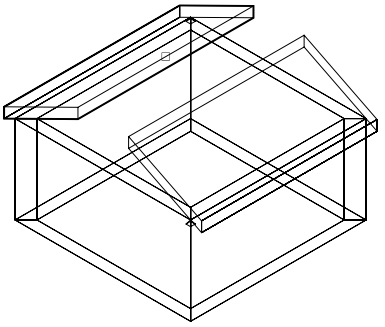
If the new mitered edges do not intersect, you can miter them by edges. For more information, see "Mitering Roof Slabs Using Edges" on page 1368.

Mitering Roof Slabs Using Edges

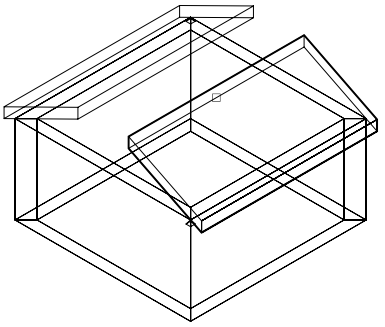
Use this procedure to miter two roof slabs that do not intersect. You can select particular edges to miter. You can miter edges of overlapping roof slabs without trimming the entire slab. To accomplish this, however, you may need to insert additional vertices. Only one edge of each roof slab is mitered.

If you need to miter multiple edges of a roof slab, stretch them to overlap the other roof slab and then miter them at their intersection. For more information, see "Mitering Roof Slabs by Intersection" on page 1367.

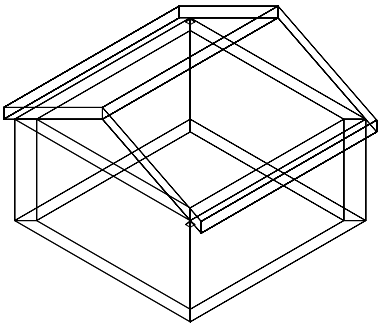
Mitering roof slabs by edge



select first roof slab edge



select second roof slab edge



resulting roof slabs mitered at edge

1. Select one of the two roof slabs you want to miter, right-click, and click Miter.
2. Enter **e** (Edges) to miter selected edges of the roof slabs.
3. Select one edge on the first roof slab.
4. Select one edge on the second roof slab.

Cutting a Roof Slab

Use this procedure to cut a roof slab into two or more roof slabs. You can use any three-dimensional (3D) object or polyline to define the cutting geometry. If you use a 3D body, such as a wall, slab, mass element, or closed polyline, the roof slab is cut along the intersection lines of the surfaces.

The roof slab is cut when the 3D body or closed polyline intersects the perimeter line of the roof slab. If you use an open polyline, the roof slab is cut along the projection to the roof slab surface.

In either case, when the intersection line crosses the roof slab multiple times, multiple roof slabs are created. If the intersection line has multiple edges, multiple edges are added to the new roof slabs.

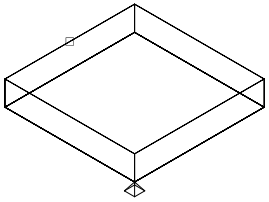
The smoothness (tessellation) of curved edges is controlled by the FACETDEV variable. For more information about FACETDEV, see "AEC Facet Deviation" on page 1409.

1. Draw an object or polyline for defining the cutting geometry.
2. Select the roof slab you want to cut, right-click, and click Cut.
3. Select the object or polyline that represents the cutting geometry, and press ENTER.

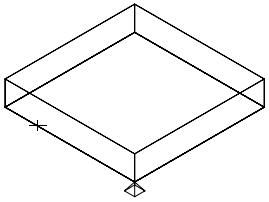
Adding a Vertex to a Roof Slab

Use this procedure to add a vertex to a roof slab edge. Adding a vertex creates two roof slab edges from one edge.

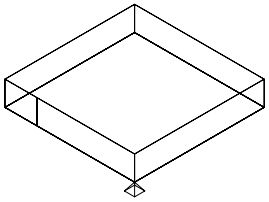
Adding a vertex to the side of a roof slab



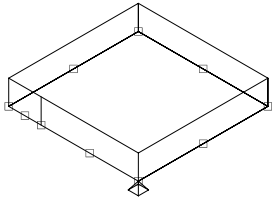
select roof slab



specify point for new vertex



resulting new vertex



resulting roof slab grips

1. Select the roof slab to which to add the vertex, right-click, and click Add Vertex.
2. Specify a point for the new vertex.

To place a new vertex at a precise intersection point, use Intersection or Apparent Intersection object snaps.

The new vertex is added to the nearest roof slab edge, perpendicular to the specified point. If there is no point perpendicular to the roof, no vertex is added.

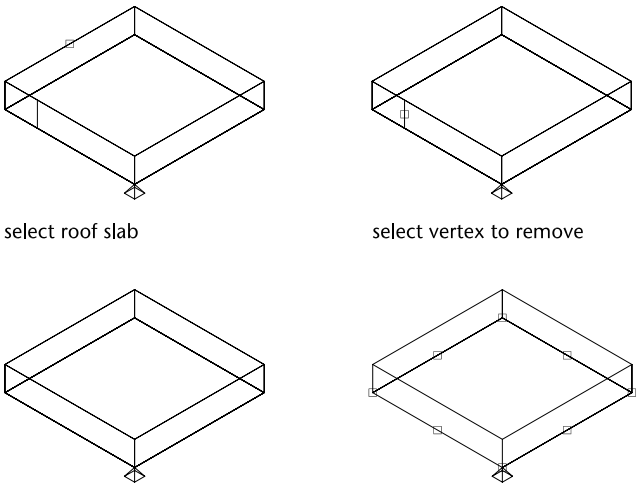
3 To see the new vertex, select the roof slab.

A new grip point is displayed where you specified the new vertex, and additional grips are displayed for the additional roof edge created.

Deleting a Vertex from a Roof Slab

Use this procedure to delete vertices from roof slabs. After deleting a vertex, the two adjacent vertices connect in a straight line.

Removing a vertex from the side of a roof slab



1 Select the roof slab from which to delete the vertex, right-click, and click Remove Vertex.

2 Specify a point on the vertex that you want to delete.

Adding a Hole to a Roof Slab

Use this procedure to add a hole to a roof slab. The hole adds new vertices and edges to the slab that you can edit as you do any other vertex or edge.

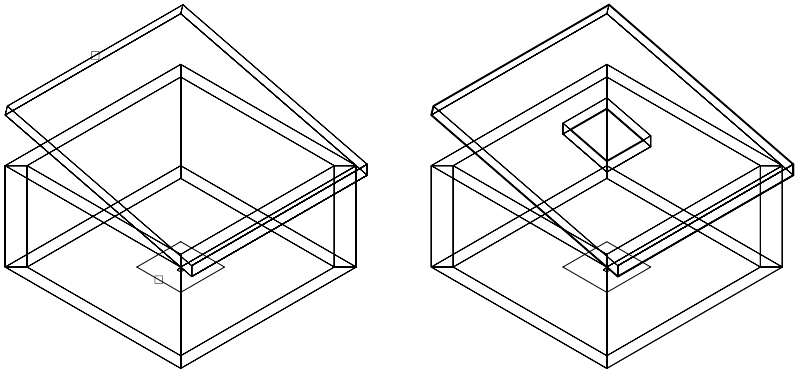
You can use polylines or three-dimensional (3D) objects, such as walls and mass elements, to create holes in a roof slab

- Holes generated by a closed polyline are projected from the polyline to the roof slab, using the current user coordinate system (UCS).
- 3D objects must intersect the roof slab without any projection.

If the objects contain an interior void, you are prompted to use the inside or outside surface to create the hole. For example, if you create a chimney using four wall objects, you can cut the hole at the inside or outside of the chimney. The new hole faces are aligned with the surfaces of the cutting bodies, and are not necessarily parallel to each other.

The smoothness (tessellation) of curved edges is controlled by the FACETDEV variable. For more information about FACETDEV, see "AEC Facet Deviation" on page 1409.

Adding a hole to a roof slab



select roof slab and polyline to cut hole

resulting hole cut in roof slab

1. Draw a closed polyline in the shape and location for the hole, or add an object in the location for the hole.
2. Select the roof slab to which to add the hole, right-click, and click Hole ➤ Add.
3. Select the closed polyline or object to define the hole, and press ENTER.
4. When prompted to erase the layout geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.
5. If you select 3D objects, you are prompted to create the hole at the inside or outside surface of the cutting objects. Press ENTER to use the outside of the object to define the hole, or enter **i** (Inside) to use the inside or void of the object to define the hole.

This prompt is displayed even when the bodies do not contain an inner void, in which case the Inside option does not create a hole.

NOTE If you create a hole that is outside or which overlaps the roof slab baseline or perimeter line at a roof slab overhang, the body of the slab is cut but the fascia and soffit remain. In this case, it is better to create a hole by cutting the slab. For more information, see "Cutting a Roof Slab" on page 1369.

Removing a Hole from a Roof Slab

Use this procedure to remove a hole from a roof slab.

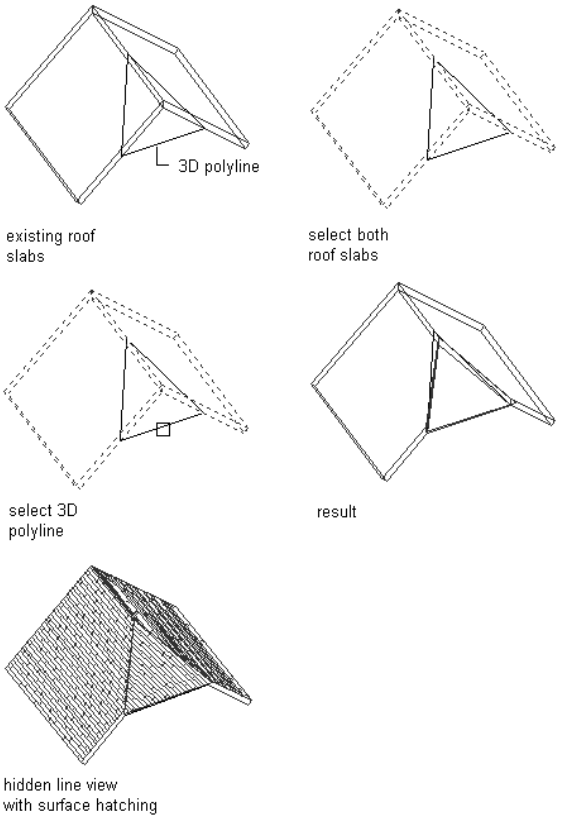
1. Select the roof slab from which to remove the hole, right-click, and click Hole ➤ Remove.
2. Select an edge of the hole to remove in the roof slab.

Creating a Clipped Gable Roof

Use this procedure to modify two roof slabs to add a third slab, creating a clipped gable roof.

1. Create a gable roof with two roof slabs.
2. In an isometric view, draw a 3D polyline in the shape and location of the clipped roof slab.
3. Enter **roofslab.**
4. Enter **e** (Edit).
5. Enter **x** (Xcut).
6. Select the two roof slabs and press ENTER.
7. Select the 3D polyline and press ENTER twice.

Creating a clipped gable roof



NOTE You can edit the outside edge of the new roof slab to change it from square to plumb. For more information, see "Changing the Edges of a Roof Slab" on page 1362.

Adding Objects to a Roof Slab (Boolean)

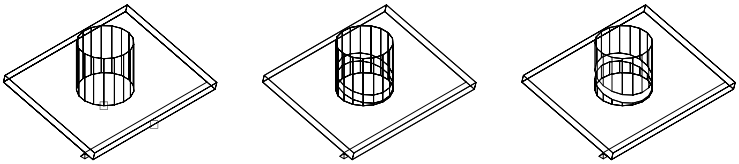
Use this procedure to add to a roof slab three-dimensional (3D) geometry (such as rib joists, curbs, or cornice returns) that cannot be defined by the perimeter, style, or edge profiles.

This procedure fuses 3D geometry of selected objects with the roof slab, so that a section cut through the roof slab is displayed as a single outline. Typically, after adding objects to a roof slab, you freeze the layer on which the

objects are placed. If you move or edit the objects, the roof slab is updated accordingly.

NOTE The object added to the roof slab is not included for Area in the LIST command or in a Schedule Query result.

Adding an object to a roof slab



select slab and object | specify additive option | erase original object

1. Create an object to add to the roof slab in its actual location.
2. Select the roof slab on which to add the object, right-click, and click Boolean ➤ Add.
3. Select the object to add to the roof slab, and press ENTER.

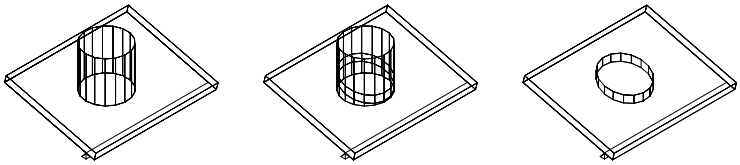
Subtracting Objects from a Roof Slab (Boolean)

Use this procedure to subtract from a roof slab three-dimensional (3D) geometry that cannot be defined by the perimeter, style, or edge profiles. For example, a pitch-pocket shape that does not fully penetrate the roof slab can be subtracted from the slab.

This procedure carves out the body of the roof slab using the geometry of the selected objects, such that a section cut through the roof slab produces a single outline. Typically, after subtracting objects from a roof slab, you freeze the layer on which the objects are placed. If you move or edit the objects, the roof slab is updated accordingly.

NOTE The object subtracted from the roof slab is not included for Area in the LIST command or in a Schedule Query result.

Subtracting an object from a roof slab



select slab and object | specify subtractive option | erase original object

1. Create an object that defines the shape to subtract from a roof slab in its actual location.
2. Select the roof slab from which to subtract the object, right-click, and click Boolean ➤ Subtract.
3. Select the object to subtract from the roof slab, and press ENTER.

Removing Objects from a Roof Slab (Boolean)

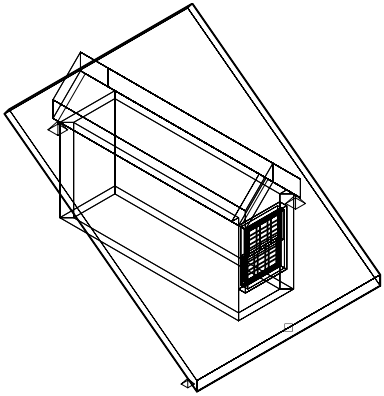
Use this procedure to remove Boolean geometry from roof slabs. The objects are detached from the roof slab, but are not removed from the drawing.

1. Select the roof slab from which to remove the object, right-click, and click Boolean ➤ Detach.
2. Select the object to remove from the roof slab, and press ENTER.

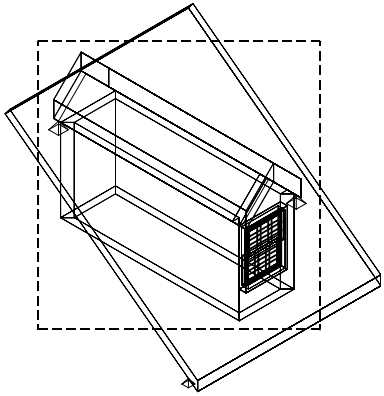
Creating a Dormer in a Roof Slab

Use this procedure to add a dormer to a roof slab. You must first create the roof slabs, walls, and all other parts of the dormer, so that an appropriate hole can be cut in the roof slab. The walls you create for the dormer must include a back segment, so that a complete hole for the dormer can be cut in the roof slab.

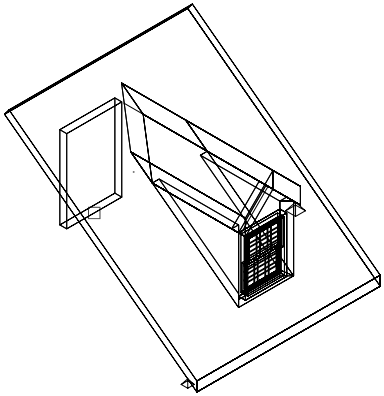
Adding a dormer to a roof slab



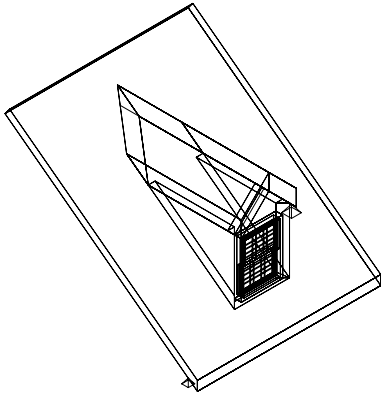
select roof slab



select dormer objects



erase rear dormer wall



resulting dormer cut through roof slab

1. Create the walls for the dormer, including a closing rear wall.
2. Right-click a roof slab tool, and click Apply Tool Properties to ➤ Linework, Walls and Roof.

   A roof slab tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.
3. Select the walls, and press ENTER.
4. Miter the roof slab edges as required.

5 Move the structure so that the walls and roof slabs of the dormer fully penetrate the existing roof slab in the correct position.

6 Select the roof slab to add the dormer to, right-click, and click Roof Dormer.

7 Select the objects that form the dormer, and press ENTER.

8 When prompted to slice the walls with the roof slab, press ENTER to slice the walls, or enter **n** (No) to leave the walls as they are.

9 Erase the wall at the rear of the dormer.

Specifying the Material of a Roof Slab

Use this procedure to select a different material for components of an individual roof slab.

To change the materials assigned to all roof slabs of the same roof slab style, see "Specifying the Materials of a Roof Slab Style" on page 1385.

NOTE If a material assignment does not determine the display properties of the roof slab component, you can change the properties of the display component as described in "Specifying the Display Properties of a Roof Slab" on page 1379.

---

1 Select the roof slab you want to change, right-click, and click Edit Object Display.

2 To verify that the material assignment determines the display properties of the component, click the Display Properties tab, select the display representation on which to display the changes, and click .

3 Click the Layer/Color/Linetype tab, verify that By Material is selected for the component, and click OK.

4 Click the Materials tab.

5 Select the component you want to change, and select a different material definition.

You can select any material definition in the current drawing,

or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

6 Click OK.

Specifying the Display Properties of a Roof Slab

Use this procedure to change the following properties of the display components of an individual roof slab:

- Visibility (display component is on or off)
- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

To change these display properties for all roof slabs of the same style, see "Specifying the Display Properties of a Roof Slab Style" on page 1388.

NOTE If a material assignment determines the properties of a roof display component, you can change the properties of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Specifying the Material of a Roof" on page 1328.

1 Select the roof slab you want to change, right-click, and click Edit Object Display.

2 Click the Display Properties tab.

3 Select the display representation on which to display the changes, and select Object Override.

The display representation in bold is the current display representation.

4 If necessary, click .

5 Click the Layer/Color/Linetype tab.

6 Select the component to change, and select a different setting for the property.

7 Click OK twice.

Specifying the Hatching of a Roof Slab

Use this procedure to specify the hatching of the components of an individual roof slab. Hatching is displayed only in display representations that are used in the Top view (plan view) of a drawing.

To change the hatching for all roof slabs of the same roof slab style, see "Specifying the Hatching of a Roof Slab Style" on page 1389.

NOTE If a material assignment determines the hatching properties of a roof slab display component, you can change the hatching of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Specifying the Material of a Roof Slab" on page 1378.

1. Select the roof slab you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation on which to display the changes, and select Style Override.
4. If necessary, click .
5. Click the Hatching tab.
6. Select the display component, and click the setting for Pattern.
7. Select the hatching for the display component:

If you want to . . .	Then . . .
specify a hatching pattern that is available in the software	select Predefined for Type, and select a pattern.
specify a custom pattern	select Custom for Type, and enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
specify single hatching	select User-Defined for Type, and clear Double Hatch.
specify double hatching	select User-Defined for Type, and select Double Hatch.
specify solid fill	select Solid Fill for Type.

8 Click OK.

9 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

10 Click Angle, and enter the angle for the selected pattern.

11 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the roof slab, regardless of the roof slab rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

12 Click X Offset and Y Offset, and enter offset values.

13 Click OK twice.

Specifying the Cut Plane Height of a Roof Slab

Use this procedure to specify the cut plane height of a roof slab.

If you specify a value for the cut plane height greater than zero, you must specify the layer, color, and, linetype for the elements above and below the cut plane height. This is especially important if you add or subtract roof Boolean objects that change the thickness of the slab.

To change the cut plane height for all roof slabs of the same roof slab style, see "Specifying the Cut Plane Height of a Roof Slab Style" on page 1391.

1 Select the roof slab you want to change, right-click, and click Edit Object Display.

2 Click the Display Properties tab.

3 Select the display representation on which to display the changes, and select Style Override.

4 If necessary, click .

5 Click the Other tab.

6 Select Override Display Configuration Cut Plane, and enter a value for Cut Plane Height.

7 Click OK twice.

Changing the Location of a Roof Slab

Use this procedure to relocate a roof slab by changing the coordinate values of its insertion point. The roof slab also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the roof slab are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the roof slab by aligning its normal with another axis. You can also rotate the roof slab on its plane by changing the rotation angle.

For information about the WCS and UCS, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Select the roof slab you want to change.
2. On the Properties palette, expand Basic, and expand Location.
3. Select Additional Information.
4. Specify the location of the roof slab:

If you want to . . .	Then . . .
relocate the roof slab	enter new coordinate values under Insertion Point.
locate the roof slab on the *XY* plane	make the normal of the roof slab parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the roof slab on the *YZ* plane	make the normal of the roof slab parallel to the *X* axis: under Normal, enter **1** for X, and enter **0** for Y and Z.
locate the roof slab on the *XZ* plane	make the normal of the roof slab parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the roof slab	enter a new value for Rotation Angle.

5. Click OK.

Attaching Hyperlinks, Notes, or Files to a Roof Slab

Use this procedure to attach hyperlinks, notes, or files to a roof slab. You can also edit hyperlinks and notes, and edit or detach reference files from a roof slab.

1 Select the roof slab.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 Click OK.

5 To add a note, click the setting for Notes, and enter the note.

6 Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK twice.

Roof Slab Styles

Roof slab styles control the appearance of roof slab objects. Using roof slab styles, you can specify dimensions, components, edge conditions, materials, and other characteristics to create new types of roof slabs, such as custom roof slabs with unique fascias and soffits.

Using Materials in Roof Slab Styles

You can use materials to control how roof slabs of each style are displayed in a drawing. You assign materials to the roof slab components in the style. The components are then displayed using the display properties of the assigned materials. For more information see, "Material Components and Display Properties" on page 498.

Autodesk® Architectural Desktop provides predefined materials for common design purposes. You can use the predefined materials "as is," modify them

for your project requirements, or define new materials. For more information about materials and how to define them, see "Specifying the Material of a Roof Slab" on page 1378and "Creating and Editing Materials" on page 517.

Creating Tools from Roof Slab Styles

You can create a roof slab tool from any roof slab style. You can drag the style from the Style Manager onto a tool palette. You can then specify default settings for any roof slab created with that tool. For more information, see "Using Roof Slab Tools to Create a Roof Slab" on page 1337.

Managing Roof Slab Styles

When you create, copy, or edit styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Creating a Roof Slab Style
- Specifying the Fixed Thickness of a Roof Slab Style
- Specifying the Materials of a Roof Slab Style
- Specifying the Display Properties of a Roof Slab Style
- Specifying the Hatching of a Roof Slab Style
- Specifying the Cut Plane Height of a Roof Slab Style
- Adding Classifications to a Roof Slab Style
- Attaching Notes or Files to a Roof Slab Style

Creating a Roof Slab Style

Use this procedure to create a roof slab style. You can create a style using default style properties, or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

Specifying the Fixed Thickness of a Roof Slab Style

Use this procedure to specify a fixed thickness and thickness offset of a roof slab style. If you specify a fixed thickness in the roof slab style, you cannot specify a thickness when you add or modify roof slabs of this style.

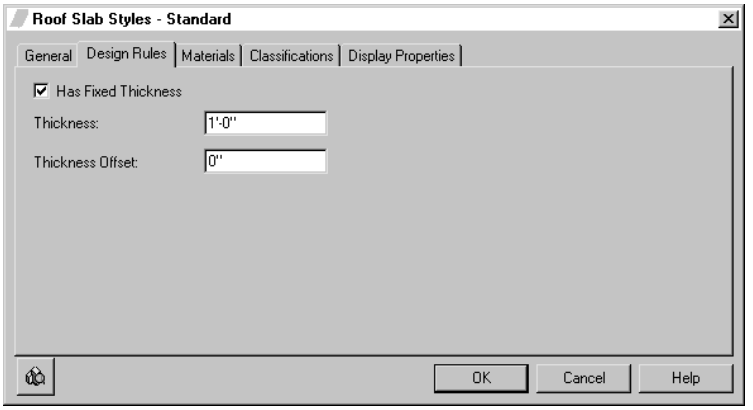
1 Open a tool palette that has a roof slab tool.

A roof slab tool is located within the Architectural Object Tools Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Right-click a roof slab tool, and click Roof Slab Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Design Rules tab.



5 Select Has Fixed Thickness, and enter a value for Thickness.

6 Enter a value for Thickness Offset.

A negative value drops the roof slab bottom below the baseline.

7 Click OK twice.

Specifying the Materials of a Roof Slab Style

A roof slab consists of a number of components whose display properties can be determined by the material assigned to each component.

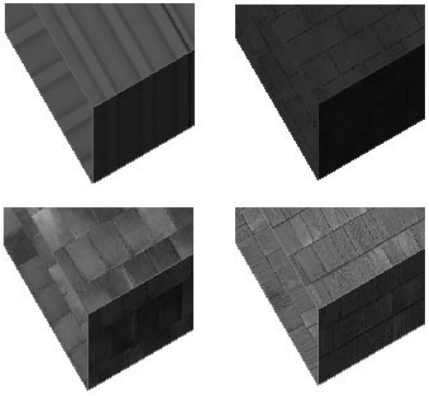
You assign one material to each physical component of a roof slab. For example, you can assign a shingles material to the slab. You assign materials to components in each display representation in which the material is to be used.

If you want to use the display properties of the roof slab style, instead of using material display properties, you can turn off the material assignments in the display properties of the roof slab style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface hatch component of a mate-

rial is used to hatch all object surfaces in three-dimensional (3D) model views and in elevations. For more information see, "Material Components and Display Properties" on page 498.

Roof Slabs with assigned materials



Related Topics and Procedures

- Roof Slab Materials and Display Components
- Assigning Materials to a Roof Slab Style

Roof Slab Materials and Display Components

A roof slab object consists of a number of display components that can be determined by materials.

The following table identifies the material component that corresponds to each roof slab component.

Roof Slab Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Reflected Plan, Screened	
Below Cut Plane Body	No Material
Above Cut Plane Body	No Material
Below Cut Plane Outline	No Material
Above Cut Plane Outline	No Material
Cut Line	Linework

Roof Slab Component	Material Component
Hatch	No Material
Baseline	No Material
Fascia	LInework
Soffit	Linework
Pivot Point	No Material
Warning	No Material
Model, Model ByBlock, Model Monochrome	
Warning	No Material
Baseline	No Material
Slab	3D Body
Fascia	3D Body
Soffit	3D Body
Pivot Point	No Material
Section	
Boundary	No Material
Hatch	No Material
Inside Cutting Body	No Material
Inside Full Body	No Material
Outside Cutting Body	No Material
Outside Full Body	No Material

Assigning Materials to a Roof Slab Style

Use this procedure to assign materials to individual components of a roof slab style. Components use the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the roof slab. Custom components and components that are only symbolic graphics do not

use materials for their display properties. For example, roofs may be shingled and have metal fascias and soffits.

NOTE If a material assignment does not determine the display properties of a roof slab component, you can change the display properties of the roof slab style as described in "Specifying the Display Properties of a Roof Slab Style" on page 1388.

1. Open a tool palette that has a roof slab tool.
2. Right-click a roof slab tool, and click Roof Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation on which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Select the component you want to change, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make apply to all objects that are assigned the material.
11. Click OK twice.

Specifying the Display Properties of a Roof Slab Style

Use this procedure to change the properties of the following display components of a roof slab style:

- Visibility (display component is on or off)
- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE If a material assignment determines the display properties of components on the roof slab style, you can change the properties of the display components by clearing By Material or by overriding the material assignment with a different material. For more information, see "Specifying the Materials of a Roof Slab Style" on page 1385.

1. Open a tool palette that has a roof slab tool.
2. Right-click a roof slab tool, and click Roof Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation on which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select the component to change, and select a different setting for the property.
9. Click OK twice.

Specifying the Hatching of a Roof Slab Style

Use this procedure to specify the hatching of a roof slab style. Hatching is displayed only in display representations that are used in the Top view (plan view) of a drawing.

1. Open a tool palette that has a roof slab tool.
2. Right-click a roof slab tool, and click Roof Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation on which to display the changes, and select Style Override.

6 If necessary, click .

7 Click the Hatching tab.

8 Click the setting for Pattern.

9 Select the hatching pattern:

If you want to . . .	Then . . .
specify a hatching pattern that is available in the software	select Predefined for Type, and select a pattern.
specify a custom pattern	select Custom for Type, and enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
specify single hatching	select User-Defined for Type, and clear Double Hatch.
specify double hatching	select User-Defined for Type, and select Double Hatch.
specify solid fill	select Solid Fill for Type.

10 Click OK.

11 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

12 Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the roof slab, regardless of the roof slab rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

14 Click X Offset and Y Offset, and enter offset values.

15 Click OK twice.

Specifying the Cut Plane Height of a Roof Slab Style

Use this procedure to specify the cut plane height of a roof slab style.

If you specify a value for the cut plane height greater than zero, you must specify the layer, color, and, linetype for the elements above and below the cut plane height. This is especially important if you add or subtract roof Boolean objects that change the thickness of the slab.

1. Open a tool palette that has a roof slab tool.
2. Right-click a roof slab tool, and click Roof Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation on which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. Select Override Display Configuration Cut Plane, and enter a value for Cut Plane Height.
9. Click OK twice.

Adding Classifications to a Roof Slab Style

Use this procedure to specify classifications for any classification definition applied to a roof slab style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Open a tool palette that has a roof slab tool.
2. Right-click a roof slab tool, and click Roof Slab Styles.
3. Right-click the style that you want to change, and click Edit.
4. Click the Classifications tab.

   By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to roof slab styles.
5. For each classification definition, select the classification you want to apply to the current roof slab style.
6. Click OK twice.

Attaching Notes or Files to a Roof Slab Style

Use this procedure to enter notes and attach reference files to a roof slab style. You can also edit notes and edit or detach reference files from a roof slab style.

1. Open a tool palette that has a roof slab tool.
2. Right-click a roof slab tool, and click Roof Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the General tab.
5. To add a description to the roof slab, enter it for Description.
6. Click Notes.
7. To add a note, click the Text Notes tab, and enter the note.
8. Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9. Click OK twice.

Roof Slab Edge Styles

Roof slab edge styles control the appearance of the edges of roof slab objects. Using roof slab edge styles, you can specify dimensions, such as the overhang length, and the orientation and angle of the edges. You can also specify a fascia and soffit for the edge style.

Components of Roof Slab Edge Styles

The roof slab edge style defines the appearance of roof slab edges. Each style consists of two optional components a fascia and a soffit.

A fascia is a shape applied to the outside face of a slab edge. A soffit is a shape applied to the underside of an edge overhang.

You can create fascia and soffit components by defining profiles that provide the two-dimensional (2D) geometry of the component whose shape is then extruded along the slab edge.

The fascia component follows the orientation of the roof slab edge, plumb, or square cut. The soffit component, however, is always oriented to the horizontal. Either component can have a positive or negative angle, relative to its base orientation.

The +/- directions for the edge component angles remain the same regardless of their orientation in the *XY* plane. They always follow the roof slab slope, so that, for example, a +30° soffit and a +30° slab would be parallel. Similarly, a +10° (plumb cut) fascia and a -10° soffit would meet at a right angle. Mirroring a roof slab maintains the same angle signs for all components.

Controlling the Placement of Fascia and Soffits on Roof Slab Edges
The fascia profile is drawn at actual size, except when you select Auto-Adjust. If the roof slab edge is sloped relative to the ground plane, the length is measured parallel to that slope, and not plumb with the ground. When you select Auto-Adjust to Edge Height, the fascia profile is scaled about its insertion point so that its lowest *Y* axis point aligns with the bottom of the roof slab edge.

NOTE Slope offsets are measured relative to the roof slab edge angle from the ground plane, and not from the world UCS.

The soffit profile is drawn at actual size, except when you select Auto-Adjust. The soffit angle is measured about its insertion point, using the local *X* axis of the profile.

When you select Auto-Adjust to Overhang Depth, the soffit profile is scaled about the insertion point, so that the furthest *X* axis point aligns with a plumb line from the roof slab baseline or perimeter line. Auto-Adjust scaling is adjusted by the horizontal offset from the roof slab baseline dimension.

Using Materials in Roof Slab Edge Styles
You can use materials to control how roof slab edges of each style are displayed in a drawing. You assign materials to the roof slab edge components in the style. The components are then displayed using the display properties of the assigned materials.

Autodesk®Architectural Desktop provides predefined materials for common design purposes. You can use the materials "as is," modify them for your project requirements, or define new materials. For more information about materials and how to define them, see "Materials" on page 491.

Managing Roof Slab Edge Styles

When you create, copy, or edit styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Creating a Roof Slab Edge Style
- Creating Profiles for Fascia and Soffits
- Editing the Geometry of Fascia and Soffits
- Specifying the Overhang, Orientation, and Angle of a Roof Slab Edge Style
- Specifying a Fascia and Soffit for a Roof Slab Edge Style
- Specifying the Materials of a Roof Slab Edge Style
- Attaching Notes or Files to a Roof Slab Edge Style

Creating a Roof Slab Edge Style

Use this procedure to create a roof slab edge style. You can create a style using default style properties, or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects.

   If necessary, expand Roof Slab Edge Styles.
3. Create a new roof slab edge style:

If you want to . . .	Then . . .
create a style with default properties	right-click Roof Slab Edge Styles, and click New.
create a style from an existing style	right-click the roof slab edge style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new roof slab edge style, and press ENTER.

5 To edit the new roof slab edge style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.
specify the overhang, orientation, and angle for the style	see "Specifying the Overhang, Orientation, and Angle of a Roof Slab Edge Style" on page 1401.
specify soffits and fascias for the style	see "Specifying a Fascia and Soffit for a Roof Slab Edge Style" on page 1402.
assign materials to the components of the roof slab edge style	see "Assigning Materials to a Roof Slab Edge Style" on page 1406.
add notes and files to the style	see "Attaching Notes or Files to a Roof Slab Edge Style" on page 1407.

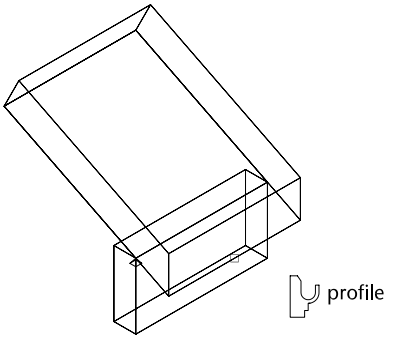
6 When you finish changing the roof slab edge style properties, click OK twice.

Creating Profiles for Fascia and Soffits

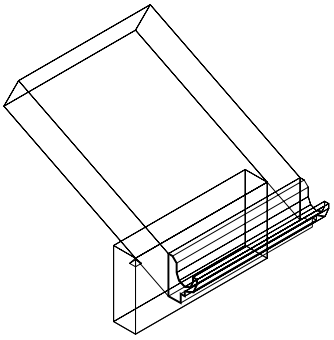
You create profiles for fascia and soffits from two-dimensional (2D) polylines. You can create a profile from a single polyline to represent solid fascia or soffits, such as a wood fascia. You can also create a profile from concentric polylines that can include one or more voids to represent fascia or soffits that are extruded, such as aluminum soffits.

You can draw these polylines anywhere in the drawing and use any scale relative to your final fascia or soffit size. To ensure the fascia or soffit is of a relative size, draw the polyline by snapping to an existing fascia or soffit, and then move the polyline into a clean area of the drawing to create the profile.

Assigning a profile as a fascia

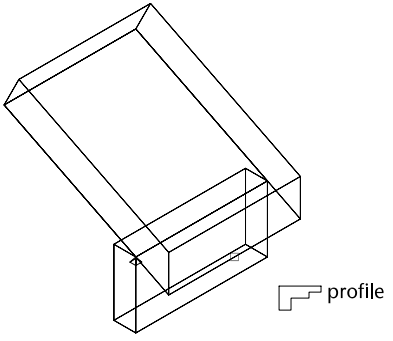


select roof slab edge

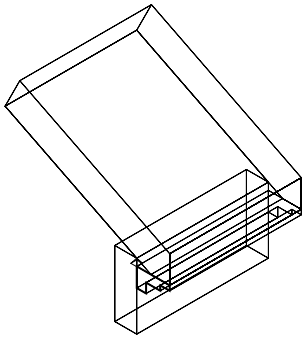


resulting profile assigned as fascia

Assigning a profile as a soffit



select roof slab edge



resulting profile assigned as soffit

Related Procedures

- Creating a Profile from a Single Polyline
- Creating a Profile from Concentric Polylines
- Controlling Profile Edges and Extrusion

Creating a Profile from a Single Polyline

Use this procedure to convert a single polyline to a profile.

1. Draw closed or open polylines representing the fascia or soffit.
2. On the Desktop menu, click Profiles ➤ Profile Definitions.
3. Select Profiles, right-click, and click New.
4. Enter a name for the new profile, and press ENTER.

5 Select the profile name, right-click, and click Set From.

6 Select the polyline for the profile.

7 When prompted to add another ring, enter **y** (Yes), and press ENTER.

8 Select an inner or additional polyline, and press ENTER.

9 When prompted to specify whether the inner ring is a void area, enter **y** (Yes), and press ENTER.

10 When prompted to add another ring, enter **n** (No), and press ENTER.

11 Specify the insertion point for the fascia or soffit.

The insertion point is typically the lower-left corner.

12 Click OK.

Creating a Profile from Concentric Polylines

Use this procedure to convert multiple concentric polylines to a profile.

1 Draw closed or open polylines representing the fascia or soffit.

2 On the Desktop menu, click Profiles ➤ Profile Definitions.

3 Select Profiles, right-click, and click New.

4 Enter a name for the new profile, and press ENTER.

5 Select the profile name, right-click, and click Set From.

6 Select the polyline for the profile.

7 When prompted to add another ring, enter **y** (Yes), and press ENTER.

8 Select an inner or additional polyline, and press ENTER.

9 When prompted to specify whether the inner ring is a void area, enter **y** (Yes), and press ENTER.

10 When prompted to add another ring, enter **n** (No), and press ENTER.

11 Specify the insertion point for the fascia or soffit.

The insertion point is typically the lower-left corner.

12 Click OK.

Controlling Profile Edges and Extrusion

Use this procedure to specify the following parameters for a profile:

- the position of each edge in a profile (left, right, back, discard, none)
- the axis along which an object is extruded from the shape of a profile

These settings determine how surface hatching is applied to objects created from the profile and how the objects are extruded from the two-dimensional (2D) profile.

NOTE The shape of any objects already created from the profile changes when you change profile edges or the axis of extrusion.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects, and expand Profile Definition.
3. Right-click the profile you want to change, and click Edit.
4. Click the Profile Edges tab.
5. Select an edge, and specify its position:

If you want to . . .	Then . . .
let the software determine the position of edges	click Calculate Default Edge Positions. You can then override the position of individual edges, if necessary.
select a position for an edge	select the setting for Edge, and select a new position.
exclude an edge from surface hatching	select the setting for Edge, and select None.
discard an edge	select the setting for Edge, and select Discard.

6. Specify the axis of extrusion based on the type of object created from the profile:

If you want to . . .	Then . . .
create a roof slab or slab fascia	select X for Extrusion Direction.
create a slab soffit	select Y for Extrusion Direction.
extrude mass elements	select Z for Extrusion Direction.

7. Click OK twice.

Editing the Geometry of Fascia and Soffits

Use this procedure to edit the geometry of the profile used to define the fascia and soffit of a roof slab edge style. You can also add a profile to the fascia or

soffit of a roof slab edge style that does not currently use a profile to define its shape.

NOTE If you want to replace the geometry of the profile with newly drawn polylines, draw them before you start this procedure.

1. Add a roof slab object that has the style you want to change.
2. Add or edit a profile:

If you want to . . .	Then . . .
add an existing profile to the style	select the roof slab, right-click, and click Add Edge Profiles. Select an edge. Select the name of the profile for the fascia or soffit, and click OK.
create a profile and add it to the style	select the roof slab, right-click, and click Add Edge Profiles. Select an edge. Select Start from scratch for Fascia or Soffit Profile Definition, enter a name for the new profile, and click OK. A rectangle profile is created for you to edit.
edit the existing profile for the style	select the roof slab, right-click, and click Edit Edge Profile in Place.

NOTE If you are prompted about the selected edge not having an edge style and overhang, click Yes.

3. If you receive a message that the profile is not drawn to size, click Yes.

   The area of the roof slab edge defined by the profile is selected and hatched in the drawing.

NOTE After you perform an editing task from the shortcut menu, you may need to select the profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select the profile, and right-click to display the shortcut menu.

4 Edit the profile as necessary:

If you want to . . .	Then . . .
change the shape of the perimeter of the profile or its rings	select the profile, and use grips to adjust the shape.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace an existing ring of the profile with new geometry	select the profile, right-click, and click Replace Ring. Select the ring to replace, and select the new geometry. Press ENTER to keep the geometry, or enter **n** (No) to erase it.

5 Save or discard the changes:

If you want to . . .	Then . . .
restore the profile to its original shape	select the profile, and click .
save the changes to the current profile	select the profile, and click . The roof slab style uses the edited profile to define its geometry. Any other objects or styles that use this profile are also updated with the edited geometry.
save the changes to a new profile definition	select the profile, right-click, and click Save as New Profile. Enter a name for the new profile definition, and click OK. The roof slab uses the new profile to define its geometry. Any roof slabs of this style are updated with the new geometry. Other styles or objects that use the original profile are not affected.

Specifying the Overhang, Orientation, and Angle of a Roof Slab Edge Style

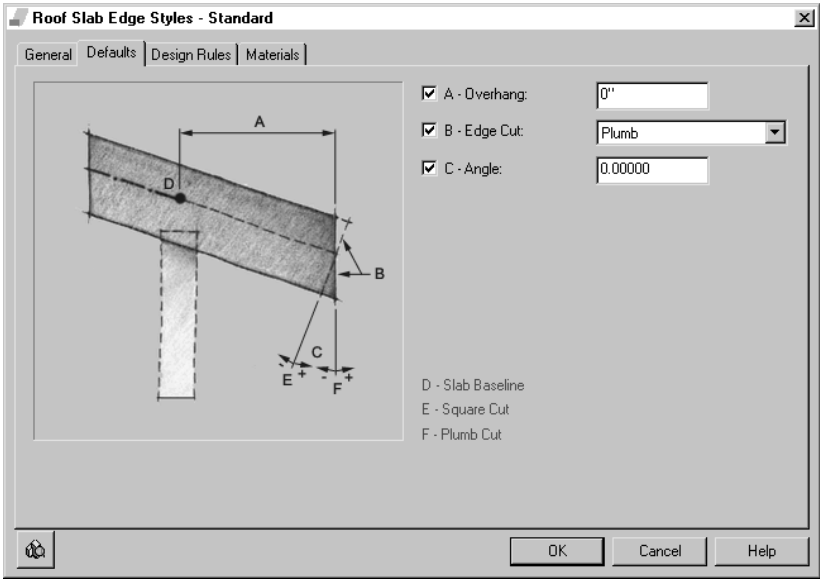
Use this procedure to specify the default overhang depth, type of orientation, and angle of a roof slab edge style.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Roof Slab Edge Styles.

3 Right-click the roof slab edge style that you want to change, and click Edit.

4 Click the Defaults tab.

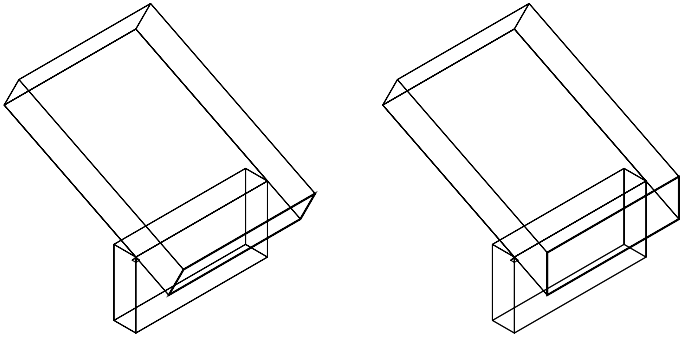


5 Specify the overhang, orientation, and angle of the roof slab edge:

If you want to . . .	Then . . .
specify the overhang of the roof slab	select Overhang, and enter a value.
specify the orientation of the roof slab edge	select Edge Cut, and select a setting: ■ Select Square to cut the edge 90 degrees with the plane of the slab. ■ Select Plumb to cut the edge perpendicular with the ground.

If you want to . . .	Then . . .
specify the angle of the roof slab edge	select Angle, and enter a value. A positive value moves the bottom of the edge out and a negative value moves the bottom of the edge in.

Specifying square and plumb edges



square edge

plumb edge

6 Click OK twice.

Specifying a Fascia and Soffit for a Roof Slab Edge Style

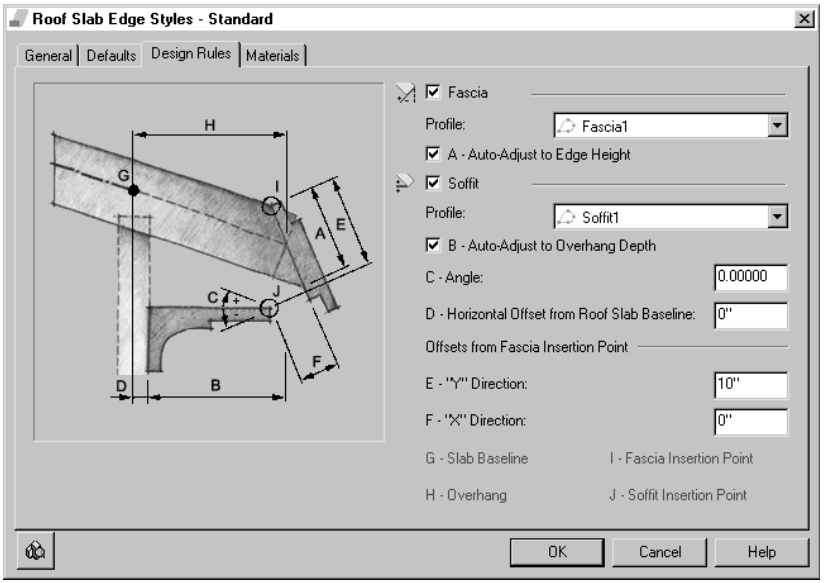
Use this procedure to specify a fascia and soffit for a roof slab edge style. The drawing must contain profiles for the fascia and soffits in order to specify them. For more information, see "Creating Profiles for Fascia and Soffits" on page 1395.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Roof Slab Edge Styles.

3 Right-click the roof slab edge style that you want to change, and click Edit.

4 Click the Design Rules tab.



5 Select Fascia, and select a profile that defines the geometry of the fascia.

If you select *NONE*, display component settings apply to the slab edge line or plane where the fascia is located.

6 Specify how the fascia is to be scaled on the roof slab edge:

If you want to . . .	Then . . .
scale the fascia to fit the height of the roof slab edge	select Auto-Adjust to Edge Height.
use the fascia at its drawn size	clear Auto-Adjust to Edge Height.

7 Select Soffit, and select a profile that defines the geometry of the soffit.

If you select *NONE*, display component settings apply to the slab edge line or plane where the soffit is located.

8 Specify how the soffit is to be scaled on the roof slab overhang:

If you want to . . .	Then . . .
scale the soffit to fit the depth of the overhang	select Auto-Adjust to Overhang Depth.
use the soffit at its drawn size	clear Auto-Adjust to Overhang Depth.

9 Specify the placement of the soffit:

If you want to . . .	Then . . .
specify the soffit angle of the roof slab edge	enter a value for Angle, with zero being horizontal. A positive value slopes the soffit up from the insertion point, and a negative value slopes the soffit down.
specify the horizontal offset from the roof slab baseline or perimeter line for the roof slab edge	enter a value for Horizontal Offset from Slab Baseline. This option is available only if you select Auto-Adjust to Overhang Depth.
specify the soffit offsets from the insertion point of the fascia	enter values for *Y* Direction and *X* direction.

10 Click OK twice.

Specifying the Materials of a Roof Slab Edge Style

A roof slab edge consists of a number of components whose display properties can be determined by the material assigned to the component.

You assign one material to each component of the roof slab edge. For example, you assign a metal material to the fascia and a wood material to the soffit. You assign materials to components in each display representation in which the material is to be used.

If you want to use the display properties of the roof slab edge style, instead of using material display properties, you can turn off the material assignments in the display properties of the style you want to change.

Material definitions consist of display components that correspond to component types of objects. For example, the linework component of a material is used for all linework in plan view. The Surface hatch component of a material is used to hatch all object surfaces in three-dimensional (3D) model views and in elevations. For more information see, "Material Components and Display Properties" on page 498.

Related Topics and Procedures

- Roof Slab Edge Materials and Display Components
- Assigning Materials to a Roof Slab Edge Style

Roof Slab Edge Materials and Display Components

The edge of a roof slab object consists of a number of display components that can be determined by materials.

The following table lists roof slab edge components and the material components that determine them.

Roof Slab Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Reflected Plan, Screened	
Below Cut Plane Body	No Material
Above Cut Plane Body	No Material
Below Cut Plane Outline	No Material
Above Cut Plane Outline	No Material
Cut Line	Linework
Hatch	No Material
Baseline	No Material
Fascia	Linework
Soffit	Linework
Pivot Point	No Material
Warning	No Material
Model, Model ByBlock, Model Monochrome	
Warning	No Material

Roof Slab Component	Material Component
Baseline	No Material
Slab	3D Body
Fascia	3D Body
Soffit	3D Body
Pivot Point	No Material
Section	
Boundary	No Material
Hatch	No Material
Inside Cutting Body	No Material
Inside Full Body	No Material
Outside Cutting Body	No Material
Outside Full Body	No Material

Assigning Materials to a Roof Slab Edge Style

Use this procedure to assign materials to individual components of a roof slab edge style. Component use the display properties of the material instead of the style display properties.

NOTE The display properties of roof slab edge styles are controlled by the roof slab styles that use them. Therefore, to edit the display properties of roof slab edge style components, you must edit the roof slab style that uses the roof slab edge style you want to change. For more information, see "Specifying the Display Properties of a Roof Slab Style" on page 1388.

You can assign a material to any physical component of the roof slab edge. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, roofs may have metal fascias and soffits.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Roof Slab Edge Styles.

3 Right-click the roof slab edge style to which to assign materials, and click Edit.

4 Click the Materials tab.

5 Select the component you want to change, and select a different material definition.

You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make apply to all objects that are assigned the material.

6 Click OK twice.

7 To assign the material that uses the roof slab edge style you changed, see "Assigning Materials to a Roof Slab Style" on page 1387.

Attaching Notes or Files to a Roof Slab Edge Style

Use this procedure to enter notes and attach reference files to a roof slab edge style. You can also edit notes and edit or detach reference files from a roof slab edge style.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Roof Slab Edge Styles.

3 Right-click the roof slab edge style you want to edit, and click Edit.

4 Click the General tab.

5 To add a description to the roof slab, enter it for Description.

6 Click Notes.

7 To add a note, click the Text Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.

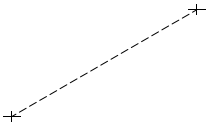
If you want to . . .	Then . . .
detach a reference file	select the file name, and click Delete.

9 Click OK twice.

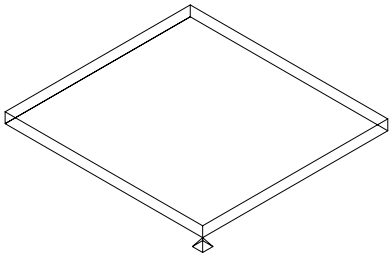
Ortho Close and Close

You can use Ortho Close and Close to create a closed roof slab.

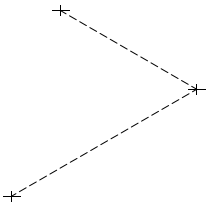
Using ortho close with two and three specified points



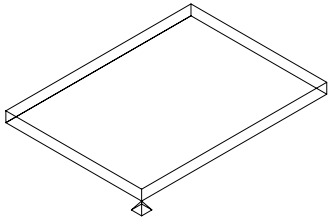
specify first and second edge points



resulting square roof slab with ortho close



specify first, second, and third edge points



resulting rectangular roof slab with ortho close

Ortho Close

Use Ortho Close to square off the last edge of the roof slab with the first edge.

This option closes the roof slab by using the first line and the selected direction, and draws a square roof slab based on the current settings for adding a roof slab. The direction is extended until it meets a line perpendicular to the initial edge of the roof slab.

Close

This option closes the roof slab by creating a slab segment from the last point specified to the first point specified.

After you have specified three or more points, click Close to connect the last point of the roof slab to the first point.

AEC Facet Deviation

The smoothness (tessellation) of curved edges is controlled by the FACETDEV variable. This variable sets the number of facets to display on curved AEC objects, and must be set before converting the polyline to slabs.

The facet deviation is available only on the command line by entering **AecFacetDev**.

The number you set as the facet deviation defines the maximum distance from the chord to the arc, the chord being an edge created from faceting the curve to the true mathematical arc. The facet deviation has a range of greater than zero (0) and no upper limit.

The minimum number of facets is eight. For example, create a cylinder mass element to have a 1' radius, and set the **aecfacetdev** to 1'. The cylinder has eight faces.

Stairs

21

Stairs are AEC objects that use flights of treads and risers to accommodate vertical circulation. Stairs also interact with railing objects. You can control the style of the stair, the shape of the landing, whether the stairs have open or closed treads, and the height and width of the stair run.

Stair Shapes

While strictly rectangular stairs are predominant in modern buildings, there are many cases when the edges of a flight are not parallel, or follow some curved shape. Landings can also have non-rectangular shapes. Stairs allow the use of nearly arbitrary profiles for the edges of flights and landings. In addition, railings and stringers can be anchored to stairs and can follow the edges of flights and landings.

Landings and Turns

Stairs are created at a specified overall height that requires a total length based on the tread length. Within that length, you can place landings or turns. When you begin to create a stairway, a rectangular box is displayed that represents the width and length of the stair as if it were a straight stairway. As you select consecutive points, depending upon the shape of the stair selected, landings and turns are created.

Materials in Stairs

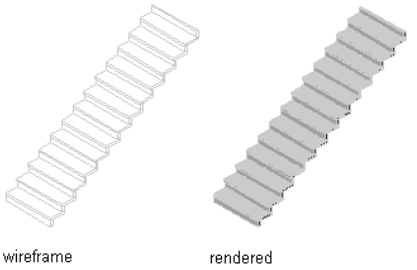
In Autodesk Architectural Desktop, you can assign materials to a stair. These materials are displayed in wireframe and working shade views, or when linked into VIZ Render. Materials have specific settings for the physical com-

In this chapter

- Specifying AEC Options for Stairs
- Using Stair Tools to Create Stairs
- Creating a Stair
- Creating a Straight Stair with User-Specified Settings
- Creating a Multi-landing Stair with User-Specified Settings
- Creating an L-Shaped Stair with 45 Degree Tread
- Creating a U-shaped Stair with User-Specified Settings
- Creating a Spiral Stair with User-Specified Settings
- Creating a Ramp
- Creating a Stair Tool
- Editing Stairs
- Stair Styles
- Stair Winder Styles

ponents of a stair, such as risers, nosing, and treads.

Stair in wireframe model (left) and shaded view (right)



Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes, which contain settings for stair components. You can use these predefined materials, or modify them for your designs. You can also create your own materials. Object styles provided with the software have appropriate materials already assigned to them. For more information, see "Stair Materials and Display Components" on page 1527.

Related Topics and Procedures

- Specifying AEC Options for Stairs
- Using Stair Tools to Create Stairs
- Editing Stairs
- Stair Styles
- Stair Winder Styles

Specifying AEC Options for Stairs

Use this procedure to specify some parameters and options for stairs that are not specified in the stair styles or display properties. The options are on the AEC Object Settings tab of the Options dialog box:

- Presentation format
- Node Osnaps
- Flight height measurement

1. On the Format menu, click Options.
2. Click the AEC Object Settings tab.

3 Specify the stair defaults:

If you want to . . .	Then . . .
display the stair with no cut lines or path	select Presentation Format (No Cut Lines or Path).
use Node Osnap to select the corners of the stairs and landings	select Flight and Landing Corners for Node Osnap.
specify the stair height distance above the start of the stair and below the end of the stair as the position for the Node Osnap	select Vertical Alignment for Node Osnap.
include top and bottom offsets in the stair height measurement	select Finished Floor to Floor for Measure Stair Height.
ignore top and bottom offsets in the stair height measurement	select Rough Floor to Floor for Measure Stair Height.

4 Click OK.

Using Stair Tools to Create Stairs

Tools provided with Autodesk® Architectural Desktop let you quickly place stairs by selecting a stair tool with a specific stair style and other predefined properties.

The following catalogs provided with the software contain stair tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- Mytool catalog

Custom palettes created by your CAD manager or other users may also contain stair tools with stair styles and properties that are customized for your projects or office standards.

When you place stairs using stair tools, you can use the default settings of the tool, or you can change settings for any stair properties that are not controlled by the style.

Related Procedures

- Creating a Stair
- Creating a Straight Stair with User-Specified Settings
- Creating a Multi-landing Stair with User-Specified Settings
- Creating a U-shaped Stair with User-Specified Settings
- Creating a Spiral Stair with User-Specified Settings
- Creating a Ramp
- Creating a Stair Tool

Creating a Stair

Use this procedure to add a new stair that has the properties specified in the stair tool that you select. To specify settings when you add a stair, see "Creating a Straight Stair with User-Specified Settings" on page 1414.

1. Open the tool palette that you want to use, and select a stair tool.

   If necessary, scroll to display the tool that you want to use.

2. Specify the insertion point of the stair.

   You can move or hide the Properties palette to expose more of the drawing area.

3. Specify the direction point of the stair.

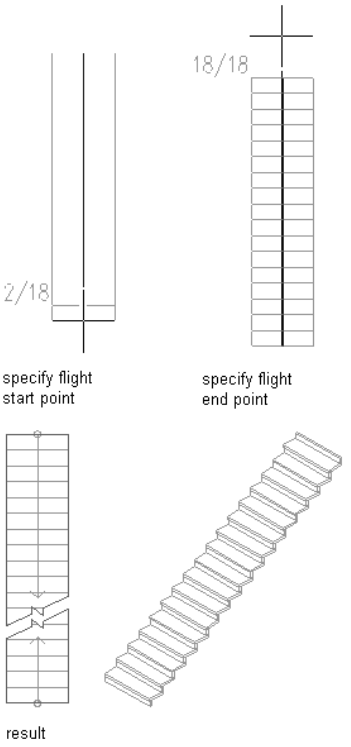
   The stair is created at the length necessary to accommodate the values used.

4. Continue adding stairs, and press ENTER.

Creating a Straight Stair with User-Specified Settings

Use this procedure to add a straight stair with settings that you specify.

Creating a straight stair



TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

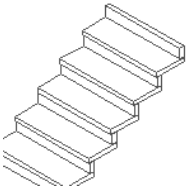
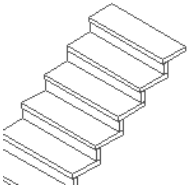
1. Open the tool palette that you want to use, and select a stair tool.
   If necessary, scroll to display the tool that you want to use.
2. On the Properties palette, expand Basic, and expand General.
3. Select a style.
4. In Shape, select Straight.

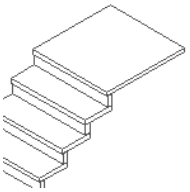
5 Specify the vertical orientation of the stair:

If you want to . . .	Then . . .
draw the stair from this floor to the floor above	select Up for Vertical Orientation.
draw the stair from this floor to the floor below	select Down for Vertical Orientation.

6 Expand Dimensions.

7 Specify stair dimensions:

If you want to . . .	Then . . .
specify the width of the stair	enter a value for Width.
specify the height of the stair	enter a value for Height.
specify the justification of the stair	enter a value for Justify. The Justify value you select controls the insertion point when you place the stair; left, center, or right at the beginning of the stair run.
end the stair run with a riser	select Riser for Terminate with.  Stairs which end with a riser will have an overall height that is one tread thickness less than the floor-to-floor height specified.
end the stair run with a tread	select Tread for Terminate with. 

If you want to . . .	Then . . .
end the stair run with a landing	select Landing for Terminate with. 
specify the overall linear length of the stair	select Calculation rules, and then enter a value for Straight Length. ■ When Straight Length is set to automatic (the icon is), the value is calculated based on the tread size and riser count. ■ When Straight Length is user-defined (the icon is), the stair length is equal to the dimension entered, and the other three values are adjusted within the code limits. ■ When Riser Count is user-defined, the tread depth is increased or decreased to accommodate the stair.
specify the total number of stair risers	select Calculation rules, and then enter a value for Riser Count. ■ When Riser Count is set to automatic (the icon is), the number of risers is based on the overall length and overall height of the stair and the code limits specified on the Design Rules tab. The Straight Length value of the stair is adjusted automatically. ■ When Riser Count is user-defined (the icon is), you can specify a value that is used to calculate the tread depth and riser height. If these values fall outside the stair limits, an error message is displayed.
specify the height of each riser in the stair flight	■ select Calculation rules, set all fields to automatic (the icons are), click the icon to Riser to change it to and enter a value for Riser.

NOTE If a value is set to user-defined on the Calculation rules worksheet, it can be modified directly in the Property palette.

NOTE If is displayed next to a field in the Calculation Rules dialog box, that field can't be changed until another field is changed from user-defined to automatic .

8 In the drawing area, specify the insertion point of the stair.

You can move or hide the Properties palette to expose more of the drawing area.

9 Specify the end point of the stair.

10 Continue adding stairs, and press ENTER.

Creating a Multi-landing Stair with User-Specified Settings

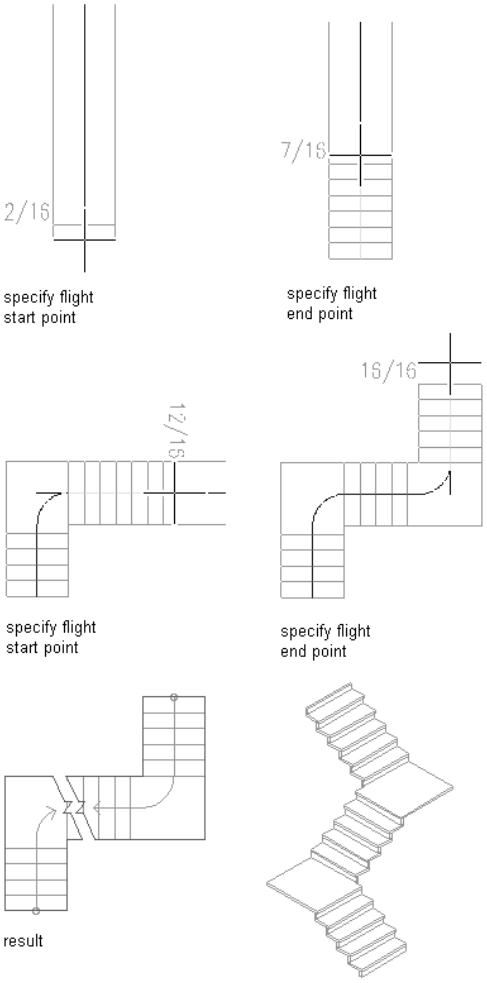
Use this procedure to create a multi-landing stair. You can use multi-landing stair shapes to define both straight and angled stair runs. You can insert quarter-landings, half-landings, and turns.

This type of stair is constrained by the design rules on the stair and the floor to floor height. For more information about stair design rules, see Specifying the Design Rules of a Stair Style.

If you are drawing the risers or flights of a stair, lines for each tread are shown. If you are drawing a flat landing, no tread lines are shown. If you are drawing a turn type landing, angled tread lines are shown through the turn. These temporary lines do not necessarily represent the actual locations of tread lines in the final stair. In addition, the number of risers currently added to the stair is displayed (to the left of the stair), along with the total number of risers required for the stair, for example "10/18".

NOTE To create a straight stair with user-specified landings, use the multi-landing shape with half landings. Select all the points in a straight line to define the flight starts and flight end points.

Creating a multi-landing stair with 1/4 landings



TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a stair tool.
   If necessary, scroll to display the tool that you want to use.
2. On the Properties palette, expand Basic, and expand General.

3 Select a style.

4 In Shape, select Multi-landing.

5 Specify the turn type:

If you want to . . .	Then . . .
create a flat landing with a user-defined length where the stair run turns	select 1/2 landing for Turn type.
create stairs with a user-defined length where the stair run turns with treads through the turn	select 1/2 turn for Turn type. **NOTE** These stairs must have at least three segments and each corner must turn in the same direction.
create a flat landing where the stair turns, with the length of the landing equal to the width of the stair	select 1/4 landing for Turn type. **NOTE** These stairs typically have two or more flights joined by square landings.
create stairs having treads along the entire length, with one or more turns in any direction	select 1/4 turn for Turn type. **NOTE** These stairs may have two or more segments, and corners may turn in either direction.

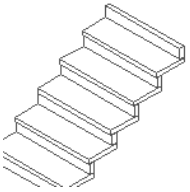
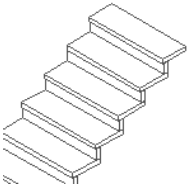
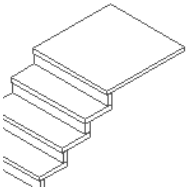
6 Specify the vertical orientation of the stair:

If you want to . . .	Then . . .
draw the stair from this floor to the floor above	select Up for Vertical Orientation.
draw the stair from this floor to the floor below	select Down for Vertical Orientation.

7 Expand Dimensions.

8 Specify stair dimensions:

If you want to . . .	Then . . .
specify the width of the stair	enter a value for Width.

If you want to . . .	Then . . .
specify the height of the stair	enter a value for Height.
specify the justification of the stair	enter a value for Justify. The Justify value you select controls the insertion point when you place the stair; left, center, or right at the beginning of the stair run.
end the stair run with a riser	select Riser for Terminate with.  Stairs which end with a riser will have an overall height that is one tread thickness less than the floor-to-floor height specified.
end the stair run with a tread	select Tread for Terminate with. 
end the stair run with a landing	select Landing for Terminate with. 

If you want to . . .	Then . . .
specify the overall linear length of the stair	select Calculation rules, and then enter a value for Straight Length. ■ When Straight Length is set to automatic (the icon is), the value is calculated based on the tread size and riser count. ■ When Straight Length is user-defined (the icon is), the stair length is equal to the dimension entered, and the other three values are adjusted within the code limits. ■ When Riser Count is user-defined, the tread depth is increased or decreased to accommodate the stair.
specify the total number of stair risers	select Calculation rules, and then enter a value for Riser Count. ■ When Riser Count is set to automatic (the icon is), the number of risers is based on the overall length and overall height of the stair and the code limits specified on the Design Rules tab. The Straight Length value of the stair is adjusted automatically. ■ When Riser Count is user-defined (the icon is), you can specify a value that is used to calculate the tread depth and riser height. If these values fall outside the stair limits, an error message is displayed.
specify the height of each riser in the stair flight	■ select Calculation rules, set all fields to automatic (the icons are), click the icon to Riser to change it to and enter a value for Riser.
specify the tread depth for each tread in the stair flight	■ select Calculation rules, set all fields to automatic (the icons are), click the icon next to Tread to change it to and enter a value for Tread. You can also specify the Riser count when you set the tread depth.

NOTE If a value is set to user-defined on the Calculation rules worksheet, it can be modified directly in the Property palette.

NOTE If is displayed next to a field in the Calculation Rules dialog box, that field can't be changed until another field is changed from user-defined to automatic .

9 Expand Advanced.

10 Specify the Floor Settings:

If you want to . . .	Then . . .
change the thickness of the floor finish material at the top of the stair	enter a value for Top offset.
change the depth of the structure at the top of the stair	enter a value for Top depth.
change the thickness of the floor finish material at the bottom of the stair	enter a value for Bottom offset.
change the depth of the structure at the bottom of the stair	enter a value for Bottom depth.

11 Set the minimum or maximum height or amount of risers in a stair flight:

12 In the drawing area, specify the insertion point of the stair.

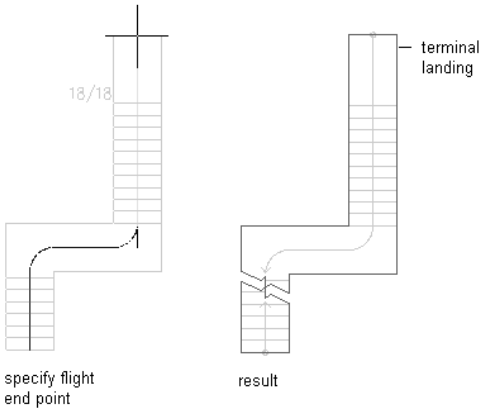
You can move or hide the Properties palette to expose more of the drawing area.

13 Specify the point of the first turn or landing for the stair.

14 Continue specifying points for the stair.

NOTE If you specified Landing for Terminate with, the last point for the stair beyond the final riser defines the end of the landing.

Specifying terminal landing length for multi-landing stair



15 Continue adding stairs, and press ENTER.

Creating an L-Shaped Stair with 45 Degree Tread

Use this procedure to add an l-shaped stair with a 45 degree turn in the winder.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Architectural Objects, and expand Stair Winder Styles.

3 Right-click, select New, and enter Single Point – 2 Tread as the style name.

4 Right-click and click Edit.

5 On the Settings tab, confirm that Use Riser Line is not selected.

6 Specify Single Point for Winder Type.

7 Select Adjust Winder Turn and enter 2 for Number of Treads in T urn.

8 Click OK twice.

9 Open the tool palette that you want to use, and select a stair tool.

If necessary, scroll to display the tool that you want to use.

10 On the Properties palette, expand Basic, and expand General.

11 In Shape, select Multi-landing.

12 In Turn type, select 1/4 turn.

13 Right-click, click Flight length and enter **t** for Tread length.

> **NOTE** If the stair style has Extend Landings to Prevent Risers and Treads Sitting under Landings turned on, the flight will not be pivoted exactly around the end of the stair.

14 In Winder Style, select Single Point – 2 Tread.

15 Draw a stair with one 90 degree turn and press ENTER.

16 Select the stair, enter **winderturnadjust** at the command line and press ENTER twice.

> **NOTE** The winderturnadjust command changes the number of treads in a turn zone for a stair using a Single Point winder style. The default number of treads is specified in the Settings tab of the Stair Winder Styles. You can change the amount of treads on the command line while running the winderturnadjust command.

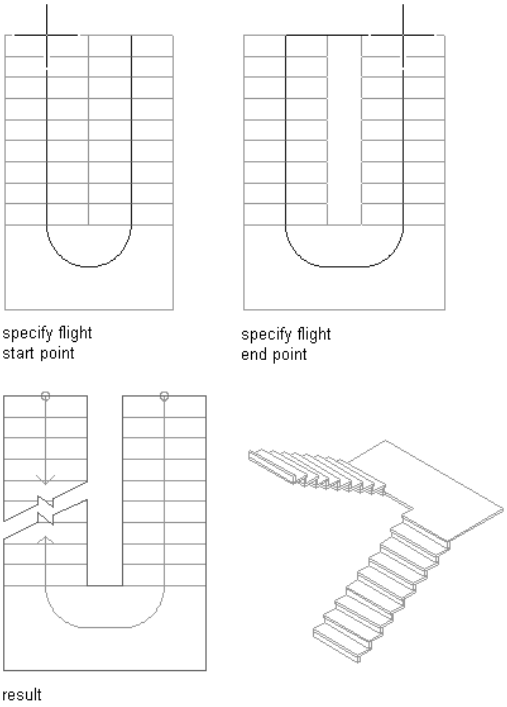
When you change the amount of treads in the turn zone, the Construction Line changes location across the stair because the tread length must remain constant along the stair. Changing the winder treads changes the width, so the line moves. The Construction Line can be edited with grips. If you move the Construction Line, the winder treads are affected.

Creating a U-shaped Stair with User-Specified Settings

Use this procedure to add a u-shaped stair with settings that you specify. U-shaped stairs have two equal-length runs joined by a half-landing. The justification setting controls where the points you specify to define the stair fall within its width.

When drawing the stair, the flights are shown with lines for each tread. Flat landings have no tread lines, while turn type landings show tread lines through the entire turn. For turn type stairs, these temporary lines do not necessarily represent the actual locations of tread lines in the final stair.

Creating a U-shaped stair



TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a stair tool.
   If necessary, scroll to display the tool that you want to use.
2. On the Properties palette, expand Basic, and expand General.
3. Select a style.
4. In Shape, select U-shaped.

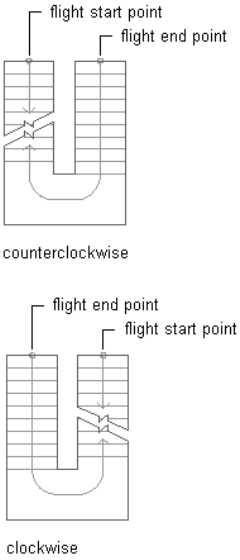
5 Specify the turn type:

If you want to . . .	Then . . .
create a flat landing where the stair run turns back in the opposite direction	select 1/2 landing for Turn type.
create stairs where the stair run turns back in the opposite direction with treads throughout the run	select 1/2 turn for Turn type.

6 Specify the horizontal orientation of the stair:

If you want to . . .	Then . . .
draw the u-shaped stair so that the right is the outer edge of the stair and left is the inner edge	select Counterclockwise for Horizontal Orientation.
draw the u-shaped stair so that the left is the outer edge of the stair and right is the inner edge	select Clockwise for Horizontal Orientation.

Specifying the horizontal direction for U-shaped stairs



7 Specify the vertical orientation of the stair:

If you want to . . .	Then . . .
draw the stair from this floor to the floor above	select Up for Vertical Orientation.
draw the stair from this floor to the floor below	select Down for Vertical Orientation.

8 Expand Dimensions.

9 Specify stair dimensions:

If you want to . . .	Then . . .
specify the width of the stair	enter a value for Width.
specify the floor-to-floor height of the stair	enter a value for Height.

If you want to . . .	Then . . .
specify the justification of the stair	enter a value for Justify. The Justify value you select controls the insertion point when you place the stair; left, center, or right at the beginning of the stair run.
end the stair run with a riser	select Riser for Terminate with. Stairs which end with a riser will have an overall height that is one tread thickness less than the floor-to-floor height specified.
end the stair run with a tread	select Tread for Terminate with.
end the stair run with a landing	select Landing for Terminate with.

If you want to . . .	Then . . .
specify the overall linear length of the stair	select Calculation rules, and then enter a value for Straight Length. ■ When Straight Length is set to automatic (the icon is), the value is calculated based on the tread size and riser count. ■ When Straight Length is user-defined (the icon is), the stair length is equal to the dimension entered, and the other three values are adjusted within the code limits. ■ When Riser Count is user-defined, the tread depth is increased or decreased to accommodate the stair.
specify the total number of stair risers	select Calculation rules, and then enter a value for Riser Count. ■ When Riser Count is set to automatic (the icon is), the number of risers is based on the overall length and overall height of the stair and the code limits specified on the Design Rules tab. The Straight Length value of the stair is adjusted automatically. ■ When Riser Count is user-defined (the icon is), you can specify a value that is used to calculate the tread depth and riser height. If these values fall outside the stair limits, an error message is displayed.
specify the height of each riser in the stair flight	■ select Calculation rules, set all fields to automatic (the icons are), click the icon to Riser to change it to and enter a value for Riser.
specify the tread depth for each tread in the stair flight	■ select Calculation rules, set all fields to automatic (the icons are), click the icon next to Tread to change it to and enter a value for Tread. You can also specify the Riser count when you set the tread depth.

NOTE If a value is set to user-defined on the Calculation rules worksheet, it can be modified directly in the Property palette.

NOTE If is displayed next to a field in the Calculation Rules dialog box, that field can't be changed until another field is changed from user-defined to automatic .

10 Expand Advanced.

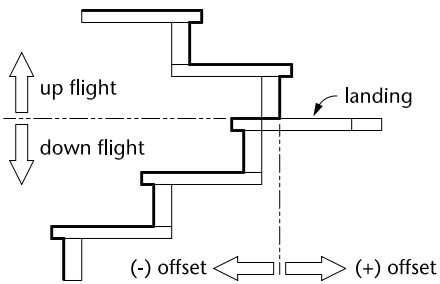
11 Specify the Constraints:

If you want to . . .	Then . . .
place the treads and risers with the minimum landing extension	select Free for Alignment.
align the tread of the up flight to the tread of the down flight	select Tread to tread for Alignment.
align the tread of the up flight to the riser of the down flight	select Tread to riser for Alignment.
align the riser of the up flight to the riser of the down flight	select Riser to riser for Alignment.

12 Specify a value for Alignment offset.

When you select Tread to tread, Tread to riser, or Riser to riser, you can specify an offset value. A positive offset value means that the down flight tread location is closer to landing than the up flight tread location.

Specifying tread to riser alignment offsets



13 Specify a value for the Extend alignment.

14 Specify a value for Uneven tread on which specifies which flight will be longer if the total number of treads is uneven. Select Upper flight to place the Uneven tread on the upper flight. Select Lower flight to place the uneven tread on the lower flight.

15 Specify the Floor Settings:

If you want to . . .	Then . . .
change the thickness of the floor finish material at the top of the stair	enter a value for Top offset.
change the depth of the structure at the top of the stair	enter a value for Top depth.
change the thickness of the floor finish material at the bottom of the stair	enter a value for Bottom offset.
change the depth of the structure at the bottom of the stair	enter a value for Bottom depth.

16 Set the minimum or maximum height or number of risers in a stair flight:

17 In the drawing area, specify the insertion point of the stair.

You can move or hide the Properties palette to expose more of the drawing area.

18 Specify the end point of the stair.

19 Continue adding stairs, and press ENTER.

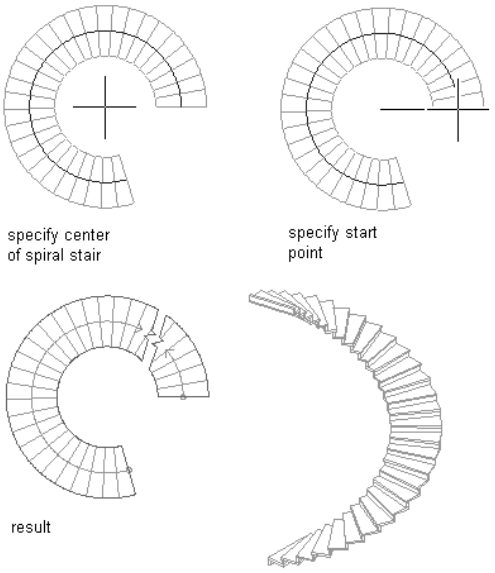
Creating a Spiral Stair with User-Specified Settings

Use this procedure to create a circular sweeping and spiral stair. A spiral stair revolves about a common center point from bottom to top.

You can specify a radius either directly or on the screen only when the arc constraint is free. Otherwise, the radius is determined from the specified

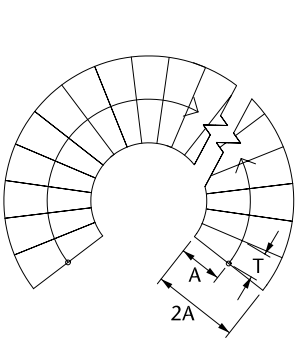
tread length and arc constraint. In that case, you need to adjust the tread length to achieve a desired radius.

Creating a spiral stair

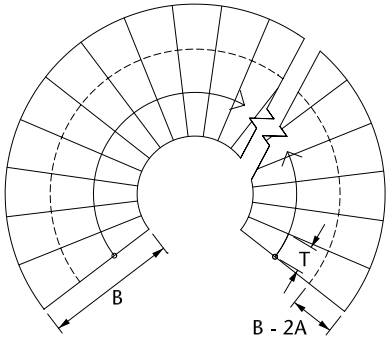


To create a spiral stair with the specified tread depth (T) that occurs at a specified distance from the inner edge, first construct the stair with a width equal to twice the required distance (A). Next, use Customized Edges to offset the outer edge to the desired total width B. The offset distance is equal to B - 2A.

Creating a spiral stair with a specified tread depth at a specified distance



spiral stair with width of 2A



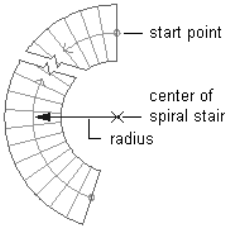
offset edge by B - 2A

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

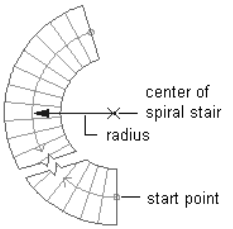
1. Open the tool palette that you want to use, and select a stair tool.
   If necessary, scroll to display the tool that you want to use.
2. On the Properties palette, expand Basic, and expand General.
3. Select a style.
4. In Shape, select Spiral.
5. Specify the horizontal orientation of the stair:

If you want to . . .	Then . . .
draw the spiral stair in a counterclockwise direction	select Counterclockwise for Horizontal Orientation.
draw the spiral stair in a clockwise direction	select Clockwise for Horizontal Orientation.

Specifying the horizontal orientation for a spiral stair



counterclockwise



clockwise

6 Specify the vertical orientation of the stair:

If you want to . . .	Then . . .
draw the stair from this floor to the floor above	select Up for Vertical Orientation.
draw the stair from this floor to the floor below	select Down for Vertical Orientation.

NOTE If Terminate with is set to Landing, the vertical orientation is up and cannot be changed.

7 Expand Dimensions.

8 Specify stair dimensions:

If you want to . . .	Then . . .
specify the width of the stair	enter a value for Width.

If you want to . . .	Then . . .
specify the floor-to-floor height of the stair	enter a value for Height.
specify the justification of the stair	enter a value for Justify. The Justify value you select controls the insertion point when you place the stair; left, center, or right at the beginning of the stair run.
end the stair run with a riser	select Riser for Terminate with. **NOTE** Stairs which end with a riser will have an overall height that is one tread thickness less than the floor-to-floor height specified. **NOTE** If the vertical orientation is set to Down, Terminate with is set to Riser and cannot be changed.
end the stair run with a tread	select Tread for Terminate with.
end the stair run with a landing	select Landing for Terminate with.
specify the exact radius for the spiral stair	select No for Specify On Screen and enter a value for Radius.
define the radius for the stair dynamically	select Yes for Specify On Screen.

If you want to . . .	Then . . .
specify the overall linear length of the stair	select Calculation rules, and then enter a value for Straight Length. ■ When Straight Length is set to automatic (the icon is), the value is calculated based on the tread size and riser count. ■ When Straight Length is user-defined (the icon is), the stair length is equal to the dimension entered, and the other three values are adjusted within the code limits. ■ When Riser Count is user-defined, the tread depth is increased or decreased to accommodate the stair.
specify the total number of stair risers	select Calculation rules, and then enter a value for Riser Count. ■ When Riser Count is set to automatic (the icon is), the number of risers is based on the overall length and overall height of the stair and the code limits specified on the Design Rules tab. The Straight Length value of the stair is adjusted automatically. ■ When Riser Count is user-defined (the icon is), you can specify a value that is used to calculate the tread depth and riser height. If these values fall outside the stair limits, an error message is displayed.
specify the height of each riser in the stair flight	■ select Calculation rules, set all fields to automatic (the icons are), click the icon to Riser to change it to and enter a value for Riser.
specify the tread depth for each tread in the stair flight	■ select Calculation rules, set all fields to automatic (the icons are), click the icon next to Tread to change it to and enter a value for Tread. You can also specify the Riser count when you set the tread depth.

NOTE If a value is set to user-defined on the Calculation rules worksheet, it can be modified directly in the Property palette.

NOTE If is displayed next to a field in the Calculation Rules dialog box, that field can't be changed until another field is changed from user-defined to automatic .

9 Select the type of arc constraint to use when creating the spiral stair:

If you want to . . .	Then . . .
create a spiral stair run with no constraints	select Free for Arc constraint.
create a spiral stair with a specific number of degrees for the stair flight	select Total Degrees for Arc constraint and enter a value for Arc angle. This includes the terminal landing or tread.
create a spiral stair with a specific degree for each tread in the stair	select Degrees per Tread for Arc constraint and enter a value for Arc angle.

10 Expand Advanced.

11 Specify the Floor Settings:

If you want to . . .	Then . . .
change the thickness of the floor finish material at the top of the stair	enter a value for Top offset.
change the depth of the structure at the top of the stair	enter a value for Top depth.
change the thickness of the floor finish material at the bottom of the stair	enter a value for Bottom offset.

12 Set the minimum or maximum height or amount of risers in a stair flight.

13 Specify the center point for the spiral stair.

14 Specify the location of the stair.

15 Continue adding stairs, and press ENTER.

Creating a Ramp

Use this procedure to create a ramp using stairs. The Ramp-Concrete style (in the Stair Styles drawing) includes the correct settings for creating a ramp.

The ramp stringer type should be used for creating ramps. The stringer facets display component provide the landing lines for ramps, and an End with tread setting makes it so that the connection to the next level works correctly instead of having one riser height between the ramp and the surface it should meet.

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

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1 Import the ramp style from the Stair Styles drawing.

For information about copying styles into your drawing, see "Copying Styles between Drawings" on page 545.

2 Open the tool palette that you want to use, and select a stair tool.

If necessary, scroll to display the tool that you want to use.

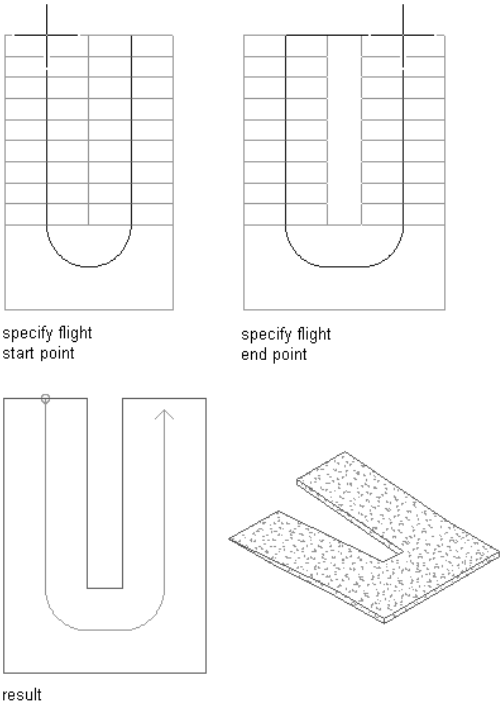
3 On the Properties palette, expand Basic, and expand General.

4 Select the Ramp-Concrete style.

5 Specify the location of the stair.

6 Continue adding stairs, and press ENTER.

Creating a U-shaped concrete ramp



Creating a Stair Tool

Use this procedure to create a stair tool and add it to a tool palette. You may want to create your own stair tools if you are placing multiple stair of specific styles with additional stair properties that you want to be the same each time you add a stair of that type.

1. Open the tool palette where you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a stair in the drawing	select the stair, and drag it to the tool palette.

If you want to . . .	Then . . .
create a tool from a stair style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.
6. Expand Basic, and expand General.
7. Click the setting for Description, enter a description of the stair created from this tool, and click OK.
8. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.
9. Select a stair style.

NOTE If a multi-landing or u-shaped stair is selected, the turn type can be set. If the turn type is 1/2 or 1/4 turn, the winder style can be set.

10. Select the drawing file containing the style used for this stair.
11. Click OK.

Editing Stairs

You can edit stairs by changing the style of the stair, the width and height of the stair, the size of the tread, and the justification. You can also change constraints, components, landing extensions, and location, in addition to the style and dimensions.

Autodesk®Architectural Desktop offers several methods for editing stairs:

- You can directly edit stairs using grips for dimensions and other physical characteristics.
- You can change stair settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected stair.

Related Procedures

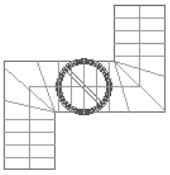
- Using Grips to Edit Stairs
- Changing the Width of a Flight
- Changing the Shape of a Flight
- Changing the Shape of a Landing
- Changing the Side of a Stair
- Changing the Height of a Stair
- Changing the Justification of a Stair
- Changing the Style of a Stair
- Changing the Horizontal Direction of a Spiral or U-shaped Stair
- Changing the Constraints of a Spiral Stair
- Changing the Constraints of a Spiral Stair
- Changing the Outside Edge of a Spiral Stair
- Changing the Dimensions of a Stair
- Changing the Floor Settings of a Stair
- Changing the Length Limits of a Flight
- Anchoring a Stair to a Landing
- Releasing Anchored Stairs
- Editing Winders
- Stair Interference Conditions
- Changing the Alignment of a U-shaped Stair
- Changing the Constraints of a Spiral Stair
- Changing the Components of a Flight
- Changing the Components of a Landing
- Changing the Extension of a Landing
- Changing the Display of an Overlapping Stair
- Applying Tool Properties to an Existing Stair
- Changing the Location of a Stair
- Specifying the Materials of a Stair
- Changing the Display Properties of Individual Stairs

- Attaching Hyperlinks, Notes, or Files to a Stair

Using Grips to Edit Stairs

When you use grips to edit stairs, the stairway continues to be constrained by the design limits and length specified when the stair was created if Automatic Length is set to No. This is the case for all stairs in previous version drawings. If you move beyond those limits, a warning symbol is displayed.

Viewing the stairs warning symbol



You can use grips to create multi-landing stairs that have skewed landings and angled stair runs. Changing the configuration of a landing may result in changes to the stair run.

You can increase or decrease the overall width of the stair run for U-shaped stairs.

The radius and start point can be changed for spiral stairs. You can use grips to increase or decrease the overall width of the stair run for spiral stairs. If you change the width of the stair after grip editing a side, the changes are lost.

NOTE You cannot use any of the plan representation grips to alter the floor-to-floor height. Select the stair in a view direction other than TOP to use a grip to change the floor-to-floor height.

Each stair shape has different grips associated with it.

Relates Procedures

- Using Grips to Edit Straight Stairs
- Using Grips to Edit Multi-Landing Stairs
- Using Grips to Edit U-Shaped Stairs
- Using Grips to Edit Spiral Stairs

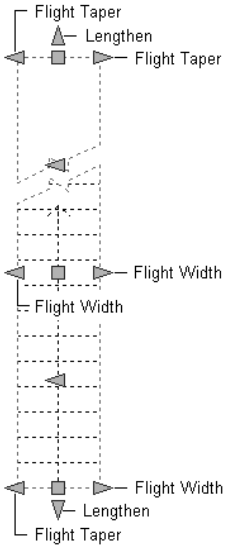
Using Grips to Edit Straight Stairs

Refer to the illustrations and steps in this topic to use straight stair grips to edit stairs.

Editing Stair Dimensions

1. Select the straight stair.
2. Select the grip for the dimension you want to change.

Straight Stair Dimension Grips



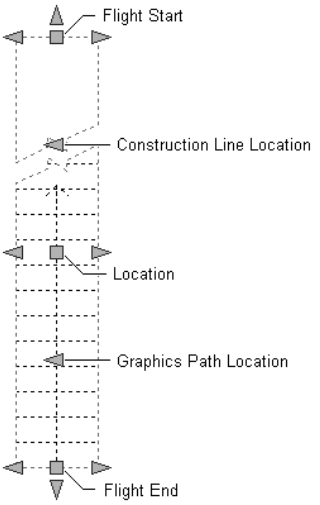
NOTE The lengthen grips move a straight stair unless it ends with a landing.

3. Move the grip until the dimension value you want is displayed and click once, or enter a value.

Changing the Location or Position of a Straight Stair

1. Select the straight stair.
2. Move the appropriate grip to change the location of the stair, its start point, construction line, graphics path, or its endpoint.

Straight Stair Location Grips



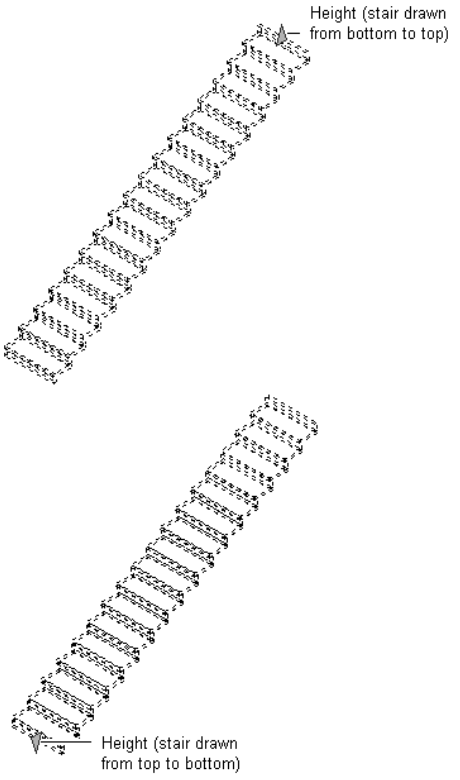
Changing the Height of a Straight Stair

1 Select the straight stair.

2 Move the Height grip to change the height of the stair.

NOTE This grip only displays in 3D views of the stair.

Straight Stair Height Grip



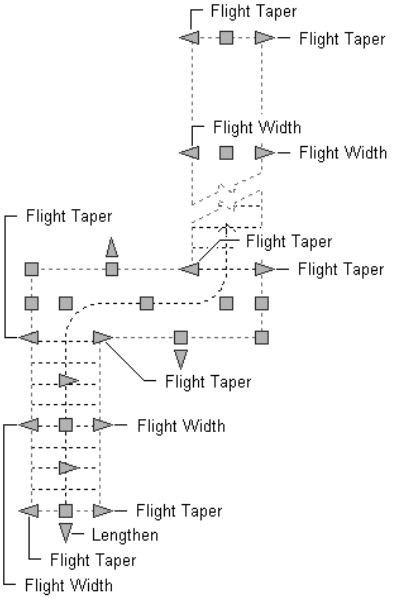
Using Grips to Edit Multi-Landing Stairs

Refer to the illustrations and steps in this topic to use multi-landing stair grips to edit stairs.

Editing Multi-Landing Stair Dimensions

1. Select the multi-landing stair.
2. Select the grip for the dimension you want to change.

Multi-Landing Stair Dimension Grips



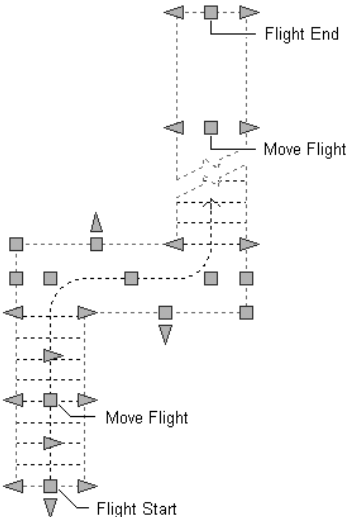
3 Move the grip until the dimension value you want is displayed and click once, or enter a value.

Changing the Location or Position of a Multi-Landing Stair

1 Select the multi-landing stair.

2 Move the appropriate grip to change the location of the stair, its start point, construction line, graphics path, or its endpoint.

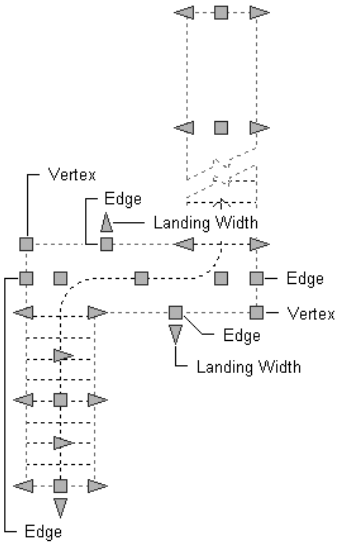
Multi-Landing Stair Location Grips



Changing the Shape of Landings for Multi-Landing Stair

1. Select the multi-landing stair.
2. Move the appropriate grip to change the shape of the landing of the stair.

Multi-Landing Stair Landing Editing Grips

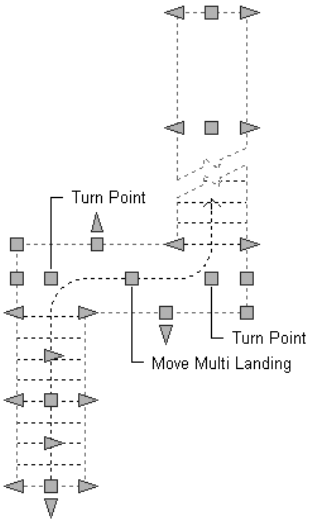


NOTE Once a landing edge has been customized by moving any of the vertex or edge grips, the landing width grips are no longer displayed.

Changing the Location of a Landing for a Multi-Landing Stair

1. Select the multi-landing stair.
2. Move the appropriate grip to change the location of the landing by changing the location of the turn point for each side of the landing or by moving the entire landing.

Multi-Landing Stair Landing Movement Grips

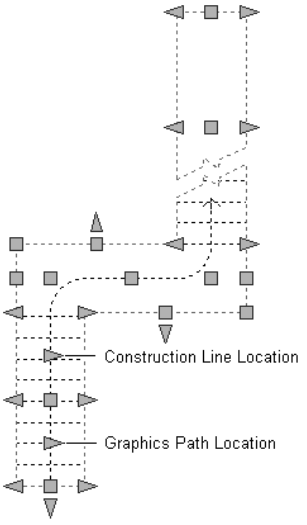


Changing the Construction Line or Graphics Path of a Multi-Landing Stair

1. Select the multi-landing stair.
2. Move the Construction Line or Graphics Path grip.

NOTE Only one of the Construction Line or Graphics Path can be displayed at a time. This is controlled on the Other tab of the current plan display representation. For information about his setting, see "Specifying the Display of Other Characteristics of a Stair" on page 1512.

Multi-Landing Stair Construction Line and Graphics Path Grips



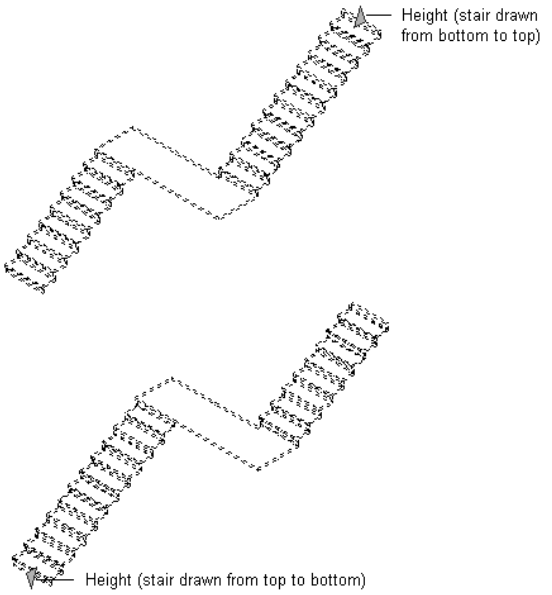
Changing the Height of a Multi-Landing Stair

1 Select the multi-landing stair.

2 Move the Height grip to change the height of the stair.

NOTE This grip only displays in 3D views of the stair.

Multi-Landing Stair Height Grip



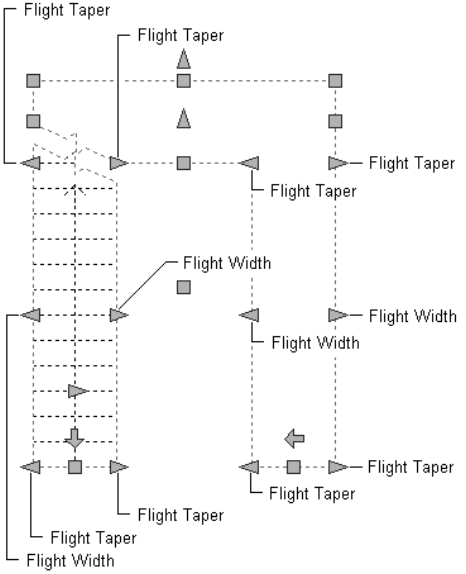
Using Grips to Edit U-Shaped Stairs

Refer to the illustrations and steps in this topic to use u-shaped stair grips to edit stairs.

Editing U-Shaped Stair Dimensions

1. Select the u-shaped stair.
2. Select the grip for the dimension you want to change.

U-Shaped Stair Dimension Grips



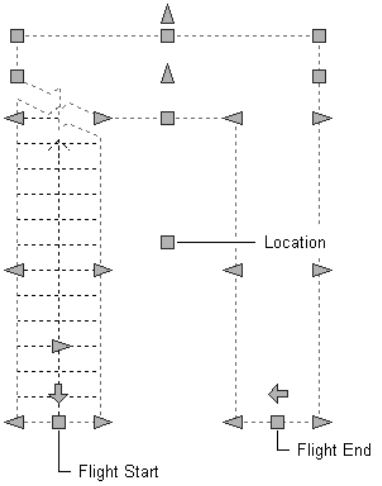
3 Move the grip until the dimension value you want is displayed and click once, or enter a value.

Changing the Location or Position of a U-Shaped Stair

1 Select the u-shaped stair.

2 Move the appropriate grip to change the location of the stair, its start point, construction line, graphics path, or its endpoint.

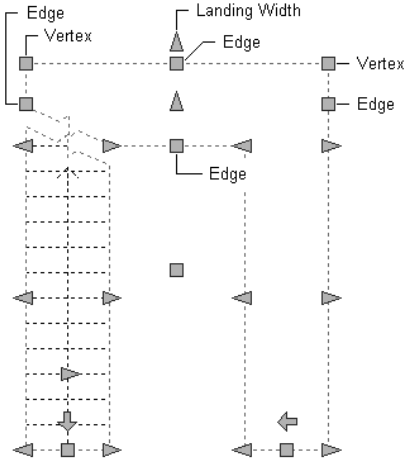
U-Shaped Stair Location Grips



Changing the Shape of Landings for U-Shaped Stair

1. Select the u-shaped stair.
2. Move the appropriate grip to change the shape of the landing of the stair.

U-Shaped Stair Landing Editing Grips



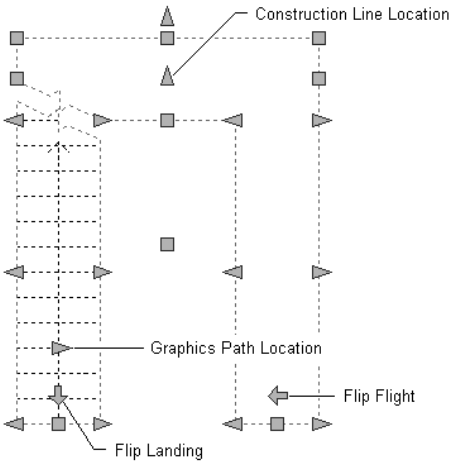
Changing the Construction Line or Graphics Path of a U-Shaped Stair

1. Select the u-shaped stair.
2. Move the Construction Line or Graphics Path grip.

NOTE Only one of the Construction Line or Graphics Path can be displayed at a time.

3. Move the appropriate Flip grip to flip the stair landing from one side of the flight start grip to the other or to switch the two flights.

Multi-Landing Stair Construction Line and Graphics Path Grips

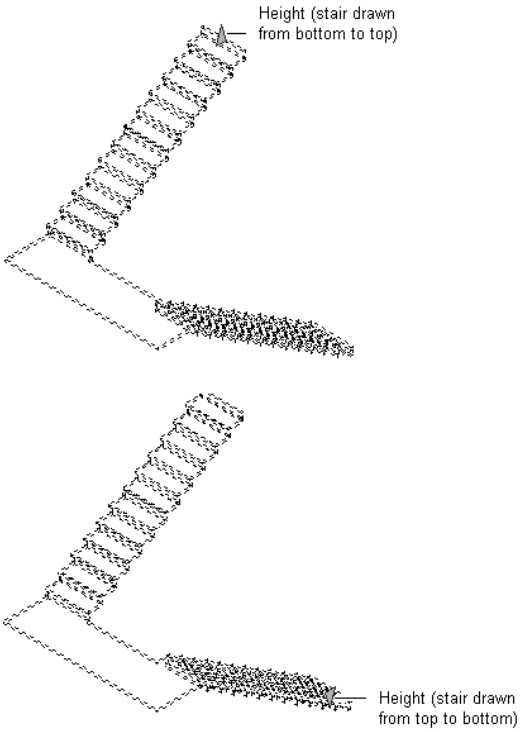


Changing the Height of a U-Shaped Stair

1. Select the u-shaped stair.
2. Move the Height grip to change the height of the stair.

NOTE This grip only displays in 3D views of the stair.

U-Shaped Stair Height Grip



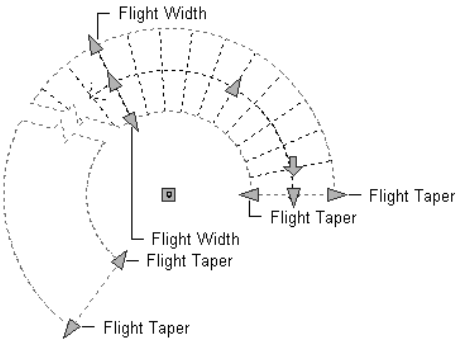
Using Grips to Edit Spiral Stairs

Refer to the illustrations and steps in this topic to use spiral stair grips to edit stairs.

Editing Spiral Stair Dimensions

1. Select the spiral stair.
2. Select the grip for the dimension you want to change.

Spiral Stair Dimension Grips



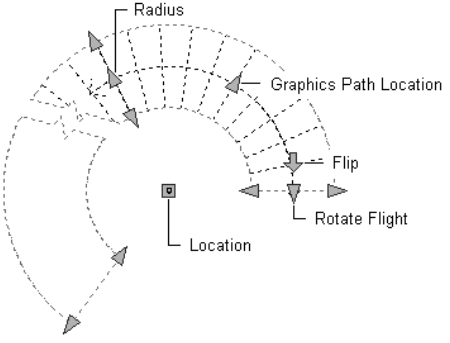
3 Move the grip until the dimension value you want is displayed and click once, or enter a value.

Changing the Location or Position of a Spiral Stair

1 Select the spiral stair.

2 Move the appropriate grip to change the location of the stair, its start point, construction line, graphics path, or its endpoint. You can also flip the stair around the start point,

Spiral Stair Location Grips



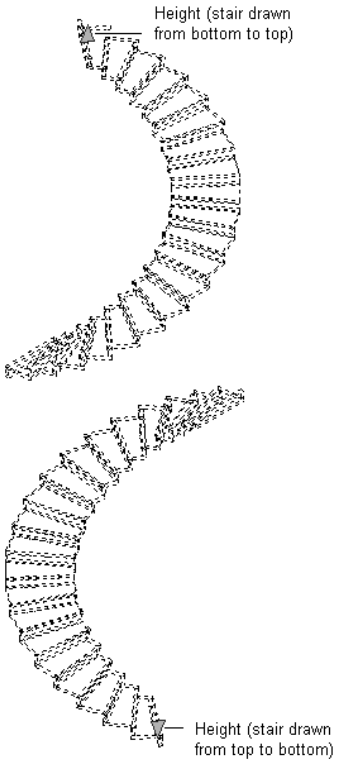
Changing the Height of a Spiral Stair

1 Select the spiral stair.

2 Move the Height grip to change the height of the stair.

NOTE This grip only displays in 3D views of the stair.

Spiral Stair Height Grip



Changing the Width of a Flight

Use this procedure to change width of a stair flight. You can also change the stair width on the Properties palette.

For more information about stair grips, see "Using Grips to Edit Stairs" on page 1443.

NOTE If you change the width of the stair after grip editing a side, the grip changes are lost.

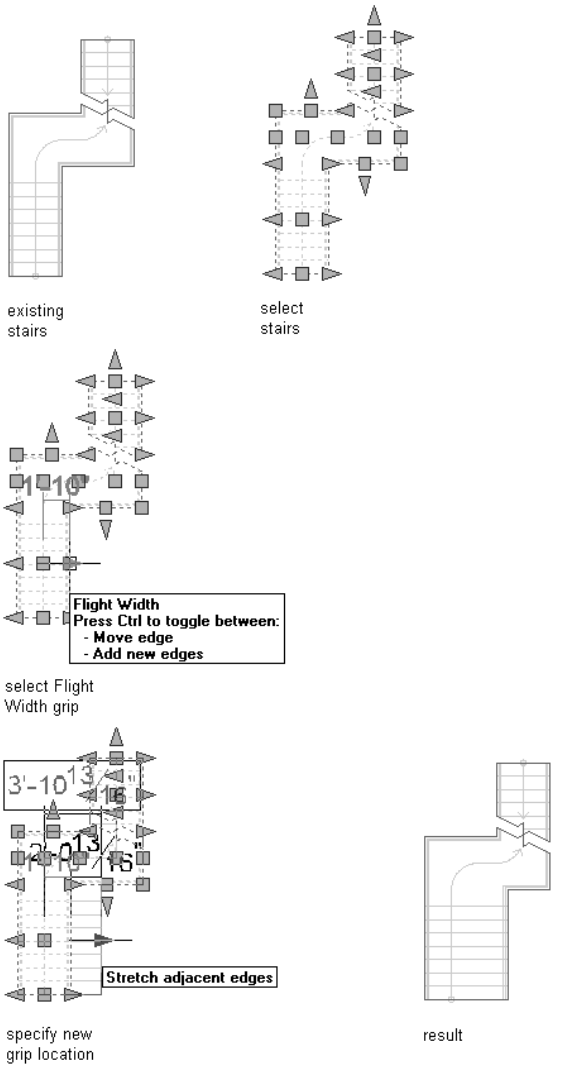
1 Select the stair.

2 Select a Flight Width grip, move the grip until the width value you want is displayed, and click once.

After selecting a grip, you can also enter a precise value to increase or decrease the width of the stair.

The entire edge of the flight moves to the selected location. The flight entry width also changes to fit the new stair width.

Using grips to change stair flight width



Changing the Shape of a Flight

Use this procedure to change the top and bottom width of a single flight on U-shaped, multi-landing, or spiral shape stairs. Each side of a flight can be tapered independently using grip points.

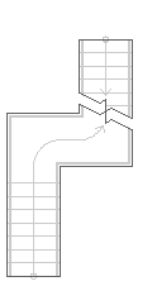
For more information about stair grips, see "Using Grips to Edit Stairs" on page 1443.

NOTE If you change the width of the stair after grip editing a side, the grip changes are lost.

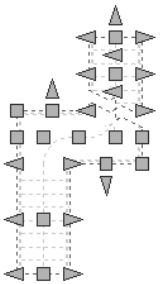
1. Select the stair to modify.
2. Select the Flight Taper grip on the stair flight, and move the grip away from stair path to new location.

   The flight changes to the new shape.

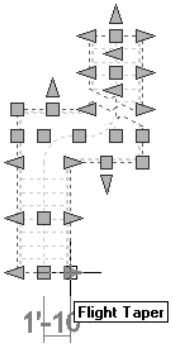
Using grips to change stair flight taper



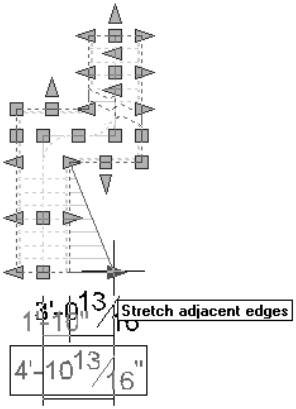
existing stairs



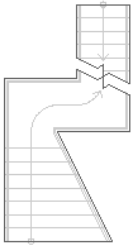
select stairs



select Flight Taper grip



specify new grip location



result

Changing the Shape of a Landing

Use this procedure to change the angles and positions of landing edges on U-shaped and multi-landing stairs. Each edge of a landing can be tapered or moved independently using grip points.

For more information about stair grips, see "Using Grips to Edit Stairs" on page 1443.

NOTE If you change the width of the stair after grip editing a side, the grip changes are lost.

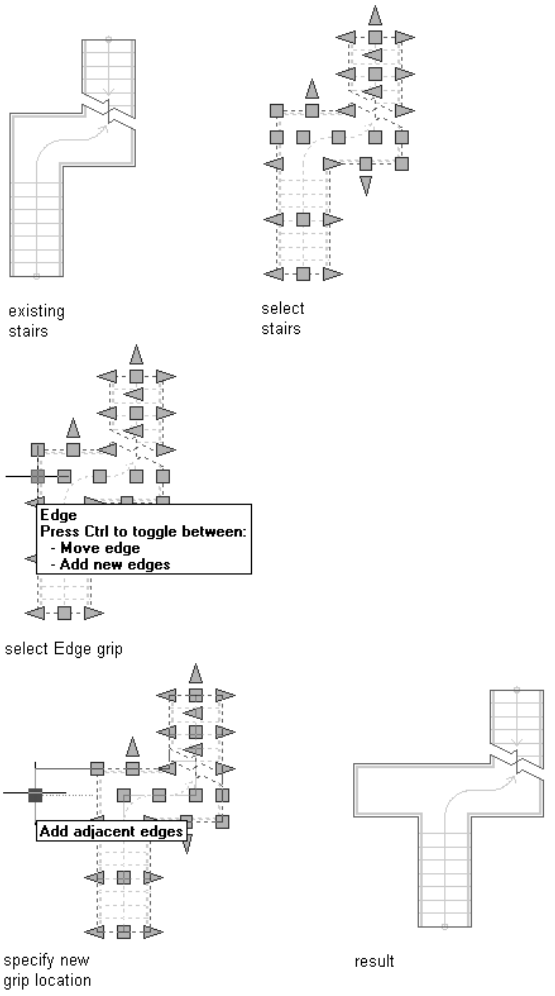
1. Select the stair to modify.
2. Select a Vertex grip on the landing, and move the grip away from the stair path to a new location.

   The landing changes to the new shape. If the vertex grip is shared between a landing and flight, the flight moves with the landing.

3. Select an Edge grip on the landing, and move the grip perpendicular to the stair path to new location.

   The entire edge of the landing moves to the selected location.

Using grips to change a stair landing width by adding an edge



4 Select an Edge grip on the side of a landing, press CTRL then move the grip away from the stair path.

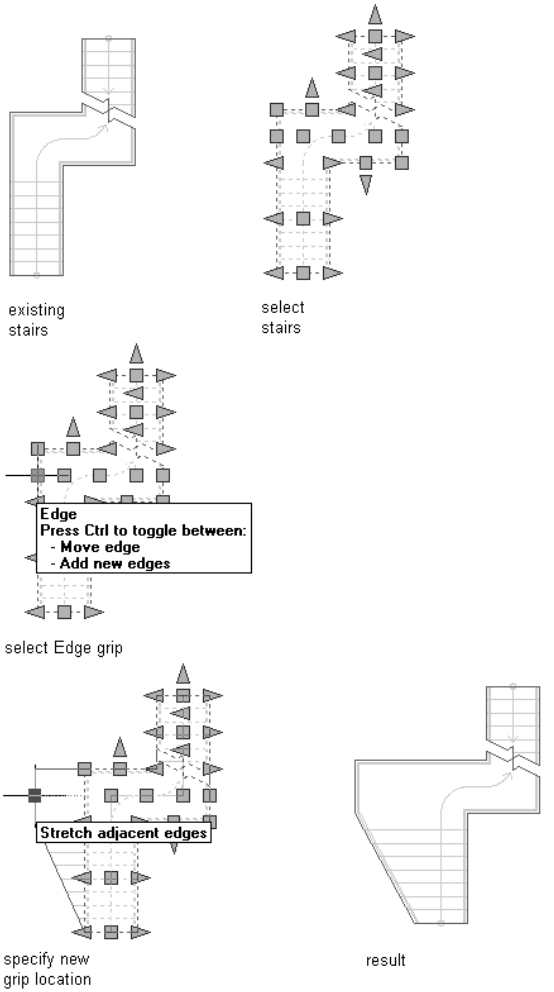
An adjacent edge of the landing is created.

Changing the Side of a Stair

You can determine the shape of one edge of a stair run that includes flights and landings, for straight, U-shaped, multi-landing, or spiral stairs.

The size of the landing must be adjusted to prevent overlapping treads when the inner edge of a stair is projected to a profile that lies outside of the original stair. The initial size of the landing is determined by projecting the diagonal of the original landing to the profile.

Using grips to change a stair landing width



Pushing one tread into the landing with its grip results in forcing the landing to lengthen in the other direction. Pulling one tread away from the landing does not affect the other end of the landing. The stair is automatically lengthened at its top, to accommodate the larger landing. You can modify

the length with the top and bottom grips, at the end of the stair walking path.

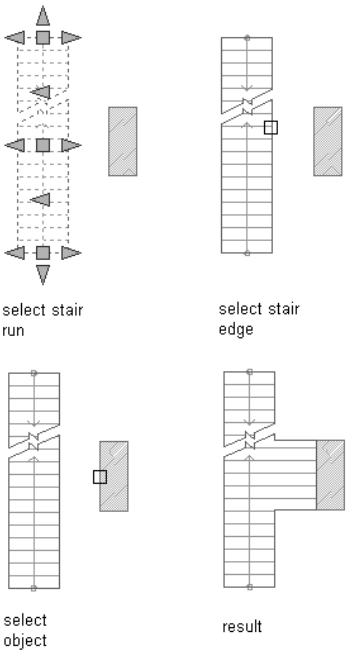
Related Topics and Procedures

- About Projecting the Side of a Stair
- Projecting the Side of a Stair
- Offsetting the Side of a Stair
- Generating a Polyline from the Edge of a Stair
- Removing Changes from the Side of a Stair

About Projecting the Side of a Stair

You can project the edge of a stair to most AEC objects (such as walls or mass elements, but excluding multi-view blocks).

Projecting a stair edge to an object



NOTE In the case of projection of an edge of a stair that has an inner corner, it is clear how to project the outer edge of the stair to the selected object, but projection of the inner corner is ambiguous. Rather than attempting to guess the correct solution, these cases are not projected, and a dialog box is displayed with

an explanation that edges of stairs with interior corners can be projected only to objects that extend beyond both ends of the stair.

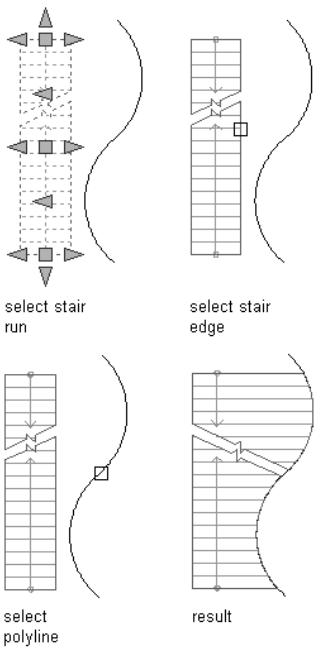
The stair length is extended at its original width when the object (or polyline) does not extend far enough for the stair to project completely.

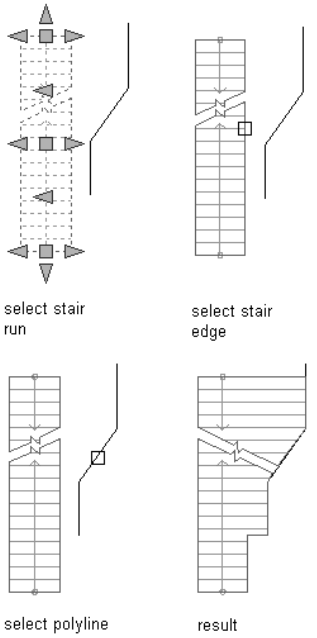
Projecting the Side of a Stair

Use this procedure to project the side of a stair to an existing polyline, wall, other AEC object, or solid. Objects to project to must extend the full length of the stair for an interior corner to project properly.

For more information about stair grips, see "Using Grips to Edit Stairs" on page 1443.

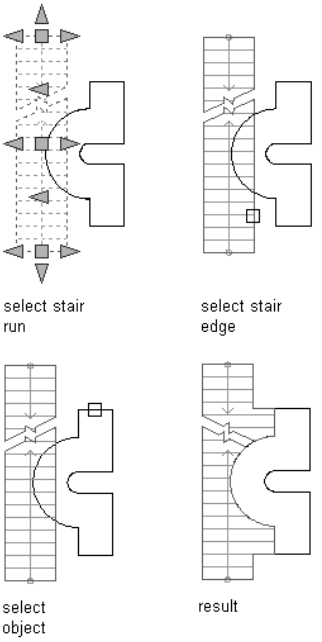
Projecting stair edges to a curved polyline





NOTE If you change the width of the stair after projecting a side, the changes to the projected edge are lost.

1. Select a stair, right-click, and click Customize Edge ➤ Project.
2. Select the edge of a stair to change.
3. Select a polyline, object or profile to project to, and press ENTER.



Treads are extended using the line of the current front and back edge.

NOTE If edges intersect, which can happen with only spiral and winding shapes, a defect marker is displayed.

Offsetting the Side of a Stair

Use this procedure to offset the side of a stair flight by a specified value.

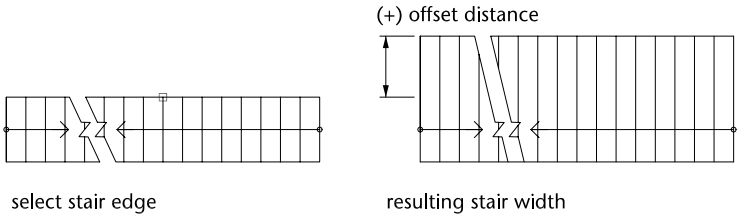
For more information about stair grips, see "Using Grips to Edit Stairs" on page 1443.

NOTE If you change the width of the stair after offsetting a side, the offset changes are lost.

1. Select a stair, right-click, and click Customize Edge ➤ Offset.
2. Select the edge of a stair to be offset.
3. Enter the distance to offset, where positive is out and negative is in and press ENTER.

   Treads are extended using the line of the current front and back edge.

Offsetting the edge of a stair



NOTE If edges intersect, which can happen with only spiral and winding shapes, a defect marker is displayed.

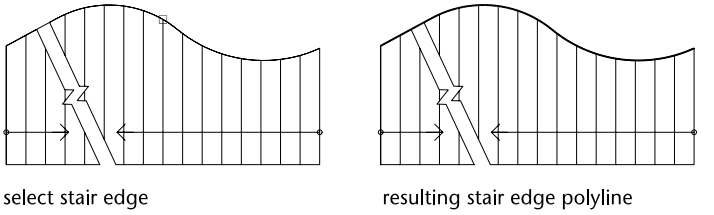
Generating a Polyline from the Edge of a Stair

Use this procedure to generate a polyline from the edge of a stair. The polyline is generated at the stair bottom elevation.

For more information about stair grips, see "Using Grips to Edit Stairs" on page 1443.

You can keep some sample polylines in the drawing, and use the final choice to project to. That way, you can project the stair edge, edit the stair, then generate the polyline, change the stair again, generate another polyline, change the stair some more, and finally project to the best version you created.

Generating a polyline from a stair edge



1. Select a stair, right-click, and click Customize Edge ➤ Generate Polyline.
2. Select the edge of a stair.
3. Press ENTER.

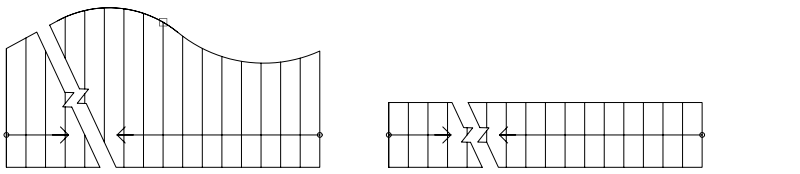
A polyline is created at the stair bottom elevation along the length of the stair run.

Removing Changes from the Side of a Stair

Use this procedure to return the selected edge of the stair to its default profile. If the stair is back to its original condition, the Width is restored to the original value, rather than *VARIES*. This change affects the treads, risers, and stringers.

For more information about stair grips, see "Using Grips to Edit Stairs" on page 1443.

Removing changes made to the side of a stair



select stair edge

stair edge returned to previous configuration

1. Select a stair, right-click, and click Customize Edge ➤ Remove Customization.
2. Select the edge of a stair.
3. Press ENTER.

Changing the Height of a Stair

Use this procedure to change the height of a stair. You can also change the stair height on the Properties palette.

For more information about stair grips, see "Using Grips to Edit Stairs" on page 1443.

1. Select the stair in an isometric view.
2. Select the Height grip, move the grip until the value you want is displayed, and click once.

   After selecting a grip, you can also enter a precise value to increase or decrease the height of the stair.

NOTE If you edit the height of a stair with landings, so that a landing would be below the new height, the landing is not displayed. If you edit the height again, and move it to a location above the previous landing, the landing is no longer there. To retain the stair path which includes the landing, use the AecStairFit command to set Automatic Landings to No.

Changing the Justification of a Stair

Use this procedure to change the justification of an individual stair. The stair remains in the same location, but changes in the width keep the new justification point constant.

For example, a stair that has right justification changes the left edge when the width is changed.

1. Select the stair you want to change, and double-click it.
2. On the Properties palette, expand Basic, and expand General.
3. Select Left, Center, or Right for Justify.

   This does not change the location of the stair, but changing this value specifies the point from which changes to the width are calculated from this point forward.

Changing the Style of a Stair

Use this procedure to select a different stair style for one or more stairs.

1. Select the stairs to change, and double-click one of them.
2. Expand Basic, and expand General.
3. Select a different style.

Changing the Horizontal Direction of a Spiral or U-shaped Stair

Use this procedure to change the orientation of a spiral stair.

1. Select a spiral or u-shaped stair.
2. Specify the horizontal orientation of the stair:

If you want to . . .	Then . . .
draw the spiral or u-shaped stair in a counterclockwise direction	select Counterclockwise for Horizontal Orientation.
draw the spiral or u-shaped stair in a clockwise direction	select Clockwise for Horizontal Orientation.

NOTE This is equivalent to selecting the flip grip that mirrors the stair around its start point.

Changing the Constraints of a Spiral Stair

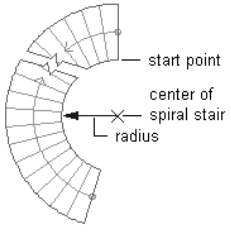
Use this procedure to control what constrains the spiral stair by specifying a total degree amount or how many degrees per tread to use. These fields are available only when you select a spiral-shaped stair to modify.

1. Select a spiral stair.
2. Specify the arc constraint:

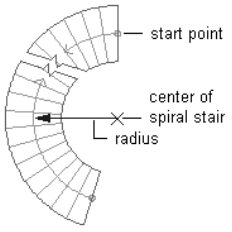
If you want to . . .	Then . . .
display the spiral stair with no constraint	select Free for Arc Constraint.
specify the total degrees for the stair flight	select Total Degrees for Arc Constraint, and enter a value for Arc Angle.
specify the specific degree for each tread in the stair	select Degrees per Tread for Arc Constraint, and enter a value for Arc Angle.

3. Specify the Radius of the stair.

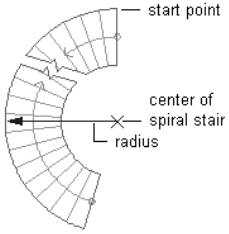
   The radius is measured from the center point of the spiral stair to the selected justification point.



right-justified



center justified



left-justified

4 Click OK.

Changing the Outside Edge of a Spiral Stair

Use this procedure to change the outside edge of a spiral stair. You can change the edge in two ways:

- When you use the Flight Width grip point, you uniformly change the width of the stair along the entire arc. The endpoints of the outer edges of the stair move. This changes the size of the stair.
- When you click the Flight Width grip point and press CTRL, you maintain the center of the stair and the outside grip points. This changes the shape of the stair.

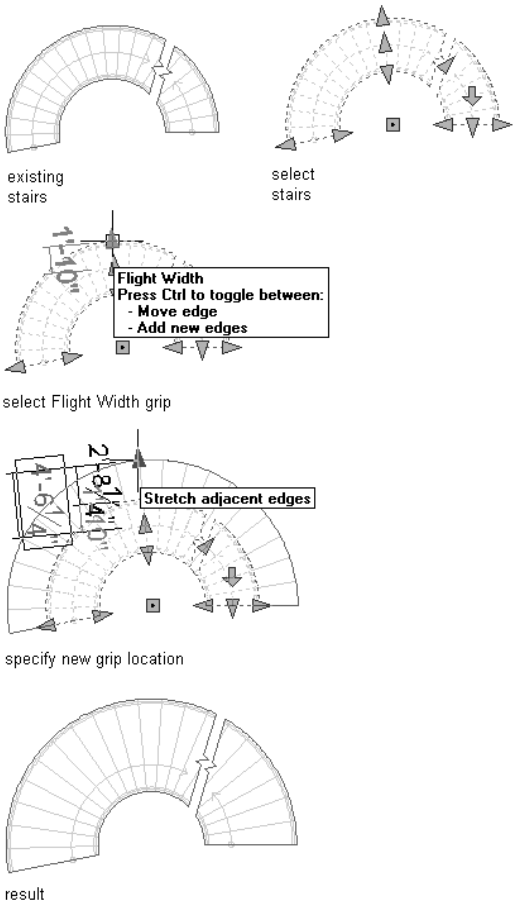
1 Select a spiral stair.

2 Change a spiral stair:

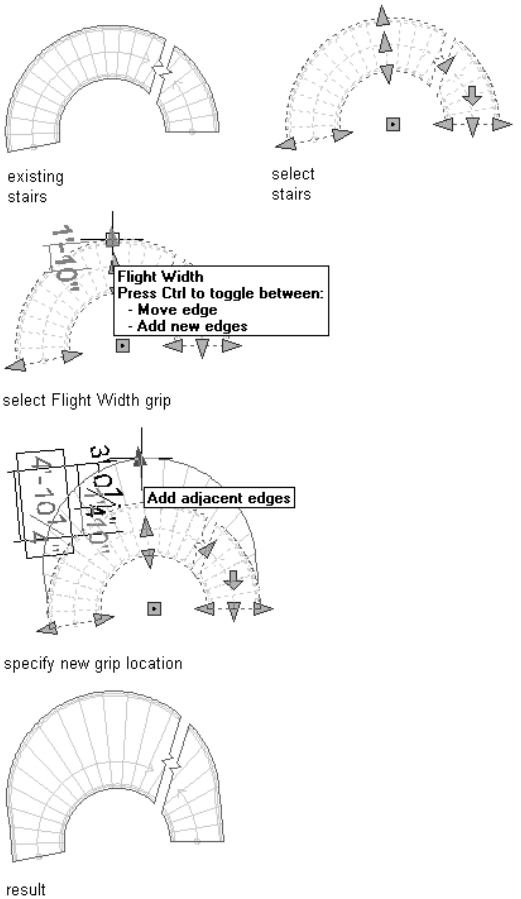
If you want to . . .	Then . . .
uniformly change the width of a spiral stair along the entire arc	click the Flight Width grip of the spiral stair.
maintain the center and outside grip points while changing the shape of a spiral stair	click the Flight Width grip of the spiral stair and press CTRL.

3 Move the grip to change the size or shape of the stair.

Using grips to change the flight width of a spiral stair run



Using grips to change the flight width of a spiral stair run by adding an edge



Changing the Dimensions of a Stair

Use this procedure to control the various dimensions associated with calculating the stair.

Some of the interacting dimensions can be user-defined and some are automatic, depending upon the combination of fields that are selected. Only logical combinations are available when the rule based calculator is in effect. When the rule-based calculator is not in effect, either tread or straight length can be user-defined and either riser count or riser height can be user-defined.

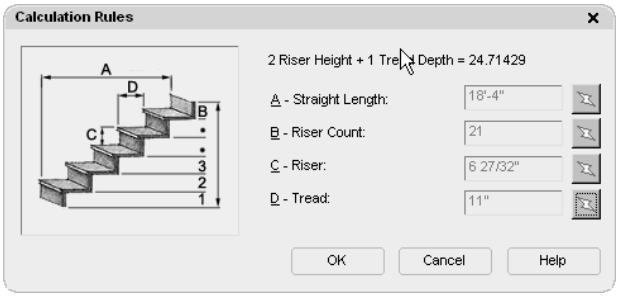
1 Select the stair.

2 On the Properties palette, expand Basic, and expand Dimensions.

3 Change any of the dimensions of the stair:

If you want to . . .	Then . . .
specify the width of the stair run	enter a value for Width. **NOTE** If you change the width of the stair after grip or otherwise customizing an edge, the changes are lost.
specify the floor-to-floor height for the stair	enter a value for Height.
specify the justification of the stair	select Left, Center, or Right for Justify. This does not change the location of the stair, but changing this value determines the point from which the width is calculated if it is subsequently changed.

4 Select Calculation rules:



If you want to . . .	Then . . .
specify the overall linear length of the stair	enter a value for Straight Length. ■ When Straight Length is set to automatic (the icon is), the value is calculated based on the tread size and riser count. ■ When Straight Length is user-defined (the icon is), the stair length is equal to the dimension entered, and the other three values are adjusted within the code limits. If these values fall outside the stair limits, an error message is displayed. ■ When Riser Count is user-defined, the tread depth is increased or decreased to accommodate the stair.
specify the total number of stair risers	enter a value for Riser Count. ■ When Riser Count is set to automatic (the icon is), the number of risers is based on the overall length and overall height of the stair and the code limits specified on the Design Rules tab. The Straight Length value of the stair is adjusted automatically. ■ When Riser Count is user-defined (the icon is), you can specify a value that is used to calculate the tread depth and riser height. ■ If these values fall outside the stair limits, an error message is displayed.

If you want to . . .	Then . . .
specify the height of each riser in the stair flight	■ set all fields to automatic (the icons are), click the icon to Riser to change it to and enter a value for Riser height.
specify the tread depth for each tread in the stair flight	■ set all fields to automatic (the icons are), click the icon next to Tread to change it to and enter a value for Tread depth. You can also specify the Riser count when you set the tread depth.

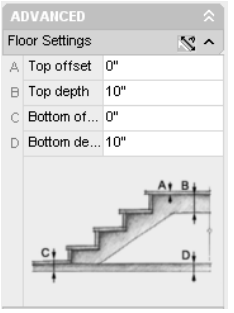
NOTE If is displayed next to a field in the Calculation Rules dialog box, that field can't be changed until another field is changed from user-defined to automatic .

Changing the Floor Settings of a Stair

Use this procedure to control how the stair interacts with the floor at the beginning and end of the stair run.

1 Select a stair.

2 On the Properties palette, expand Advanced, and expand Floor Settings.



3 Change settings for how the stair meets the top and bottom floors:

If you want to . . .	Then . . .
specify the thickness of the floor finish material at the top floor of the stair	enter a value for Top Offset.
specify the depth of the structure at the top floor	enter a value for Top Depth.
specify the thickness of the floor finish material at the bottom floor of the stair	enter a value for Bottom Offset.
specify the depth of the structure at the bottom floor	enter a value for Bottom Depth.

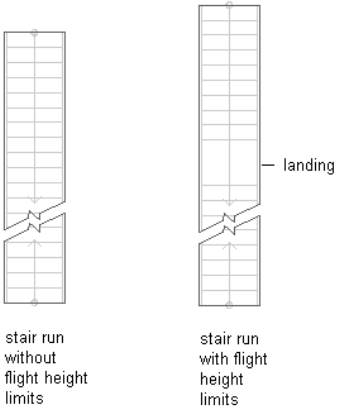
NOTE The Top and Bottom Depth settings currently have no effect on the stair or stringers. In addition, the top offset has no visible effect on the stair. Bottom offset extends or truncates any attached stringers. Both offset values affect the rough floor-to-floor height, if it is displayed.

Changing the Length Limits of a Flight

Use this procedure to change the limits for the flight of a stair. A flight can have no limits, or limits that are constrained by a minimum number of risers, minimum height, maximum number of risers, or a maximum height.

Use these settings to create automatic landings in a stair flight. For example, if a stair flight has 18 treads and you set the maximum treads to 15, the stair will have two flights with one landing in the middle, keeping under the 15 maximum risers on wither side of the landing.

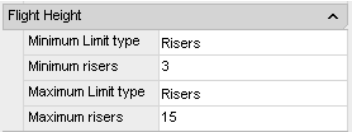
Specifying flight height limits for a stair run



1 Select a stair.

2 On the Properties palette, expand Advanced, and expand Flight Height.

Flight Height with Risers Limit Type



3 Specify the constraints for flight length:

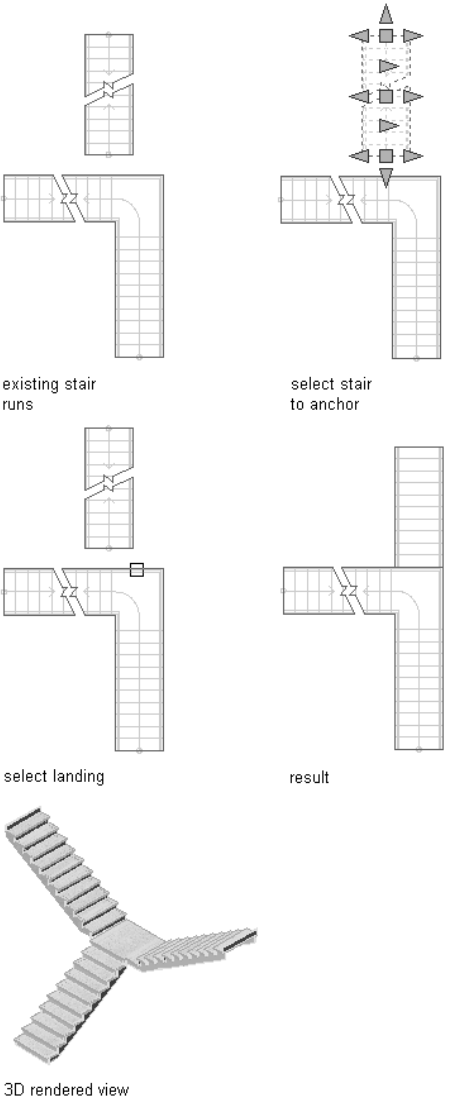
If you want to . . .	Then . . .
specify no limits on the flight	select None for Minimum Limit type and None for Maximum Limit type.
specify a minimum number of risers per flight	select Risers for Minimum Limit type, and enter a value for Minimum risers.
specify a minimum height for the flight	select Height for Minimum Limit type, and enter a value for Minimum height.
specify a maximum number of risers per flight	select Risers for Maximum Limit type, and enter a value for Maximum risers.
specify a maximum height for the flight	select Height for Maximum Limit type, and enter a value for Maximum height.

Anchoring a Stair to a Landing

Use this procedure to anchor a landing to an existing landing.

1. Draw a stair with a landing and a second stair to attach to the landing. See "Using Stair Tools to Create Stairs" on page 1413 for more information about creating stairs.
2. Select the stair to anchor to a landing.
3. Select the stair to anchor to a landing, right-click, and click Stair Landing Anchor ➤ Anchor to Landing.
4. Select a location on the landing to anchor the center of the start of the stair run. The flight will be perpendicular to the landing edge.

Anchoring a stair run to a landing



NOTE Stairs created with a Vertical Orientation of Up go up from the landing while stairs created with a Vertical Orientation of Down go down from the landing.

This is a good situation in which to use the renumber riser numbering feature. See "Specifying the Riser Numbering Display for Individual Stairs" on page 1514.

Releasing Anchored Stairs

Use this procedure to release stairs anchored to landings.

- Select the stair to anchored to the landing, right-click, and click Stair Landing Anchor ➤ Release.

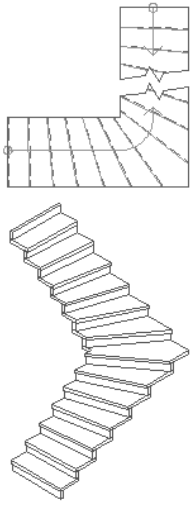
NOTE The stair remains in the same location, but is no longer anchored to the landing.

Editing Winders

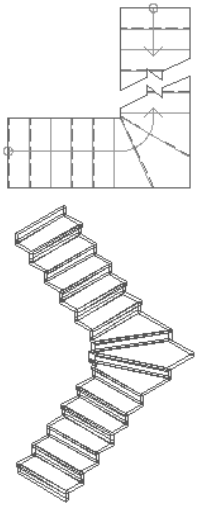
There are three different winder types which give you different levels of control for 1/2 turn and 1/4 turn stairs.

For information about creating new winder styles, see "Creating a Stair Winder Style" on page 1535.

Balanced Winder Style



Single Point Winder Style



Related Procedures

- Editing Winders with the Single Point Winder Style
- Editing Winders with the Manual Winder Style

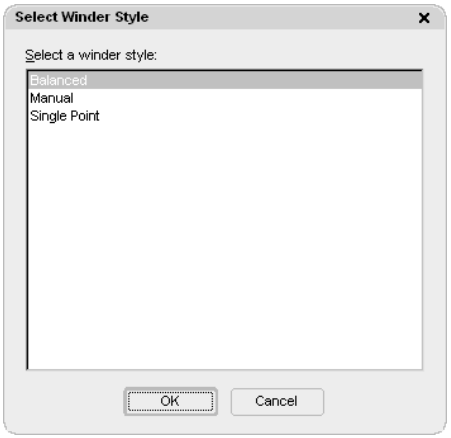
Editing Winders with the Single Point Winder Style

Use this procedure to change the winders defined by the Single Point winder style. With Single Point in a 1/4 turn stair, a turn zone is defined by projecting two lines perpendicular to the stair flight's construction line from the Turn Center grip. With Single Point in a 1/2 turn stair, the turn zone by projecting two lines perpendicular to the stair flight's construction line if it is possible.

The winders within the turn zone are set to an angle converging on the Turn Center grip.

1. Select a 1/2 turn or 1/4 turn stair.
2. If the Winder Style is balanced, select the circular Edit Turns trigger grip. The Select Winder styles dialog box displays.

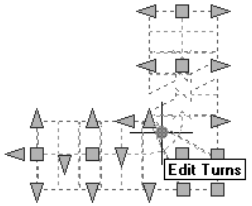
NOTE Only the winder styles present in the drawing are displayed.



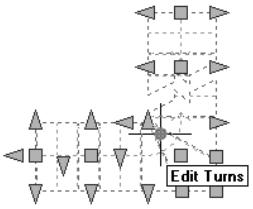
3 Select a Single Point style from the list and click OK.

NOTE To select the style from the Properties palette, expand Basic, expand General and select Single Point for Winder Style.

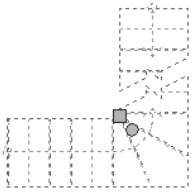
4 Select the Edit Turns trigger grip.



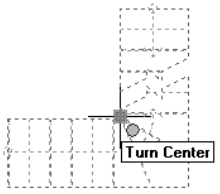
select stair



select Edit Turns trigger grip



view single point winder grips



select Turn Center grip

NOTE To have the converging point on the edge of the stair, you must uncheck the Use Riser Lines setting. See "Specifying the Stair Winder Style Settings" on page 1536. for more information about this setting.

5 Click and drag the Turn Center grip to change the winders in the turn zone.

Editing Winders with the Manual Winder Style

Use this procedure to change individual winders. Each winder is moved based on its intersection with the stair's Construction Line.

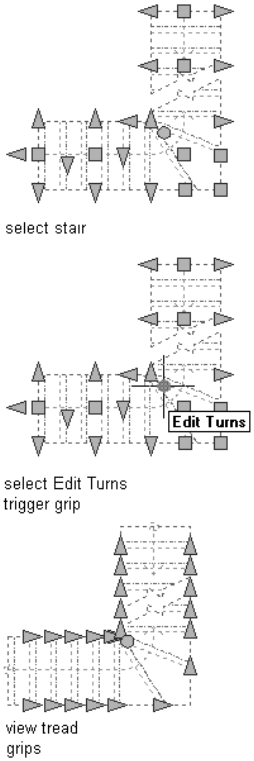
The grips are placed at the end of the riser or tread line, based on the Use Riser Line setting in the Stair Winder Style dialog box. For more information, see "Specifying the Stair Winder Style Settings" on page 1536.

1. Select a 1/2 turn or 1/4 turn stair.
2. If the Winder Style is balanced, select the circular Edit Turns trigger grip. The Select Winder styles dialog box displays.

3. Select a Manual style from the list and click OK.

NOTE To select the style from the Properties palette, expand Basic, expand General and select Manual for Winder Style.

4. Select the Edit Turns trigger grip.



NOTE Because the tread depth must be the same for each tread, the tread line will pivot around the construction line.

5 Click a Tread End or Riser End grip and drag it. The individual tread or riser changes to the selected angle.

Stair Interference Conditions

You can control the height and width of a stair's interference condition with walls, slabs, spaces, curtain walls, and door and window assemblies. When you add an interference condition between a stair and one of the valid objects, a box is cut out around the stair based on the specified headroom height and side clearance.

Related Procedures

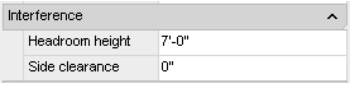
- Creating an Interference Condition in a Wall

- Removing a Stair Interference Condition from a Wall
- Creating an Interference Condition in a Slab
- Removing a Stair Interference Condition from a Slab
- Creating an Interference Condition in a Space
- Removing a Stair Interference Condition from a Space
- Creating an Interference Condition in a Curtain Wall
- Removing a Stair Interference Condition from a Curtain Wall
- Creating an Interference Condition in a Door/Window Assembly
- Removing a Stair Interference Condition from a Door/Window Assembly
- Changing the Interference Size of a Stair

Creating an Interference Condition in a Wall

Use this procedure to create a stair interference area in a wall. When you add an interference condition between a stair and a wall, an opening is created in the wall around the stair based on the stair's specified headroom height and side clearance.

1. Create a stair that intersects with a wall. See "Using Stair Tools to Create Stairs" on page 1413for information about creating stairs.
2. On the Properties palette, expand Advanced, and expand Interference.



3. Set the size of the interference condition.

If you want to . . .	Then . . .
specify the height above the treads for the interference condition	enter a value for Headroom height.
specify the width of the interference condition on all sides of a stair run, other than where you stop on and off at the first and last treads	enter a value for Side clearance.

4. Click in the drawing to deselect the stair.
5. Select the wall to intersect, right-click, and click Interference Condition ➤ Add.
6. Select the stair.
7. Select the shrinkwrap effect and press ENTER. See "Working with Interference Conditions" on page 1861for more information about shrinkwrapping.

NOTE The size of the intersection with the wall automatically changes if you change the Interference values of the stair.

Removing a Stair Interference Condition from a Wall

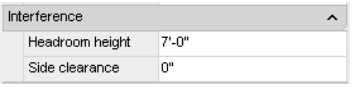
Use this procedure to remove a stair interference from a wall.

1. Click in the drawing to deselect the stair.
2. Select the wall to remove the interference from, right-click, and click Interference Condition ➤ Remove.
3. Select the stair and press ENTER.

Creating an Interference Condition in a Slab

Use this procedure to create a stair interference area in a slab. When you add an interference condition between a stair and a slab, a box is cut out around the stair from the slab based on the specified headroom height and side clearance.

1. Create a stair that intersects with a slab. See "Using Stair Tools to Create Stairs" on page 1413for information about creating stairs.
2. On the Properties palette, expand Advanced, and expand Interference.

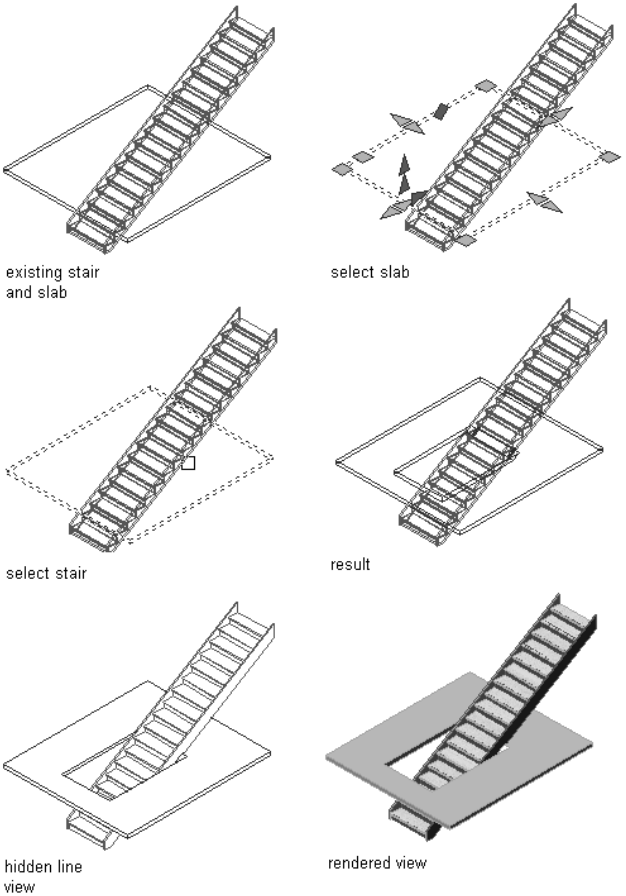


3. Set the size of the interference condition.

If you want to . . .	Then . . .
specify the height above the treads for the interference condition	enter a value for Headroom height.
specify the width of the interference condition on all sides of a stair run, other than where you stop on and off at the first and last treads	enter a value for Side clearance.

4. Click in the drawing to deselect the stair.
5. Select the slab to intersect, right-click, and click Boolean ➤ Subtract.
6. Select the stair and press ENTER.

Creating a slab and stair interference condition



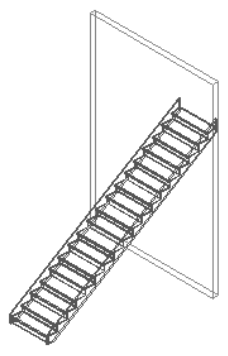
NOTE The size of the intersection with the slab automatically changes if you change the Interference values of the stair.

Removing a Stair Interference Condition from a Slab

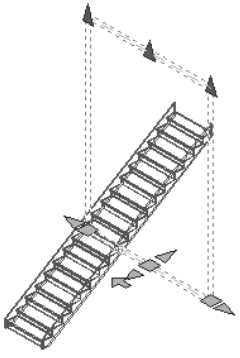
Use this procedure to remove a stair interference from a slab.

1. Select the slab to remove the interference from, right-click, and click Boolean ➤ Detach.
2. Select the stair and press ENTER.

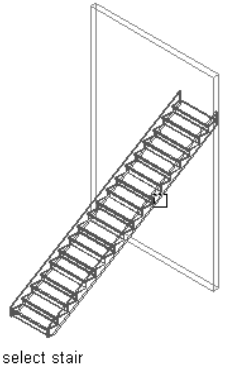
Creating a wall and stair interference condition



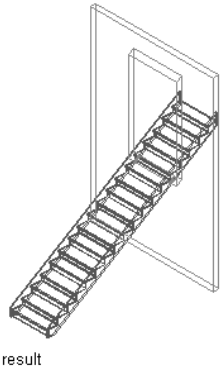
existing stair and wall



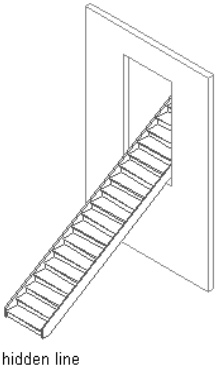
select wall



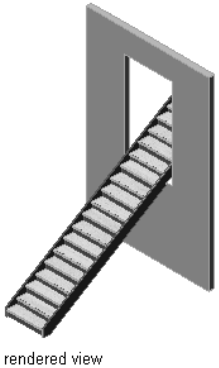
select stair



result



hidden line view

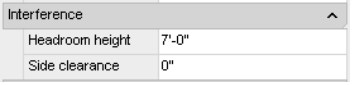


rendered view

Creating an Interference Condition in a Space

Use this procedure to create a stair interference area in a space. When you add an interference condition between a stair and a space, a box is cut out around the stair from the space based on the specified headroom height and side clearance.

1. Create a stair that intersects with a space. See "Using Stair Tools to Create Stairs" on page 1413 for information about creating stairs.
2. On the Properties palette, expand Advanced, and expand Interference.



3. Set the size of the interference condition.

If you want to . . .	Then . . .
specify the height above the treads for the interference condition	enter a value for Headroom height.
specify the width of the interference condition on all sides of a stair run, other than where you stop on and off at the first and last treads	enter a value for Side clearance.

4. Click in the drawing to deselect the stair.
5. Select the space to intersect, right-click, and click Interference Condition.
6. Enter **a** (Add), select the space, and press ENTER.
7. Select the stair and press ENTER twice.

NOTE The size of the intersection with the space automatically changes if you change the Interference values of the stair.

Removing a Stair Interference Condition from a Space

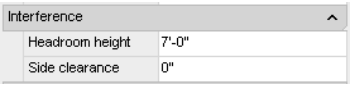
Use this procedure to remove a stair interference from a space.

1. Select the space to remove the interference from, right-click, and click Interference Condition.
2. Enter **r** (Remove), select the space, and press ENTER.
3. Select the stair and press ENTER twice.

Creating an Interference Condition in a Curtain Wall

Use this procedure to create a stair interference area in a curtain wall. When you add an interference condition between a stair and a curtain wall, a box is cut out around the stair from the wall based on the specified headroom height and side clearance. You have the option of cutting the infills, frames and mullions of the curtain wall.

1. Create a stair that intersects with a curtain wall. See "Using Stair Tools to Create Stairs" on page 1413for information about creating stairs.
2. On the Properties palette, expand Advanced, and expand Interference.



3. Set the size of the interference condition.

If you want to . . .	Then . . .
specify the height above the treads for the interference condition	enter a value for Headroom height.
specify the width of the interference condition on all sides of a stair run, other than where you stop on and off at the first and last treads	enter a value for Side clearance.

4. Click in the drawing to deselect the stair.
5. Select the curtain wall to intersect, right-click, and click Interference Condition ➤ Add.
6. Select the stair.
7. Specify whether to apply the interference condition to the infill of the curtain wall.
8. Specify whether to apply the interference condition to the frames of the curtain wall.
9. Specify whether to apply the interference condition to the mullions of the curtain wall.

Removing a Stair Interference Condition from a Curtain Wall

Use this procedure to remove a stair interference from a curtain wall.

1. Click in the drawing to deselect the stair.
2. Select the curtain wall to remove the interference from, right-click, and click Interference Condition ➤ Remove.

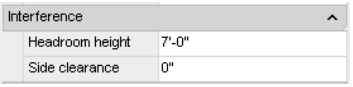
3 Select the stair and press ENTER.

Creating an Interference Condition in a Door/Window Assembly

Use this procedure to create a stair interference area in a door/window assembly. When you add an interference condition between a stair and a door/window assembly, a box is cut out around the stair from the door/window assembly based on the specified headroom height and side clearance. You have the option of cutting the infills, frames and mullions of the door/window assembly.

1 Create a stair that intersects with a door/window assembly. See "Using Stair Tools to Create Stairs" on page 1413for information about creating stairs.

2 On the Properties palette, expand Advanced, and expand Interference.



3 Set the size of the interference condition.

If you want to . . .	Then . . .
specify the height above the treads for the interference condition	enter a value for Headroom height.
specify the width of the interference condition on all sides of a stair run, other than where you stop on and off at the first and last treads	enter a value for Side clearance.

4 Click in the drawing to deselect the stair.

5 Select the door/window assembly to intersect, right-click, and click Interference Condition ➤ Add.

6 Select the stair.

7 Specify whether to apply the interference condition to the infill of the door/window assembly.

8 Specify whether to apply the interference condition to the frames of the door/window assembly.

9 Specify whether to apply the interference condition to the mullions of the door/window assembly.

Removing a Stair Interference Condition from a Door/Window Assembly

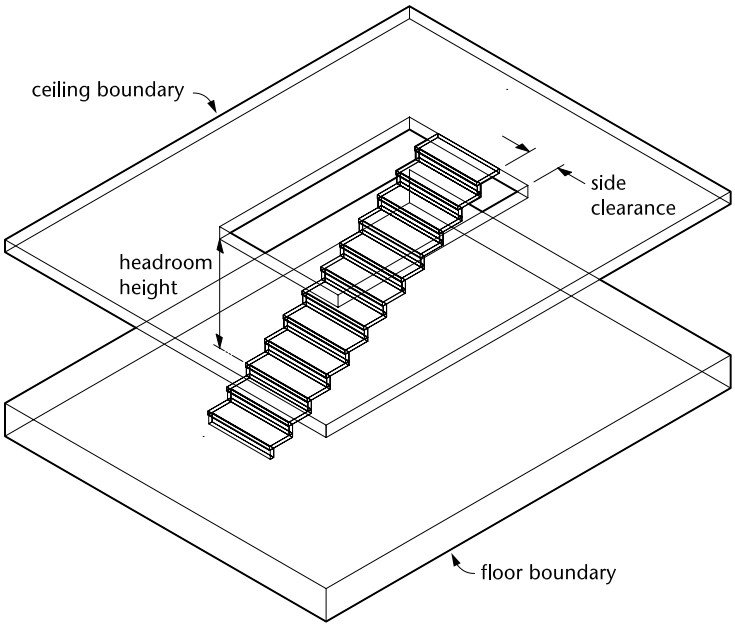
Use this procedure to remove a stair interference from a door/window assembly.

1. Click in the drawing to deselect the stair.
2. Select the door/window assembly to remove the interference from, right-click, and click Interference Condition ➤ Remove.
3. Select the stair and press ENTER.

Changing the Interference Size of a Stair

Use this procedure to control the size of the stair interference area.

Specifying headroom height and side clearance for a stair and a space object



1. Select the stair.
2. On the Properties palette, expand Advanced, and expand Interference.

3 Change the values for stair interference:

If you want to . . .	Then . . .
specify the height above the treads for the interference condition	enter a value for Headroom height.
specify the width of the interference condition on all sides of a stair run, other than where you stop on and off at the first and last treads	enter a value for Side clearance.

Changing the Alignment of a U-shaped Stair

Use this procedure to change the alignment and the alignment offset of a U-shaped stair. These fields are available only when you select a U-shaped stair to modify.

1 Select a u-shaped stair.

2 On the Properties palette, expand Advanced, and expand Constraints.

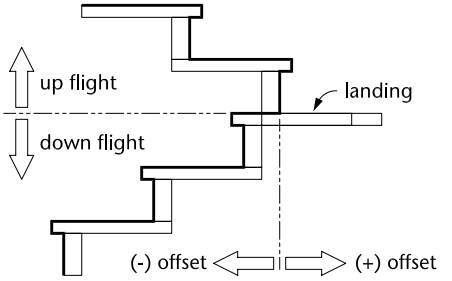
3 Specify the alignment of a U-shaped stair:

If you want to . . .	Then . . .
place the treads and risers where necessary to complete the stair	select Free for Alignment.
align the tread of the up flight to the tread of the down flight	select Tread to Tread for Alignment.
align the tread of the up flight to the riser of the down flight	select Tread to Riser for Alignment.
align the riser of the up flight to the riser of the down flight	select Riser to Riser for Alignment.

4 Specify a value for Alignment offset.

When you select Tread to Tread, Tread to Riser, or Riser to Riser, you can specify an offset value. A positive offset value means that the down flight tread location is closer to landing than the up flight tread location.

Specifying tread to riser alignment offsets



5 Specify a value for Extend alignment.

6 Specify a value for Uneven tread on which specifies which flight will be longer if the total number of treads is uneven. Select Upper flight to place the Uneven tread on the upper flight. Select Lower flight to place the uneven tread on the lower flight.

Changing the Components of a Flight

Use this procedure to change the tread, riser thickness, and nosing length for each stair. You can also turn on or off the display of the tread and riser.

NOTE If component settings are unavailable, they are controlled by the stair style, and you cannot change them for individual stairs.

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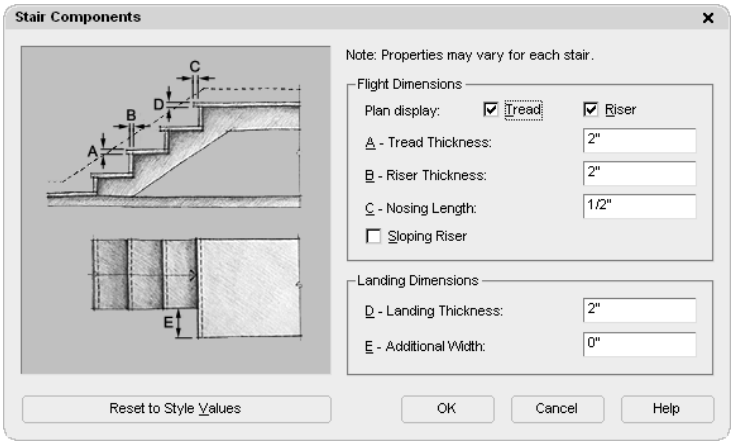
1 Select the stair.

2 On the Properties palette, expand Advanced, expand Worksheets, and click in Components.



3 Under Flight Dimensions, select or clear the display of treads and risers.

When the tread or riser display is off, the corresponding thickness becomes unavailable.

4 Specify the flight dimensions:

If you want to . . .	Then . . .
specify the thickness of each tread	select Tread, and enter a value for Tread Thickness.
specify the thickness of the riser	select Riser, and enter a value for Riser Thickness.
specify the length of the edge of a stair tread that projects over the riser	enter a value for Nosing Length.
specify sloping risers	select Sloping Riser.

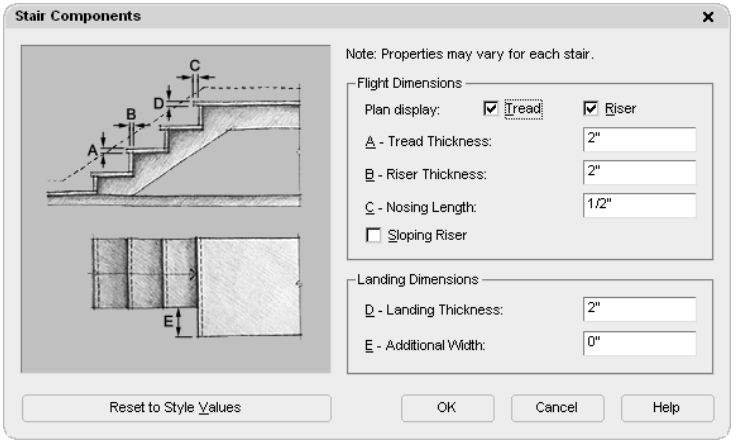
5 Click OK.

Changing the Components of a Landing

Use this procedure to change the landing thickness and specify additional width for stair landings.

NOTE If component settings are unavailable, they are controlled by the stair style, and you cannot change them for individual stairs.

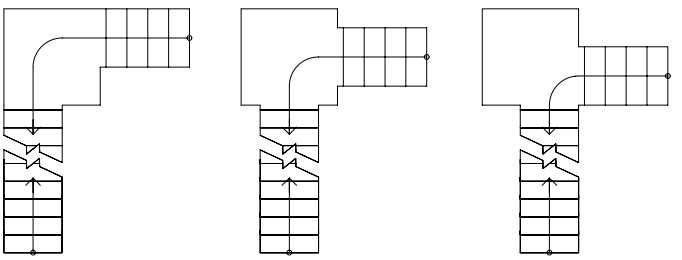
1. Select the stair.
2. On the Properties palette, expand Advanced, expand Worksheets, and click in Components.



3. Enter a value for Landing Thickness.
4. Enter a value for Additional Width.

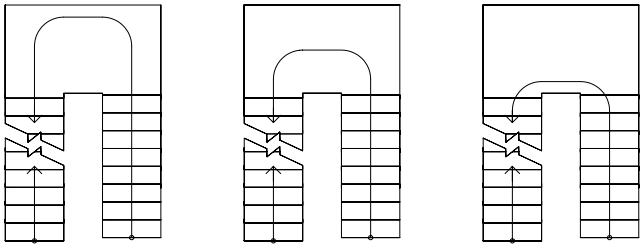
   The type of landing and the justification of the stair determine where the additional width is added to the landing.

Adding width to a quarter landing



left justified | center justified | right justified

Adding width to a half landing



5 Click OK.

About the Dimensions of Landing Components

Landing components are specified as part of style, but apply only to multi-landing and U-shaped stairs. Stringer dimensions are specified for the flight and landing in a single table. The flight stringer type (slab, housed, or saddled) controls what is available for the landing (total depth *only* for housed and ramp, waist depth for all types). If the flight has no stringers, the landing has none.

All landings of a single stair initially use the same dimensions. You can then customize each one separately by grip stretching or projection. Horizontal positions and the widths of stringers are identical between flights and landings.

Landing extension values apply only to U-shaped and multi-landing stairs with flat landings. Landing specific dimensions are ignored for turn landings. The default values for styles in the Stair Styles drawing are specified in accordance with the most common situation for stairs.

If the option to resolve the meeting of flight and landing stringers is left off, the flight stringer terminates at the landing.

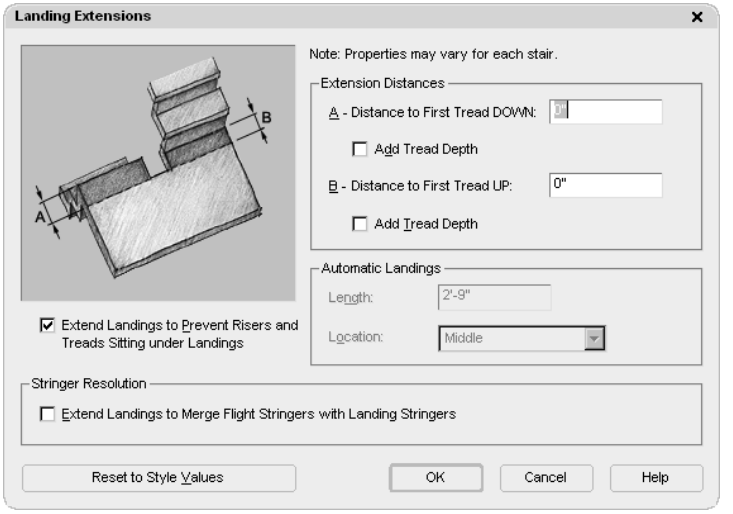
Changing the Extension of a Landing

Use this procedure to change the distances between landings and treads and the stringer resolution for stairs. You can differentiate the size of landing components from those used for the stair flights.

NOTE If settings for landing extensions are unavailable, they are controlled by the stair style, and you cannot change them for individual stairs.

1 Select the stair.

2 On the Properties palette, expand Advanced, expand Worksheets, and click in Landing extensions.



3 Specify the extension distances:

If you want to . . .	Then . . .
add to the distance to the first tread on the down side of the landing	enter a value for Distance to First Tread DOWN. To extend the landing down by a single tread, select Add Tread Depth.
add to the distance to the first tread on the up side of the landing	enter a value for Distance to First Tread UP. To extend the landing up by a single tread, select Add Tread Depth.

For more information about landing extensions and stringer resolution, see "About the Dimensions of Landing Components" on page 1503.

4 Under Stringer Resolution, select Extend Landings to Merge Flight Stringers with Landing Stringers to automatically merge the flight stringers with the landing stringers.

This provides additional landing extension, if necessary, to make the flight stringers meet the landing stringers without any discontinuity.

NOTE Automatic landing settings are always controlled by the stair style.

5 Click OK.

Stairs created in previous versions of Autodesk Architectural Desktop have the setting for Extend Landings to Prevent Risers and Treads Sitting Under Landings turned on. This should be turned off to achieve flush or rectangular landings, but it will change the position of the top or bottom of the stair, which may require adjusting other building objects.

Changing the Display of an Overlapping Stair

Use this procedure to create an overlapping stair and set the display properties to view the overlapped section correctly.

To set the stair display, the Plan Overlapping display rep needs to be turned on and specific components need to be set. For the overlapping stairs, in addition to the usual up and down groups there are 4 other groups of display components only available in Plan Overlapping.

Display rep group	Definition
"components" up (above overlap)	These are the stair components below the cut height that are above the overlap section.
"components" down (above overlap)	These are the stair components above the cut height that are above the overlap section.
"components" up (below overlap)	These are the stair components below the cut height that are below the overlap section.
"components" down (below overlap)	These are the stair components above the cut height that are below the overlap section.

1 Open the tool palette that you want to use, and select a stair tool.

If necessary, scroll to display the tool that you want to use.

2 On the Properties palette, expand Basic, and expand General.

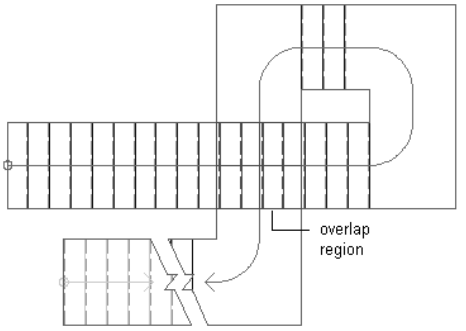
3 Select a style.

4 In Shape, select Multi-landing.

5 Specify the1/2 landing for turn type.

6 Draw a multi-landing stair that overlaps itself.

Viewing an overlapping stair condition



7 On the Format menu, click Display Manager.

8 Expand Sets and select whichever display set is current (in bold).

9 Click the Display Representation Control tab. Scroll to the Stair object.

10 Turn on Plan Overlapping in addition to the current display representation, and click OK.

11 For this example, we are going to display all components of the stair above the overlap section outlined in red. Select the stair, right-click, and click Edit Object Display.

12 Click the Display Properties tab.

13 Click Object Override for Plan, Plan Low Detail, or Plan High Detail, whichever is displayed in the current display set. Select all the components and turn the visibility off, and click OK.

14 Click Object Override for Plan Overlapping. Select the desired components and turn the visibility on. For this example, turn the visibility on for Riser up, Nosing up, Path up, Outline up, Riser down, Nosing down, Path down, Outline down, Riser down (above overlap), Nosing down (above overlap), Path down (above overlap), Outline down (above overlap), Riser down (below overlap), Nosing down (below overlap), Path down (below overlap), and Outline down (below overlap).

15 Select Riser down (above overlap), Nosing down (above overlap), Path down (above overlap), and Outline down (above overlap). Select any of the colors from the selected components, select red in the Select Color dialog box and click OK twice.

NOTE If the stair style includes stringers, they should be added to the set of components.

16 Click OK twice.

Applying Tool Properties to an Existing Stair

Use this procedure to apply the properties of a stair tool to one or more existing stairs. The properties include the stair style and any other settings specified in the tool you select.

1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a stair tool, and click Apply Tool Properties to Stair.

3 Select the stairs, and press ENTER.

4 Edit the properties of the stairs in the Properties palette, if needed.

NOTE Some tool properties cannot be applied to existing stairs. For example, stair shape and turn type will not change. In addition, some properties may be incompatible with existing stairs. For example, a stair that has a vertical orientation of Down cannot terminate with a landing.

Changing the Location of a Stair

Use this procedure to relocate a stair by changing the coordinate values of its insertion point. The stair also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the stair are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the stair by aligning its normal with another axis. You can also rotate the stair on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2002 User's Guide*.

1 Double-click the stair you want to change.

2 In the Properties palette, expand Basic, and expand Location.

3 Select Additional information.

4 Specify the location of the stair:

If you want to . . .	Then . . .
relocate the stair	enter new coordinate values under Insertion Point.
locate the stair on the *XY* plane	make the normal of the stair parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the stair on the *YZ* plane	make the normal of the stair parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the stair on the *XZ* plane	make the normal of the stair parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the stair	enter a new value for Rotation Angle.

5 Click OK.

Specifying the Materials of a Stair

Use this procedure to select a different material for components of an individual stair.

To change the materials assigned to all stairs of the same stair style, see "Assigning Materials to a Stair Style" on page 1527.

NOTE If a material assignment does not determine the display properties of a stair component, you can change the properties of the display component as described in "Specifying the Display Properties of a Stair Style" on page 1528.

1 Select the stair you want to change, right-click, and click Edit Object Display.

2 To verify that the material assignment determines the display properties of the component, click the Display Properties tab, select the display representation where you want the changes to appear, and click .

NOTE Only the Model display representation supports properties By Material.

3 Click the Layer/Color/Linetype tab, verify that By Material is selected for the component, and click OK.

4 Click the Materials tab.

5 Select the component you want to change, select Object Override, and select a different material definition.

You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

6 Click OK.

Changing the Display Properties of Individual Stairs

In most cases, you want the appearance of stairs that belong to the same style to be consistent throughout a drawing. However, in certain instances, you may need to override a display property for an individual stair to achieve a specific result. All the display properties that you can specify in stair styles are available for individual stairs:

- Whether the display properties of stair components are determined by material assignments
- The layer, color, and linetype of the display components of the stair
- The cut plane height and the display of components relative to the cut plane
- Other specific stair display information, such as riser numbering

When you change the display properties of an individual stair, the changes apply only to that stair. Other stairs of the same style are not affected. To change the display properties of all stairs of a specific stair style, see "Stair Styles" on page 1516.

Related Procedures

- Specifying the Layer, Color, and Linetype of a Stair
- Specifying the Cut Plane Display of a Stair
- Specifying the Display of Other Characteristics of a Stair
- Specifying the Riser Numbering Display for Individual Stairs

Specifying the Layer, Color, and Linetype of a Stair

Use this procedure to change the following display properties of the components of an individual stair:

- Visibility (component is on or off)
- By material (a material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

To change these display properties for all stairs of the same stair style, see "Specifying the Display Properties of a Stair Style" on page 1528.

NOTE If a material assignment determines the properties of a stair display component, you can change the properties of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Specifying the Materials of a Stair" on page 1508.

---

1. Select the stair you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.
4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Specifying the Cut Plane Display of a Stair

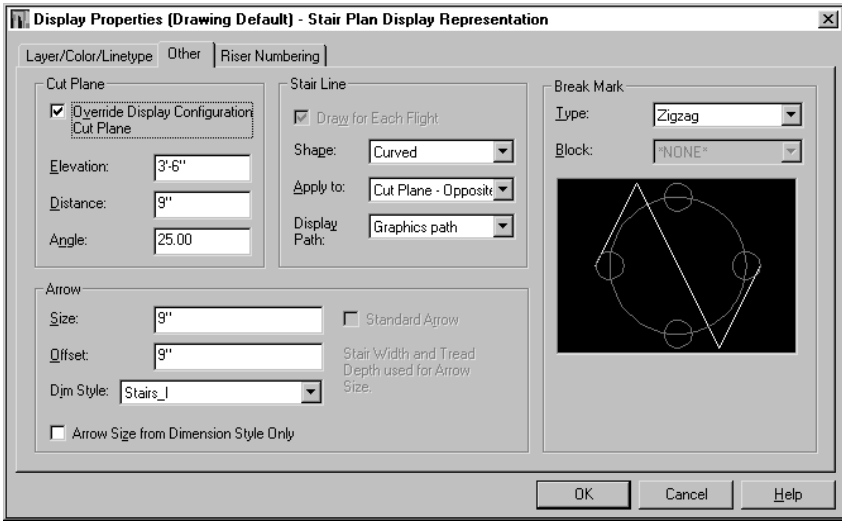
Use this procedure to specify the properties of one or more cut planes for an individual stair. Cut plane display properties apply only to display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

To change the cut plane display properties for all stairs of the same stair style, see “Specifying the Display of Other Characteristics of a Stair Style” on page 1530.

1. Select the stair you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Other tab.



6. Click Override Display Configuration Cut Plane to change the elevation of the Display Configuration cut plane for the stair.

NOTE When the Display Configuration Cut Plane is used, stairs display only from the current floor elevation up to the cut height, and from the current floor elevation down to the appropriate cut height of the level below.

7. Enter a value for Elevation.
8. Enter a value for Distance to change the space between the two cut plane lines.

9 Enter a value for Angle to change the angle of the stair cut lines.

10 Click OK twice.

Specifying the Display of Other Characteristics of a Stair

Use this procedure to specify other display properties for an individual stair, such as how to display the arrow in the path, which Display Path to show, and what type of break mark to use in the stair display. These display properties apply only to display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

To change these display properties for all stairs of the same stair style, see "Specifying the Display Properties of a Stair Style" on page 1528.

1 Select the stair you want to change, right-click, and click Edit Object Display.

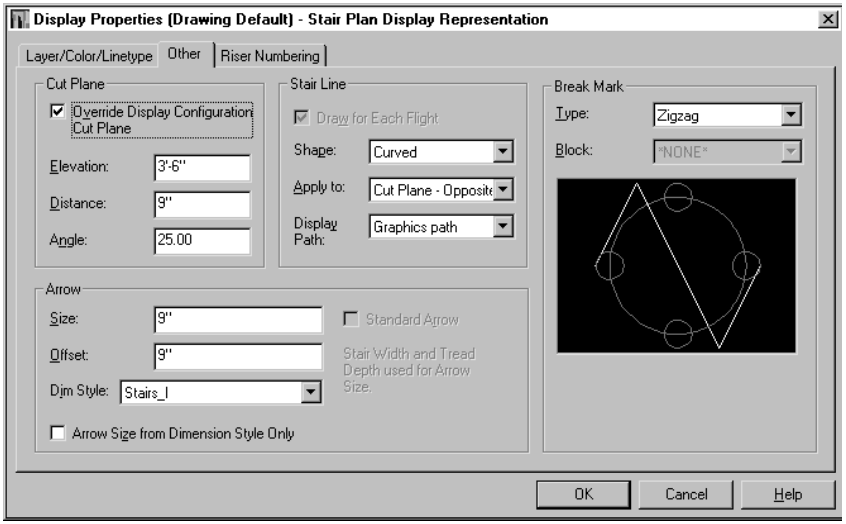
2 Click the Display Properties tab.

3 Select the display representation where you want the changes to appear, and select Object Override.

The display representation in bold is the current display representation.

4 If necessary, click .

5 Click the Other tab.



6 Select the display properties for the stair:

If you want to . . .	Then . . .
change the display size of the arrow and break mark	enter a value for Size.
change the offset location of the arrow display	enter a value for Offset.
change the dimension style used for the arrow display	select a style from Dim Style. **NOTE** If a dimension style other than Standard is used for the arrow, and you want the arrow size to be controlled by the dimension style only, check this option. This is the default for all previous version drawings. If this is unchecked, the size of the arrow is multiplied by the arrow size setting.
change the shape of the stair line	select a value for shape. Curved adds an arc when the stair line changes. Straight displays an angle when the stair line changes.
display the arrow at the end of each cut plane pointing in the same direction throughout the length of the stair	select Cut Plane - Parallel for Apply to and make sure that Draw for Each Flight is not selected.
display the arrow at the end of each cut plane and at the end of each flight pointing in the same direction	select Cut Plane - Parallel for Apply to and make sure that Draw for Each Flight is selected.
display the arrow at the end of the entire stair	select Entire Stair for Apply to and make sure that Draw for Each Flight is not selected.
display the arrow at the end of each flight pointing in the same direction	select Entire Stair for Apply to and make sure that Draw for Each Flight is selected.
display the arrow on each side of the cut plane	select Cut Plane - Opposite for Apply to.
change which stair line is displayed	select a value for Display Path.
change the type of break mark that is displayed at the cut plane	under Break Mark, select a mark for Type.
specify a custom break mark to display at the cut plane	select Custom Shape for Type, and then select a block from Block.

7 Click OK twice.

Specifying the Riser Numbering Display for Individual Stairs

Use this procedure to define and display riser numbers for individual stairs.

To change these display properties for all stairs of the same stair style, see "Specifying the Riser Numbering Display of a Stair Style" on page 1532.

1 Select the stair you want to change, right-click, and click Edit Object Display.

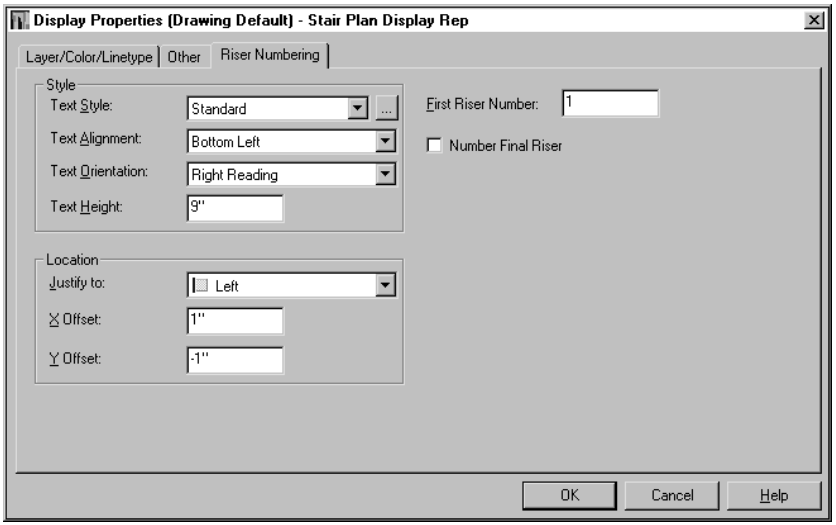
2 Click the Display Properties tab.

3 Select the display representation where you want the changes to appear, and select Object Override.

The display representation in bold is the current display representation.

4 If necessary, click .

5 Click the Riser Numbering tab.



6 Select the riser numbering display properties for the stair:

If you want to . . .	Then . . .
change the text style of the riser numbers	select a style for Text Style, or click to edit the text style.

If you want to . . .	Then . . .
change the alignment of the riser numbers	select an alignment for Text Alignment.
change the orientation of the riser numbers	select an orientation for Text Orientation.
change the text height of the riser numbers	enter a value for Text Height.
change the location where the numbers are justified to	select Left, Center or Right for Justify to.
change the location of the numbers along the length of the stair flight	enter a value for X Offset. This is relative to the selected position of the riser.
change the location of the numbers to the left or right	enter a value for Y Offset. This is relative to the selected position of the riser.
set the first number for the riser numbering	enter a value for First Riser Number.
number the last riser in the stair	select Number Final Riser.

7 Click OK twice.

Attaching Hyperlinks, Notes, or Files to a Stair

Use this procedure to attach hyperlinks, notes, or files to a stair. You can also edit hyperlinks and notes, and edit or detach reference files from a roof.

1 Select the stair you want to attach information to.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 Click OK.

5 To add a note, click the setting for Notes, and enter the note.

6 Click OK.

7 To add a reference file, click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click OK.
edit the description of a reference file	click in the document's Description field. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application. **NOTE** If the referenced file is an AutoCAD drawing, you must click OK in the Reference Docs dialog before the drawing is displayed.
detach a reference file	select the file name, and click .

8 Click OK.

Stair Styles

A stair style is a group of properties assigned to a stair that determines the appearance and other characteristics of the stair.

You can use a stair style to control properties for all stairs that use that style, rather than changing properties for each individual stair in the drawing. Various styles exist in the templates for common stair configurations, such as steel-pan, ramp - concrete, and wood-housed. Within the stair style, you can specify the dimensions, landing extensions, components, and display properties of the stair.

Stair Components and Design Rules

In a stair style, you specify the properties of stair components:

- risers and treads
- stringers
- landings
- landing extensions

Design rules determine the code limits for maximum, optimum, and minimum slopes for the stair style.

Display Components of Stairs

Display components determine the graphical characteristics, such as color and linetype, of stair components. Other display properties you can change for a stair style include cut plane, stair line, arrow properties, and the break mark.

Using Materials in Stair Styles

You can use materials to control how stairs of each style are displayed in a drawing. You assign materials to the stair components in the style. The components are then displayed using the display properties of the assigned materials.

Creating Tools from Stair Styles

You can create a stair tool from any stair style. You can drag the style from the Style Manager onto a tool palette. You can then specify default settings for any stair created from the tool. For more information, see "Creating a Stair Tool" on page 1440.

Managing Stair Styles

To create, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk® Architectural Desktop, where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Creating a Stair Style
- Specifying the Design Rules of a Stair Style
- Specifying the Stringers of a Stair Style
- Specifying the Components of a Stair Style
- Specifying the Landing Extension of a Stair Style
- Stair Materials and Display Components
- Specifying the Layer/Color/Linetype of a Stair Style
- Specifying the Display of Other Characteristics of a Stair Style
- Specifying the Riser Numbering Display of a Stair Style
- Specifying Classifications for a Stair Style
- Adding Notes and Files to a Stair Style

Creating a Stair Style

Use this procedure to create a stair style. You can create a style using default style properties, by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Architectural Objects, and expand Stair Styles.

3 Create a stair style:

If you want to . . .	Then . . .
create a style with default properties	right-click Stair Styles, and click New.
create a style from an existing style	right-click the stair style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new stair style, and press ENTER.

5 To edit the new stair style, right-click the style, and click Edit:

If you want to . . .	Then . . .
specify design rules for the style	see "Specifying the Design Rules of a Stair Style" on page 1519.
specify the stringer properties for the style	see "Specifying the Stringers of a Stair Style" on page 1520.
specify the thicknesses and widths of treads, risers, and landings for the style	see "Specifying the Components of a Stair Style" on page 1523.
specify the landing extension properties of the style	see "Specifying the Landing Extension of a Stair Style" on page 1524.
specify display properties, such as layer, color, and linetype, for the components of the style	see "Specifying the Layer/Color/Linetype of a Stair Style" on page 1529.

If you want to . . .	Then . . .
specify cut plane properties, arrow properties, and other display properties of the style	see "Specifying the Display of Other Characteristics of a Stair Style" on page 1530.
add notes and files to the style	see "Adding Notes and Files to a Stair Style" on page 1534.

6 When you finish specifying the properties of the stair style, click OK.

7 If you want to assign the style to a stair tool, drag the style from the Style Manager to a tool palette.

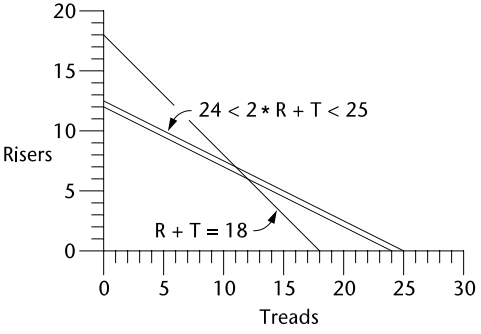
You can later rename the tool and specify other properties for it as described in "Creating a Stair Tool" on page 1440.

8 Click OK.

Specifying the Design Rules of a Stair Style

Use this procedure to specify the minimum, maximum, and optimal code limits for the riser height and tread depth and specify the stair calculator rules.

Specifying stair design rules

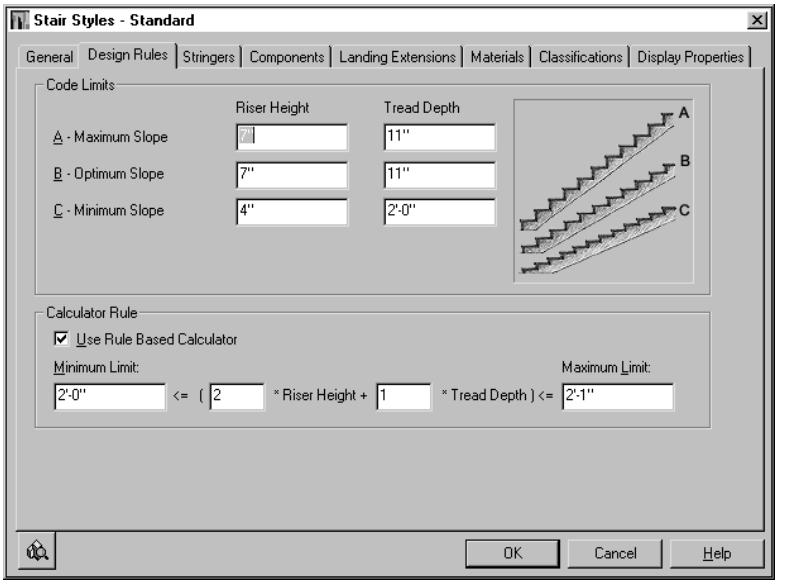


1 Open a tool palette that has a stair tool.

2 Right-click a stair tool, and click Stair Styles.

3 Right-click the stair style you want to change, and click Edit.

4 Click the Design Rules tab.



5 Specify the default Riser Height and Tread Depth for the Minimum Slope, Optimum Slope, and Maximum Slope.

NOTE Use values that represent the actual dimensions of the tread and riser components that you want to create, not just the ratios of these dimensions.

Subject to the constraints of the calculator rules and the fact that the tread heights must be an even divisor of the floor-to-floor height, the software gets as close as possible to the selected optimal tread length and riser height.

6 To change the default stair calculator, select Use Rule Based Calculator.

The fields in the Calculator Rule section become available for editing.

7 When you finish changing the properties of the stair style, click OK twice.

Specifying the Stringers of a Stair Style

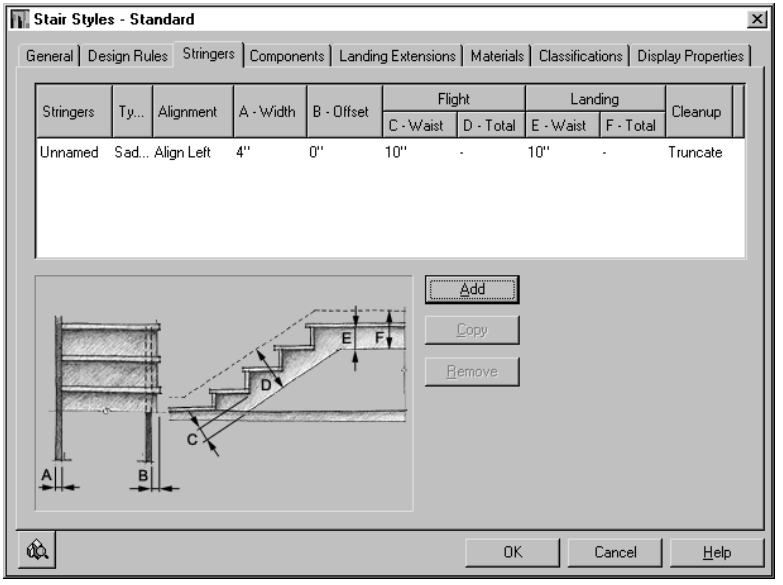
Use this procedure to include stringers with the stair style. A stair style can have one or more stringers. You can specify the properties of each stringer. If the style uses stringers, you can specify the depth of the waist at flights and landings. For Ramp or Housed type stringers, you can also specify the total depth at flights and landings.

1 Open a tool palette that has a stair tool.

2 Right-click a stair tool, and click Stair Styles.

3 Right-click the stair style you want to change, and click Edit.

4 Click the Stringers tab.



If the style does not use stringers, proceed to step 6.

5 Add or remove stringers:

If you want to . . .	Then . . .
add a stringer to the stair style	click Add.
add an identical stringer to the list	select the stringer you want to duplicate, and click Copy.
delete a stringer from the list	select the stringer, and click Remove.

6 Specify the properties of each stringer:

If you want to . . .	Then . . .
specify the name of a stringer	select the current name, and enter a new name.
specify the type of stringer	click the current Type, and select Saddled or Housed.
specify the alignment of a stringer	click the current alignment, and select Align Left, Align Right, Center, or Full Width.
specify the width of a stringer	enter a value for Width.
specify the offset of a stringer	enter a value for Offset.
specify the flight waist	under Flight, enter a value for Waist.
specify the flight total	under Flight, enter a value for Total.
specify the landing waist	under Landing, enter a value for Waist.
specify the landing total	under Landing, enter a value for Total.
stop the stringer at a landing	select Truncate for Cleanup.
allow the stringer to continue under a landing	select Cleanup for Cleanup.

7 Click Slab for Type to edit the slab settings:

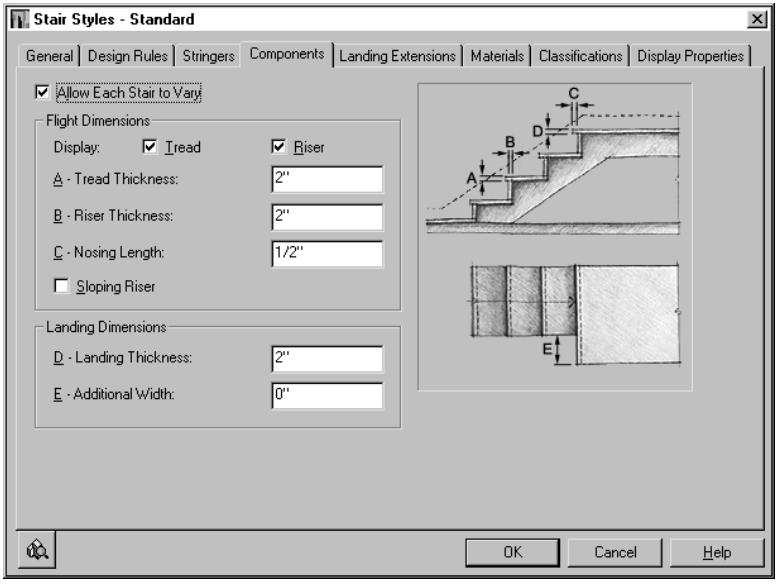
If you want to . . .	Then . . .
specify the thickness of the slab at flights	under Flight, enter a value for Waist.
specify the thickness of the slab at landings	under Landings, enter a value for Waist.

8 When you finish changing the properties of the stair style, click OK twice.

Specifying the Components of a Stair Style

Use this procedure to specify the display of treads and risers and edit the thicknesses and widths of treads, risers, and landings. Also, you can specify whether these properties of the style are allowed to vary with individual stairs.

1. Open a tool palette that has a stair tool.
2. Right-click a stair tool, and click Stair Styles.
3. Right-click the stair style you want to change, and click Edit.
4. Click the Components tab.



5. Specify whether stairs of this style can vary:

If you want to . . .	Then . . .
specify flight dimensions, such as tread thickness, riser thickness, and nosing length, when you add or modify stairs	select Allow Each Stair to Vary.
require all stairs of this style to use the flight dimension settings of the style	clear Allow Each Stair to Vary.

NOTE If Allow Each Stair to Vary is checked, changes on this tab do not affect existing stairs. To make these stairs match the style settings, select the stair, display its properties, display the Components worksheet and click Reset to Style Values.

6 Turn the display of treads and risers on or off.

If tread is off, the tread thickness and landing thickness become unavailable.

7 Specify the flight dimensions:

If you want to . . .	Then . . .
specify the thickness of treads	enter a value for Tread Thickness.
specify the thickness of risers	enter a value for Riser Thickness.
specify the length of the edge of a stair tread that projects over the riser	enter a value for Nosing Length.
specify sloping risers	select Sloping Riser.

8 Specify the landing dimensions:

If you want to . . .	Then . . .
specify the thickness of landings	enter a value for Landing Thickness.
specify additional width for landings	enter a value for Additional Width.

9 When you finish changing the properties of the stair style, click OK twice.

Specifying the Landing Extension of a Stair Style

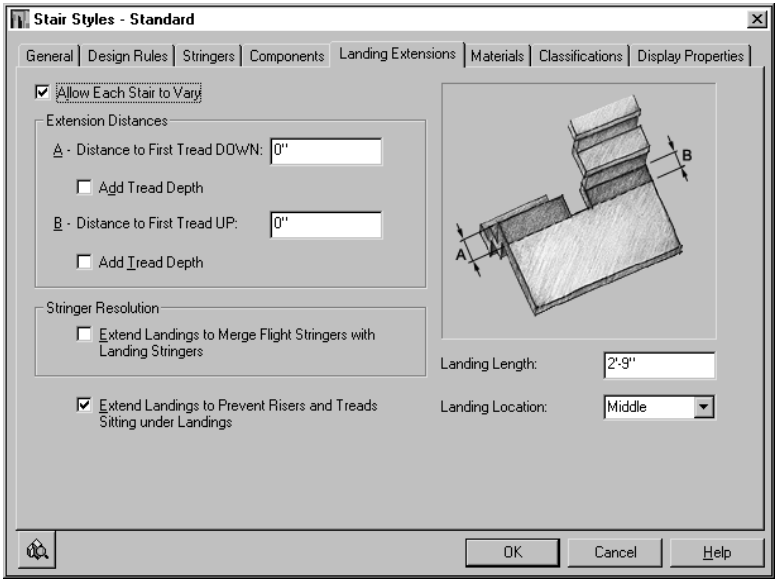
Use this procedure to change the distances between landings and treads and the stringer resolution of stairs. You can differentiate the size of landing components from those used for the stair flights.

1 Open a tool palette that has a stair tool.

2 Right-click a stair tool, and click Stair Styles.

3 Right-click the stair style you want to change, and click Edit.

4 Click the Landing Extensions tab.



5 Specify whether stairs of this style can vary:

If you want to . . .	Then . . .
specify stringer resolution, and extension dimensions, such as distance to first tread up, and distance to first tread down, when you add or modify stairs	select Allow Each Stair to Vary.
require all stairs of this style to use the extension dimension settings of the style	clear Allow Each Stair to Vary.

6 Specify extension distances:

If you want to . . .	Then . . .
add to the distance to the first tread on the down side of the landing	enter a value for Distance to First Tread DOWN. To extend the landing down by a single tread, select Add Tread Depth.
add to the distance to the first tread on the up side of the landing	enter a value for Distance to First Tread UP. To extend the landing up by a single tread, select Add Tread Depth.

7 Select Extend Landings to Merge Flight Stringers with Landing Stringers.

This option extends the landing to merge the flight stringers with the landing stringers.

8 Select Extend Landings to Prevent Risers and Treads Sitting Under Landings.

This option is on by default for all stairs from previous version drawings. Uncheck it to allow the creation of flush rectangular landings.

9 When landings get placed automatically, the length and location of these landings are specified in Landing Length and Landing Location.

If you want to . . .	Then . . .
set the size of automatic landings	enter a value for Landing Length.
set the placement of automatic landings	select Top, Middle, or Bottom for Landing Location.

10 When you finish changing the properties of the stair style, click OK twice.

Assigning Materials to Components in a Stair Style

A stair consists of a number of components whose display properties can be determined by the materials assigned to each component. When you assign materials to a stair style, you assign one material to each physical component of the stair. For example, you assign a wood or metal material to treads, concrete to a concrete component, and so on. You assign materials to compo-

nents in each display representation where you want the materials to be used.

If you want to use the display properties of the stair style, instead of using material display properties, you can turn off the material assignments in the display properties of the stair style.

Material definitions consist of display components that correspond to component types of objects. For example, the 3D body component of a material is used for all linework in model views.

Related Topics and Procedure

- Stair Materials and Display Components
- Assigning Materials to a Stair Style

Stair Materials and Display Components

The following table identifies the material component that corresponds to each stair component.

Stair Component	Material Component
Model	
Stringer	3D Body
Tread	3D Body
Landing	3D Body
Riser	3D Body

Assigning Materials to a Stair Style

Use this procedure to assign materials to the individual components of a stair style. When you assign a material to a stair component and By Material is selected for that component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the stair. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, a riser is a physical component that you can assign material to while the graphics path is a symbol, and you cannot assign a material to it.

NOTE If a material assignment does not determine the display properties of a stair component, you can change the display properties of the stair style as described in "Specifying the Display Properties of a Stair Style" on page 1528.

1. Open a tool palette that has a stair tool.
2. Right-click a stair tool, and click Stair Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.

   NOTE Only the Model display representation uses materials.

6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.

9. Click the Materials tab.
10. Select the component you want to change, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

11. Click OK twice.

Specifying the Display Properties of a Stair Style

In most cases, you can assign materials to stair components so that the appearance of stairs that belong to the same style to is consistent throughout a drawing and with other stairs and objects that use the same materials.

If a component cannot be assigned a material, or if you do not want to use materials but still want consistency among stairs of the same style, you can specify the display properties of the stair components in the stair style:

- The layer, color, and linetype of stair components
- The cut plane height and the display of components relative to the cut plane
- Other specific stair display information, such as riser numbering

Related Procedures

- Specifying the Layer/Color/Linetype of a Stair Style
- Specifying the Display of Other Characteristics of a Stair Style
- Specifying the Riser Numbering Display of a Stair Style

Specifying the Layer/Color/Linetype of a Stair Style

Use this procedure to specify how the various components of the stair are displayed in a particular view. You can change the following display properties of the components of a stair style:

- Visibility (on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale
- Plot style, if the drawing uses style-based plotting rather than color-based

Plan views of stairs include stringers, risers, nosing, path symbols, and stair outlines. You can specify the visibility of these components for above and below the cut plane of the stair. Isometric (model) views of stairs include stringers, tread, and risers.

To change these display properties for an individual stair, see "Changing the Display Properties of Individual Stairs" on page 1509.

NOTE If a material assignment determines the display properties of components in the stair style, you can change the properties of the display component by clearing By Material. You can also override the material assignment with a different material. For more information, see "Assigning Materials to a Stair Style" on page 1527.

---

1. Open a tool palette that has a stair tool.
2. Right-click a stair tool, and click Stair Styles.

3 Right-click the stair style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Style Override.

6 If necessary, click .

7 Click the Layer/Color/Linetype tab.

8 Select the component to change, and select a different setting for the property.

9 Click OK twice.

Specifying the Display of Other Characteristics of a Stair Style

Use this procedure to specify settings for the cut plane and related symbols.

Plan views of stairs includes stringers, risers, nosing, path symbols, and stair outlines. You can specify the visibility of these components for above and below the cut plane of the stair.

1 Open a tool palette that has a stair tool.

2 Right-click a stair tool, and click Stair Styles.

3 Right-click the stair style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Style Override.

6 If necessary, click .

7 Click Edit Display Props.

8 Click the Other tab.

9 Click Override Display Configuration Cut Plane to change the elevation of the Display Configuration cut plane for the stair.

NOTE When the Display Configuration Cut Plane is used, stairs display only from the current floor elevation up to the cut height, and from the current floor elevation down to the appropriate cut height of the level below.

---

10 Enter a value for Elevation.

11 Enter a value for Distance to change the space between the two cut plane lines.

12 Enter a value for Angle to change the angle of the stair cut lines.

13 Specify the display of the cut plane:

If you want to . . .	Then . . .
specify the height of the cut plane measured from the beginning of the stair	enter a value for Elevation. The space for the cut plane is centered on the closest tread.
specify the width of the cut plane	enter a value for Distance.
specify the angle of the cut plane	enter a value for Angle.

14 Specify the display of the arrow and the stair line:

If you want to . . .	Then . . .
change the display size of the arrow	enter a value for Size.
change the offset location of the arrow display	enter a value for Offset.
change the dimension style used for the arrow display	select a style from Dim Style. **NOTE** If a dimension style other than Standard is used for the arrow, and you want the arrow size to be controlled by the dimension style only, check this option. This is the default for all previous version drawings. If this is unchecked, the size of the arrow is multiplied by the arrow size setting.
change the shape of the stair line	select a value for shape. Curved adds an arc when the stair line changes. Straight displays an angle when the stair line changes.
display the arrow at the end of each cut plane pointing in the same direction throughout the length of the stair	select Cut Plane - Parallel for Apply to and make sure that Draw for Each Flight is not selected.
display the arrow at the end of each cut plane and at the end of each flight pointing in the same direction	select Cut Plane - Parallel for Apply to and make sure that Draw for Each Flight is selected.

If you want to . . .	Then . . .
display the arrow at the end of the entire stair	select Entire Stair for Apply to and make sure that Draw for Each Flight is not selected.
display the arrow at the end of each flight pointing in the same direction	select Entire Stair for Apply to and make sure that Draw for Each Flight is selected.
display the arrow on each side of the cut plane	select Cut Plane - Opposite for Apply to.
change which stair line is displayed	select a value for Display Path.
change the type of break mark that is displayed at the cut plane	under Break Mark, select a mark for Type.
specify a custom break mark to display at the cut plane	select Custom Shape for Type, and then select a block from Block.

15 Specify the display of the break mark:

If you want to . . .	Then . . .
change the style of the break mark	select an option for Type. The available options are None, Curved, Zigzag, and Custom Shape.
specify a custom shape for the break mark	select Custom Shape for Type, and select the desired name for Block.

16 Click OK twice.

Specifying the Riser Numbering Display of a Stair Style

Use this procedure to define the display of riser numbers for a stair style.

1 Open a tool palette that has a stair tool.

2 Right-click a stair tool, and click Stair Styles.

3 Right-click the stair style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Style Override.

6 If necessary, click .

7 Click Edit Display Props.

8 Click the Riser Numbering tab.

9 Select the riser numbering display properties for the stair style:

If you want to . . .	Then . . .
change the text style of the riser numbers	select a style for Text Style, or click to edit the text style.
change the alignment of the riser numbers	select an alignment for Text Alignment.
change the orientation of the riser numbers	select an orientation for Text Orientation.
change the text height of the riser numbers	enter a value for Text Height.
change the location where the numbers are justified to	select Left, Center or Right for Justify to.
change the location of the numbers along the length of the stair flight	enter a value for X Offset. This is relative to the selected position of the riser.
change the location of the numbers to the left or right	enter a value for Y Offset. This is relative to the selected position of the riser.
set the first number for the riser numbering	enter a value for First Riser Number.
number the last riser in the stair	select Number Final Riser.

10 Click OK twice.

Specifying Classifications for a Stair Style

Use this procedure to specify classifications for any classification definition applied to a stair style.

For more information about creating and applying classification definitions, see “Classification Definitions” on page 2289.

1 Open a tool palette that has a stair tool.

2 Right-click a stair tool, and click Stair Styles.

3 Right-click the style that you want to change, and click Edit.

4 Click the Classifications tab.

By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to stair styles.

5 For each classification definition, select the classification you want to apply to the current stair style.

6 Click OK twice.

Adding Notes and Files to a Stair Style

Use this procedure to enter notes and attach reference files to a stair style. You can also edit notes and edit or detach reference files attached to the style.

1 Open a tool palette that has a stair tool.

2 Right-click a stair tool, and click Stair Styles.

3 Right-click the stair style that you want to change, and click Edit.

4 Click the General tab.

5 To add a description to the stair style, enter it for Description.

6 Click Notes.

7 To add a note, click the Text Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK twice.

Stair Winder Styles

A stair winder style is a group of properties assigned to a stair winder that determines the type of winder used in stairs that contain 1/4 turn or 1/2 turns.

To create, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk® Architectural Desktop, where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Creating a Stair Winder Style
- Specifying the Stair Winder Style Settings
- Adding Notes and Files to a Stair Winder Style

Creating a Stair Winder Style

Use this procedure to create a stair winder style. You can create a style using default style properties, by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Architectural Objects, and expand Stair Winder Styles.
3. Create a stair winder style:

If you want to . . .	Then . . .
create a style with default properties	right-click Stair Winder Styles, and click New.
create a style from an existing style	right-click the stair winder style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new stair winder style, and press ENTER.

5 To edit the new stair winder style, right-click the style, and click Edit:

If you want to . . .	Then . . .
specify settings for the style	see "Specifying the Stair Winder Style Settings" on page 1536.

6 When you finish specifying the properties of the stair winder style, click OK twice.

Specifying the Stair Winder Style Settings

Use this procedure to determine which type of winder is defined for the selected winder style.

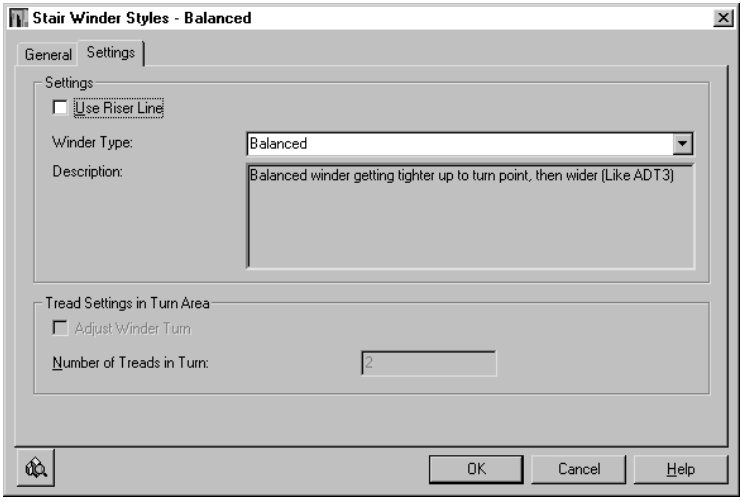
1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Architectural Objects, and expand Stair Winder Styles.

3 Select a Stair Winder Style, right click and click Edit.

4 Click the Settings tab.



5 Specify the stair winder settings:

If you want to . . .	Then . . .
use the riser lines to adjust the winders	select Use Riser Line.
use the tread lines to adjust the winders	make sure Use Riser Line is not selected.
have the treads turn continuously along the length of the stair	select Balanced for Winder Type. **NOTE** This is the type used by all previous version stairs with 1/2 or 1/4 turns.
adjust each winder separately	select Manual for Winder Type.
adjust winders based on a single point and a turn zone	select Single Point for Winder Type.
set an amount of winders to use when Single Point is selected for Winder Type	select Adjust Winder Turn and enter a value for Number of Treads in Turn.

NOTE When using the single point type, it is important to uncheck Use Riser Line if the turn point will be on the edge or corner of the stair. Otherwise the treads will overlap and the stair will be defective.

6 When you finish specifying the properties of the stair winder style, click OK twice.

Adding Notes and Files to a Stair Winder Style

Use this procedure to enter notes and attach reference files to a stair winder style. You can also edit notes and edit or detach reference files attached to the style.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Architectural Objects, and expand Stair Winder Styles.

3 Select a Stair Winder Style, right click and click Edit.

4 Click the General tab.

5 To add a description to the stair style, enter it for Description.

6 Click Notes.

7 To add a note, click the Text Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK twice.

Structural Members

22

A structural member is an object that can represent a beam, brace, or column in a drawing. All the beams, braces, and columns that you create are sub-types of a single structural member object.

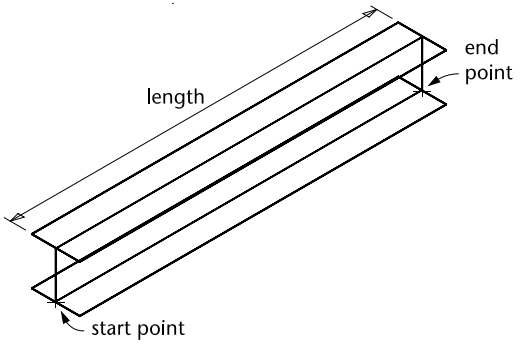
In this chapter

- Process Overview: Creating Structural Members with the Structural Member Catalog or Structural Member Style Wizard
- Creating Structural Member Styles in the Structural Member Catalog
- Creating a Structural Member Style with the Structural Member Style Wizard
- Creating Structural Member Tools
- Creating Structural Members Using Structural Member Tools
- Editing Structural Members
- Structural Member Styles
- Creating Custom Structural Members

Creating Structural Members

You create a structural member in Autodesk Architectural Desktop by extruding a structural shape along a path. The style that you use to create the structural member provides the shape. The shape, similar to a profile, is a 2-dimensional cross-section of a structural member. You define the extrusion path (axis) of the member when you specify start and end points for the member or when you convert linework to a member.

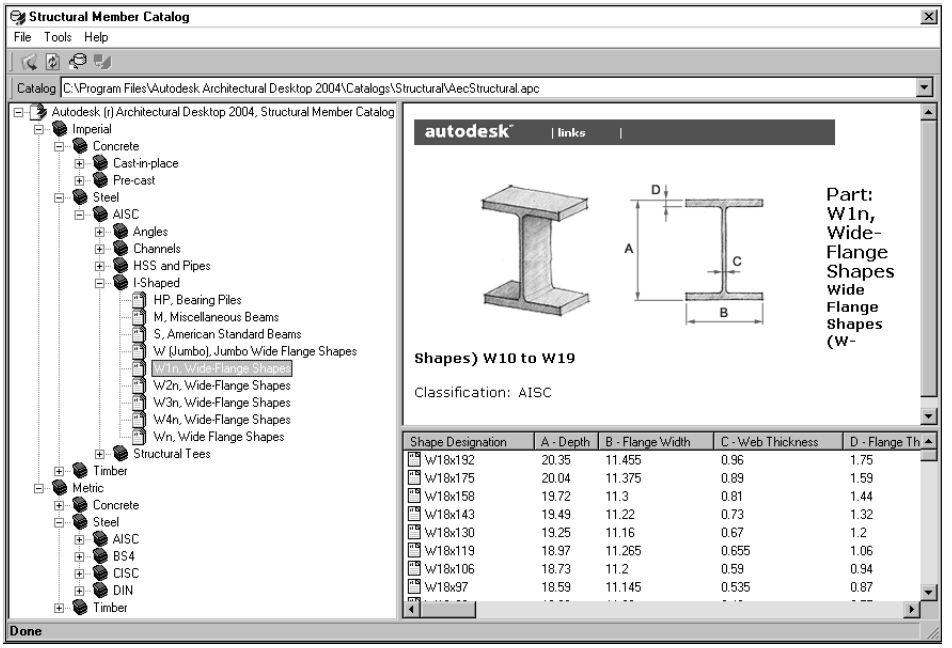
Creating a structural member



Creating Styles with the Structural Member Catalog and Structural Member Style Wizard

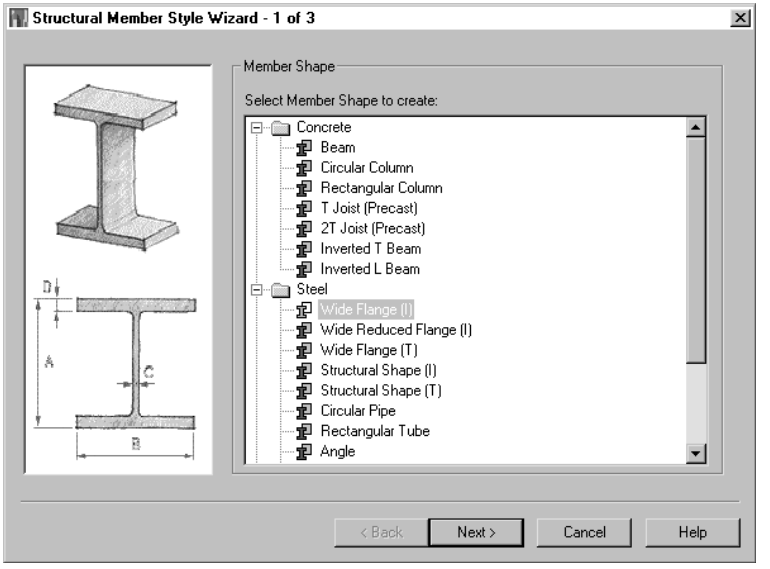
To create styles for most standard beams, braces, and columns, you can use the Structural Member Catalog included in Autodesk Architectural Desktop. The catalog contains specifications for industry-standard concrete, steel, and timber structural shapes organized in a Windows® Explorer-like tree view. You can browse the catalog, select a shape, and create a style.

Structural Member Catalog



If you know the type, shape, and shape dimensions of the member that you want to create, you can quickly enter the information in the Structural Member Style wizard to create a style. You can create a structural member shape within a style that is based on any of the nineteen different member shapes in the catalog.

Structural Member Style Wizard

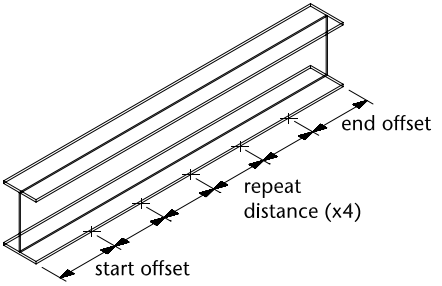


After you create structural member styles, you can drag them from the Style Manager onto tool palettes to create structural member tools.

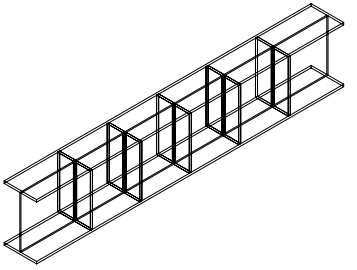
Adding Graphics to Structural Members

You can add blocks to the display of structural members as components in display representations. For example, you can create blocks that represent stiffener plates and add them to beams or create blocks that represent clip angles and add them to members.

Adding stiffener plates to a beam



specifying custom block locations

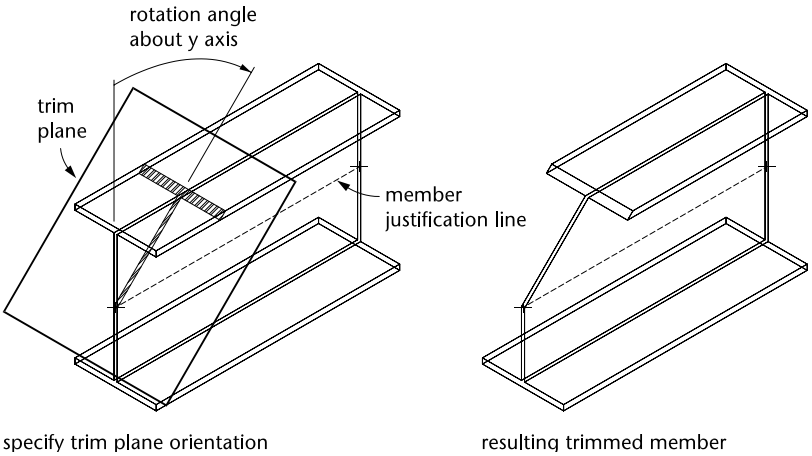


resulting stiffener plates added to beam

Trimming Structural Members

You can use trim planes to trim structural members in your drawings. A trim plane is a cutting plane that trims a structural member to a location that you define on the structural member. You can use trim planes to clean up joints between multiple structural members. For example, use multiple trim planes to angle both ends of a brace in a diagonally braced frame.

Trimming a structural member with a trim plane



Creating Column Grids

When you create a column, you can attach it to a grid. You can also create a column grid with the structural column grid tool that is included in Autodesk Architectural Desktop. The tool creates a grid with columns pre-anchored to nodes on the grid. For more information, see "Creating Column Grids" on page 1089.

Materials in Structural Members

In Autodesk® Architectural Desktop, you can assign materials to a structural member. These materials are displayed in wireframe and working shade views, or when linked into VIZ Render. Materials have specific settings for the physical components of a structural member.

Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes, which contain settings for structural members. You can use these predefined materials, or modify them to your special designs. You can also create your own materials from scratch.

For more information, see "Specifying the Materials of a Structural Member Style" on page 1601.

Creating Custom Structural Members

You can use the styles from the Structural Member Catalog and Structural Style wizard to create structural members for most of your design needs. However, your project requirements may require you to create structural members that cannot be created from a shape in the catalog or created with the wizard. For example, you may want to create:

- a column with a shape that tapers from start to end
- a composite column created from a steel shape encased in a concrete shape
- a rigid frame created from multiple tapering shapes extruded along the path of the frame
- a structural member with a custom shape that cannot be created in the catalog or with the wizard

To create custom structural members, you use the design rules within a structural member style to extrude one or more shapes along the path of the member. You can use shapes created in the catalog or with the wizard, or you can create your own custom shapes.

Predefined Custom Structural Member Styles

You can access predefined styles for custom structural members from the *Member Styles* and *Bar Joists Styles* drawings located in the *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial or Metric* folder. If you are running Windows NT®, these drawings are located in the *\winnt\Profiles\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial or Metric* folder.

Related Topics and Procedures

- Process Overview: Creating Structural Members with the Structural Member Catalog or Structural Member Style Wizard
- Creating Structural Member Styles in the Structural Member Catalog
- Creating a Structural Member Style with the Structural Member Style Wizard
- Creating Structural Member Tools
- Creating Structural Members Using Structural Member Tools
- Editing Structural Members
- Structural Member Styles
- Creating Custom Structural Members

Process Overview: Creating Structural Members with the Structural Member Catalog or Structural Member Style Wizard

This process overview describes how you can create structural members with styles that you create in the Structural Member Catalog or with the Structural Member Style wizard. This overview assumes that you need to create your own structural member styles and tools to create structural members. If you have a tool palette of structural member tools, see "Creating Structural Members Using Structural Member Tools" on page 1562.

The process of creating a structural member from the catalog or with the wizard has three steps:

Step 1: Create a structural member style in the Structural Member Catalog or with the Structural Member Style wizard.

If you know the type, shape, and shape dimensions of the member that you want to create, you can quickly enter the information in the Structural Member Style wizard to create a style.

Alternatively, browse the Structural Member Catalog and select a shape to create a style.

Step 2: Drag the style from the Style Manager onto a tool palette to create a structural member tool.

Step 3: Create a structural member or convert linework to a structural member with the tool that you created in step 2.

Related Topics and Procedures

- Creating Structural Member Styles in the Structural Member Catalog
- Creating a Structural Member Style with the Structural Member Style Wizard
- Creating Structural Member Tools
- Creating Structural Members Using Structural Member Tools

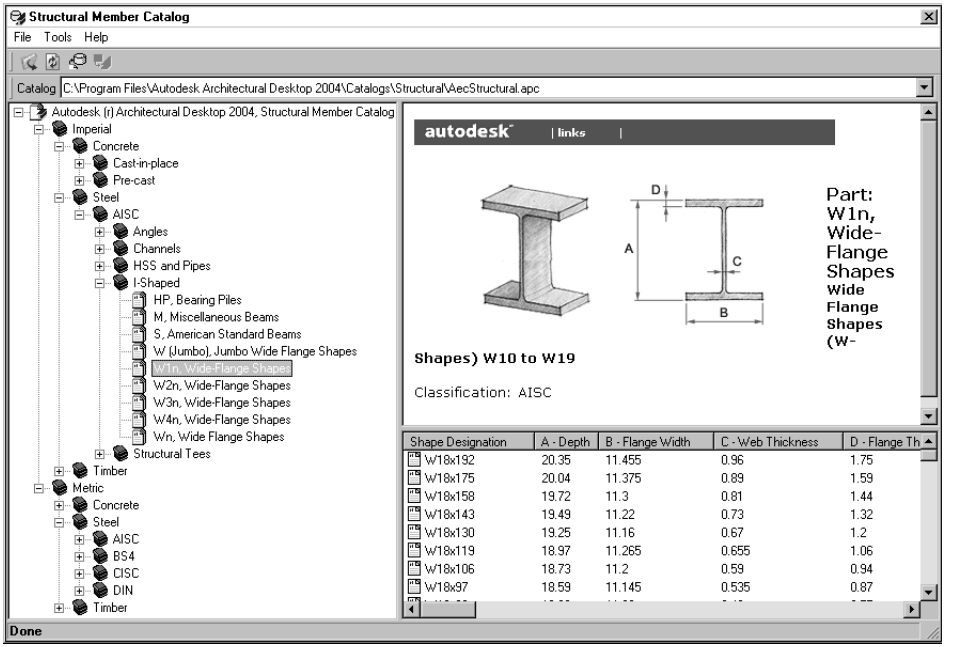
Creating Structural Member Styles in the Structural Member Catalog

The Structural Member Catalog contains specifications for different types and sizes of standard structural shapes. You can browse the catalog, select a shape, and create a structural member style that contains the selected shape. When you create a structural member with the style, the style provides the shape of the member.

Organization of the Structural Member Catalog

The left pane of the Structural Member Catalog contains standard structural shapes organized in a Windows®Explorer-like tree view. Several industry standard specifications are organized in the tree, first by imperial or metric units, and then by material.

Structural Member Catalog



Browsing the Catalog

You can open all the levels in the tree pane under a unit and material to view the different structural shape types available in the catalog. When you select a shape type in the tree view, a preview image of the shape with its dimen-

sions displays in the upper right pane. All the available sizes of the shape type display in the lower right pane.

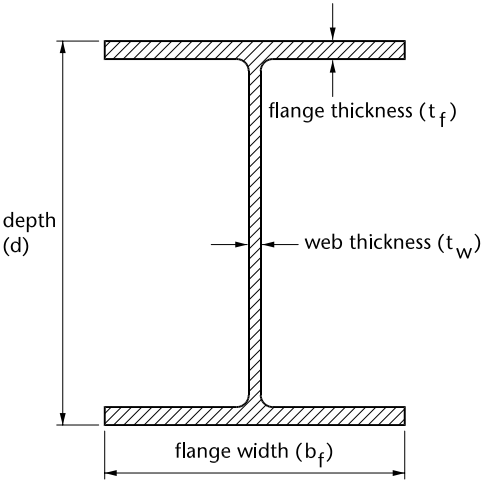
If you have a structural member in a drawing with a style created in the catalog, you can locate the catalog shape contained in that style from the member.

Creating Structural Member Styles from Catalog Shapes

When you create a structural member style in the catalog, the dimensions of the catalog shape that you select define and store the shape in the style.

For example, the dimensions of the steel beam selected in the previous illustration include its depth (d), flange width (bf), flange thickness (tf), and web thickness (tw). When you create a style, these dimensions create the following shape that is stored in the style.

A shape from the Structural Member Catalog



When you create a beam in your drawing with this style, the style provides the shape of the beam. You determine the length, start and end offsets, justification, and roll of the beam when you create the beam.

Contents of the Structural Member Catalog

When you display the Structural Member Catalog, a default catalog file, *AecStructural.apc*, provides the catalog content. This file is located in: *C:\\Program Files\Autodesk Architectural Desktop 2004\Catalogs\Structural*.

In the future, additional catalog files that you can open in the catalog may become available on the Autodesk web site, or you may create your own catalog files.

Related Procedures

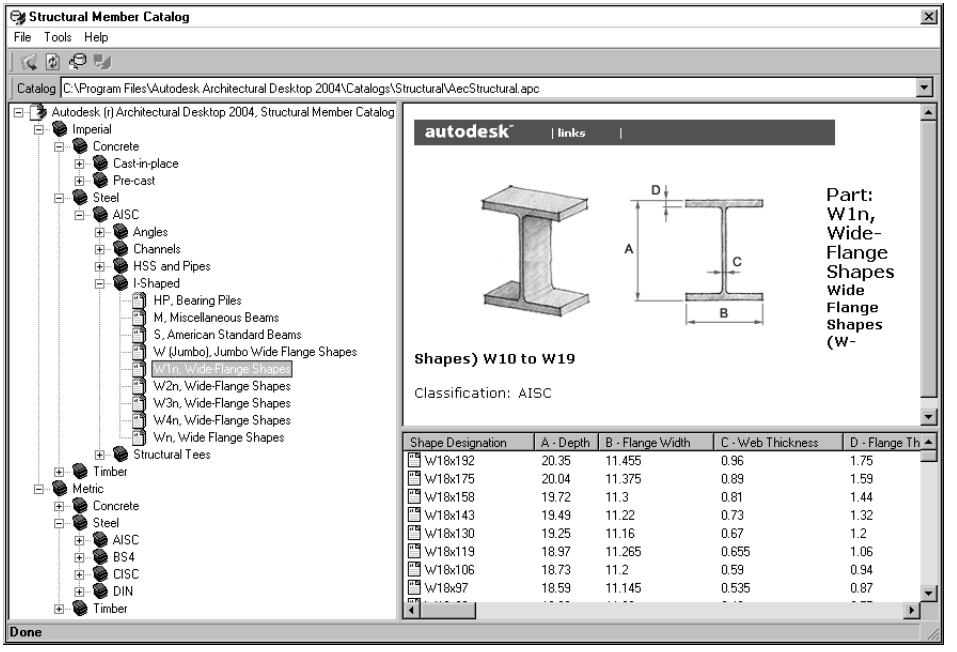
- Opening the Structural Member Catalog
- Creating a Style from a Shape in the Structural Member Catalog
- Locating a Shape in the Structural Member Catalog from a Structural Member in a Drawing
- Opening a Catalog File in the Structural Member Catalog

Opening the Structural Member Catalog

Use this procedure to open the Structural Member Catalog.

1 On the Format menu, click Structural Member Catalog.

Opening the Structural Member Catalog



2 Move and resize the Structural Member Catalog, or resize the left and right panes within the catalog as needed to view catalog information.

3 Click to close the Structural Member Catalog.

Creating a Style from a Shape in the Structural Member Catalog

Use this procedure to create a structural member style from a shape that you select in the Structural Member Catalog.

1. On the Format menu, click Structural Member Catalog.

   A tree view in the left pane of the catalog lists the available shapes.

2. Expand Imperial or Metric in the tree view.
3. Expand the type of material (Concrete, Steel, or Timber) for the structural shape that you want to create with the style.
4. Expand the shape that you want to create.

   Depending on the member, you may need to expand one or more levels in the tree.

5. Select the shape type of the member that you want to create.

   In the top right pane, a preview of the shape displays.

   In the bottom right pane, a list of the available sizes of the selected shape display. The following shapes may take a significant amount to time to display:

   - Imperial ➤ Steel ➤ AISC ➤ HSS and Pipes ➤ HSS, Small Hollow Structural Sections
   - Metric ➤ Steel ➤ CISC ➤ Angles ➤ L, Angle Shapes
   - Metric ➤ Steel ➤ CISC ➤ I-Shaped ➤ W, Wide Flange Shapes
   - Metric ➤ Steel ➤ CISC ➤ I-Shaped ➤ WWF, Welded Wide Flange Shapes
   - Metric ➤ Steel ➤ CISC ➤ Structural Tees ➤ WT, Tee Shapes

6. Under Shape Designation in the bottom right pane, select the shape size that you want to use to create your style, right-click, and click Generate Member Style.
7. Enter a style name, if necessary, and click OK.

   The name of the shape is used as the default style name. Special characters in the shape name, such as quotation marks, are substituted with underscores. If you change the default style name, you cannot use any of the following special characters in your style name:

   - Less-than and greater-than symbols (< >)
   - Forward slashes and backslashes (/ \)
   - Quotation marks (")

- Colons (:)
- Semicolons (;)
- Question marks (?)
- Commas (,)
- Asterisks (*)
- Vertical bars (|)
- Equal signs (=)
- Back quotes (`)

8 Continue creating structural member styles, or click to close the Structural Member Catalog.

You can access the style that you created in the Style Manager, create a new structural member tool from the style, modify an existing tool to use that style, or apply the style to an existing member.

Locating a Shape in the Structural Member Catalog from a Structural Member in a Drawing

Use this procedure to locate a shape in the Structural Member catalog from a shape contained in the style of a structural member in a drawing. You may find this command useful if you created a style from a shape in the catalog and did not name it with the same name as the catalog shape.

1 On the Format menu, click Structural Member Catalog.

2 On the Tools menu in the Structural Member Catalog, click Locate.

3 Select the structural member in the drawing that you want to select in the catalog.

The shape that you located from the existing member is selected in the Structural Member Catalog.

Opening a Catalog File in the Structural Member Catalog

Use this procedure to open a new catalog file in the Structural Member Catalog.

1 On the Format menu, click Structural Member Catalog.

2 Specify the location of the new catalog file:

If you . . .	Then . . .
know the location and name of the catalog file	enter the full path and name of the catalog file in the Catalog bar under the Structural Member Catalog toolbar.
want to browse your hard disk or server for a catalog	on the File menu in the Structural Member Catalog, click Open. Select a new catalog file, and click Open.

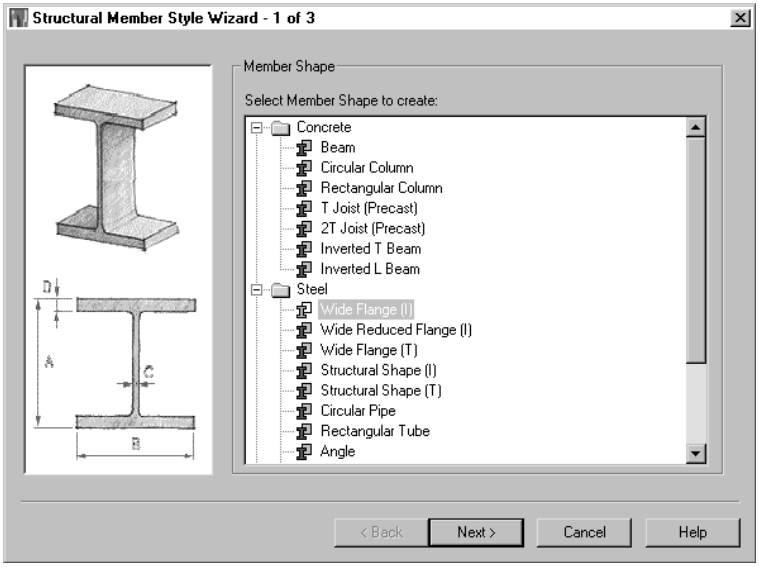
Creating a Structural Member Style with the Structural Member Style Wizard

Use this procedure to create a structural member style with the Structural Member Style wizard. You can create a structural member shape within the style that is based on any of the nineteen different shape types in the Structural Member Catalog. The current drawing units determine the units of the style that you create.

1 On the Format menu, click Structural Member Style Wizard.

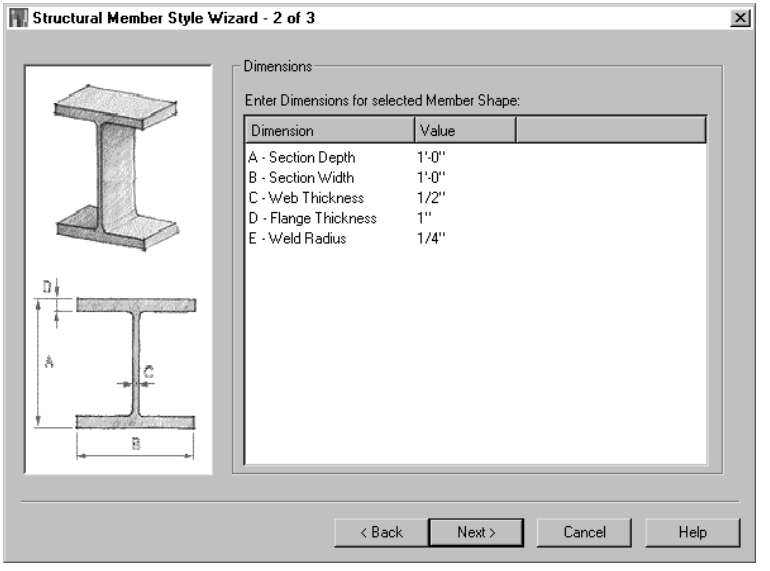
2 Select the type of structural member shape that you want to create, and click Next.

Selecting a structural member shape type



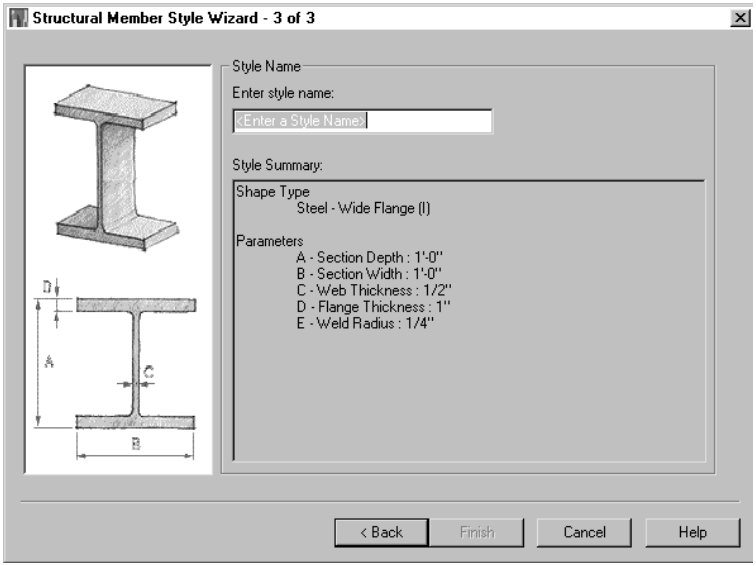
3 Enter dimensions for the shape, and click Next.

Entering the structural member dimensions



4 Enter a name for the structural member style, and click Finish.

Entering a structural member style name



You cannot use the following special characters in your style names:

- Less-than and greater-than symbols (< >)
- Forward slashes and backslashes (/ \)
- Quotation marks (")
- Colons (:)
- Semicolons (;)
- Question marks (?)
- Commas (,)
- Asterisks (*)
- Vertical bars (|)
- Equal signs (=)
- Back quotes (`)

You can access the style that you created in the Style Manager, create a new structural member tool from the style, modify an existing tool to use that style, or apply the style to an existing member.

Creating Structural Member Tools

You can create structural member tools and add them to tool palettes. Tool palettes in Autodesk®Architectural Desktop let you quickly place beams,

braces, and columns by selecting a structural member tool with a specific style and other predefined properties.

If you created structural member styles in the Structural Member Catalog or with the Structural Member Style wizard, you can drag the styles from the Style Manager to tool palettes and then customize the properties of the new tools.

You can also use any of the following methods to create structural member tools:

- Drag a structural member that has the properties you want to a tool palette.
- Copy an existing tool in the current palette, paste it onto the current palette or a different palette, and then customize the properties of the new tool.
- Drag a tool from the Content Browser to a tool palette and then customize the properties of the new tool.

Related Procedures

- Creating a Beam Tool
- Creating a Brace Tool
- Creating a Column Tool

Creating a Beam Tool

Use this procedure to create a structural beam tool and add it to a tool palette.

1. Open the tool palette where you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a structural member style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
create a tool from a beam in the drawing	select the beam, and drag it to the tool palette.
copy a tool in the current palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	right-click the tool, and click Copy. Open the other palette, and click Paste.

If you want to . . .	Then . . .
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

The description displays in the tooltip when you select the tool from the tool palette and describes the tool if you store it in a tool catalog in the Content Browser.

6 Expand Basic, and expand General.

7 Enter a description of the beams that you can create using this beam tool.

8 If you do not want to use the layer assignments specified in the layer key style used in the drawing, specify a layer key and any layer key overrides.

9 Select a structural member style, and select a style location, if not the current drawing.

The style provides the shape of the beam.

10 Expand Dimensions.

11 Specify offsets:

If you want to . . .	Then . . .
offset the beam on its extruded axis at the start point of the beam	enter a value for Start offset. A positive value shortens the beam on its axis, while a negative value lengthens the beam.
offset the beam on its extruded axis at the endpoint of the beam	enter a value for End offset. A positive value lengthens the beam on its axis, while a negative value shortens the beam on its axis.

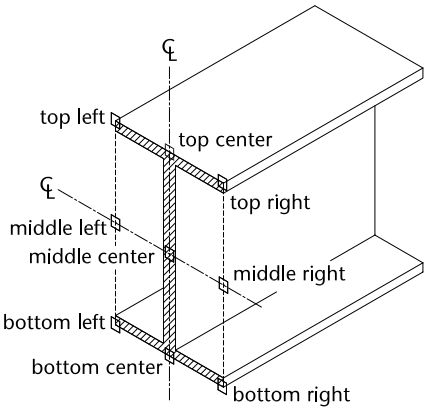
12 Enter a value for Roll.

The roll specifies the rotation of the beam around its extruded axis. A positive value for roll rotates the beam counter-clockwise when viewed from the end to the start of the member.

13 Specify the beam justification, which positions the beam shape in relation to its extruded axis when you draw the beam:

If you want to . . .	Then . . .
position the axis of the beam along the centroid of the beam shape	select Baseline for Justify. **NOTE** This applies to members created with styles from the Structural Member Catalog only.
position the axis of the beam along one of nine positions on the beam shape	select one of the nine positions for Justify. **NOTE** These positions are defined at a roll of zero, viewing the beam from the end to the start.

Justification options for a beam



14 To specify the justification of members with multiple shapes and segments created with this tool, select a setting for Justify using overall extents:

If you want to . . .	Then . . .
justify the member based on the largest cross-sectional extents of the member	select Yes. The justification is applied to all shape definitions at each node of the member.

If you want to . . .	Then . . .
justify the member based on the priorities of the shapes assigned in the design rules of the member style	select No. The justification is calculated based on the cross-sectional extents at each node and applied to the shape or shapes with the lowest priority at each node.

For more information about members with multiple shapes and segments, see "Creating Custom Structural Members" on page 1615.

15 Click OK.

Creating a Brace Tool

Use this procedure to create a structural brace tool and add it to a tool palette.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a structural member style in the Style Manager.	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
create a tool from a brace in the drawing	select the brace, and drag it to the tool palette.
copy a tool in the current palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	right-click the tool, and click Copy. Open the other palette, and click Paste.
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

The description displays in the tooltip when you select the tool from the tool palette and describes the tool if you store it in a tool catalog in the Content Browser.

6 Expand Basic, and expand General.

7 Enter a description of the braces that you can create using this brace tool.

8 If you do not want to use the layer assignments specified in the layer key style used in the drawing, specify a layer key and any layer key overrides.

9 Select a structural member style, and select a style location, if not the current drawing.

The style provides the shape of the brace.

10 Expand Dimensions.

11 Specify offsets:

If you want to . . .	Then . . .
offset the brace on its extruded axis at the start point of the brace	enter a value for Start offset. A positive value shortens the brace on its axis, while a negative value lengthens the brace.
offset the brace on its extruded axis at the endpoint of the brace	enter a value for End offset. A positive value lengthens the brace on its axis, while a negative value shortens the brace on its axis.

12 Enter a value for Roll.

The roll specifies the rotation of the brace around its extruded axis. A positive value for roll rotates the brace counter-clockwise when viewed from the end to the start of the brace.

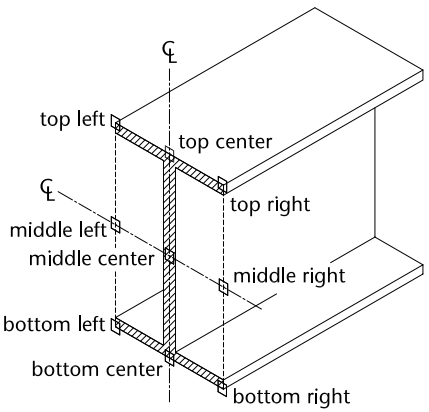
13 Specify the rise, which is the vertical distance between the start and endpoint of the brace:

If you want to . . .	Then . . .
specify the rise of the brace before you draw it	select No for Specify on Screen, and enter a value for Rise.
specify the rise of the brace by specifying a 3D endpoint for the end of the brace	select Yes for Specify on Screen.

14 Specify the brace justification, which positions the brace shape in relation to its extruded axis when you draw the brace:

If you want to . . .	Then . . .
position the axis of the brace along the centroid of the brace shape	select Baseline for Justify. **NOTE** This applies to members created with styles from the Structural Member Catalog only.
position the axis of the brace along one of nine positions on the brace shape	select one of the nine positions for Justify. **NOTE** These positions are defined at a roll of zero, viewing the beam from the end to the start.

Justification options for a brace



15 To specify the justification of members with multiple shapes and segments created with this tool, select a setting for Justify using overall extents:

If you want to . . .	Then . . .
justify the member based on the largest cross-sectional extents of the member	select Yes. The justification is applied to all shape definitions at each node (vertex) of the member.

If you want to . . .	Then . . .
justify the member based on the priorities of the shapes assigned in the design rules of the member style	select No. The justification is calculated based on the cross-sectional extents at each node and applied to the shape or shapes with the lowest priority at each node.

For more information about members with multiple shapes and segments, see "Creating Custom Structural Members" on page 1615.

16 Click OK.

Creating a Column Tool

Use this procedure to create a structural column tool and add it to a tool palette.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a structural member style in the Style Manager.	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
create a tool from a column in the drawing	select the column, and drag it to the tool palette.
copy a tool in the current palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	right-click the tool, and click Copy. Open the other palette, and click Paste.
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

The description displays in the tooltip when you select the tool from the tool palette and describes the tool if you store it in a tool catalog in the Content Browser.

6. Expand Basic, and expand General.
7. Enter a description of the columns that you can create using this column tool.
8. If you do not want to use the layer assignments specified in the layer key style used in the drawing, specify a layer key and any layer key overrides.
9. Select a structural member style, and select a style location, if not the current drawing.

   The style provides the shape of the column.
10. Expand Dimensions.
11. Specify offsets:

If you want to . . .	Then . . .
offset the column on its extruded axis at the start point of the column	enter a value for Start offset. A positive value shortens the column on its axis, while a negative value lengthens the column on its axis.
offset the column on its extruded axis at the endpoint of the column	enter a value for End offset. A positive value lengthens the column on its axis, while a negative value shortens the column on its axis.

12. Specify the roll, or rotation of the column around its extruded axis:

    A positive value for roll rotates the column counter-clockwise when viewed from the end (top) to the start (bottom) of the column.

If you want to . . .	Then . . .
specify the roll of the column before you insert it	select No for Specify on Screen, and enter a value for Roll.
specify the roll of the column by rotating it in your drawing after you insert it	select Yes for Specify on Screen.

13 Specify the column justification, which positions the column shape in relation to its extruded axis when you draw the column:

If you want to . . .	Then . . .
position the axis of the column along the centroid of the column shape	select Baseline for Justify. **NOTE** This applies to members created with styles from the Structural Member Catalog only.
position the axis of the column along one of nine positions on the column shape	select one of the nine positions for Justify. **NOTE** These positions are defined at a roll of zero, viewing the column from the top to the bottom.

14 To specify the justification of members with multiple shapes and segments created with this tool, select a setting for Justify using overall extents:

If you want to . . .	Then . . .
justify the member based on the largest cross-sectional extents of the member	select Yes. The justification is applied to all shape definitions at each node of the member.
justify the member based on the priorities of the shapes assigned in the design rules of the member style	select No. The justification is calculated based on the cross-sectional extents at each node and applied to the shape or shapes with the lowest priority at each node.

For more information about members with multiple shapes and segments, see "Creating Custom Structural Members" on page 1615.

15 Click OK.

Creating Structural Members Using Structural Member Tools

Tool palettes in Autodesk®Architectural Desktop let you quickly place beams, braces, and columns by selecting a structural member tool with a specific style and other predefined properties. You can also use structural member

tools to convert linework to structural members and to apply the settings of a structural member tool to existing structural members.

Custom palettes created by you or your CAD manager may contain structural member tools from styles created in the Structural Member Catalog or Structural Member Style wizard. These palettes may be customized for your projects or office standards.

The default tool palettes in the workspace contain sample structural member tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain structural member tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- Mytool catalog

When you create structural members using structural member tools, you can use the default settings of the tool, or you can specify settings for any structural member properties that are not controlled by the style.

Related Procedures

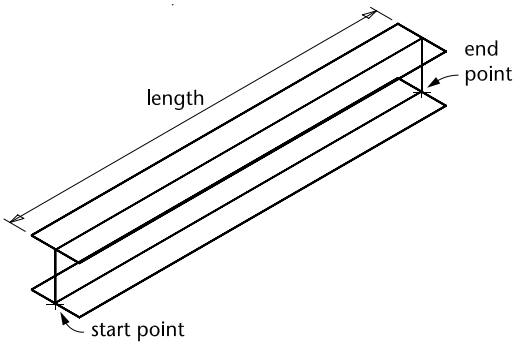
- Creating a Beam
- Creating a Beam with User-Specified Settings
- Creating a Brace
- Creating a Brace with User-Specified Settings
- Creating a Freestanding Column
- Creating a Freestanding Column with User-Specified Settings
- Creating a Column Anchored to a Grid
- Creating a Column Anchored to a Grid with User-Specified Settings
- Creating a Structural Member from Linework

Creating a Beam

Use this procedure to add a new beam that has the properties specified in the structural beam tool that you select. The style specified in the tool provides its shape. You specify the start point and endpoint of the beam to define an extrusion path for the shape.

To specify settings when you add a beam, see "Creating a Beam with User-Specified Settings" on page 1564.

Creating a beam



1 Open the tool palette that you want to use, and select a structural beam tool.

   If necessary, scroll to display the tool that you want to use.

2 Specify the start point of the beam.

   You can move or hide the Properties palette to expose more of the drawing area.

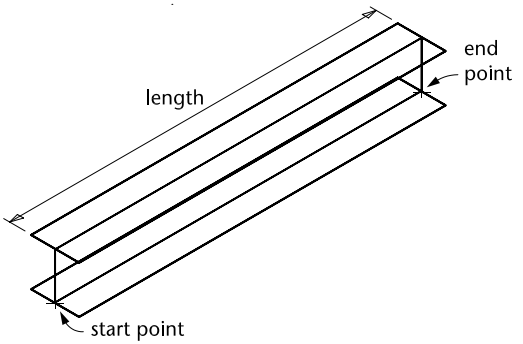
3 Specify the endpoint of the beam:

If you want to . . .	Then . . .
create a single beam	specify the endpoint of the beam, and press ENTER.
create additional beams, using the endpoint of the previous beam as the start point of each new beam	specify additional endpoints, and press ENTER.

Creating a Beam with User-Specified Settings

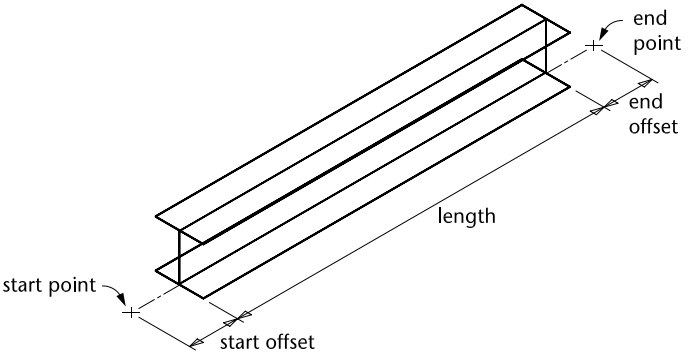
Use this procedure to add a new beam with settings that you specify. The style that you use to create the brace provides its shape. You specify the start point and endpoint of the beam to define an extrusion path for the shape.

Creating a beam



Optionally, offset the beam from its start or endpoint.

Offsetting a beam



TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a structural beam tool.

   If necessary, scroll to display the tool that you want to use.

2. On the Properties palette, expand Basic, and expand General.
3. Select a structural member style.

   The style provides the shape of the beam.
4. Expand Dimensions.

5 Specify offsets:

If you want to . . .	Then . . .
offset the beam on its extruded axis at the start point of the beam	enter a value for Start offset. A positive value shortens the beam on its axis, while a negative value lengthens the beam.
offset the beam on its extruded axis at the endpoint of the beam	enter a value for End offset. A positive value lengthens the beam on its axis, while a negative value shortens the beam on its axis.

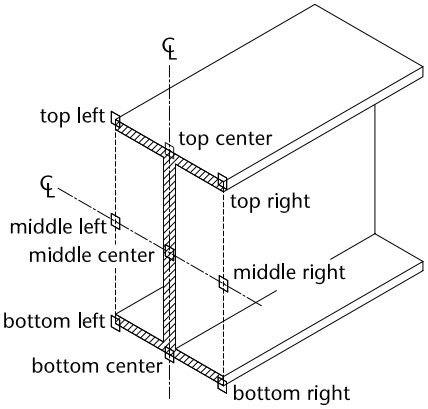
6 Enter a value for Roll.

The roll specifies the rotation of the beam around its extruded axis. A positive value for roll rotates the beam counter-clockwise when viewed from the end to the start of the member.

7 Specify the beam justification, which positions the beam shape in relation to its extruded axis when you draw the beam:

If you want to . . .	Then . . .
position the axis of the beam along the centroid of the beam shape	select Baseline for Justify. **NOTE** This applies to members created with styles from the Structural Member Catalog only.
position the axis of the beam along one of nine positions on the beam shape	select one of the nine positions for Justify. **NOTE** These positions are defined at a roll of zero, viewing the beam from the end to the start.

Justification options for a beam



8 In the drawing area, specify the start point of the beam.

You can move or hide the Properties palette to expose more of the drawing area.

9 Specify an endpoint:

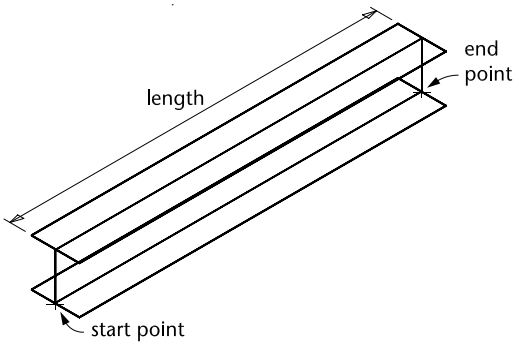
If you want to . . .	Then . . .
create a single beam	specify the endpoint of the beam, and press ENTER.
create additional beams, using the endpoint of the previous beam as the start point of each new beam	specify additional endpoints, and press ENTER.

Creating a Brace

Use this procedure to add a new brace that has the properties specified in the structural brace tool that you select. The style specified in the tool provides its shape. You specify the start point and endpoint of the brace to define an extrusion path for the shape.

To specify settings when you add a brace, see "Creating a Brace with User-Specified Settings" on page 1568.

Creating a brace



1 Open the tool palette that you want to use, and select a structural brace tool.

   If necessary, scroll to display the tool that you want to use.

2 Specify the start point of the brace.

   You can move or hide the Properties palette to expose more of the drawing area.

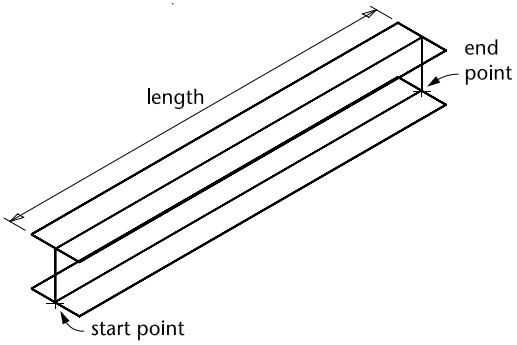
3 Specify an endpoint:

If you want to . . .	Then . . .
create a single brace	specify the endpoint of the brace, and press ENTER.
create additional braces	continue to specify brace start and endpoints, and press ENTER.

Creating a Brace with User-Specified Settings

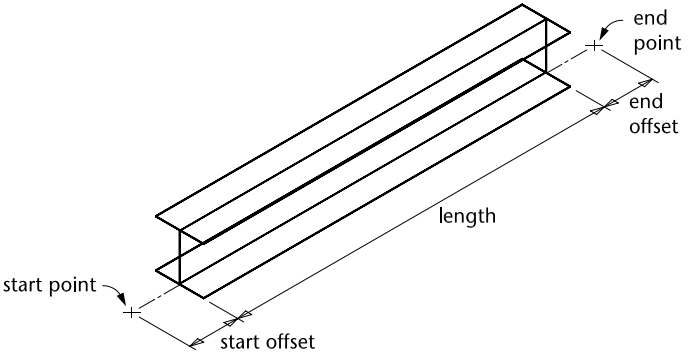
Use this procedure to add a new brace with settings that you specify. The style that you use to create the brace provides its shape. You specify the start point and endpoint of the brace to define an extrusion path for the shape.

Creating a brace



Optionally, offset the brace from its start or endpoint.

Offsetting a brace



TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a structural brace tool.

   If necessary, scroll to display the tool that you want to use.

2. On the Properties palette, expand Basic, and expand General.
3. Select a structural member style.

   The style provides the shape of the brace.

4. Expand Dimensions.

5 Specify offsets:

If you want to . . .	Then . . .
offset the brace on its extruded axis at the start point of the brace	enter a value for Start offset. A positive value shortens the brace on its axis, while a negative value lengthens the brace.
offset the brace on its extruded axis at the endpoint of the brace	enter a value for End offset. A positive value lengthens the brace on its axis, while a negative value shortens the brace on its axis.

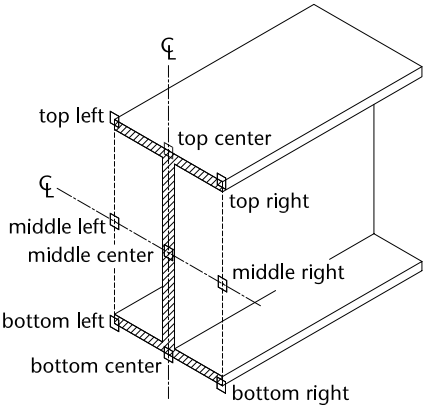
6 Enter a value for Roll.

The roll specifies the rotation of the brace around its extruded axis. A positive value for roll rotates the brace counter-clockwise when viewed from the end to the start of the brace.

7 Specify the brace justification, which positions the brace shape in relation to its extruded axis when you draw the brace:

If you want to . . .	Then . . .
position the axis of the brace along the centroid of the brace shape	select Baseline for Justify. **NOTE** This applies to members created with styles from the Structural Member Catalog only.
position the axis of the brace along one of nine positions on the brace shape	select one of the nine positions for Justify. **NOTE** These positions are defined at a roll of zero, viewing the beam from the end to the start.

Justification options for a brace



8 Specify the rise, which is the vertical distance between the start and endpoint of the brace:

If you want to . . .	Then . . .
specify the rise of the brace before you draw it	select No for Specify Rise on Screen, and enter a value for Rise.
specify the rise of the brace by specifying a 3D endpoint for the end of the brace.	select Yes for Specify Rise on Screen.

9 In the drawing area, specify the start point of the brace.

You can move or hide the Properties palette to expose more of the drawing area.

10 Specify an endpoint for the brace:

- If you entered a value for Rise in step 8, then the endpoint of the brace is the *X* and *Y* coordinates of the endpoint that you selected. The *Z* coordinate equals the *Z* coordinate of the start point plus the value for the rise.
- If you selected Specify on Screen in step 8, the endpoint of the brace is the 3D point that you selected.

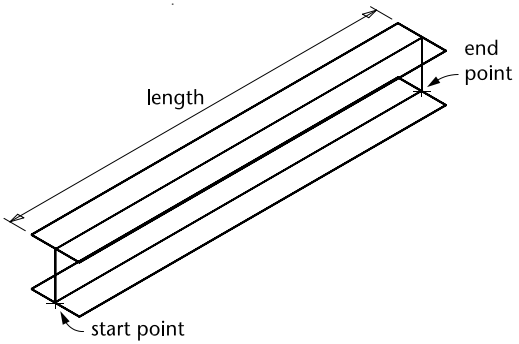
11 Continue adding braces, and press ENTER.

Creating a Freestanding Column

Use this procedure to add a new column that has the properties specified in the structural column tool that you select. The style specified in the tool provides its shape. Unlike beams and braces, columns are created with their length (*X*-axis) positioned in a positive direction along the current UCS *Z*-axis. The length of the column defines the extrusion path for the column shape.

To specify settings when you add a column, see "Creating a Freestanding Column with User-Specified Settings" on page 1573.

Creating a column



1. Open the tool palette that you want to use, and select a structural column tool.

   If necessary, scroll to display the tool that you want to use.

2. Press ENTER to create a freestanding column.
3. Specify the insert point of the column.

   You can move or hide the Properties palette to expose more of the drawing area.

4. Specify the roll, or rotation of the column around its extruded axis:

   A positive value for roll rotates the column counter-clockwise when viewed from the end (top) to the start (bottom) of the column.

If you want to . . .	Then . . .
specify the roll of the column before you insert it	select No for Specify Roll on Screen, and enter a value for the column in the property palette.

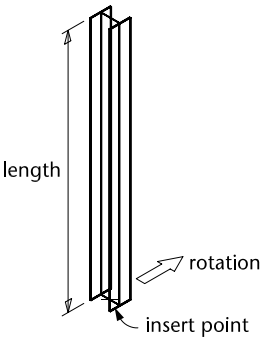
If you want to . . .	Then . . .
specify the roll of the column by rotating it in your drawing after you insert it	select Yes for Specify Roll on Screen, and specify a point in your drawing or enter a value.

5 Continue adding columns, and press ENTER.

Creating a Freestanding Column with User-Specified Settings

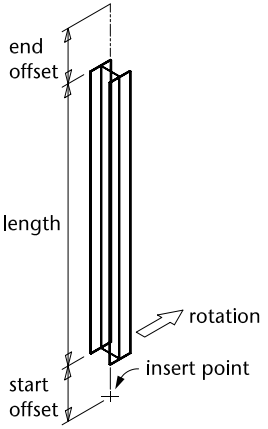
Use this procedure to create a free-standing column, with settings that you specify. The structural member style that you use to create the column provides its shape. Unlike beams and braces, you create columns with their length (*X*-axis) positioned in a positive direction along the current UCS *Z*-axis. You specify the length of the column to define an extrusion path for the shape.

Creating a free-standing column



Optionally, offset the column from its start or endpoint.

Offsetting a column



TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a Structural Column tool.

   If necessary, scroll to display the tool that you want to use.
2. Press ENTER to create a free-standing column.
3. On the Properties palette, expand Basic, and expand General.
4. Select a structural column style.

   The style of the column provides its shape.
5. Expand Dimensions.
6. Specify offsets:

If you want to . . .	Then . . .
offset the column on its extruded axis at the start point of the column	enter a value for Start offset. A positive value shortens the column on its axis, while a negative value lengthens the column.
offset the column on its extruded axis at the endpoint of the column	enter a value for End offset. A negative value lengthens the column on its axis, while a positive value shortens the column.

7 Enter a value for Logical length.

The logical length of the column is the length (height) of the column before offsets are applied.

8 Specify the roll, or rotation of the column around its extruded axis:

A positive value for roll rotates the column counter-clockwise when viewed from the end (top) to the start (bottom) of the column.

If you want to . . .	Then . . .
specify the roll of the column before you insert it	select No for Specify Roll on Screen, and enter a value for Roll.
specify the roll of the column by rotating it your drawing after you insert it	select Yes for Specify Roll on Screen.

9 Specify the column justification, which positions the column shape in relation to its extruded axis when you draw the column:

If you want to . . .	Then . . .
position the extruded axis of the column at the centroid of the column shape	select Baseline for Justify. **NOTE** This applies to members created with styles from the Structural Member Catalog only.
position the extruded axis of the column along one of nine positions on the column shape	select one of the nine positions for Justify. **NOTE** These positions are defined at a roll of zero, viewing the column from the top to the bottom.

10 In the drawing area, specify the insert point of the column.

You can move or hide the Properties palette to expose more of the drawing area.

11 If you selected Specify on Screen for the roll of the column, select a point in your drawing.

12 Continue adding columns, and press ENTER.

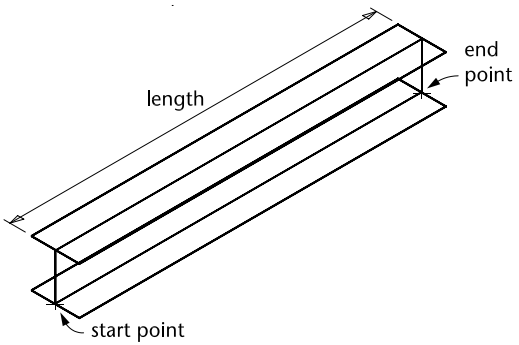
Creating a Column Anchored to a Grid

Use this procedure to anchor a column that has the properties specified in the structural column tool that you select to a grid. The style specified in the tool provides its shape. Unlike beams and braces, columns are created with their length (*X*-axis) positioned in a positive direction along the current UCS *Z*-axis. The length of the column defines the extrusion path for the column shape. You select the position to anchor the column to on the grid.

To specify settings when you anchor a column to a grid, see "Creating a Column Anchored to a Grid with User-Specified Settings" on page 1577.

To create a column grid with pre-anchored columns, see "Creating a Column Grid" on page 1204.

Creating a column



1. Open the tool palette that you want to use, and select a structural column tool.

   If necessary, scroll to display the tool that you want to use.

2. Select the grid.
3. Specify the insert point of the column on the grid.

   You can move or hide the Properties palette to expose more of the drawing area.

4. Continue adding columns to the grid, and press ENTER.

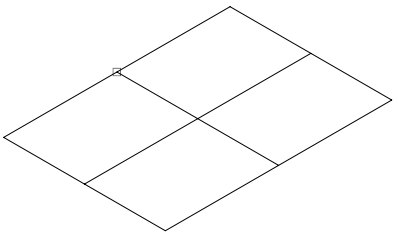
IMPORTANT Columns grids that have numerous columns attached to them can take longer than expected to display on screen. This is because structural members carry additional information that may be used for structural analysis.

Creating a Column Anchored to a Grid with User-Specified Settings

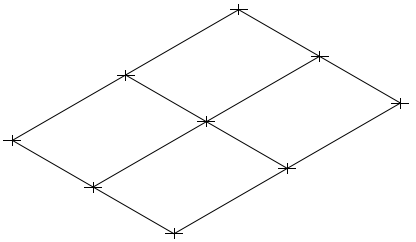
Use this procedure to anchor a column to a grid as you create it, with settings that you specify. The structural member style that you use to create the column provides its shape. Unlike beams and braces, columns are created with their length (*X*-axis) positioned in a positive direction along the current UCS *Z*-axis. The length of the column defines the extrusion path for the column shape. You select the position to anchor the column to on the grid.

To create a column grid with pre-anchored columns, see "Creating a Column Grid" on page 1204.

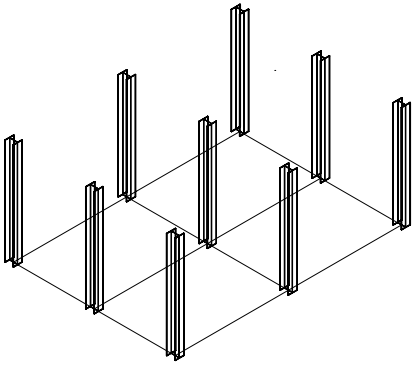
Creating anchored columns



select column grid

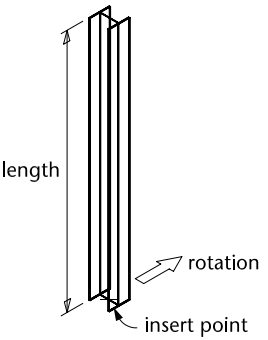


specify column insert points



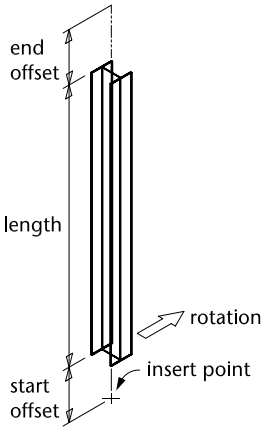
resulting columns attached to column grid

Creating a column



Optionally, offset the column from its start or endpoint.

Offsetting a column



TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a Structural Column tool.

   If necessary, scroll to display the tool that you want to use.

2. Select the grid.
3. On the Properties palette, expand Basic, and expand General.
4. Select a structural column style.

   The style of the column provides its shape.

5 Expand Dimensions.

6 Specify offsets:

If you want to . . .	Then . . .
offset the column on its extruded axis at the start point of the column	enter a value for Start offset. A positive value shortens the column on its axis, while a negative value lengthens the column.
offset the column on its extruded axis at the endpoint of the column	enter a value for End offset. A negative value lengthens the column on its axis, while a positive value shortens the column.

7 Enter a value for Logical length.

The logical length of the column is the length (height) of the column before offsets are applied.

8 Specify the column justification, which positions the column shape in relation to its extruded axis when you draw the column:

If you want to . . .	Then . . .
position the axis of the column along the centroid of the column shape	select Baseline for Justify. **NOTE** This applies to members created with styles from the Structural Member Catalog only.
position the axis of the column along one of nine positions on the column shape	select one of the nine positions for Justify.

9 Specify the insert point of the column on the grid.

10 Continue adding columns to the grid, and press ENTER.

IMPORTANT Columns grids that have numerous columns attached to them can take longer than expected to display on screen. This is because structural members carry additional information that may be used for structural analysis.

Creating a Structural Member from Linework

Use this procedure to convert any of the following objects to structural members with structural member tools:

- Arcs
- Lines
- Open polylines
- Open polylines with arc segments

When you use a tool to convert linework to a structural member, the style specified in the tool provides the shape of the member. The linework defines the extrusion path for the shape. You can convert multiple lines to create multiple members, convert curved lines to create curved members, and convert multi-segmented lines to create multi-segmented members.

NOTE Converting an arc to a structural member is the only method of creating a curved structural member. For more information about curved structural members, see "About Curved Structural Members" on page 1590.

---

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

2. Right-click a structural member tool, and click Apply Tool Properties to Linework.
3. Select the linework to convert, and press ENTER.

   WARNING! You cannot convert a closed polyline (a polyline with a start node that coincides with its end node) to a structural member.

   ---

4. When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.
5. Edit the properties of the structural member in the Properties palette, if necessary.
6. If you

   created a structural member by converting a polyline, the initial orientation of the structural member is set to the UCS that was current when you drew the polyline. You can change the orientation by adjusting the roll of the member.

Editing Structural Members

After you create a structural member, you can change any properties of the member that you specified when you created it and make additional modifications. You can change the start and end offsets of a member, or add or remove them. You can change the length, justification, and location of a member. For a curved structural member, you can change the radius.

You can change the geometry of a structural member by trimming it. By changing the structural member type, you can change a brace to beam, or a column to a brace. By changing the style of a structural member, you can change its shape.

Autodesk®Architectural Desktop offers several methods for editing structural members:

- You can directly edit structural members using grips for dimensions and other physical characteristics.
- You can change structural member settings on the Properties palette.
- You can select editing commands from the context menu for a selected structural member.

Related Topics and Procedures

- Using Grips to Edit Structural Members
- Changing the Structural Member Length
- Changing the Structural Member Start and End Offsets
- Changing the Radius of a Curved Structural Member
- Changing the Structural Member Justification
- Changing the Structural Member Type
- Trimming Structural Members
- Changing the Style of a Structural Member
- Changing the Location of a Structural Member
- Applying Tool Properties to a Structural Member
- Attaching Hyperlinks, Notes, and Files to a Structural Member

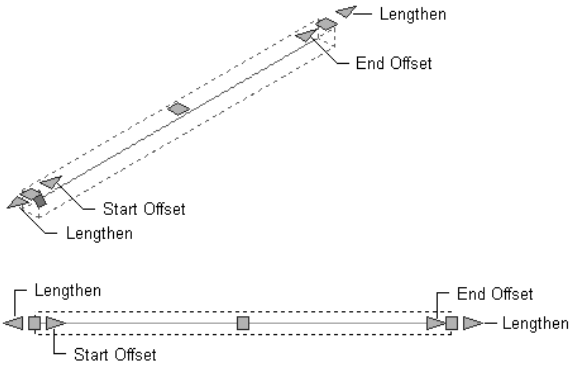
Using Grips to Edit Structural Members

Refer to the illustrations and steps in this topic to use grips to edit structural members.

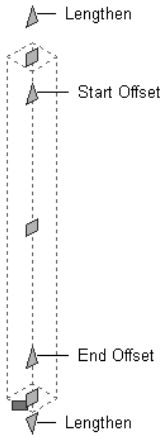
Editing Structural Member Dimensions

1. Select the structural member.
2. Select the grip for the dimension you want to change.

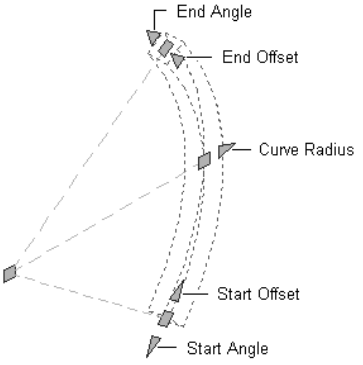
Grips for length, start offset, and end offset of a straight beam or brace



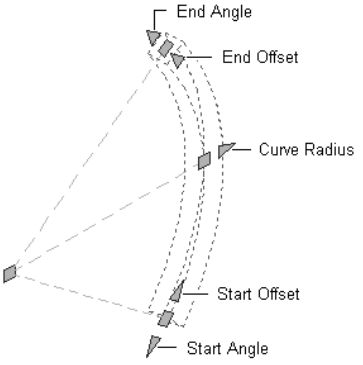
Grips for length, start offset, and end offset of a straight column



Grips for start and end angles, radius, and start and end offsets of a curved beam or brace



Grips for start and end angles, radius, and start and end offsets of a curved column



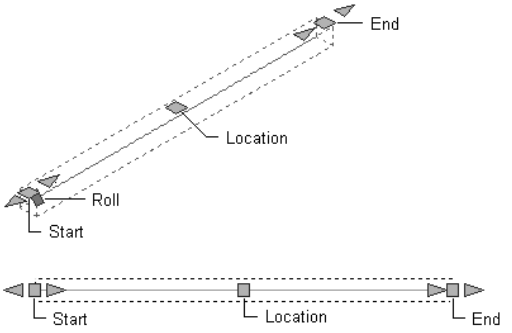
3 Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Changing the Location or Position of a Structural Member

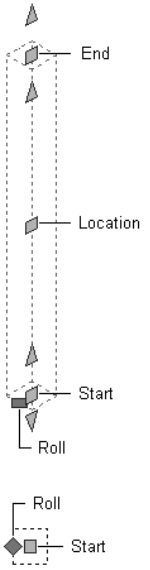
1 Select the structural member.

Move the appropriate grip to change the location of the structural member, or its roll (the rotation of the member around its extruded axis).

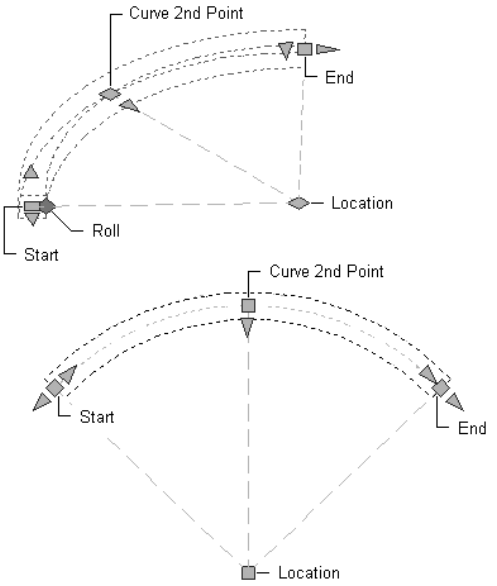
Location and roll grips for a straight beam or brace



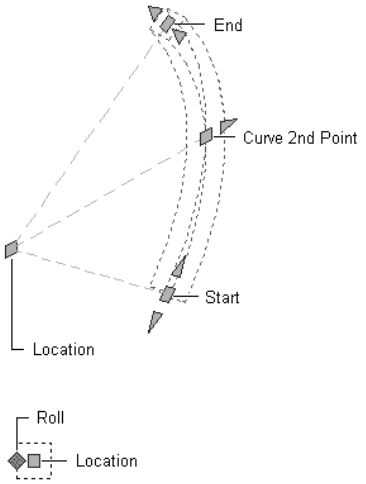
Location and roll grips for a straight column



Location and roll grips for a curved beam or brace



Location and roll grips for a curved column



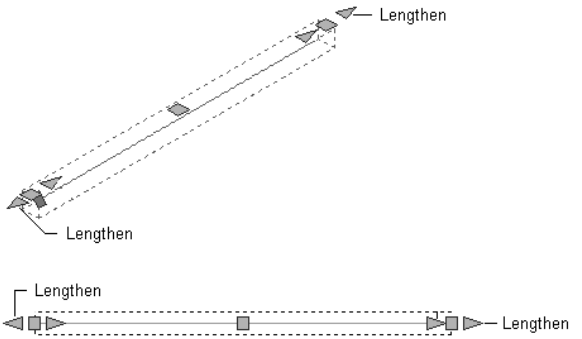
2 Move the grip until the dimension value you want is displayed, and click once, or enter a value.

Changing the Structural Member Length

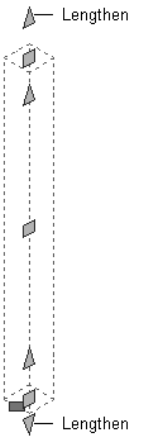
Use this procedure change the length of a structural member. You can also change the structural member length on the Properties palette.

1. Select the structural member.
2. Select a Lengthen grip, move the grip until the length value you want displays, and click once.

Grips for length of a straight beam or brace



Grips for length (height) of a straight column



After selecting a grip, you can also enter a value to increase or decrease the length of the structural member.

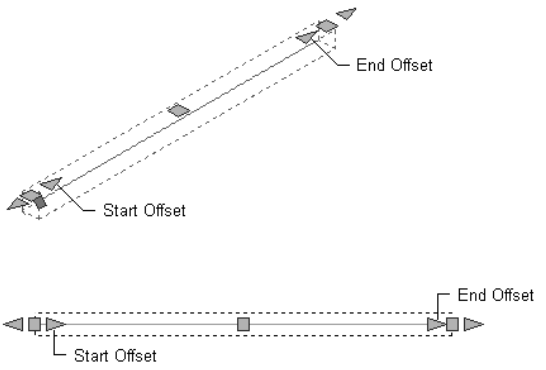
Changing the Structural Member Start and End Offsets

Use this procedure to offset a structural member from the start or endpoint of its path. You can remove or change existing offsets, or add new offsets to the start point or endpoint of a structural member. You can also change the structural member start and end offsets on the Properties palette.

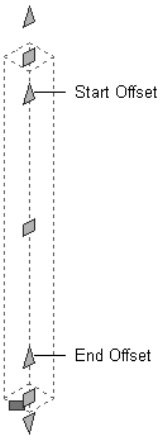
1. Select the structural member.
2. Select a Start Offset grip, move the grip until the start offset value you want displays, and click once.

   A positive start offset value shortens the member on its axis (path), while a negative start offset value lengthens the member.

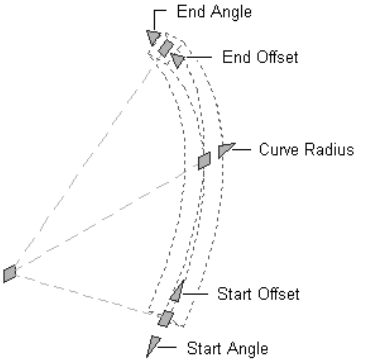
   Grips for start and end offsets of a straight beam or brace



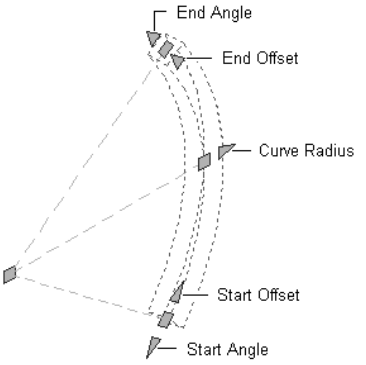
Grips for start and end offsets of a straight column



Grips for start and end angles, radius, and start and end offsets of a curved beam or brace



Grips for start and end angles, radius, and start and end offsets of a curved column



3 Select an End Offset grip, move the grip until the end offset value you want displays, and click once.

A positive end offset lengthens the member on its axis, while a negative end offset shortens the member.

After selecting a grip, you can also enter a value to increase or decrease the the start or end offset of the structural member.

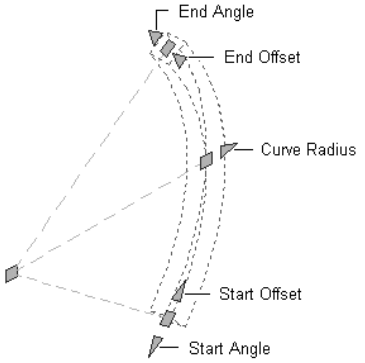
Changing the Radius of a Curved Structural Member

Use this procedure to change the radius of a curved structural member. You can also change the structural member radius on the Properties palette. For more information about curved structural members, see "About Curved Structural Members" on page 1590.

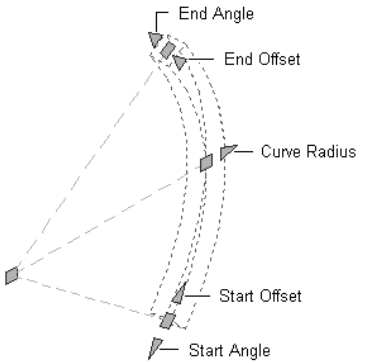
1 Select the structural member.

2 Select a Curve Radius grip, move the grip until the radius value you want displays, and click once.

Grips for start and end angles, radius, and start and end offsets of a curved beam or brace



Grips for start and end angles, radius, and start and end offsets of a curved column



About Curved Structural Members

The smoothness (tesselation) of curved edges is controlled by the FACETDEV variable. This variable sets the number of facets to display on curved AEC objects. The default value is 1/2" for drawings created from imperial templates and is 12.7 mm for drawings created from metric templates.

The number you specify for facet deviation defines the maximum distance from the chord to the arc, the chord being an edge that is created from faceting the curve, to the true mathematical arc. The facet deviation has a range of greater than zero (0) and no upper limit.

The minimum number of facets is 8. For example, if you create a cylinder mass element to have a 1' radius, and specify 1' for facetdev, the cylinder has 8 faces.

The plan representation of individual curved components of columns uses the true curved representation of the member shapes. The above and below cut components will always be faceted.

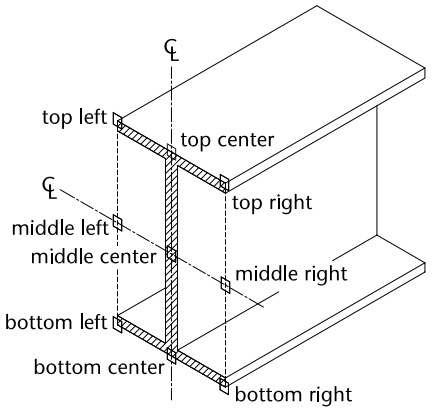
The maximum number of facets is controlled by the FACETMAX variable. This variable can be set from 100 to 10,000. Note that using a small value for FACETDEV and a large value for FACETMAX will adversely affect drawing performance.

To specify the facet deviation values for the current drawing, see "Specifying the Display Resolution of Objects with Facets" on page 564. The settings apply to all curved objects in the drawing, including curved structural members.

Changing the Structural Member Justification

Use this procedure to change the justification of a structural member. Justification positions the shape of a structural member in relation to its extruded axis. Changing the justification of an existing member moves the member and can affect how the member relates to other objects, such as how a column is positioned in relation to a column grid when it is anchored to the grid.

Justification options for a beam



You can also specify the justification of structural members with multiple shapes and segments. For more information about these members, see"Creating Custom Structural Members" on page 1615.

1. Select the structural member to change, and double-click it.
2. On the Properties palette, expand Basic, and expand Dimensions.

3 Select a setting for Justification:

If you want to . . .	Then . . .
position the axis of the member along the centroid of the member shape	select Baseline for Justify. **NOTE** This applies to members created with styles from the Structural Member Catalog only.
position the axis of the member along one of nine positions on the member shape	select one of the nine positions for Justify.

4 To specify the justification of members with multiple shapes and segments created with this tool, select a setting for Justify using overall extents:

If you want to . . .	Then . . .
justify the member based on the largest cross-sectional extents of the member	select Yes. The justification is applied to all shape definitions at each node (vertex) of the member.
justify the member based on the priorities of the shapes assigned in the design rules of the member style	select No. The justification is calculated based on the cross-sectional extents at each node and applied to the shape or shapes with the lowest priority at each node.

Changing the Structural Member Type

Use this procedure to change the type of one or more structural members. Because beams, braces, and columns are sub-types of a single structural member object, you can change a beam to a brace, a column to beam, or a brace to a beam.

1 Select the structural members to change, and double-click one of them.

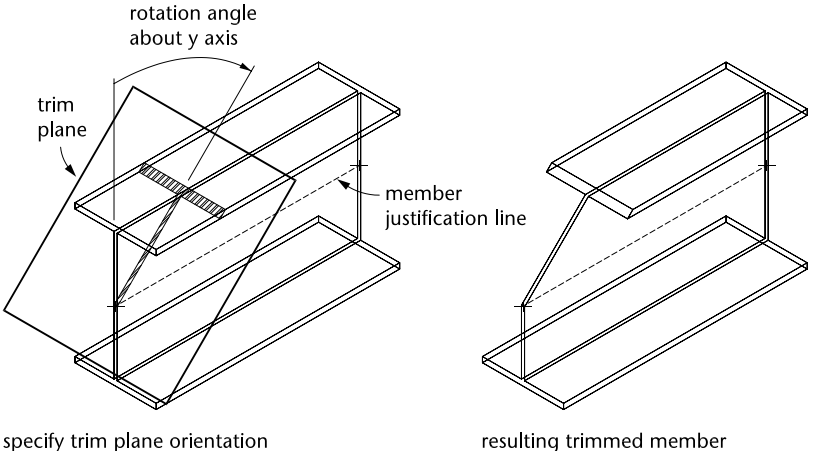
2 On the Properties palette, expand Basic and expand General.

3 Select a setting for Member type: Beam, Brace, or Column.

Trimming Structural Members

You can use trim planes to trim structural members in your drawings. A trim plane is a cutting plane that trims a structural member to a location that you define on the structural member.

Trimming a structural member with a trim plane



You can use trim planes to clean up joints between multiple structural members. For example, use multiple trim planes to angle both ends of a brace in a diagonally braced frame.

NOTE Because trim planes are infinite planes, you cannot use them to notch, cope, or cut holes in structural members.

You can add one or more trim planes to a structural member, change trim planes, and remove trim planes from a structural member to restore it to its original dimensions.

Related Procedures

- Adding a Trim Plane to a Structural Member
- Changing a Structural Member Trim Plane
- Removing a Trim Plane from a Structural Member

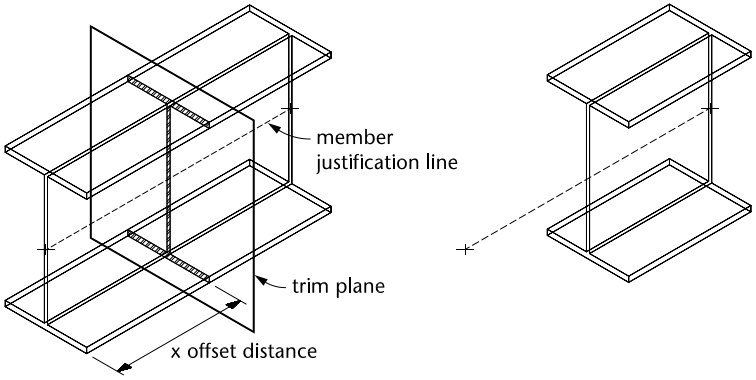
Adding a Trim Plane to a Structural Member

You can add any number of trim planes to a structural member. When you add a trim plane to one or more structural members, you define the position of the trim plane relative to the structural member that you are trimming.

When defining trim planes, you can:

- Define the position of the trim plane relative to the start or end of the extruded axis of the member.
- Offset the trim plane in the *X* direction to move the origin of the trim plane along the extruded axis of the member.

Offsetting a trim plane

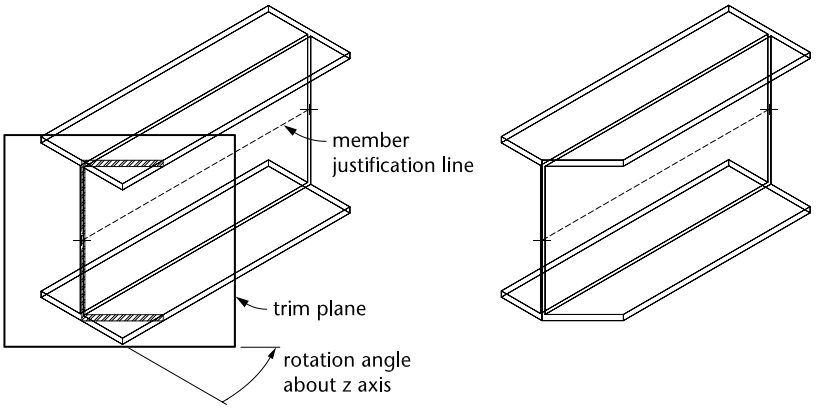


specify trim plane location

resulting trimmed member

- Offset the trim plane in the *Y* and *Z* direction to move the origin of the trim plane perpendicular to the extruded axis of the member in the *Y* and/or *Z* directions.
- Rotate the trim plane around its *Y* or *Z* axis to angle the cutting plane.

Rotating a trim plane



specify trim plane orientation

resulting trimmed member

1 Select the structural member you want to change, and double-click.

2 On the Properties palette, expand Advanced.

3 Click the setting for Trim planes.

4 Click .

5 Specify settings to position the trim plane:

If you want to . . .	Then . . .
offset the trim plane from the start point or endpoint of the member	select Start or End under Offset.
offset the trim plane in the *X* direction along the extruded axis of the member	enter an *X* value for Offset.
offset the trim plane in the *Y* and *Z* directions to position the trim plane perpendicular to the extruded axis of the member	enter *Y* and *Z* values for Offset.
rotate the trim plane around its *Y* or *Z* axis	enter *Y* and *Z* values for Rotation.

6 To copy a trim plane, select the trim plane, and click Copy.

7 Continue adding trim planes, and click OK.

Changing a Structural Member Trim Plane

After you add one or more trim planes to a structural member, you can change the orientation of the trim planes. You can also grip-edit trim planes to move and rotate them.

1 Select the structural member you want to change, and double-click.

2 On the Properties palette, expand Advanced.

3 Click the setting for Trim planes.

4 Change any of the trim plane settings:

If you want to . . .	Then . . .
change the start or end offset of the trim plane	select Start or End under Offset.
change the trim plane offset in the *X* direction along the extruded axis of the member	change the *X* value for Offset.
change the trim plane offset in the *Y* and *Z* directions to position the trim plane perpendicular to the extruded axis of the member	change the *Y* and *Z* values for Offset.
change the rotation of the trim plane around the *Y* or *Z* axis	change *Y* and *Z* values for Rotation.

NOTE If you rotate a trim plane between 90 and 270 degrees, the opposite end of the structural member is completely removed.

5 Click OK.

Removing a Trim Plane from a Structural Member

You can remove a trim plane from a structural member. When you remove all trim planes from a structural member, the structural member is restored to its original dimensions.

1. Select the structural member you want to change, and double-click.
2. On the Properties palette, expand Advanced.
3. Click the setting for Trim planes.
4. Select the trim plane that you want to remove.
5. Click Remove.
6. Click OK.

Changing the Style of a Structural Member

Use this procedure to select a different structural member style for one or more structural members. The style of a structural member provides its shape, so changing the style of a member changes its shape.

1. Select the structural members to change, double-click one of them.
2. Expand Basic, and expand General.
3. Select a different style.

Changing the Location of a Structural Member

Use this procedure to relocate a structural member by changing the coordinate values of its insert point. The structural member also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the structural member are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the structural member by aligning its normal with another axis. You can also rotate the structural member on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Double-click the structural member that you want to change.
2. In the Properties palette, expand Basic, and expand Location.
3. Enter new coordinate values for the start and end points of the structural member.

Applying Tool Properties to a Structural Member

Use this procedure to apply the properties of a structural member tool to one or more members in a drawing. The properties include any settings specified in the tool you select.

1. Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a structural member tool, and click Apply Tool Properties to ➤ Beam, Brace, or Column.

3 Select the structural members, and press ENTER.

4 Edit the properties of the structural member on the Properties palette, if necessary.

Attaching Hyperlinks, Notes, and Files to a Structural Member

Use this procedure to enter notes and attach hyperlinks and reference files to a structural member. You can also edit notes and edit or detach reference files from a structural member.

1 Double-click the structural member.

2 In the Properties palette, click the Extended Data tab.

3 Click the setting for Hyperlink.

4 Specify the link, and click OK.

5 Click the setting for Notes.

6 Enter the note, and click OK.

7 Click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter your comments under Description for the document you are describing
edit a reference file	double-click the reference file name to start the application needed to edit it.
detach a reference file	select the file name, and click Delete.

8 Click OK.

Structural Member Styles

A structural member style is a group of properties assigned to a structural member that determines the shape and other characteristics of the structural member. You can use structural member styles to represent standard structural member types for specific jobs and drawings or for office standards.When you create or modify a structural member style, the structural members using the style have the settings and characteristics of the style.

Usually you create structural member styles from the Structural Member Catalog or with the Structural Member wizard and drag them from the Style Manager onto a tool palette. You can also create your own structural member styles for custom structural members that you cannot create from the catalog or with the wizard. For more information, see "Creating Custom Structural Members" on page 1615.

Creating Tools from Structural Member Styles

You can create a structural member tool from any structural member style. Usually, you want to create structural members tools from styles that you create in the Structural Member Catalog or with the Structural Member Style wizard. However, you can also create a structural member tool from a style that you create in the Style Manager. You can save the style to a drawing file and create a structural member tool with the style. You can then specify default settings for any structural member created with that tool. For more information, see "Creating Structural Member Tools" on page 1553.

Managing Structural Member Styles

To create, edit, copy, or purge structural member styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager."

Related Topics and Procedures

- Creating a Structural Member Style in the Style Manager
- Specifying the Materials of a Structural Member Style
- Specifying the Display Properties of a Structural Member Style
- Specifying Classifications for a Structural Member Style
- Attaching Notes and Files to a Structural Member Style

Creating a Structural Member Style in the Style Manager

Use this procedure to create a structural member style in the Style Manager. You can create a style using default style properties, by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Structural Member Styles.
3. Create a structural member style:

If you want to . . .	Then . . .
create a style with default properties	right-click Structural Member Styles, and click New.
create a style from an existing style	right-click the structural member style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new structural member style, and press ENTER.
5. To edit the new structural member style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.
change the design rules of the style to create a custom structural member	see "Creating Custom Structural Members" on page 1615.
specify materials for the components of the style	see "Specifying the Materials of a Structural Member Style" on page 1601.
specify hatching, cut plane properties, and other display properties of the style	see "Specifying the Display Properties of a Structural Member Style" on page 1603.
add classifications to a structural member style	see "Specifying Classifications for a Structural Member Style" on page 1613.

If you want to . . .	Then . . .
add notes and files to the style	see "Attaching Notes and Files to a Structural Member Style" on page 1614.

6 Click OK.

7 If you want to assign the style to a structural member tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating Structural Member Tools" on page 1553.

8 Click OK.

Specifying the Materials of a Structural Member Style

A structural member consists of a number of components whose display properties can be determined by the materials assigned to each component. When you assign materials to a structural member style, you assign one material to each physical component of the structural member. You assign materials to components in each display representation where you want the materials to be used.

If you want to use the display properties of the structural member style, instead of using material display properties, you can turn off the material assignments in the display properties of the structural member style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in three dimensional (3D) model views and in elevations.

Related Topics and Procedure

- Structural Member Materials and Display Components
- Assigning Materials to a Structural Member Style

Structural Member Materials and Display Components

The following table identifies the material component that corresponds to each structural member component:

Structural Member Component	Material Component
Elevation, Elevation High Detail	
Visible Comp 1-10	Plan Linework
Model, Model High Detail, Model Low Detail	
Component 1 - 10	3D Body
Plan, Plan Low Detail, Plan High Detail, Plan Presentation, Plan Screened	
Visible Comp 1-10	Plan Linework
Hatch 1 - 20	Plan Hatch
Reflected, Reflected Screened	
Visible Comp 1-10	Plan Linework

Assigning Materials to a Structural Member Style

Use this procedure to assign materials to the individual components of a structural member style. When you assign a material to a structural member component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the structural member. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, all structural member components are physical components that you can assign materials. The connection marker and axis are symbols, and you cannot assign materials to them.

NOTE If a material assignment does not determine the display properties of a structural member component, you can change the display properties of the structural member style as described in "Specifying the Display Properties of a Structural Member Style" on page 1603.

1 Open a tool palette that has a structural member tool.

2. Right-click a structural member tool, and click Structural Member Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Select the component you want to change, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.
11. Click OK twice.

Specifying the Display Properties of a Structural Member Style

In most cases, you can assign materials to structural member components so that the appearance of structural members that belong to the same style is consistent throughout a drawing and with other structural members and objects that use the same materials.

If a component cannot be assigned a material, or if you do not want to use materials but still want consistency among structural members of the same style, you can specify the display properties of the structural member components in the structural member style:

- Layer, color, and linetype of structural member components
- Hatching used with each component
- Cut plane height and the display of components relative to the cut plane

- Other specific structural member display information, such as whether custom blocks are added to the display of the structural member

Related Procedures

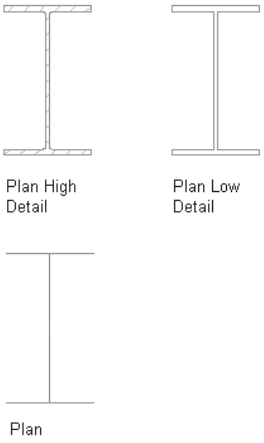
- About Structural Member Display Representations
- Specifying the Layer, Color, and Linetype of a Structural Member Style
- Specifying the Hatching for Components of a Structural Member Style
- Specifying the Cut Plane Elevation of a Structural Member Style
- Using Custom Blocks to Add Graphics to a Structural Member Style
- Adding Custom Blocks as a Display Component in a Structural Member Style
- Turning Off Custom Blocks in a Structural Member Style
- Removing Custom Blocks from a Structural Member Style

About Structural Member Display Representations

Structural member geometry is created by a shape contained in the style of the structural member that is extruded along the axis of the member. Each shape can have different levels of detail in its geometry, allowing different displays of the structural member that the shape is defining. If you look at the display representations of a structural member, you see that there may be more than one of the same representation. Each representation displays the structural shape in a different level of detail.

For example, you can use the Plan, Plan High Detail, and Plan Low Detail structural member representations to display a plan view of a structural member.

Displaying a structural member with the Plan High Detail, Plan Low Detail, and Plan display representations



The Plan Low Detail display representation displays the member with simple lines and arcs. You can use display representation to create a top view framing plan where you want a single line representation of a column. The Plan Low Detail display representation includes two display components, Beam Sketch and Brace Sketch. You can change the display properties of these components, such as layer, color, and linetype, to differentiate the display of beams and braces. You can also add offsets between members in this representation to display them as you typically would in a top view framing plan.

The Plan and Plan High Detail display representations display the previous column using closed polylines. Both representations display the column geometry, but the Plan High Detail representation is more detailed, including fillets in the column display. Use the Plan representation to improve performance while modeling, and the Plan High Detail representation to display an added level of detail for detail drawings.

The following table lists the structural member display representations and their uses:

Use this display representation . . .	**To . . .**
Elevation	display an elevation view of a structural member with simplified geometry for better performance when modeling.

Use this display representation . . .	To . . .
Elevation High Detail	display an elevation view of a structural member in full detail.
Logical	display the extruded axis of a structural member and connections between members. Connections are automatically established between members when they touch endpoint to endpoint or endpoint to a point on the extruded axis of another member.
Model	display a 3D structural member with simplified geometry for better performance when modeling.
Model High Detail	display a 3D structural member in full detail for large scale details.
Plan	display a 2D structural member in less detail than the Plan High Detail representation to improve performance. Members display as closed polylines, rather than lines and arcs as in the Plan Low Detail representation.
Plan High Detail	display a 2D structural member in full detail.
Plan Low Detail	display a 2D structural member with simple lines and arcs to create a top view framing plan. Includes a Beam Sketch and Brace Sketch display component to differentiate beams and braces in plan view.
Plan Presentation	display a 2D structural member with solid hatching (poche) for plan view presentation drawings.
Plan Screened	display a 2D structural member in the screened portion of a screened floor plan, with components and hatching visibly lighter than some other objects.
Reflected	display a 2D structural member in a reflected ceiling plan.
Reflected Screened	display a 2D structural member in the screened portion of a screened reflected ceiling plan with components and hatching visibly lighter than some other objects.

Specifying the Layer, Color, and Linetype of a Structural Member Style

Use this procedure to change the following display properties of the components of a structural member style:

- Visibility (component is on or off)
- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE If a material assignment determines the display properties of components in the structural member style, you can change the properties of the display component by clearing By Material. You can also override the material assignment with a different material. For more information, see "Assigning Materials to a Structural Member Style" on page 1602.

---

1. Open a tool palette that has a structural member tool.
2. Right-click a structural member tool, and click Structural Member Styles.
3. Right-click the structural member style that you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select the component to change, and select a different setting for the property.
9. Click OK twice.

NOTE For multi-component structural members, hidden lines are calculated one component at a time.

Specifying the Hatching for Components of a Structural Member Style

Use this procedure to specify the hatching of the components of a structural member style. Structural member hatching is displayed only in display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

1. Open a tool palette that has a structural member tool.
2. Right-click a structural member tool, and click Structural Member Styles.
3. Right-click the structural member style that you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Hatching tab.
8. Select a component, and click the setting for Pattern.
9. Select the hatching for the component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

10. Click OK.
11. Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.
12. Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

14 Click OK twice.

Specifying the Cut Plane Elevation of a Structural Member Style

Use this procedure to specify the cut plane elevation of a structural member style. The cut plane settings you specify in the structural member style override the cut plane settings in any display configuration applied to a viewport.

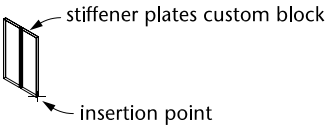
NOTE If the cut plane does not intersect the structural member, all visible and hidden components display. If the cut plane does intersect the member, only the cross section of the components of the structural member displays. These are the actual member shapes unless you select Do True Cut.

1 Open a tool palette that has a structural member tool.
2 Right-click a structural member tool, and click Structural Member Styles.
3 Right-click the structural member style that you want to change, and click Edit.
4 Click the Display Properties tab.
5 Select the display representation where you want the changes to appear, and select Style Override.
6 If necessary, click .
7 Click the Cut Plane tab.
8 Select Override Display Configuration Cut Plane.
9 Enter a value for Cut Plane Elevation.
10 Click OK twice.

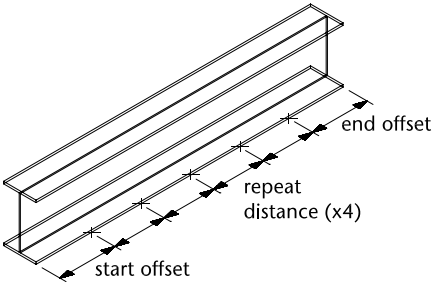
Using Custom Blocks to Add Graphics to a Structural Member Style

You can add custom blocks to the display of a structural member as a component in a display representation. For example, you can add stiffener plates to beams as a custom blocks or add clip angles to members as a custom blocks.

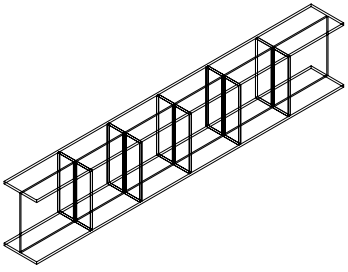
Creating a stiffener plate custom block



Adding the custom block to the display of a structural member



specifying custom block locations



resulting stiffener plates added to beam

Custom blocks can be either 2D or 3D. When you add a custom block, you can specify several rules for positioning and scaling the new component. Each custom block also appears in the display properties component list so that you can control its layer, color, and linetype. For more information, see "Adding Custom Blocks as a Display Component in a Structural Member Style" on page 1611.

Be sure to set the properties of the objects used to create your custom blocks to ByBlock. Otherwise, you cannot control these objects through the display properties. For more information about ByBlock, see "Working with Layers and Properties" in the online *AutoCAD 2004 User's Guide*.

To change these display properties for all structural members of the same structural member style, see "Specifying the Display Properties of a Structural Member Style" on page 1603.

Adding Custom Blocks as a Display Component in a Structural Member Style

Use this procedure to add or edit custom block components in the display representation of a structural member style.

1. Create a 2D or 3D block for the component that you want to add to the structural member.

   Create the block in the same plane as the structural member that you use to represent structural member. For more information about custom blocks, see "Using Custom Blocks to Add Graphics to a Structural Member Style" on page 1610

2. Open a tool palette that has a structural member tool.
3. Right-click a structural member tool, and click Structural Member Styles.
4. Right-click the structural member style that you want to change, and click Edit.
5. Click the Display Properties tab.

   The display representation in bold is the current display representation.

6. Select the display representation where you want the changes to appear, and select Object Override.
7. If necessary, click .
8. Click the Other tab.
9. Under Custom Block Display, click Add.
10. Click Select Block and select the block you created.
11. Select a setting for Position Along (x) to position the block in a location along the X-axis of the member.
12. Specify an insertion offset of the block in the *X*, *Y*, and *Z* directions.
13. Specify whether you want repeat the block display along the X-axis of the member:

If you want to . . .	Then . . .
repeat the display of the block along the X-axis of the member	select Repeat Block Display.
offset the repeated blocks from the start or endpoint of the member	enter values for Start Offset and End Offset.

If you want to . . .	Then . . .
specify the space between the repeated blocks	enter a value for space between.
increase the spacing between repeated blocks so the insertion point of the last block is at the end offset distance from the end of the member	select Fit, and select Space Evenly.
scale the block so the extents of all the blocks fit between the start and end offset distances	select Fit, and select Scale to Fit.

14 Specify whether to mirror the block in the *X*,*Y*, or *Z* direction:

If you want to . . .	Then . . .
create a mirror of the block in the *X* direction	select Mirror X.
create a mirror of the block in the *Y* direction	select Mirror Y.
create a mirror of the block in the *Z* direction	select Mirror Z.

15 Click OK three times.

Turning Off Custom Blocks in a Structural Member Style

Use this procedure to turn off the display of custom blocks without removing them from the structural member style.

1 Open a tool palette that has a structural member tool.

2 Right-click a structural member tool, and click Structural Member Styles.

3 Right-click the structural member style that you want to change, and click Edit.

4 Click the Display Properties tab.

The display representation in bold is the current display representation.

5 Select the display representation where you want to turn off custom blocks, and select Object Override.

6 If necessary, click .

7 Click the Other tab.

8 Under Custom Block Display, select Disable Custom Blocks.

9 Click OK twice.

Removing Custom Blocks from a Structural Member Style

Use this procedure to remove custom blocks from the display of a structural member.

1 Open a tool palette that has a structural member tool.

2 Right-click a structural member tool, and click Structural Member Styles.

3 Right-click the structural member style that you want to change, and click Edit.

4 Click the Display Properties tab.

The display representation in bold is the current display representation.

5 Select the display representation where you want to turn off custom blocks, and select Object Override.

6 If necessary, click .

7 Click the Other tab.

8 Under Custom Block Display, select the block and click Remove.

9 Click OK twice.

Specifying Classifications for a Structural Member Style

Use this procedure to specify classifications for any classification definition applied to a structural member style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1 Open a tool palette that has a structural member tool.

2 Right-click a structural member tool, and click Structural Member Styles.

3 Right-click the style that you want to change, and click Edit.

4 Click the Classifications tab.

By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to structural member styles.

5 For each classification definition, select the classification you want to apply to the current structural member style.

6 Click OK twice.

Attaching Notes and Files to a Structural Member Style

Use this procedure to enter notes and attach reference files to a structural member style. You can also edit notes and edit or detach reference files from a structural member style.

1 Open a tool palette that has a structural member tool.

2 Right-click a structural member tool, and click Structural Member Styles.

3 Right-click the structural member style you want to change, and click Edit.

4 Click the General tab.

5 To add a description to the structural member style, enter it for Description.

6 Click Notes.

7 To add a note, click the Text Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK.

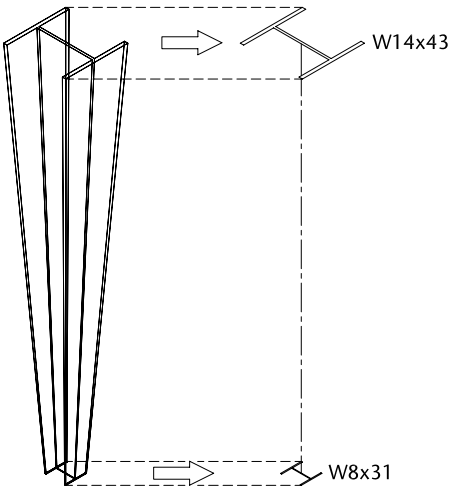
Creating Custom Structural Members

You can specify design rules within a structural member style to a create custom structural member. The design rules allow you to specify one or more shapes to extrude along the path (axis) of a structural member. You can assign and position a start and end shape for each segment of a structural member.

Creating Single-Segmented Custom Structural Members

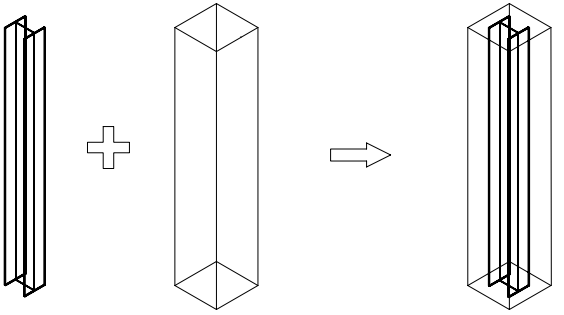
A single-segment member can start and end with the same shape, or you can specify different start and end shapes, resulting in a member that starts with one shape and ends with another. For example, you can create a tapered column by assigning different start and end shapes to a single-segment column.

Creating a tapered column



You can also assign different shapes to the same single-segment member by adding a component to the member. By adding a component in the design rules and assigning different shapes to the same segment, you can create a structural member with overlapping shapes. For example, you can create a concrete encased steel column by adding a component with a steel column shape to a concrete column.

Creating a composite steel and concrete column



W8x31 steel column

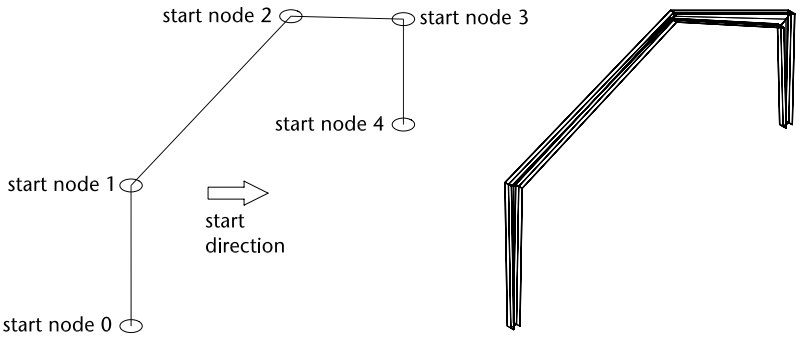
16"x16" rectangular concrete column

composite steel and concrete column

Creating Multi-Segmented Custom Structural Members

For multi-segmented structural members, you can assign different shapes to each segment of the member as components of the member. A series of nodes (starting at 0 at the start point of the member) correspond to each vertex of the member path. By assigning different shapes to segments between nodes on the member path, you can create a structural member that transforms from one shape to different shapes along the member path. For example, you can use this method to create a rigid frame.

Creating the rigid frame



custom member nodes

polyline converted to rigid frame

Creating Custom Shapes for Structural Members

When you create custom structural members, you can use the shapes contained in styles that you create from the Structural Member Catalog or Structural Member Style wizard, or you can create your own custom shapes.

When you create a custom shape, you can only add it to a structural members in the design rules of the structural member style.

Related Topics and Procedures

- Understanding the Design Rules of a Structural Member
- Changing the Shape in the Style of a Structural Member
- Adding a Shape to a Structural Member
- Creating a Single-Component Structural Member: Tapered Column
- Creating a Multi-Component Structural Member: Composite Column
- Creating a Multi-Component Structural Member Using Multiple Segments: Rigid Frame
- Creating Custom Shapes for Structural Members

Understanding the Design Rules of a Structural Member

Use this procedure to access and understand the options in the design rules of a structural member.

1. Select a structural member, right-click, and click Edit Member Style.
2. Click Design Rules.
3. On the Design Rules tab, click Show Details.

   You can use the following options in the design rules to create custom members:

This option . . .	Allows you to . . .
Component	add multiple components to a structural member. Each component includes a name and can include a start and end shape and a priority. You can remove and copy the components of a structural member.
Start Shape and End Shape	select a shape and a set of parameters to the start and end of a structural member component. The component shapes can be the same shape or a different shape. If End Shape is using the Start Shape, an asterisk (*) displays next to the end shape. To transform the shape of the member along the member path, the end shape must be explicitly set.

This option . . .	Allows you to . . .
Priority	assign a priority to a component. Components that start and end at a common node are mitered based on their priorities. Components with the same priority are factored into the miter angle between the components. Components with different priorities are not factored into the miter angle. Components with the lowest priority will affect the justification of the member when Justify Overall Extents is cleared on the Dimensions tab in the properties of the member.
Name	select shapes that you assign to the start and end of the member or member segment. You can select shapes contained in structural member styles, or custom shapes that you create.
Relative to	define the position of the shape relative to the start or end of the member.
Node	place shapes on the member path relative to the start or end of the member. To place shapes on the member path, assign them to nodes on the member path. A single segment member has two nodes; the start point and the endpoint of the member. Multi-segmented members have additional nodes located at each vertex of the member path, allowing you to assign different shapes to the start and end of each segment of the member. If you place shapes on the member path relative to the start of the member, then the start point of the member path is Node 0. The first vertex on the member path is Node 1, and so on until the endpoint of the member path is defined as the final node. If you place shapes on the member path relative to the end of the member, then the endpoint of the member is Node 0.
Scale	scale the shape.
Mirror	mirror the shape.
Rotation	rotate the shape.
X	offset the shape in the *X* direction along the member path.
Y	offset the shape in the *Y* direction perpendicular to the member path.
Z	offset the shape in the *Z* direction perpendicular to the member path.

4 Click Add to add a component to a structural member.

   A component with the same values as the preceding component is added to the design rules.

5 Click Copy to copy a component.

6 Click Remove to remove a component.

7 Click OK.

Changing the Shape in the Style of a Structural Member

Use this procedure to change the shape that is extruded along the axis of a structural member created from a single shape. You can create a new shape for the structural member by creating a custom shape, or by creating a new style from the Structural Member Catalog that contains a shape.

1 Create a structural member with a single shape.

   For more information, see "Creating Structural Members Using Structural Member Tools" on page 1562.

2 Create a new shape for the structural member:

If you want to create . . .	Then . . .
a custom shape for the member	create a custom shape. See "Creating a Custom Shape for a Structural Member" on page 1635.
a shape from the Structural Member Catalog	create a structural member style in the Structural Member Catalog that contains the shape. See "Creating a Style from a Shape in the Structural Member Catalog" on page 1549.

3 Select the structural member, right-click, and click Edit Member Style.

4 Click Design Rules.

5 In the Name list under Start Shape, select the shape that you created in step 2.

   If you created a custom shape in step 2, the name of the shape displays in the Name list. If you created a style from the Structural Member Catalog, the shape displays in the Name list with the name of the shape that you selected in the catalog to create the style, not with the style name that you created.

6 Click OK.

Adding a Shape to a Structural Member

Use this procedure to add one or more shapes to a structural member in the design rules of the structural member style. You can create a new shape to add to the structural member by creating a custom shape, or by creating a new style from the Structural Member Catalog that contains a shape.

1 Create a structural member with a single shape.

For more information, see "Creating Structural Members Using Structural Member Tools" on page 1562.

2 Create a new shape to add to the structural member:

If you want to . . .	Then . . .
create a custom shape for the member	create a custom shape. See Creating a Custom Shape for a Structural Member.
create a shape from the Structural Member Catalog	create a structural member style in the Structural Member Catalog that contains the shape. See Creating a Style from a Shape in the Structural Member Catalog

3 Select the structural member, right-click, and click Edit Member Style.

4 Click Design Rules.

5 Click Add.

A new component is added to the structural member.

6 Type a name for each component under Component.

7 For the new component, from the Name list under Start Shape, select the shape that you created in step 2.

If you created a custom shape in step 2, the name of the shape is displayed in the Name list. If you created a style from the Structural Member Catalog, the shape is displayed in the Name list with the name of the shape that you selected in the catalog to create the style, not with the style name that you typed.

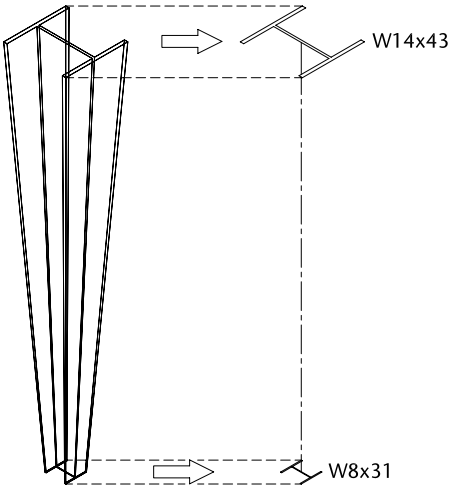
8 Click OK.

The structural member is redrawn with the new shape added to its geometry.

Creating a Single-Component Structural Member: Tapered Column

Use this example to create a tapered column, a single-component structural member that starts with one shape and ends with another.

Creating a tapered column



The process of creating this tapered column has four steps:

Step 1: Create two structural member styles in the Structural Member Catalog that contain the start and end shapes to taper over the length (height) of the column.

Step 2: Create a Tapered Column tool.

Step 3: Create a column with the tapered column style.

Step 4: Specify design rules in the tapered column style to add the start and end shapes in the styles that you created in step 1 to the tapered column.

Related Procedures

- Step 1: Creating Start and End Shapes for the Tapered Column
- Step 2: Creating the Tapered Column Tool
- Step 3: Creating a Column with the Tapered Column Tool
- Step 4: Adding the Start and End Shapes to the Tapered Column

Step 1: Creating Start and End Shapes for the Tapered Column

Use this procedure to create two styles that contain the start and end shapes for the tapered column. The first style contains the start shape for the column and the second style contains the end shape for the column.

1. On the Format menu, click Structural Member Catalog.
2. Expand Imperial in the tree view in the left pane of the Structural Member Catalog.
3. Expand Steel, AISC, and then I-Shaped.
4. Select Wn, Wide-Flange Shapes.
5. Right-click W8X31 in the lower right pane of the Structural Member Catalog, and click Generate Member Style.
6. Enter W8X31, and click OK.
7. Select W1n, Wide-Flange Shapes in the tree view in the left pane.
8. Right-click W14X43 in the lower right pane of the Structural Member Catalog, and click Generate Member Style.
9. Enter W14X43 and click OK.
10. Click to close the Structural Member Catalog.

Step 2: Creating the Tapered Column Tool

Use this procedure to create a tapered column tool. Save the style for the tapered column in the *Member Styles (Imperial).dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*.

1. On the Format menu, click Style Manager.
2. On the File menu, click Open drawing.
3. Open *Member Styles (Imperial).dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*.
4. Expand Architectural Objects, right-click Structural Member Styles, and click New.
5. Enter Tapered Column for the name, and press ENTER.
6. Click OK to close the Style Manager.
7. Click OK to save changes to the *Member Styles (Imperial).dwg*.
8. In the title bar of the tool palettes set, click , and then click New Palette.
9. Enter Structural, and press ENTER.

10 Open the Design palette, select the Structural Column tool, right-click, and click Copy.

11 Open the Structural palette, right-click, and click Paste.

12 Select the new tool, right-click, and click Properties.

13 Enter Tapered Column for the Name.

14 Click the setting for Description.

15 Enter Creates a tapered column, and click OK.

16 Expand Basic, and expand General.

17 Click Style location.

18 Select Browse, select the *Member Styles.dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*, and click Open.

19 Click Style and select Tapered Column.

20 Click OK.

Step 3: Creating a Column with the Tapered Column Tool

Use this procedure to create a column with the tapered column tool that you created.

1 Select the Tapered Column tool from the tool palette.

2 Press ENTER to create a column that is not anchored to a grid.

3 Specify the insert point of the column.

4 Specify the roll, which is the rotation around the extruded axis of the column, and press ENTER.

Step 4: Adding the Start and End Shapes to the Tapered Column

Use this procedure to add the start and end shapes to the tapered column and transform them along the member path.

1 Select the column, right-click, and click Edit Member Style.

2 Click Design Rules.

3 Click Show Details.

4 Select Unnamed under Component, and enter Component 1.

5 Under Start Shape, select W8X31 from the Name list.

6 Scroll to the end of the Design Rules dialog box to display the End Shape parameters.

7 Under End Shape, select W14X43 from the Name list.

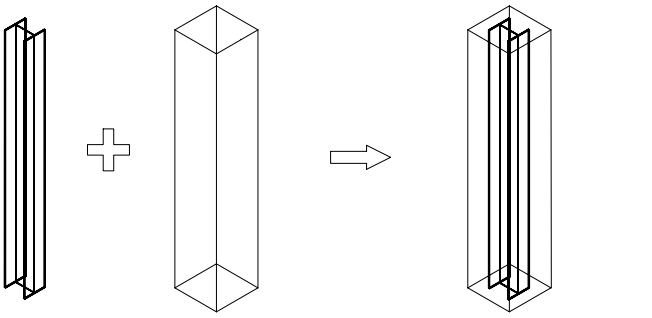
8 Click OK.

The complete tapered column displays in your drawing.

Creating a Multi-Component Structural Member: Composite Column

Use this example to create a steel column encased in concrete, a multi-component structural member with a single segment. The steel column shape is one component of the member, the concrete column shape another.

Creating a composite steel and concrete column



The process of creating this composite column has four steps:

Step 1: Create two structural member styles: one that contains the shape for the concrete column and one that contains the shape for the steel column.

Step 2: Create a Composite Column tool.

Step 3: Create a column with the composite column style.

Step 4: Specify design rules in the composite column style to add the concrete and steel shapes to the column.

Steps to Create the Composite Column:

- Step 1: Creating the Steel and Concrete Shapes for the Composite Column
- Step 2: Creating the Composite Column Tool
- Step 3: Creating a Column with the Composite Column Tool
- Step 4: Adding the Steel and Concrete Shapes to the Composite Column

Step 1: Creating the Steel and Concrete Shapes for the Composite Column

Use this procedure to create two styles: one that contains the steel shape and one that contains the concrete shape.

1. On the Format menu, click Structural Member Catalog.
2. Expand Imperial in the tree view in the left pane of the Structural Member Catalog.
3. Expand Steel, AISC, and then I-Shaped.
4. Select Wn, Wide-Flange Shapes.
5. Right-click W8X31 in the lower right pane of the Structural Member Catalog, and click Generate Member Style.
6. Enter W8X31, and click OK.
7. Expand Concrete, and then Pre-Cast.
8. Select Rectangular Columns.
9. Right-click 16X16 in the lower right pane of the Structural Member Catalog, and click Generate Member Style.
10. Enter 16X16 and click OK.
11. Click to close the Structural Member Catalog.

Step 2: Creating the Composite Column Tool

Use this procedure to create a composite column tool. Save the style for the composite column in the *Member Styles (Imperial).dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*.

1. On the Format menu, click Style Manager.
2. On the File menu, click Open drawing.
3. Open *Member Styles (Imperial).dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*.
4. Expand Architectural Objects, right-click Structural Member Styles, and click New.
5. Enter Composite Column for the name, and press ENTER.
6. Click OK to close the Style Manager.
7. Click OK to save changes to the *Member Styles (Imperial).dwg*.
8. In the title bar of the tool palettes set, click , and then click New Palette.
9. Enter Structural, and press ENTER.
10. Open the Design palette, select the Structural Column tool, right-click, and click Copy.
11. Open the Structural palette, right-click, and click Paste.
12. Select the new tool, right-click, and click Properties.

13 Enter Composite Column for the Name.

14 Click the setting for Description.

15 Enter Creates a composite column, and click OK.

16 Expand Basic, and expand General.

17 Click Style location.

18 Select Browse, select the *Member Styles.dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*, and click Open.

19 Click Style and select Composite Column.

20 Click OK.

Step 3: Creating a Column with the Composite Column Tool

Use this procedure to create a column with the composite column tool that you created.

1 Select the Composite Column tool from the tool palette.

2 Press ENTER to create a column that is not anchored to a grid.

3 Specify the insertion point of the column.

4 Specify the roll, or rotation around the extruded axis of the column, and press ENTER.

Step 4: Adding the Steel and Concrete Shapes to the Composite Column

Use this procedure to add the steel and concrete shapes to the composite column.

1 Select the column, right-click, and click Edit Member Style.

2 Click Design Rules.

3 Click Show Details.

4 Select Unnamed under Component, and enter Component 1.

5 Under Start Shape, select 16X16 from the Name list.

6 Click Add.

A new component is added to the design rules of the column. By default, the start and end shapes are the same as the preceding component.

7 Select Unnamed under Component, and enter Component 2.

8 Under Start Shape for Component 2, select W8X31 from the Name list.

Do not change the other Start Shape parameters.

9 Click OK.

The composite column displays in your drawing.

Creating a Multi-Component Structural Member Using Multiple Segments: Rigid Frame

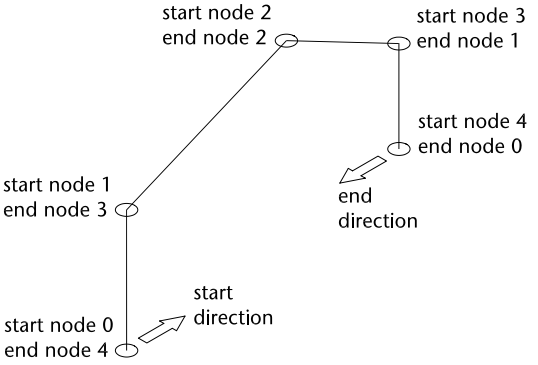
Use this example to create a rigid frame, a multi-segmented structural member created from multiple shapes that transform at each vertex of the structural member path.

To create the rigid frame, you convert a multi-segmented polyline to a structural member and assign different start and end shapes to each segment of the member as components in the design rules of the rigid frame style. A series of nodes correspond to the start point, vertices, and the endpoint of the member path. By assigning different shapes to segments between nodes on the member path, the rigid frame transforms from one shape to several shapes along its path.

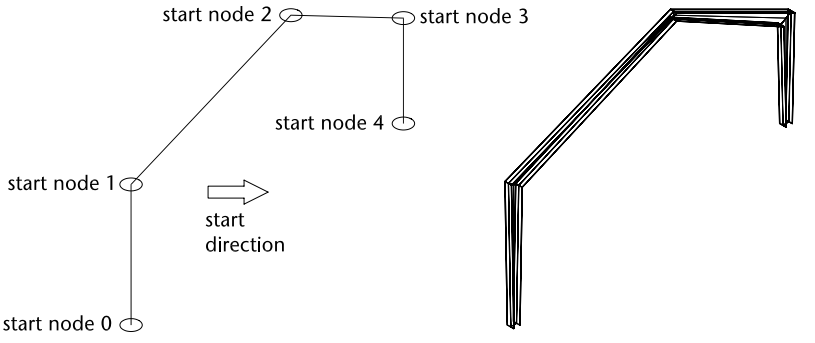
Assign shapes to the rigid frame member relative to the start of the member. The start point is defined as Node 0. The first vertex of the member is defined as Node 1, the next vertex is Node 2, and so on until the endpoint of the member, which is defined as the end node.

NOTE If you assign shapes relative to the end of the member, the endpoint of the member is defined as Node 0.

Identifying nodes on the member path



Creating the rigid frame



custom member nodes

polyline converted to rigid frame

The process of creating this rigid frame has seven steps:

Step 1: Create two styles in the Structural Member Catalog that contain the shapes that transform over the path of the rigid frame.

Step 2: Create a rigid frame style and tool.

Step 3: Draw a multi-segmented polyline path for the rigid frame and use the rigid frame tool to convert the path to a structural member.

Step 4: Create the first leg of the rigid frame by assigning start and end shapes to the first segment of the frame.

Step 5: Create the first rafter of the rigid frame by assigning start and end shapes to the second segment of the frame.

Step 6: Create the second rafter of the rigid frame by assigning start and end shapes to the third segment of the frame.

Step 7: Create the second leg of the rigid frame by assigning start and end shapes to the fourth segment of the frame.

Related Procedures

- Step 1: Creating Shapes for the Rigid Frame
- Step 2: Creating the Rigid Frame Tool
- Step 3: Drawing the Rigid Frame Path and Converting it to a Structural Member
- Step 4: Creating the First Leg of the Rigid Frame
- Step 5: Creating the First Rafter of the Rigid Frame
- Step 6: Creating the Second Rafter of the Rigid Frame
- Step 7: Creating the Second Leg of the Rigid Frame

Step 1: Creating Shapes for the Rigid Frame

Use this procedure to create two styles that contain the two shapes that transform over the path of the rigid frame.

1. On the Format menu, click Structural Member Catalog.
2. Expand Imperial in the tree view in the left pane of the Structural Member Catalog.
3. Expand Steel, AISC, and then I-Shaped.
4. Select Wn, Wide-Flange Shapes.
5. Right-click W8X31 in the lower right pane of the Structural Member Catalog, and click Generate Member Style.
6. Enter W8X31, and click OK.
7. Select W1n, Wide-Flange Shapes in the tree view in the left pane.
8. Right-click W14X43 in the lower right pane of the Structural Member Catalog, and click Generate Member Style.
9. Enter W14X43 and click OK.
10. Click to close the Structural Member Catalog.

Step 2: Creating the Rigid Frame Tool

Use this procedure to create a rigid frame tool. Save the style for the rigid frame in the *Member Styles (Imperial).dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*.

1. On the Format menu, click Style Manager.
2. On the File menu, click Open drawing.
3. Open *Member Styles (Imperial).dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*.
4. Expand Architectural Objects, right-click Structural Member Styles, and click New.
5. Enter Rigid Frame for the name, and press ENTER.
6. Click OK to close the Style Manager.
7. Click OK to save changes to the *Member Styles (Imperial).dwg*.
8. In the title bar of the tool palettes set, click , and then click New Palette.
9. Enter Structural, and press ENTER.
10. Open the Design palette, select the Structural Column tool, right-click, and click Copy.

11 Open the Structural palette, right-click, and click Paste.

12 Select the new tool, right-click, and click Properties.

13 Enter Rigid Frame for the Name.

14 Click the setting for Description.

15 Enter Creates a rigid frame, and click OK.

16 Expand Basic, and expand General.

17 Click Style location.

18 Select Browse, select the *Member Styles.dwg* located in *\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles\Imperial*, and click Open.

19 Click Style and select Rigid Frame.

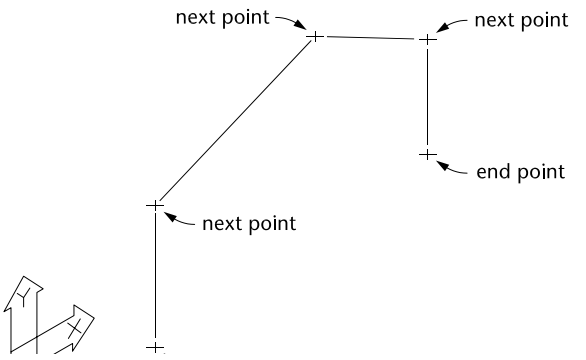
20 Click OK.

Step 3: Drawing the Rigid Frame Path and Converting it to a Structural Member

Use this procedure to draw a polyline path in the shape of the rigid frame, and then convert it with the Rigid Frame tool you created in Step 2.

1 In plan view, draw a polyline path for the rigid frame.

Drawing the rigid frame path



2 On the Structural palette, select the Rigid Frame tool.

3 Right-click, select Apply Tool Properties to, and select Linework.

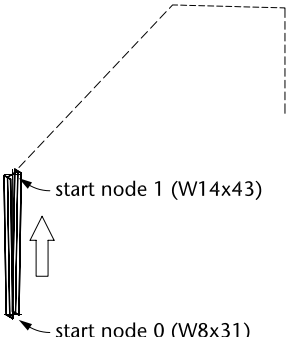
4 Select the polyline that you created in step 1.

5 Enter y (Yes) to leave the original polyline in the drawing and press ENTER.

Step 4: Creating the First Leg of the Rigid Frame

Use this procedure to create the first leg of the rigid frame by assigning a different start and end shape to the first segment of the rigid frame member.

Creating the first leg of the rigid frame



1. Select the rigid frame, right-click, and click Edit Member Style.
2. Click Design Rules.
3. Click Show Details.
4. Select Unnamed under Component, and enter Leg 1.
5. Under Start Shape, in the Name list, select W8X31.
6. Select Start for Relative to.
7. Enter 0 for Node.

   Node 0 is relative to the start point of the member path.

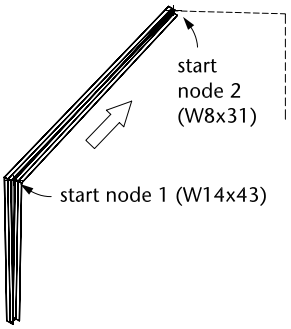
8. Enter 90 for Rotation.
9. Scroll to the end of the Design Rules dialog box to display the End Shape parameters for Leg 1.
10. Under End Shape, in the Name list, select W14X43.
11. Select Start for Relative to.
12. Enter 1 for Node.

    Node 1 corresponds to the vertex formed by the endpoint of the first segment of the member path and the start point of the second segment of the member path.

Step 5: Creating the First Rafter of the Rigid Frame

Use this procedure to create the first rafter of the rigid frame by assigning a different start and end shape to the second segment of the rigid frame member.

Creating the first rafter of the rigid frame

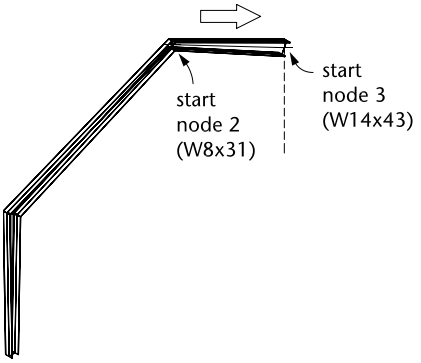


1. Click Add to add a second component to the structural member.
2. Select Unnamed under Component, and enter Rafter 1.
3. Under Start Shape, in the Name list, select W14X43.
4. Select Start for Relative to.
5. Enter 1 for Node.
6. Scroll to the end of the Design Rules dialog box to display the End Shape parameters for Rafter 1.
7. Under End Shape, in the Name list, select W8X31.
8. Select Start for Relative to.
9. Enter 2 for Node.

Step 6: Creating the Second Rafter of the Rigid Frame

Use this procedure to create the second rafter of the rigid frame by assigning a different start and end shape to the third segment of the rigid frame member.

Creating the second rafter of the rigid frame

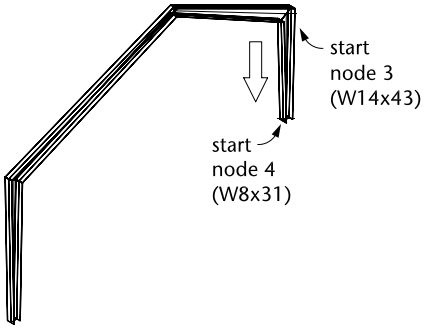


1. Click Add to add a third component to the structural member.
2. Select Unnamed under Component, and enter Rafter 2.
3. Under Start Shape, in the Name list, select W8X31.
4. Select Start for Relative to.
5. Enter 2 for Node.
6. Scroll to the end of the Design Rules dialog box to display the End Shape parameters for Rafter 2.
7. Under End Shape, in the Name list, select W14X43.
8. Select Start for Relative to.
9. Enter 3 for Node.

Step 7: Creating the Second Leg of the Rigid Frame

Use this procedure to create the second leg of the rigid frame by assigning a different start and end shape to the final segment of the rigid frame member.

Creating the second leg of the rigid frame



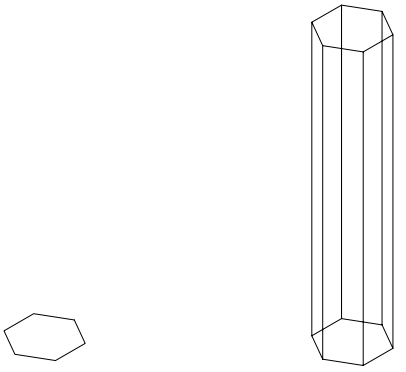
1. Click Add to add a fourth component to the structural member.
2. Select Unnamed under Component, and enter Leg 2.
3. Under Start Shape, in the Name list, select W14X43.
4. Select Start for Relative to.
5. Enter 3 for Node.
6. Scroll to the end of the Design Rules dialog box to display the End Shape parameters for Leg 2.
7. Under End Shape, in the Name list, select W8X31.
8. Select Start for Relative to.
9. Enter 4 for Node.
10. Click OK.

The complete rigid frame displays in your drawing.

Creating Custom Shapes for Structural Members

If you want to design a member with one or more shapes that you cannot create in a style in the Structural Member Catalog, you can create a custom shape.

Creating a structural member with a custom shape



When you create a custom shape, you define the shape that you want to use. To accommodate the different levels of detail in the Plan, Plan Low Detail, and Plan High Detail display representations, you may define three separate geometries for each representation. You can create the Plan Low Detail shape

from simple lines, arcs and polylines, and the Plan High Detail and Plan shapes from closed polylines that do not intersect each other.

After you have created a custom shape, you can assign the shape as a component of a structural member in the design rules of the structural member style. You can edit, copy, and purge member styles after you create them.

Related Procedures

- Creating a Custom Shape for a Structural Member
- Copying a Custom Shape
- Editing a Custom Shape
- Purging Custom Shapes

Creating a Custom Shape for a Structural Member

Use this procedure to create a custom shape for a structural member.

1. Create three geometries to define the Plan Low Detail, Plan, and Plan High Detail display of the shape.

   Use lines and arcs to create your Plan Low Detail shape, and use closed polylines that do not intersect to create your Plan and Plan Detail shapes.

2. On the Format menu, click Define Custom Member Shape.

   The following prompt displays:

   ```
   Shape [New/Copy/Edit/Purge/?]:
   ```

3. Enter **n** (New) to create a new shape.

   The following prompt displays:

   ```
   New style name or [?]:
   ```

4. Enter a new name for the shape, and press ENTER.

   The following prompt displays:

   ```
   Shape definition [Name/Description/Graphics]:
   ```

5. Enter **g** (Graphics) to define the Plan Low Detail, Plan, and Plan High Detail representations of the shape.

   NOTE If you do not want to create more than one representation for the shape, skip to step 9 and define a Plan representation to use as the default representation.

6. Enter **l** (Plan Low Detail) to define the Plan Low Detail representation of the shape.

7 Select a base point for the Plan Low Detail representation, and press ENTER.

8 Select arcs and lines to define the Plan Low Detail representation of the shape, and press ENTER.

9 To define both the Plan and Plan High Detail representations of the shape, enter **p (Plan)** or **h** (Plan High Detail).

The following prompt displays:

```
Erase polyline? [Yes/No] <N>:
```

10 Enter **y** (Yes) to erase the geometry, press enter to keep the geometry.

11 Select the first closed polylines that you want to use to create the representation.

The following prompt displays:

```
Add another ring? [Yes/No] <N>:
```

12 Complete the shape representation definition:

- Press ENTER to create the shape definition from a single polyline.
- Enter **y** (Yes) to select additional polylines to add to the shape definition. Polylines that are within other rings can be specified as void areas that become holes in the shape These polylines must be entirely within or outside each other; they cannot overlap or touch.

The following prompt displays:

```
Insertion Point or <Centroid>:
```

13 Select an insertion point for the shape, or press ENTER to use the centroid.

14 Press ENTER three times to exit the command.

Copying a Custom Shape

Use this procedure to copy a custom shape.

1 On the Format menu, click Define Custom Member Shape.

The following prompt displays:

```
Shape [New/Copy/Edit/Purge/?]:
```

2 Enter **c** (Copy) to copy a shape.

The following prompt displays:

```
Shape name to copy or [?]:
```

3 Enter the name of the shape that you want to copy, or enter **?** to select a shape to copy.

4 Enter a new shape name.

Editing a Custom Shape

Use this procedure to edit a custom shape.

1. On the Format menu, click Define Custom Member Shape.

   The following prompt displays:

   ```
   Shape [New/Copy/Edit/Purge/?]:
   ```

2. Enter **e** (Edit), and press ENTER.

   The following prompt displays:

   ```
   Shape name to edit or [?]:
   ```

3. Enter the name of the shape that you want to copy, or enter **?** to select a shape to copy.

   The following prompt displays:

   ```
   Shape definition [Name/Description/Graphics]:
   ```

4. To rename the shape, do the following:

   - Enter **n** (Name), and press ENTER.
   - Enter a new name for the shape, and press ENTER.

5. To add or change a description of the shape, do the following:

   - Enter **d** (Description), and press ENTER.
   - Enter a new description for the shape, and press ENTER.

6. To change the Plan Low Detail, Plan, or Plan High Detail representation of the shape, do the following:

   - Enter **g** (Graphics), and press ENTER.
   - Specify new geometry for the Plan Low Detail, Plan, or Plan High Detail representations.

   NOTE When you edit a representation (Plan Low Detail, Plan, or Plan High Detail), you remove the existing shape from the representation. You cannot edit the geometry of the shape in the representation. Create new shape geometry to redefine the selected representation. You can use the Insert option of the **-MemberShape** command to create lines, arcs, and polylines from existing member shapes that you can modify for new member shapes.

   ---

7. When you finish editing the shape, press ENTER three times to exit the command.

Purging Custom Shapes

Use this procedure to purge custom shapes.

1. On the Format menu, click Define Custom Member Shape.

   The following prompt displays:

   ```
   Shape [New/Copy/Edit/Purge/?]:
   ```

2. Enter **p** (Purge) to purge one or more shapes.

   The following prompt displays:

   ```
   Shapes to purge <*>:
   ```

3. To purge a single shape, do the following:

   - Enter the name of the shape, and press ENTER.
   - Enter **n** (No) to not verify the shape to purge, and press ENTER.

   The shape is purged.

4. To purge multiple shapes, do the following:

   - To purge multiple shapes, enter ***** (asterisk), and press ENTER.
   - To purge all the existing shapes, enter **n** (No), and press ENTER. To choose shapes to purge, enter **y** (Yes), press ENTER, and select the shapes that you want to purge.

5. When you finish purging custom shapes, press ENTER to end the command.

Railings

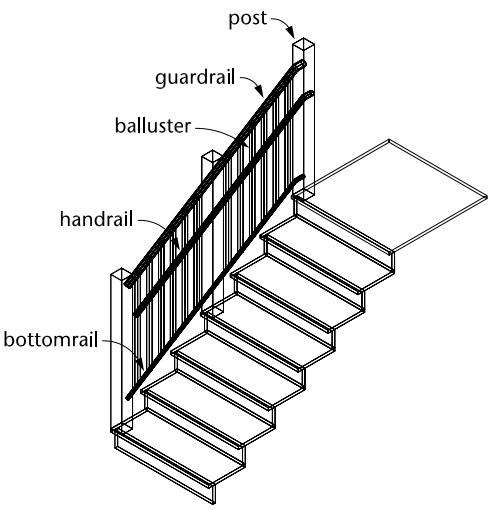
23

Railings are objects that interact with stairs and other objects. You can add railings to existing stairs, or you can create freestanding railings.

Railing Components

Railings can have guardrails, handrails, posts, balusters, and one or more bottom rails. Additionally, you can add custom blocks to a railing.

Railing components



Railing Shapes

You can attach railings to one or both sides of a stair, and you can wrap them around a landing. You can also attach railings to any other type of AEC object, like for example a massing element. You can create a custom railing by converting a

In this chapter

- Using Railing Tools to Create Railings
- Creating a Railing
- Creating an Attached Railing with User-Specified Settings
- Creating a Freestanding Railing with User-Specified Settings
- Creating a Railing from a Polyline
- Creating a Railing Tool
- Editing Railings
- Railing Styles
- Adding Custom Railing Blocks and Profiles to a Railing Style

polyline. Therefore, railings can be a variety of shapes and can be anchored to a straight stair, a multi-landing stair, a U-shaped stair, or a spiral stair.

Custom Railings

You can create custom railings by specifying custom blocks and profiles to be used for individual railing components. You can assign profiles to railing components by style so that you can reuse the custom portion to create detailed railings.

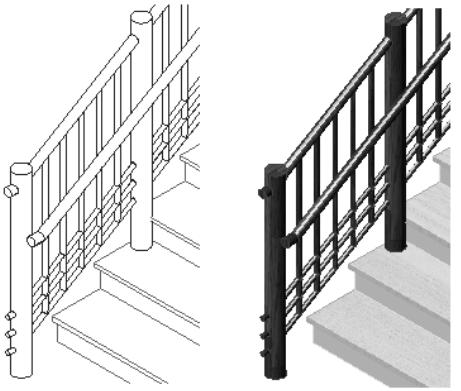
Railing Styles and Their Properties

You can use a railing style to control properties for all railings that use that style, rather than changing properties for each individual railing in the drawing. Various styles exist in the templates for common railing configurations, such as guardrail - pipe, handrail - grip, and handrail - round. Within the railing style, you can specify the rail locations and height, post locations and intervals, components and profiles, extensions, material assignments, and display properties of the railing.

Materials in Railings

In Autodesk® Architectural Desktop, you can assign materials to a railing. These materials are displayed in wireframe and working shade views, or when linked into VIZ Render. Materials have specific settings for the physical components of a railing, such as the various types of rails and posts, and the baluster. You could for example, create a wooden railing with a stainless steel handrail and bottomrail.

Railing in 2D wireframe model and rendered views



Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes, which contain settings for railings. You

can use these predefined materials, or modify them to your special designs. You can also create your own materials from scratch entirely.

For more information, see "Specifying the Materials of a Railing Style" on page 1684.

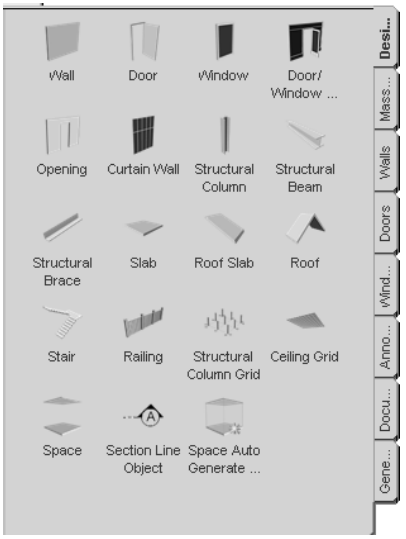
Related Procedures

- Using Railing Tools to Create Railings
- Creating a Railing
- Creating an Attached Railing with User-Specified Settings
- Creating a Freestanding Railing with User-Specified Settings
- Creating a Railing from a Polyline
- Creating a Railing Tool
- Editing Railings
- Railing Styles
- Adding Custom Railing Blocks and Profiles to a Railing Style

Using Railing Tools to Create Railings

Tools provided with Autodesk® Architectural Desktop let you quickly place railings by selecting a railing tool with a specific railing style and other predefined properties. When you place railings using railing tools, you can use the default settings of the tool, or you can change settings for the railing properties. You can also use railing tools to convert linework to railings and to apply the settings of a railing tool to existing railings.

Tool palettes containing railing tools



The default tool palettes in the workspace contain sample railing tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain railing tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- Mytool catalog

Custom palettes created by your CAD manager or other users may also contain railing tools with railing styles and properties that are customized for your projects or office standards.

Related Procedures

- Creating a Railing
- Creating an Attached Railing with User-Specified Settings
- Creating a Freestanding Railing with User-Specified Settings
- Creating a Railing from a Polyline
- Creating a Railing Tool

Creating a Railing

Use this procedure to add a new railing that has the properties specified in the railing tool that you select. To specify settings when you add a railing, see "Creating an Attached Railing with User-Specified Settings" on page 1643 and "Creating a Freestanding Railing with User-Specified Settings" on page 1647.

1. Open the tool palette that you want to use, and select a railing tool.

   If necessary, scroll to display the tool that you want to use.

2. Specify the start point of the railing.

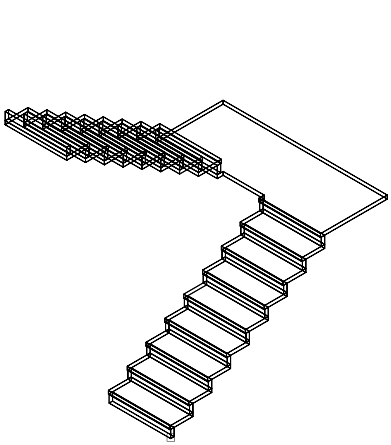
   You can move or hide the Properties palette to expose more of the drawing area.

3. Specify the end point of the railing.
4. Continue adding railings, and press ENTER.

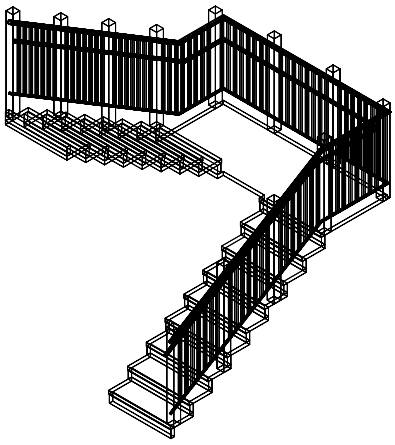
Creating an Attached Railing with User-Specified Settings

Use this procedure to create a railing that is attached to a stair and that has the settings that you specify.

Creating a railing attached to a stair



select stairs @ floor elevation



resulting railing attached to stairs

1. Open the tool palette that you want to use, and select a railing tool. If necessary, scroll to display the tool that you want to use.
2. On the Properties palette, expand Basic, and expand General.
3. Select a style.
4. Expand Dimensions.
5. Click the setting for Rail locations.

NOTE If the settings in the Rail Locations worksheet are read-only, the rail locations have been set in the style, and can not be overridden here. For more information, see "Specifying the Upper Rails of a Railing Style" on page 1675 and "Specifying the Bottom Rails of a Railing Style" on page 1677.

6. Specify the parameters for the guardrail or the handrail:

If you want to . . .	Then . . .
specify the height of the guardrail or the handrail	enter a value for Horizontal Height.
specify the height for of guardrail or the handrail while it is on a stair flight	enter a value for Sloping Height.

If you want to . . .	Then . . .
specify the distance that the guardrail or the handrail is offset from the posts	enter a value for Offset from Post.
specify the side of the post for the offset, based on the direction the stair (or railing) was drawn	select Center, Left, Right, or Auto for Side for Offset. Side for Offset is available only when there is an offset value.

Auto is useful only for railings attached to the edges of stairs. A positive value is toward the center of the stair, while a negative value is toward the outside edge. Side for Offset for handrails also has a selection of Both, so you can specify a handrail on both sides of the railing.

If you select Auto, and the railing is not attached to or is along the center of a stair, the offset is to the right.

7 Specify the settings for bottom rails:

If you want to . . .	Then . . .
specify the height of the lowest rail when it is horizontal	enter a value for Horizontal.
specify the height of the lowest rail when it is on a stair flight	enter a value for Sloping.
specify the distance that the bottomrail is offset from the posts	enter a value for Offset from Post.
specify the side of the post for the offset, based on the direction the stair (or railing) was drawn	select Center, Left, Right, or Auto for Side for Offset. Side for Offset is available only when there is an offset value.
designate more than one bottom rail	enter a value for Number of Rails. When you designate multiple bottom rails, you can enter a value for Spacing of Rails.

8 If you want to revert back to the rail settings defined in the style, click Reset To Style Values.

9 Click OK to return to the Property palette.

10 Click the setting for Post locations.

NOTE If the settings in the Post Locations worksheet are read-only, the post locations have been set in the style, and can not be overridden here. For more information, see "Specifying Posts of a Railing Style" on page 1678.

11 Specify the post locations:

If you want to . . .	Then . . .
include fixed posts at the beginning and end of the railing	select Fixed Posts.
specify the distance above or below the top rail for all posts	enter a value for Extension of ALL Posts from Top Railing.
specify the height of all posts from the floor	enter a value for Extension of ALL Posts from Floor Level.
include fixed posts at the corners of the railing	select Fixed Posts at Railing Corners.
include dynamic posts with the railing	select Dynamic Posts. You can then enter a value for Maximum Center to Center Spacing.
include balusters with the railing	select Balusters.
specify the height of all balusters from the floor	enter a value for Extension of Balusters from Floor Level.
specify the maximum distance between the balusters	enter the appropriate value for Maximum Center to Center Spacing.
override the number of balusters on each stair tread	select Stair Tread Length Override. You can then enter a value for Number per Tread. This applies only to railings that are attached to stairs.

12 If you want to revert back to the post settings defined in the style, click Reset To Style Values.

13 Click OK to return to the Property palette.

14 Expand Location.

15 For Attached to, select Stair or Stair Flight.

16 To offset the railing in or out from the side of the stair, enter an offset value.

Positive values are in toward the center of the stair and negative values are out from the center of the stair. If the railing is center justified, a positive value is to the right and a negative value is to the left.

17 To attach the railing automatically to the full length of the stair or the stair flight, select Yes for Automatic Placement.

NOTE This option is available only if you have selected to attach the railing to a whole stair. If you are attaching the railing to a stair flight, it is always attached to the full length of the stair flight.

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18 Select the stair or stair flight in the drawing to which you want to attach the new railing.

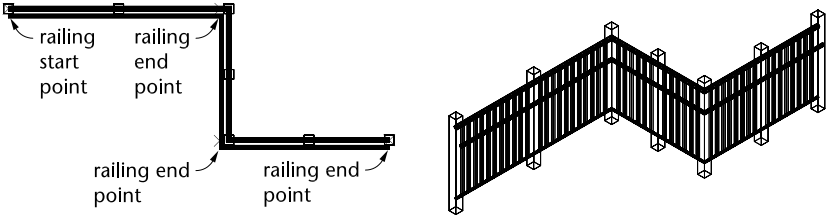
19 Select a side of a stair or a stair flight to place the railing.

20 If you have selected no automatic placement for the stair, define the contour of the desired railing by selecting points in the drawing. Then, press ENTER.

Creating a Freestanding Railing with User-Specified Settings

Use this procedure to create a freestanding railing in the drawing.

Creating a freestanding railing



1 Open the tool palette that you want to use, and select a railing tool.

If necessary, scroll to display the tool that you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Select a style.

4 Expand Dimensions.

5 Click the setting for Rail locations.

NOTE If the settings in the Rail Locations worksheet are read-only, the rail locations have been set in the style, and can not be overridden here. For more information, see "Specifying the Upper Rails of a Railing Style" on page 1675 and "Specifying the Bottom Rails of a Railing Style" on page 1677.

6 Specify the parameters for the guardrail or the handrail:

If you want to . . .	Then . . .
specify the height of the guardrail or the handrail	enter a value for Horizontal Height.
specify the height for of guardrail or the handrail while it is on a stair flight	enter a value for Sloping Height.
specify the distance that the guardrail or the handrail is offset from the posts	enter a value for Offset from Post.
specify the side of the post for the offset, based on the direction the stair (or railing) was drawn	select Center, Left, Right, or Auto for Side for Offset. Side for Offset is available only when there is an offset value.

Auto is useful only for railings attached to the edges of stairs. A positive value is toward the center of the stair, while a negative value is toward the outside edge. Side for Offset for handrails also has a selection of Both, so you can specify a handrail on both sides of the railing.

If you select Auto, and the railing is not attached to or is along the center of a stair, the offset is to the right.

7 Specify the settings for bottom rails:

If you want to . . .	Then . . .
specify the height of the lowest rail when it is horizontal	enter a value for Horizontal.
specify the height of the lowest rail when it is on a stair flight	enter a value for Sloping.
specify the distance that the bottomrail is offset from the posts	enter a value for Offset from Post.

If you want to . . .	Then . . .
specify the side of the post for the offset, based on the direction the stair (or railing) was drawn	select Center, Left, Right, or Auto for Side for Offset. Side for Offset is available only when there is an offset value.
designate more than one bottom rail	enter a value for Number of Rails. When you designate multiple bottom rails, you can enter a value for Spacing of Rails.

8 If you want to revert back to the rail settings defined in the style, click Reset To Style Values.

9 Click OK to return to the Property palette.

10 Click the setting for Post locations.

NOTE If the settings in the Post Locations worksheet are read-only, the post locations have been set in the style, and can not be overridden here. For more information, see "Specifying Posts of a Railing Style" on page 1678.

11 Specify the post locations:

If you want to . . .	Then . . .
include fixed posts at the beginning and end of the railing	select Fixed Posts.
specify the distance above or below the top rail for all posts	enter a value for Extension of ALL Posts from Top Railing.
specify the height of all posts from the floor	enter a value for Extension of ALL Posts from Floor Level.
include fixed posts at the corners of the railing	select Fixed Posts at Railing Corners.
include dynamic posts with the railing	select Dynamic Posts. You can then enter a value for Maximum Center to Center Spacing.
include balusters with the railing	select Balusters.
specify the height of all balusters from the floor	enter a value for Extension of Balusters from Floor Level.

If you want to . . .	Then . . .
specify the maximum distance between the balusters	enter the appropriate value for Maximum Center to Center Spacing.
override the number of balusters on each stair tread	select Stair Tread Length Override. You can then enter a value for Number per Tread. This applies only to railings that are attached to stairs.

12 If you want to revert back to the post settings defined in the style, click Reset To Style Values.

13 Click OK to return to the Property palette.

14 Expand Location.

15 For Attached to, select NONE.

16 Specify the start point of the railing.

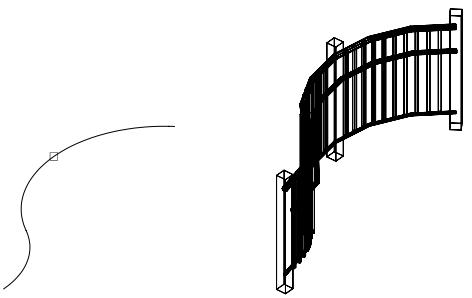
17 Specify further points for the railing.

18 Press ENTER.

Creating a Railing from a Polyline

Use this procedure to convert a polyline to a railing that has the properties of the railing tool you select. You can edit these properties after creating the railing.

Converting a polyline to a railing



select polyline resulting railing

1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a railing tool, and click Apply Tool Properties ➤ Polyline.

3 Select the polyline to convert, and press ENTER.

4 When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.

5 Edit the properties of the railing in the Properties palette, if needed.

Creating a Railing Tool

Use this procedure to create a railing tool and add it to a tool palette. You may want to create your own railing tools if you are placing multiple railings of specific styles with additional railing properties that you want to be the same each time you add a railing of that type.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a railing in the drawing	select the railing, and drag it to the tool palette.
create a tool from a railing style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 Expand Basic, and expand General.

7. Click the setting for Description, enter a description of the railing created from this tool, and click OK.
8. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.
9. Select a railing style.
10. Select the drawing file containing the style used for this railing.
11. Select if the railings created from this tool should be attached to a stair, a stair flight or be freestanding railings.
12. Click OK.

Editing Railings

You can edit railings by changing the style of the railing, the inclusion and location of various rails and posts, and the insertion point. You can also specify the height and offset of guardrails and handrails, and the extension and spacing of posts.

Methods of Editing Railings

Autodesk® Architectural Desktop offers several methods for editing railings:

- You can directly edit railings using grips for dimensions and other physical characteristics.
- You can change railing settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected railing.

Related Procedures

- Using Grips to Edit Railings
- Adding a Post to a Railing
- Removing a Post from a Railing
- Redistributing Posts on a Railing
- Hiding Posts
- Showing Hidden Posts
- Reversing the Direction of the Railing
- Anchoring an Existing Railing to a Stair
- Anchoring an Existing Railing to an Object
- Releasing an Anchored Railing
- Adding a Custom Profile to a Railing Component
- Editing a Custom Profile of a Railing Component

- Changing the Style of a Railing
- Changing the Upper Rails
- Changing the Bottom Rails
- Changing the Posts
- Changing the Railing Extensions at Floor Levels
- Changing the Railing Extensions at Landings
- Changing the Anchor Properties of a Railing
- Changing the Location of a Railing
- Applying Tool Properties to an Existing Railing
- Attaching Hyperlinks, Notes, and Files to a Railing

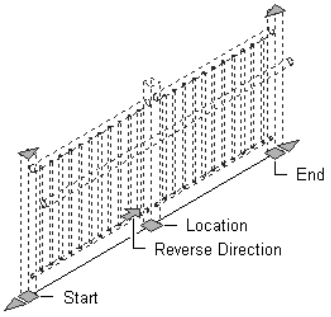
Using Grips to Edit Railings

Refer to the illustrations and steps in this topic to use railing grips to edit railings.

Editing Railing Dimensions

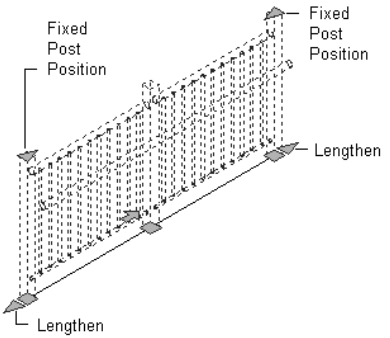
1. Select the railing.
2. Select the grip for the dimension you want to change.

   Viewing Railing Start, End, Location, and Reverse Direction Grips



3. Move the grip until the dimension value you want is displayed and click once, or enter a value.

Viewing Railing Fixed Post Position and Lengthen grips



Changing the Location or Position of a railing

1. Select the railing.
2. Move the appropriate grip to change the location of the railing, its start point, or its endpoint.

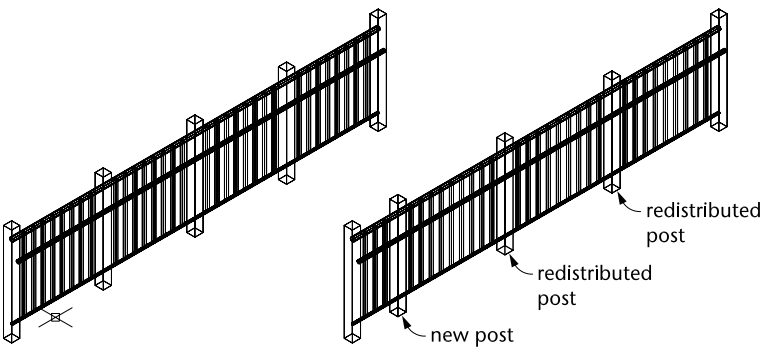
Reversing the direction of the Railing

1. Select the railing.
2. Click the direction grip (arrow grip).

Adding a Post to a Railing

Use this procedure to add a post to a railing. The post is placed at a selected point on the railing.

Adding a post to a railing



specify position for post

resulting new post and redistributed interior posts

1 Select a railing.

2 Right-click, and click Post Placement ➤ Add.

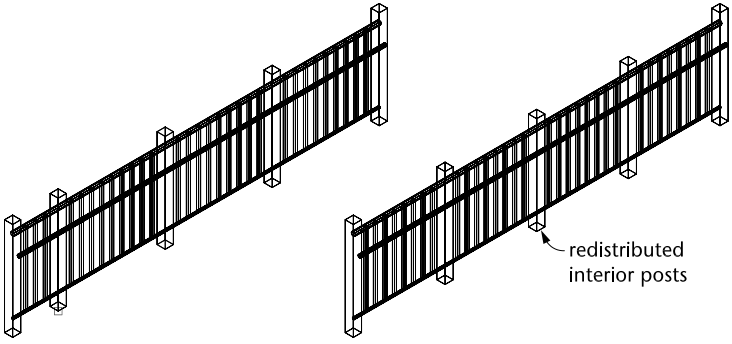
3 Select a location for a new post.

4 Press ENTER.

Removing a Post from a Railing

Use this procedure to remove posts you have added to railings. The manually-added post closest to the selected point is removed from the railing. If two posts are equidistant to the selected point, the post closer to the starting point of the railing is removed.

Removing a post from a railing



1 Select a railing.

2 Right-click, and click Post Placement ➤ Remove.

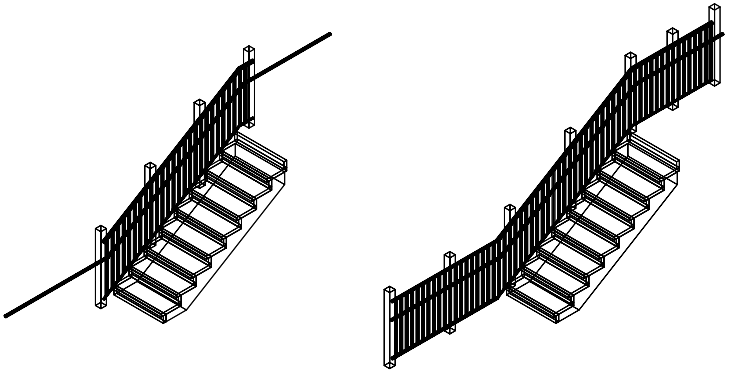
Redistributing Posts on a Railing

Use this procedure to reposition dynamic posts to account for posts that have been added or removed. You cannot redistribute displayed posts to account for hidden posts.

You may also want to redistribute posts after dragging the endpoints (start and end offset) of a railing attached to a stair. If posts are lost after trimming a railing, use the Redistribute Posts command to restore the posts.

If you have created a railing that is so short that only one post can be created, grip-editing and dragging the railing does not create another post. You must use the Redistribute Posts command to add another post to the end of the railing.

Redistributing posts on an existing railing



railing with stretched handrails

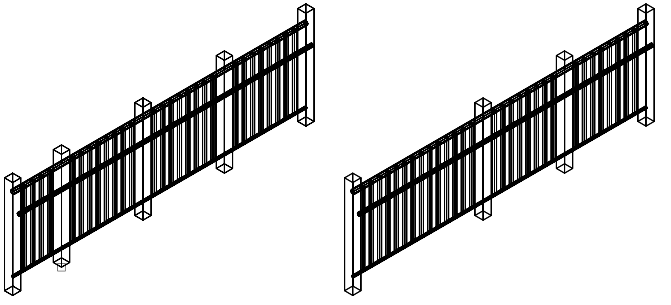
railing with redistributed posts

1. Select an existing railing.
2. Right-click, and click Redistribute Posts.

Hiding Posts

Use this procedure to hide posts in a railing. It is useful to hide posts in plan view so that the railing is visible as a solid component. These posts are not deleted, only hidden from view. You cannot hide dynamic posts.

Hiding a post on a railing



select post to hide

resulting railing

1. Select a railing.
2. Right-click, and click Post Placement ➤ Hide.

Showing Hidden Posts

Use this procedure to show hidden posts.

1. Select a railing.
2. Right-click, and click Post Placement ➤ Show.

Reversing the Direction of the Railing

Use this procedure to reverse the direction of the railing to change the location of railing components. The direction in which the railing is drawn affects the behavior of the railing and its components.

NOTE You can also reverse the direction of a railing by clicking its direction grip (arrow grip).

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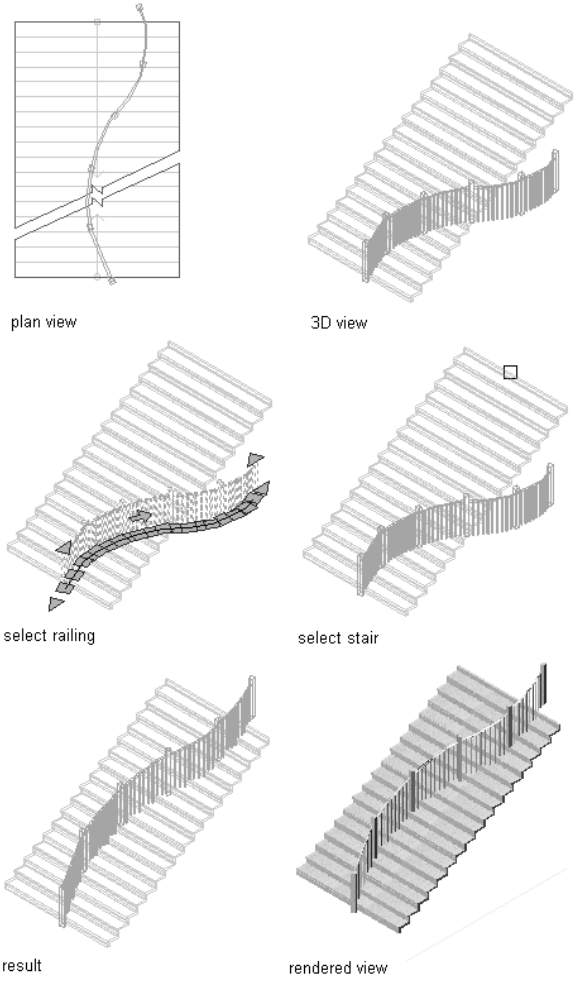
1. Select a railing.
2. Right-click, and click Reverse.

Anchoring an Existing Railing to a Stair

Use this procedure to anchor an existing railing to a stair. Once attached, the railing stays where it is located in the drawing, but it moves when the attaching stair is moved. This allows you to create free-form paths for a railing along a stair. For example, if you want to create a curved railing in the middle of a straight stair.

Railings attached to stairs respect the stair's cut plane. Also the height of the railing follows the slope of the stair, no matter where the posts are placed on the treads.

Attaching a railing to a stair



Railings that are attached to a stair or to a stair flight when created are anchored automatically to the stair, at either side of the stairs or at the centerline.

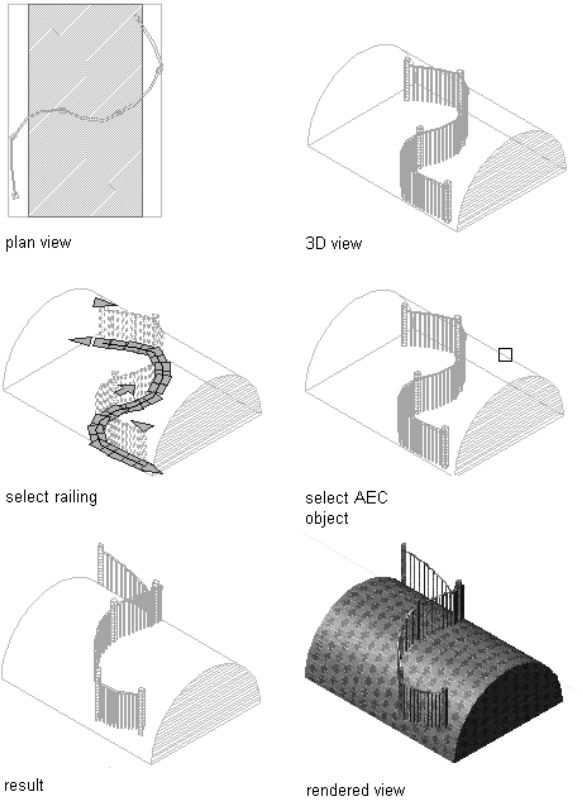
1. Select a railing.
2. Right-click, and click Railing Anchor ➤ Anchor To Stair.
3. Select a stair object, and press ENTER.

Anchoring an Existing Railing to an Object

Use this procedure to anchor an existing railing to an AEC object other than a stair. Once attached, the railing stays where it is located in the drawing, but it moves when the attaching object is moved. This allows you to create free-form paths for a railing along a stair or other object.

Railings attached to objects other than stairs follow the height of the centerline of each post.

Attaching a railing to an AEC object



1. Select a railing.
2. Right-click, and click Railing Anchor ➤ Anchor To Object.
3. Select an AEC object other than a stair, and press ENTER.
4. If you want to clean up the railing posts with the surface of the object it is attached to, enter Y (Yes) on the command line.

5 Define the contour of the railing.

If you want to . . .	Then . . .
adapt only the posts to the surface of the attached object, and have straight segments between the posts,	for Calculate Height, select At Post Locations Only.
adapt the whole railing to the surface of the attached object,	for Calculate Height, select Follow Surface.

Releasing an Anchored Railing

Use this procedure to release an anchored railing from a stair. After the railing is released, it is independent from the stair. The railing and the stair can then be moved separately.

NOTE When a railing that is anchored to a stair is released, any changes to the railing (such as grip editing or changing properties) may cause the railing to lose its slope. Be sure to correct the appearance of the railing before releasing it from the stair.

1 Select a railing.

2 Right-click, and click Railing Anchor ➤ Release.

The railing is no longer anchored to the stair.

Adding a Custom Profile to a Railing Component

Use this procedure to add a custom profile to a railing component.

Guardrails, handrails, bottom rails, and fixed and dynamic posts can be defined by a custom profile. You can add a profile to a railing component either in the railing style, as described in "Specifying the Components of a Railing Style" on page 1680, or directly on screen. When you add a custom profile on screen, the new profile is automatically saved back to the railing style.

1 Create the necessary profile definition, as described in "Creating a Profile for a Custom Railing Component" on page 1681.

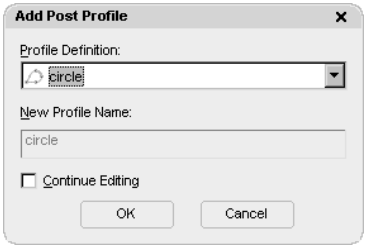
2 Select the railing to which you want to add a custom profile, right-click, and click Add Profile.

3 Select the railing component to which you want to add a profile.

You can select guard rails, hand rails, bottom rails, fixed posts, and dynamic posts.

NOTE If you have difficulties selecting the correct component, switch to another view that makes the selection easier. For example, to select a bottom rail, you would switch to a Model view.

Adding a custom profile to a railing post



4 Select the profile for the railing component.

5 Decide if you want to save the custom profile immediately back to the railing style, or if you want to proceed with editing the profile.

If you want to . . .	Then . . .
save the new profile back to the railing style	click OK.
edit the new profile	click Continue Editing, and then click OK. For information on editing a custom profile, see "Editing a Custom Profile of a Railing Component" on page 1661.

Editing a Custom Profile of a Railing Component

Use this procedure to edit a custom profile of a railing component.

1 Select a railing with a custom profile you want to edit.

2 Right-click, and click Edit Profile In Place.

This command is only available if you have profile-based components in the railing.

3 Select the component you want to edit.

NOTE If you have difficulties selecting the correct component, switch to another view that makes the selection easier. For example, to select a bottom rail, you would switch to a Model view.

You have entered the in-place editing session now. You can see this from the magenta-colored grips and light blue hatch of the temporary in-place editing profile, as well as the faded color of all other objects in the drawing. Note that while you are in the in-place editing session, you have only limited editing access to other commands in the drawing. Before working on other objects, you should first end the in-place editing session.

4 Edit the profile:

If you want to . . .	Then . . .
use grips to edit the profile	move the grips as needed.
add a vertex to the profile	select the profile, right-click, and click Add Vertex. Then, add new vertices as needed. End adding new vertices by pressing ENTER.
remove a vertex from the profile	select the profile, right-click, and click Remove Vertex. Then, remove vertices as needed. End removing vertices by pressing ENTER.
add a ring to the profile	select the profile, right-click, and click Add Ring. Then, select a closed polyline, spline, ellipse, or circle for an additional ring. Specify if you want to erase the source linework, and press ENTER.
remove a ring from a profile	select the profile, right-click, and click Remove Ring. Then select the ring you want to remove. **NOTE** You cannot remove the last ring from a profile.
replace a ring on a profile	select the profile, right-click, and click Replace Ring. Then, select a closed polyline, spline, ellipse, or circle for the replaced ring. Specify if you want to erase the source linework, and press ENTER.

5 Save the changes to the profile.

If you want to . . .	Then . . .
change the existing profile definition to reflect the new shape	select the profile, right-click, and click Save Changes. The in-place edit session is exited and the profile definition is updated.
create a new profile definition with the shape you have created	select the profile, right-click, and click Save As New Profile. Then, enter a name for the new profile and click OK. The in-place edit session is exited and the new profile definition is available in the Style Manager.
discard all changes on the profile and revert back to the previous shape	select the profile, right-click, and click Discard all Changes. The in-place edit session is exited and all changes you have made to the profile are purged.

Changing the Style of a Railing

Use this procedure to change the style associated with existing railings.

1 Select the railings for which you want to change the style, and double-click one of them.
2 Expand Basic, and expand General.
3 Select a different style.
4 Click OK twice.

Changing the Upper Rails

Use this procedure to change the following settings for an individual railing:

- guardrails
- handrails
- height
- sloping height
- offset from posts
- side for offset

NOTE If these settings are unavailable, they are controlled by the railing style. You cannot modify them for individual railings.

1 Double-click the railing for which you want to change the upper rails.
2 Expand Basic, and expand Dimensions.

3 Click the setting for Rail locations.

4 Select whether to include guardrails and handrails.

NOTE A railing must have a guardrail or a handrail. Both cannot be turned off.

5 Specify the parameters for the guardrail or the handrail:

If you want to . . .	Then . . .
specify the height of the guardrail or the handrail	enter a value for Horizontal Height.
specify the height for of guardrail or the handrail while it is on a stair flight	enter a value for Sloping Height.
specify the distance that the guardrail or the handrail is offset from the posts	enter a value for Offset from Post.
specify the side of the post for the offset, based on the direction the stair (or railing) was drawn	select Center, Left, Right, or Auto for Side for Offset. Side for Offset is available only when there is an offset value.

Auto is useful only for railings attached to the edges of stairs. A positive value is toward the center of the stair, while a negative value is toward the outside edge. Side for Offset for handrails also has a selection of Both, so you can specify a handrail on both sides of the railing.

If you select Auto, and the railing is not attached to or is along the center of a stair, the offset is to the right.

6 If you want to undo your changes and revert back to the values set in the railing style, click Reset to Style Values.

7 Click OK.

Changing the Bottom Rails

Use this procedure to change the following settings for the bottom rails of an individual railing:

- whether to use bottom rails
- number of bottom rails
- distance between rails
- height of lowest rail

NOTE If these settings are unavailable, they are controlled by the railing style. You cannot modify them for individual railings.

1. Double-click the railing for which you want to change the bottom rails.
2. Expand Basic, and expand Dimensions.
3. Click the setting for Rail Locations.
4. Select Bottomrail to add bottom rails to the railing.
5. Specify the settings for bottom rails:

If you want to . . .	Then . . .
specify the height of the lowest rail when it is horizontal	enter a value for Horizontal.
specify the height of the lowest rail when it is on a stair flight	enter a value for Sloping.
specify the distance that the bottomrail is offset from the posts	enter a value for Offset from Post.
specify the side of the post for the offset, based on the direction the stair (or railing) was drawn	select Center, Left, Right, or Auto for Side for Offset. Side for Offset is available only when there is an offset value.
designate more than one bottom rail	enter a value for Number of Rails. When you designate multiple bottom rails, you can enter a value for Spacing of Rails.

6. If you want to undo your changes and revert back to the values set in the railing style, click Reset to Style Values.
7. Click OK.

Changing the Posts

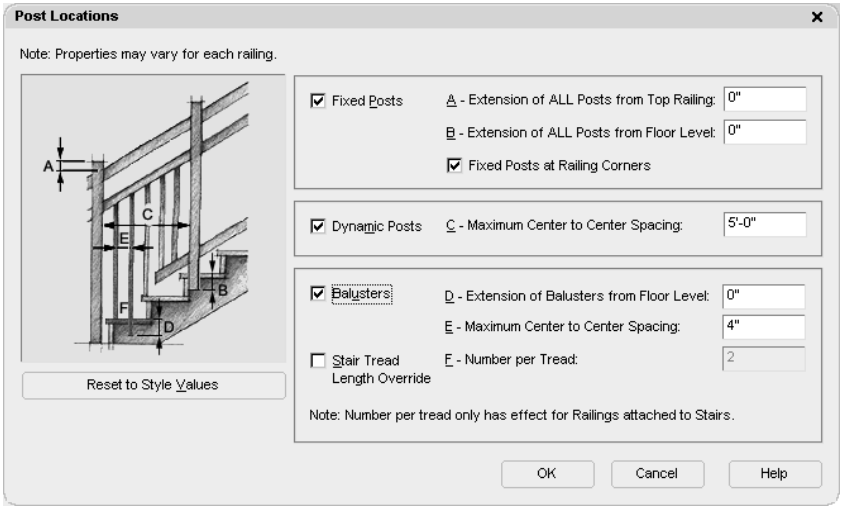
Use this procedure to change the following settings for the posts of an individual railing:

- type of posts
- amount of posts that extend above the railing
- maximum center to center spacing between posts
- maximum center to center spacing between balusters

- number of balusters per tread for railings that are attached to stairs

NOTE If these settings are unavailable, they are controlled by the railing style. You cannot modify them for individual railings.

1. Double-click the railing for which you want to change the post locations.
2. Expand Basic, and expand Dimensions.
3. Click the setting for Post locations.



4. Specify the post locations:

If you want to . . .	Then . . .
include fixed posts at the beginning and end of the railing	select Fixed Posts.
specify the distance above or below the top rail for all posts	enter a value for Extension of ALL Posts from Top Railing.
specify the height of all posts from the floor	enter a value for Extension of ALL Posts from Floor Level.
include fixed posts at the corners of the railing	select Fixed Posts at Railing Corners.

If you want to . . .	Then . . .
include dynamic posts with the railing	select Dynamic Posts. You can then enter a value for Maximum Center to Center Spacing.
include balusters with the railing	select Balusters.
specify the height of all balusters from the floor	enter a value for Extension of Balusters from Floor Level.
specify the maximum distance between the balusters	enter the appropriate value for Maximum Center to Center Spacing.
override the number of balusters on each stair tread	select Stair Tread Length Override. You can then enter a value for Number per Tread. This applies only to railings that are attached to stairs.

5 If you want to undo your changes and revert back to the values set in the railing style, click Reset to Style Values.

6 Click OK.

Changing the Railing Extensions at Floor Levels

Use this procedure to control the length of the handrail and guardrail extensions at the top and bottom of stair flights. If a bottom rail exists, it extends as far as the other railing it is below.

NOTE If these settings are unavailable, they are controlled by the railing style. You cannot modify them for individual railings.

1 Double-click the railing for which you want to change the extensions.

2 Expand Basic, and expand Dimensions.

3 Click the setting for Railing Extensions.

4 Specify the railing extension properties:

If you want to . . .	Then . . .
use values in this dialog box to specify extensions	clear Use Stair Landing Extension.

If you want to . . .	Then . . .
specify the length of the handrail and guardrail at the top of an entire stair	enter values for Handrail and Guardrail. Select + T next to the value to add the tread length to the extension value.
specify the length of the handrail and guardrail at the bottom of an entire stair	enter values for Handrail and Guardrail. Select + T next to the value to add the tread length to the extension value.

5 If you want to undo your changes and revert back to the values set in the railing style, click Reset to Style Values.

6 Click OK.

Changing the Railing Extensions at Landings

Use this procedure to control the length of the handrail and guardrail extensions at landings. If a bottom rail exists, it extends as far as the other railing it is below.

NOTE If these settings are unavailable, they are controlled by the railing style. You cannot modify them for individual railings.

1 Double-click the railing for which you want to change the extensions.

2 Expand Basic, and expand Dimensions.

3 Click the setting for Railing Extensions.

4 Specify the railing extension properties:

If you want to . . .	Then . . .
use values in this dialog box to specify extensions	clear Use Stair Landing Extension under At Landings.
specify the length of the handrail and guardrail at the top of a flight	enter values for Handrail and Guardrail. Select + T next to the value to add the tread length to the extension value.
specify the length of the handrail and guardrail at the bottom of a flight	enter values for Handrail and Guardrail. Select + T next to the value to add the tread length to the extension value.

5 If you want to undo your changes and revert back to the values set in the railing style, click Reset to Style Values.

6 Click OK.

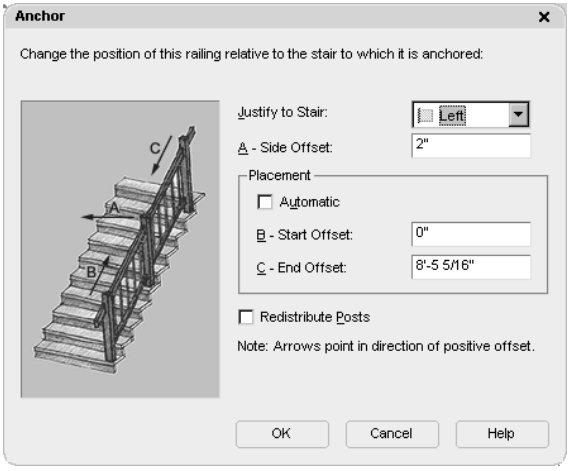
Changing the Anchor Properties of a Railing

Use this procedure to change the justification of a railing and the side, start, and end offsets. These properties apply only to railings attached to stairs.

1 Double-click the railing for which you want to change the anchor properties.

2 Expand Basic, and expand Location.

3 Click Anchor.



4 Change the justification of the railing.

5 Change the side offset from the stair:

- A value of zero places the start and end fixed posts exactly at the ends of the stair.
- Positive values move the start/end onto the stair.
- Negative values extend the railing beyond the stair bounds.

NOTE If Automatic is selected, the start and end offset options are not available.

6 Change the start offset from the top of the stair.

7 Change the ending offset at the bottom of the stair.

8 Click Redistribute Posts to change the existing posts.

NOTE If you edit a railing using grips so that the railing does not end at end on a post, you can use Redistribute Posts to move a post to the end of the edited railing.

9 Click OK.

Changing the Location of a Railing

Use this procedure to relocate a railing by changing the coordinate values of its insertion point. The railing also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the railing are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the railing by aligning its normal with another axis. You can also rotate the railing on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004User's Guide*.

NOTE You can change only the location of a freestanding railing. The location of a railing attached to a stair is defined by the stair.

1 Select the railings you want to relocate, and double-click one of them.

2 Expand Basic, and expand Location.

3 Enter a value for Rotation.

4 Enter a value for Elevation.

5 Click Additional Information for further location properties:

If you want to . . .	Then . . .
relocate the railing	enter new coordinate values under Insertion Point.
locate the railing on the *XY* plane	make the normal of the railing parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the railing on the *YZ* plane	make the normal of the railing parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.

If you want to . . .	Then . . .
locate the railing on the *XZ* plane	make the normal of the railing parallel to the *Y* axis: enter **1** for Y and enter **0** for X and Z.
change the rotation of the railing	enter a new value for Rotation Angle.

6 Click OK.

Applying Tool Properties to an Existing Railing

Use this procedure to apply the properties of a railing tool to one or more existing railings. The properties include the railing style and any other settings specified in the tool you select.

1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a railing tool, and click Apply Tool Properties to ➤ Railing.

3 Select the railings, and press ENTER.

4 Edit the properties of the railing in the Properties palette, if needed.

Attaching Hyperlinks, Notes, and Files to a Railing

Use this procedure to attach hyperlinks, text notes, and files to a railing.

1 Double-click the railing you want to attach information to.

2 Click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD 2004 Command Reference*.

4 Click the setting for Notes, and add a note. Then, click OK.

5 Click the setting for Reference Documents.

6 Attach or detach reference files:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.

If you want to . . .	Then . . .
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

7 Click OK.

Railing Styles

A railing style is a group of properties assigned to a railing that determines the appearance and other characteristics of the railing.

Railing Components

In a railing style, you specify the properties of railing components:

- guardrails
- handrails
- bottom rails
- fixed posts
- dynamic posts
- balusters

You can specify the height of rails and posts, the spacing between posts, the spacing between rails, and the width and depth of components. You can also create custom railing components by assigning custom profiles to replace standard railing components.

Custom Railing Components and Special Conditions

To create custom extruded components (railings, posts, or balusters) in a railing style, you define a profile and select it to replace a component on the Components tab. The resulting component is displayed appropriately in all views and does not have to be added to the display properties.

You can create a custom block to represent a complex design for a component that cannot be created from a profile, such as an elaborate wrought iron design in place of balusters, or an unusually shaped component. That block is used to represent the component in Model views. You can create a profile to represent the custom component in Plan views.

You can also use the custom blocks and profiles features of the display properties to represent additional railing components other than posts, rails, and balusters. In such cases, the component is added to the component rather than replacing it. For example, you can create a custom block for Model views and a profile for Plan views of a curved return piece for a railing that ends by attaching to a wall. You can then add the block or profile to the rail components.

Using Materials in Railing Styles

You can use materials to control how railings of each style are displayed in a drawing. You assign materials to the railing components in the style. The components are then displayed using the display properties of the assigned materials.

Autodesk Architectural Desktop® provides a large number of predefined materials for common design purposes. You can use these materials, modify them for your project requirements, and define new materials. For more information about materials and how to define them, see "Materials" on page 491.

Creating Tools from Railing Styles

You can create a railing tool from any railing style. You can drag the style from the Style Manager onto a tool palette. You can then specify default settings for any railing created from the tool. For more information, see "Creating a Railing Tool" on page 1651.

Managing Railing Styles

To create, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop, where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Getting Started with the Style Manager" on page 533.

Related Procedures

- Creating a Railing Style
- Specifying the Upper Rails of a Railing Style
- Specifying the Bottom Rails of a Railing Style
- Specifying Posts of a Railing Style
- Specifying the Components of a Railing Style
- Specifying the Railing Extensions of a Railing Style
- Assigning Materials to a Railing Style
- Specifying the Display Components of a Railing Style
- Attaching Notes and Files to a Railing Style

Creating a Railing Style

Use this procedure to create a railing style. You can create a style using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Railing Styles.

3 Create a railing style:

If you want to . . .	Then . . .
create a style with default properties	right-click Railing Styles, and click New.
create a style from an existing style	right-click the railing style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new railing style, and press ENTER.

5 To edit the new railing style, right-click the style, and click Edit:

If you want to . . .	Then . . .
specify default dimensions and offsets for upper rails of the style	see "Specifying the Upper Rails of a Railing Style" on page 1675.
specify default dimensions and offsets for bottom rails of the style	see "Specifying the Bottom Rails of a Railing Style" on page 1677.
specify the location and interval of posts and balusters for the style	see "Specifying Posts of a Railing Style" on page 1678.
specify the structural components of the style	see "Specifying the Components of a Railing Style" on page 1680.
specify railing extensions at floor levels and at landings	see "Specifying the Railing Extensions of a Railing Style" on page 1682
assign materials to the components of the railing style	see "Assigning Materials to a Railing Style" on page 1685.
add classifications to a railing style	see "Specifying Classifications for a Railing Style" on page 1687.

If you want to . . .	Then . . .
specify display components of the style	see "Specifying the Display Components of a Railing Style" on page 1686.
add notes and files to the style	see "Attaching Notes and Files to a Railing Style" on page 1688.

6 If you want to assign the style to a railing tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating a Railing Tool" on page 1651.

7 Click OK.

Specifying the Upper Rails of a Railing Style

Use this procedure to change the following settings for guardrails and handrails in a railing style:

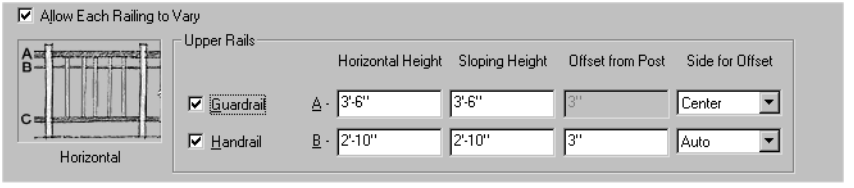
- sloping height
- offset from posts
- side for offsets

1 Open a tool palette that has a railing tool.

2 Right-click a railing tool, and click Railing Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Rail Locations tab.



5 Specify whether upper rail properties of this railing style can be overridden for individual railing objects:

If you want to . . .	Then . . .
specify guardrail and handrail properties, such as horizontal height, sloping height, and offset distance, when you add or modify railings	select Allow Each Railing to Vary.
require all railings of this style to use the upper rail settings of the style	clear Allow Each Railing to Vary.

NOTE Changes to guardrails and handrails do not affect existing railings of this style unless Allow Each Railing to Vary is clear.

6 Select whether to include guardrails and handrails.

A railing must have a guardrail or handrail. Both cannot be turned off.

7 Specify the following parameters for the guardrail or the handrail:

If you want to . . .	Then . . .
specify the height for the guardrail or the handrail	enter a value for Horizontal Height.
specify the height for the guardrail or the handrail while it is on a stair flight	enter a value for Sloping Height.
specify the distance that the guardrail or the handrail is offset from the posts	enter a value for Offset from Post.
specify the side of the post for the offset, based on the direction the stair (or railing) was drawn	select Center, Left, Right, or Auto for Side for Offset. Side for Offset is available only when there is an offset value.

Auto is useful only for railings attached to the edges of stairs. A positive value is toward the center of the stair, while a negative value is toward the outside edge. Side for Offset for handrails also has a selection of Both, so you can specify a handrail on both sides of the railing.

If you select Auto, and the railing is not attached to a stair or is along the center of a stair, the offset is to the right.

8 Click OK twice.

Specifying the Bottom Rails of a Railing Style

Use this procedure to change the following settings for bottom rails in a railing style:

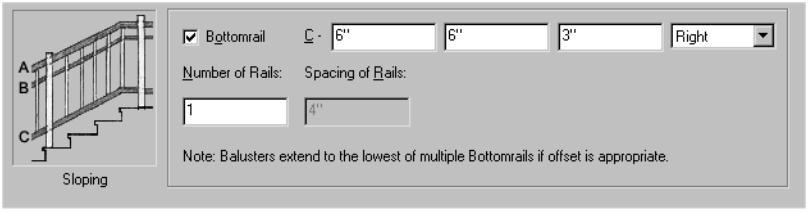
- number of bottom rails
- distance between rails
- height of lowest rail

1 Open a tool palette that has a railing tool.

2 Right-click a railing tool, and click Railing Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Rail Locations tab.



5 Specify whether bottom rail properties of this railing style can be overridden for individual railing objects:

If you want to . . .	Then . . .
specify bottom rail properties, such as horizontal height, sloping height, and number of rails, when you add or modify railings	select Allow Each Railing to Vary.
require all railings of this style to use the bottom rail settings of the style	clear Allow Each Railing to Vary.

6 Select Bottomrail to add bottom rails to the railing.

NOTE Changes to bottom rails do not affect existing railings of this style unless Allow Each Railing to Vary is clear.

7 Specify the parameters for bottom rails:

If you want to . . .	Then . . .
specify the height of the lowest rail when it is horizontal	enter a value for Horizontal.
specify the height of the lowest rail when it is on a stair flight	enter a value for Sloping.
designate more than one bottom rail	enter a value for Number of Rails. When you designate multiple bottom rails, you can enter a value for Spacing of Rails.

8 Click OK twice.

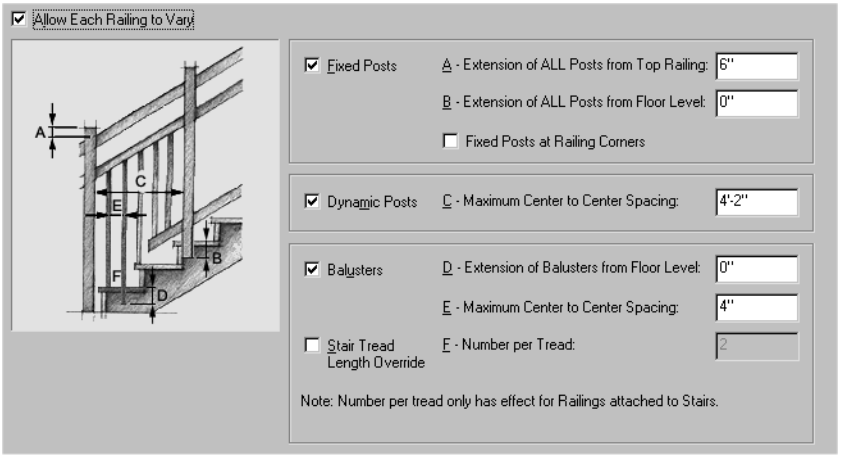
Specifying Posts of a Railing Style

Use this procedure to change the following settings for posts in a railing style:

- type of posts (fixed, dynamic, and balusters)
- amount the posts extend above railings
- maximum spacing between posts and balusters
- number of balusters for each tread for railings that are attached to stairs

Fixed posts are attached at the beginning and end of each railing. Dynamic posts are added to the railing between the fixed posts. Balusters are closely spaced supports for a railing. You can specify the spacing between dynamic posts and between balusters.

1 Open a tool palette that has a railing tool.
2 Right-click a railing tool, and click Railing Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Post Locations tab.



5 Specify whether the post properties of this railing style can be overridden for individual railing objects:

If you want to . . .	Then . . .
specify post properties, such as fixed posts, dynamic posts, and balusters, when you add or modify railings	select Allow Each Railing to Vary.
require all railings of this style to use the post settings of the style	clear Allow Each Railing to Vary.

NOTE Changes to posts do not affect existing railings of this style unless Allow Each Railing to Vary is clear.

6 Specify the post locations:

If you want to . . .	Then . . .
include fixed posts at the beginning and end of the railing	select Fixed Posts.
specify the distance above or below the top rail for all posts	enter a value for Extension of ALL Posts from Top Railing.
specify the height of all posts from the floor	enter a value for Extension of ALL Posts from Floor Level.

If you want to . . .	Then . . .
include fixed posts at the corners of the railing	select Fixed Posts at Railing Corners.
include dynamic posts with the railing	select Dynamic Posts. You can then enter a value for Maximum Center to Center Spacing.
include balusters with the railing	select Balusters. You can then enter a value for Maximum Center to Center Spacing.
override the number of balusters on each stair tread	select Stair Tread Length Override. You can then enter a value for Number per Tread. This applies only to railings that are attached to stairs.

7 Click OK.

Specifying the Components of a Railing Style

Use this procedure to specify the shape of the railing components, and the width, depth, and rotation of each component for each railing style.

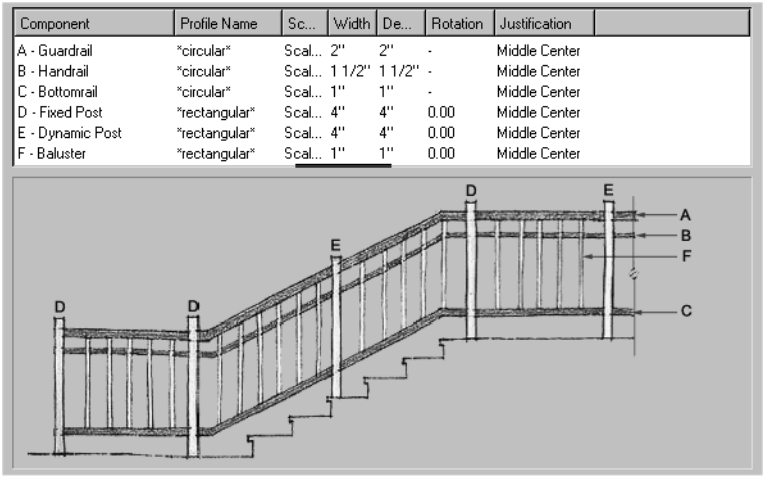
You can use profiles to create railing components with custom shapes. The custom profile replaces a component on the Components tab of the Railing Styles dialog box. For more information, see "Creating a Profile for a Custom Railing Component" on page 1681.

1 Open a tool palette that has a railing tool.

2 Right-click a railing tool, and click Railing Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Components tab.



5 Select the component to change.

6 Select the profile you want to use for the selected component.

The default profiles are circular and rectangular. Any profiles in the current drawing are also displayed.

7 Click Width, and enter a width for the selected component.

8 Click Depth, and enter a depth for the selected component.

Depth is not available for the default circular profile.

9 Click Rotation, and enter a rotation for the selected component.

Rotation is not available for rail components, or when the default circular profile is used for posts.

10 Click OK twice.

Creating a Profile for a Custom Railing Component

Use this procedure to create a profile from a closed polyline. You can then use the profile to define a custom railing component. The custom shape is extruded from the profile along the length of the component.

The height and the width of the polyline you use to create the profile define the height and the width of the railing component. You can change the scale and dimensions of the profile as you add it.

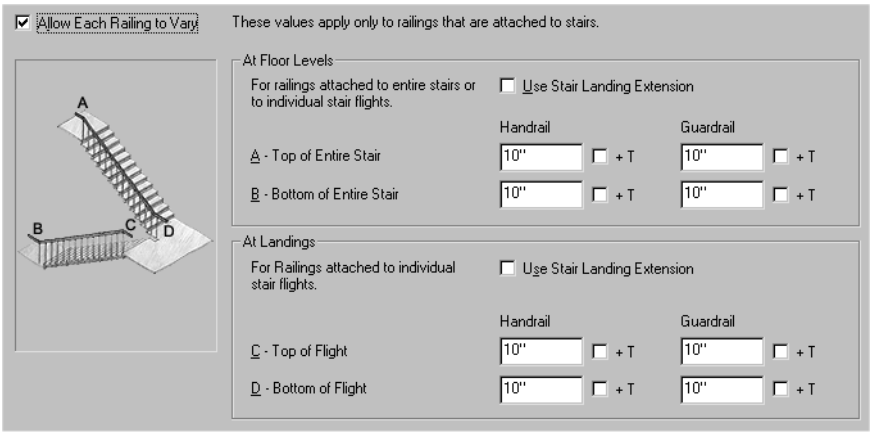
1. Draw a closed polyline of the height and the depth needed for the resulting railing component.
2. On the Format menu, click Style Manager.
3. Expand Multi-Purpose Objects, and expand Profiles.
4. Right-click, and click New.
5. Enter a name for the profile.
6. Right-click the new profile, and click Set From.
7. Select the profile in the drawing area.
8. When prompted to add another ring, press ENTER.
9. Press ENTER to accept Centroid as the insertion point of the profile.
10. Click OK.

You can now use the profile to replace a railing component. For more information, see "Adding Custom Railing Blocks and Profiles to a Railing Style" on page 1689.

Specifying the Railing Extensions of a Railing Style

Use this procedure to control the length of the handrail and guardrail extensions at the top and bottom of stair flights. If a bottom rail exists, it extends as far as the other railing it is below. If railing extensions are not allowed to vary, the endpoint cannot be grip edited.

1. Open a tool palette that has a railing tool.
2. Right-click a railing tool, and click Railing Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Extensions tab.



5 Specify whether railing extensions of this railing style can be overridden for individual railing objects:

If you want to . . .	Then . . .
specify railing extension properties, such as handrails and guardrails at the top and bottom of entire stairs, when you add or modify railings	select Allow Each Railing to Vary.
require all railings of this style to use the extension settings of the style	clear Allow Each Railing to Vary.

NOTE Changes to railing extensions do not affect existing railings of this style unless Allow Each Railing to Vary is clear.

6 Specify the properties of railing extensions:

If you want to . . .	Then . . .
use values in this dialog box to specify extensions	clear Use Stair Landing Extension under At Floor Levels.
specify the length of the handrail and guardrail at the top of an entire stair	enter values for Handrail and Guardrail. Select + T next to the value to add the tread length to the extension value.

If you want to . . .	Then . . .
specify the length of the handrail and guardrail at the bottom of an entire stair	enter values for Handrail and Guardrail. Select + T next to the value to add the tread length to the extension value.
use values in this dialog box to specify extensions	clear Use Stair Landing Extension under At Landings.
specify the length of the handrail and guardrail at the top of a flight	enter values for Handrail and Guardrail. Select + T next to the value to add the tread length to the extension value.
specify the length of the handrail and guardrail at the bottom of a flight	enter values for Handrail and Guardrail. Select + T next to the value to add the tread length to the extension value.

7 Click OK twice.

Specifying the Materials of a Railing Style

A railing consists of a number of components whose display properties can be determined by the materials assigned to each component.

When you assign materials to a railing style, you assign one material to each physical component of the railing. For example, you assign a wood material to the balusters of a railing and a stainless steel material to the handrail and bottomrail. You assign materials to components in each display representation where you want the materials to be used.

If you want to use the display properties of the railing style, instead of using material display properties, you can turn off the material assignments in the display properties of the railing style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in three dimensional (3D) model views and in elevations.

Related Topics and Procedure

- Railing Materials and Display Components
- Assigning Materials to a Railing Style

Railing Materials and Display Components

The following table identifies the material component that corresponds to each railing component.

Railing Component	Material Component
Plan, Plan Screened, Plan High Detail	
Posts	Linework
Guardrail	Linework
Handrail	Linework
Bottomrail	Linework
Plan Low Detail	
Posts	Linework
Guardrail	Linework
Handrail	Linework
Model, Model ByBlock, Model Monochrome	
Baluster	3D Body
Posts	3D Body
Guardrail	3D Body
Handrail	3D Body
Bottomrail	3D Body

Assigning Materials to a Railing Style

Use this procedure to assign materials to the individual components of a railing style. When you assign a material to a railing component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the railing. Custom components and components that are only symbolic graphics do not use materials for their display properties.

NOTE If a material assignment does not determine the display properties of a railing component, you can change the display properties of the railing style as described in "Specifying the Display Components of a Railing Style" on page 1686.

1. Open a tool palette that has a railing tool.
2. Right-click a railing tool, and click Railing Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Select the component you want to change, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.
11. Click OK twice.

Specifying the Display Components of a Railing Style

Use this procedure to change the properties of the display components of a railing style:

- Visibility (display component is on or off)

- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE If a material assignment determines the display properties of components in the railing style, you can change the properties of the display component by clearing By Material. You can also override the material assignment with a different material. For more information, see "Specifying the Materials of a Railing Style" on page 1684.

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1. Open a tool palette that has a railing tool.
2. Right-click a railing tool, and click Railing Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select the component to change, and select a different setting for the property.
9. Click OK twice.

Specifying Classifications for a Railing Style

Use this procedure to specify classifications for any classification definition applied to an railing style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Open a tool palette that has an railing tool.
2. Right-click a railing tool, and click Railing Styles.
3. Right-click the style that you want to change, and click Edit.
4. Click the Classifications tab.

By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to area styles.

5 For each classification definition, select the classification you want to apply to the current railing style.

6 Click OK twice.

Attaching Notes and Files to a Railing Style

Use this procedure to enter notes and attach reference files to a railing style. You can also edit notes and edit or detach reference files from a railing style.

1 Open a tool palette that has an railing tool.

2 Right-click a railing tool, and click Railing Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the General tab.

5 To add a description to the railing style, enter the description under Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK when you are done editing.
detach a reference file	select the file name, click Delete, and click OK.

9 Click OK twice.

Adding Custom Railing Blocks and Profiles to a Railing Style

You can specify custom blocks and profiles that are added to or replace individual railing components. Posts, dynamic posts, and balusters can be added to or replaced. Other railing components can be added to, but not replaced.

When you add a custom block and profile, you can specify several rules for positioning and scaling the new component. Each custom block or profile is also added to the display properties so that you can control its layer, color, and linetype. Be sure that the objects used to create the custom blocks are created with their properties designated as ByBlock. Otherwise, they cannot be controlled through the display properties. For more information about ByBlock, see "Control the Color and Linetype Properties in Blocks" in the online *AutoCAD® 2004 User's Guide*.

After you create custom blocks and profiles, you can attach them to railing styles. Using custom blocks and profiles, railing styles can provide a much richer and more flexible set of railing graphics.

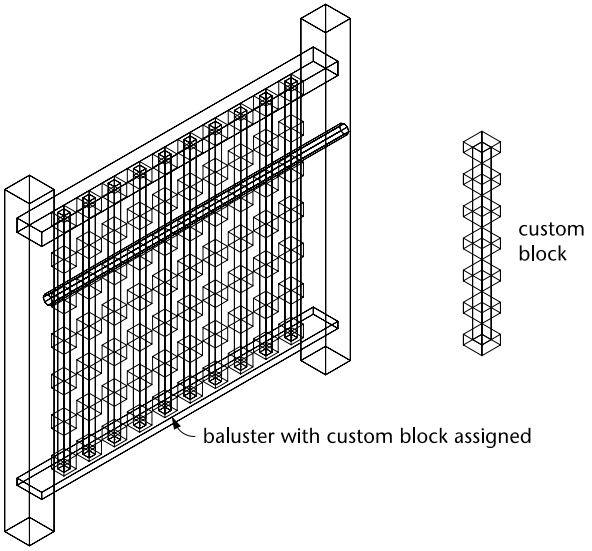
Related Procedures

- Adding a Custom Block to a Railing Style
- Adding a Custom Profile to a Railing Style
- Turning off a Custom Block or Custom Profile in a Railing Style
- Removing a Custom Block from a Railing Style

Adding a Custom Block to a Railing Style

Use this procedure to add a custom block to a railing style. The block can replace a railing component, such as a baluster, or be added to a component. You attach the block in display representations, such as Model, that show the railing in three dimensions.

Assigning a custom block as a baluster component to a railing



You can use a block to replace a component on the Components tab of the Railing Styles dialog box, or you can use a block to represent additional railing components in the display of railings. You add a block to the display components of a style; a component that you replace on the Components tab is already a part of the display properties.

1. Create a block to represent the component to add to the railing.

   Create the block in the same plane as the railing you are going to attach it to. Be sure that the objects used to create the custom blocks are created with their properties designated as ByBlock. Otherwise, they cannot be controlled through the display properties.

2. Open a tool palette that has a railing tool.
3. Right-click a railing tool, and click Railing Styles.
4. Right-click the style you want to edit, and click Edit.
5. Click the Display Properties tab.
6. Select the display representation where you want the changes to appear, and select Style Override.

NOTE You can add a custom block to a railing only in Model-based display representations.

7 If necessary, click .

8 Click the Other tab.

9 Click Add.

10 In the Custom Block dialog box, click Select Block.

11 Select the block to use, and click OK.

12 Specify the scale of the custom block:

If you want to . . .	Then . . .
use the block at its drawn size	clear all options under Scale to Fit.
scale the custom block to the width of the object it is attached to	select Width.
scale the custom block to the depth of the object it is attached to	select Depth.
scale the custom block to the height of the object it is attached to	select Height.
lock the *XY* shape of the object	select Lock Ratio. If the object is scaled in one direction to fit another criterion for Scale to Fit, the whole custom block is scaled equally.
add the selected block to the railings between the selected components	select Between Comp. Baluster, Main Post, and Dynamic Posts are the only valid component selections.

13 Specify the Mirror In direction, if necessary:

If you want to . . .	Then . . .
create a mirror of the component in the *X* direction, along the length of the railing	select Mirror X.
create a mirror of the component in the *Y* direction, across the width of the railing	select Mirror Y.
create a mirror of the component in the *Z* direction	select Mirror Z.

14 Specify the location of the insertion point in relation to the object:

If you want to . . .	Then . . .
specify the location of the *X* insertion point	select Left, Center, or Right for X.
specify the location of the *Y* insertion point	select Front, Center, or Back for Y.
specify the location of the *Z* insertion point	select Bottom, Middle, or Top for Z.

15 Specify the insertion offset for the component in the *X*, *Y*, and *Z* directions.

16 Specify the type of railing component that the block represents:

If you want to . . .	Then . . .
represent balusters with the block	select Baluster for Component.
represent main posts with the block	select Main Post for Component.
represent dynamic posts with the block	select Dynamic Post for Component.
replace the current baluster, main post, or dynamic post with the block	select Replace.
represent a guardrail with the block	select Guardrail for Component.
represent a handrail with the block	select Handrail for Component.
represent a bottom rail with the block	select Bottomrail for Component.

The two groups of components are mutually exclusive, so selecting an object from one column makes the other unavailable. You can select more than one object in each column to apply the block to each selected component. For example, you can use the same block for the main posts and dynamic posts.

17 Specify where the block is applied to the components:

If you want to . . .	Then . . .
apply the block to all instances of the selected components	select All for Attach to.
apply the block to the first instance of the selected component, based on the direction the railing was drawn	select First for Attach to.
apply the block to the last instance of the selected component, based on the direction the railing was drawn	select Last for Attach to.
apply the block to a selected number of components	select Selection for Attach to. The components are numbered in the order the railing was drawn, beginning with 1.

18 Click OK three times.

After adding the block to the style, you can specify the layer, color, and linetype of the block. For more information, see "Specifying the Display Components of a Railing Style" on page 1686.

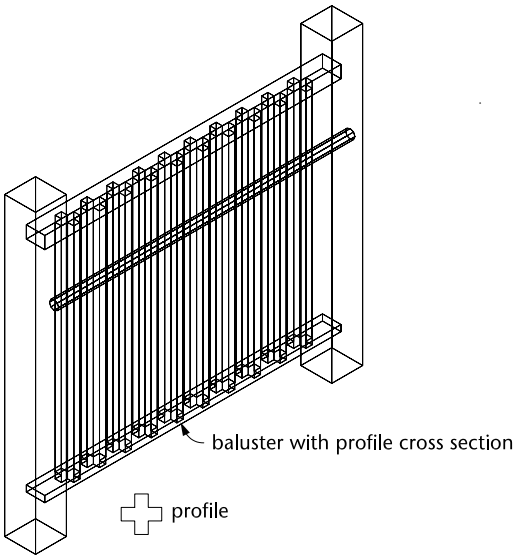
Adding a Custom Profile to a Railing Style

Use this procedure to add a custom profile to a railing style in the Plan display representation. You can replace one or more railing components with a custom profile, or you can assign different custom profiles to different railing components.

You can use a profile to replace a component on the Components tab of the Railing Styles dialog box, or you can use a profile to represent additional railing components in the display of railings. You add a profile to the display properties of a style; a component that you replace on the Components tab is already a part of the display properties.

For more information about creating profiles for railing components, see "Creating a Profile for a Custom Railing Component" on page 1681.

Assigning a profile to a baluster in a railing



1. Create a profile to represent the component to add to the railing. Create the profile in the *XY* plane.
2. Open a tool palette that has a railing tool.
3. Right-click a railing tool, and click Railing Styles.
4. Right-click the style you want to edit, and click Edit.
5. Click the Display Properties tab.
6. Select the display representation where you want the changes to appear, and select Style Override.

NOTE You can add a custom profile to a railing only in Plan-based display representations.

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7. If necessary, click .
8. Click the Other tab.
9. Click Add.
10. In the Custom Profile dialog box, click Select Profile.
11. Select the profile, and click OK.

12 Specify the scale of the custom profile:

If you want to . . .	Then . . .
use the block at its drawn size	clear all options under Scale to Fit.
scale the custom profile to the width of the object it is attached to	select Width.
scale the custom profile to the depth of the object it is attached to	select Depth.
scale the custom profile to the height of the object it is attached to	select Height.
lock the *XY* shape of the object	select Lock Ratio. If the object is scaled in one direction to fit another criterion for Scale to Fit, the whole custom profile is scaled equally.
add the selected profile to the railings between the selected components	select Between Comp. Baluster, Main Post, and Dynamic Posts are the only valid component selections.

13 Specify the Mirror In direction, if necessary:

If you want to . . .	Then . . .
create a mirror of the component in the *X* direction, along the length of the railing	select Mirror X.
create a mirror of the component in the *Y* direction, across the width of the railing	select Mirror Y.

14 Specify the angle to rotate the component in the *Z* direction, if necessary.

15 Specify the location of the insertion point in relation to the object:

If you want to . . .	Then . . .
specify the location of the *X* insertion point	select Left, Center, or Right for X.

If you want to . . .	Then . . .
specify the location of the *Y* insertion point	select Front, Center, or Back for Y.

16 Specify the insertion offset for the component in the *X* and*Y* directions.

17 Specify the type of railing component that the profile represents:

If you want to . . .	Then . . .
represent balusters with the selected profile	select Baluster for Component.
represent main posts with the selected profile	select Main Post for Component.
represent dynamic posts with the selected profile	select Dynamic Post for Component.
replace the current baluster, main post, or dynamic post with the selected profile	select Replace.
add a guardrail to the selected profile	select Guardrail for Component.
add a handrail to the selected profile	select Handrail for Component.
add a bottom rail to the selected profile	select Bottomrail for Component.

The two groups of components are mutually exclusive, so selecting an object from one column makes the other unavailable. You can select more than one object in each column, to apply the profile to each selected component. For example, you can use the same profile for the main posts and dynamic posts.

18 Specify where the profile is applied to the components:

If you want to . . .	Then . . .
apply the profile to all instances of the selected components	select All for Attach to.
apply the profile to the first instance of the selected component, based on the direction the railing was drawn	select First for Attach to.

If you want to . . .	Then . . .
apply the profile to the last instance of the selected component, based on the direction the railing was drawn	select Last for Attach to.
apply the profile to a selected number of components.	select Selection for Attach to. The components are numbered in the order the railing was drawn.

19 Click OK three times.

Turning off a Custom Block or Custom Profile in a Railing Style

Use this procedure to turn off the display of all custom blocks or profiles without actually removing them from the railing style.

You can selectively turn off the visibility of individual display blocks on the Layer/Color/Linetype tab. This is one way to switch between alternate blocks. For more information, see "Specifying the Display Components of a Railing Style" on page 1686.

1 Open a tool palette that has a railing tool.

2 Right-click a railing tool, and click Railing Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Style Override.

NOTE Custom blocks are added and turned off in Model-based display representations; Custom profiles are added and turned off in Plan-based display representations.

6 If necessary, click .

7 Click the Other tab.

8 Disable the custom component:

If you want to . . .	Then . . .
turn off a custom block	click Disable Custom Blocks.

If you want to . . .	Then . . .
turn off a custom profile	click Disable Custom Profile

9 Click OK twice.

Removing a Custom Block from a Railing Style

Use this procedure to delete custom components from a railing style.

1 Open a tool palette that has a railing tool.
2 Right-click a railing tool, and click Railing Styles.
3 Right-click the style you want to edit, and click Edit.
4 Click the Display Properties tab.
5 Select the display representation where you want the changes to appear, and select Style Override.

NOTE Custom blocks are added and removed in Model-based display representations; Custom profiles are added and removed in Plan-based display representations.

6 If necessary, click .
7 Click the Other tab.
8 Select the component to remove, and click Remove.
9 Click OK twice.

Slabs

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A slab is a three-dimensional (3D) body, bounded by a planar polygon (perimeter) of any shape, and with multiple edges. A slab is defined by its perimeter, edge conditions, and style. You can use slabs to draw floors and other objects that require a flat surface and edge conditions.

Methods of Creating Slabs
You can create slabs independently, or you can create them from existing objects, such as walls and polylines. Slabs created from objects do not maintain a link to the original object, but they give you greater control over their geometry and detail.

Slab Body
The body of a slab is an extrusion perpendicular to the plane of the perimeter and is defined by the following geometry:

- The perimeter of a slab is a planar polygon defined by the *X,Y,Z* coordinates of its vertices.
- A slab has three or more vertices, with the ability to add or remove vertices. Each pair of vertices defines an edge.
- The thickness of a slab extrusion is specified either in the slab style (when it has a fixed thickness) or for each slab.
- The position of the slab bottom, relative to its perimeter plane, is controlled by the thickness offset value in the slab style.
- The baseline of a slab is defined by the first two points you select when defining the slab vertices.

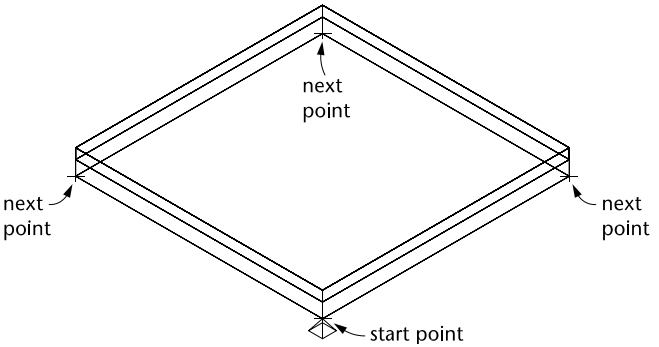
In this chapter

- Using Slab Tools to Create Slabs
- Creating a Slab
- Creating a Slab with User-specified Settings
- Creating a Slab Tool
- Creating a Slab from Walls
- Creating a Slab from a Polyline
- Editing Slabs
- Slab Styles
- Slab Edge Styles

- The slab insertion point, by default, is the first point on the baseline. You can offset the baseline either horizontally or vertically from the insertion point to allow for precise alignment with walls or structural elements.
- A slab has a slope (pitch), which you can specify either as an angle or as a rise-to-run ratio. If you change the slope, the slab rotates around the slope pivot point.
- The pivot point is initially the first vertex of the baseline, but you can move it to any other point, either on or off the slab. A small pyramid-shaped marker represents the pivot point.

The following illustration shows a slab.

Geometry of a slab



- An imaginary line passing through a slab at the perimeter line (in section) is called the slopeline. The slopeline aligns the slab with the wall base height. The slopeline is the position of the slab baseline relative to its bottom face. The value you enter for the thickness offset in the slab style determines the distance between the slab baseline and the bottom face of the slab.

Slab Edge

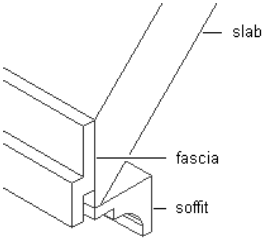
The following parameters define a slab edge:

- orientation (plumb or square)
- angle (relative to the orientation)
- edge style (fascia and soffit)
- overhang (defines the point at which the fascia begins)

You apply a fascia and soffit to slab edges with styles that define edge conditions

- The fascia is defined by a profile, with its insertion point located at the top of the slab edge. The local *Y* axis of the profile polyline aligns with the slab edge angle.
- The soffit is also defined by a profile, with its insertion point positioned at the *X* and *Y* offsets from the fascia insertion point.

Viewing Slab fascia and soffit components



Edge Control

You can customize each slab edge individually, applying styles and making other adjustments as required by your design.

You can control the edge conditions of each slab edge. A slab edge style defines the fascia and soffit design from profiles that you create for these components. You can specify whether the style uses a fascia, a soffit, both, or neither. You also specify how the fascia and soffit are positioned relative to the slab.

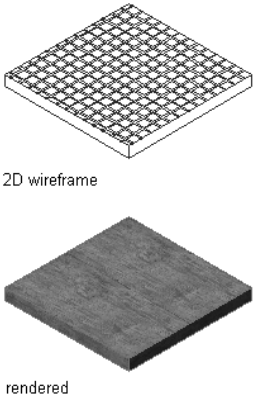
Slab Styles

Use slab styles to create default properties for dimensions, edge styles for the fascia and soffit, and entity properties for layer, color, and linetype. Slab styles allow you to use a different style for each edge of the slab.

Materials in Slabs

You can assign materials to a slab. For example, a floor slab can be assigned a material representing tiles with concrete edges. These materials are displayed in wireframe or rendered views. Materials have specific settings for individual components of slabs, such as the body, fascia and soffit.

Viewing Slabs in 2D wireframe and rendered views



Tiled floor slab with concrete edges

Autodesk® Architectural Desktop provides predefined materials for common design purposes. These materials contain settings for slabs that you can use "as is" or modify for special designs. You can also create materials from scratch. If you create a material to use only for slabs, name it accordingly; for example, Slab—Ceramic Tile or Slab Edge—Concrete. This will help in organizing your material definitions. For more information, see "Specifying the Materials of a Slab Style" on page 1735.

Editing Slabs

In addition to the control provided by slab styles and edge styles, slab tools let you edit slabs to fit unique conditions. You can add holes to slabs for structures such as chimneys and vent pipes. You can also use slabs to create dormers.

Related Topics and Procedures

- Using Slab Tools to Create Slabs
- Creating a Slab
- Creating a Slab with User-specified Settings
- Creating a Slab Tool
- Creating a Slab from Walls
- Creating a Slab from a Polyline
- Editing Slabs
- Slab Styles
- Slab Edge Styles

Using Slab Tools to Create Slabs

Tools provided with Autodesk®Architectural Desktop let you quickly place slabs. Each tool has a specific slab style and other predefined properties. You can use the default settings of the tool, or you can change the settings for slab properties. You can also use slab tools to convert linework to slabs and to apply the settings of a slab tool to existing slabs.

The Design tool palette contains a sample slab tool that you can use and customize as needed. Custom palettes created by your CAD manager or other users may also contain slab tools with slab styles and properties that are customized for your projects or office standards.

A slab tool is also included in the Autodesk Architectural Desktop Stock Tool catalog supplied with the Content Browser. For information about using the Content Browser, see "Content Browser."

Related Procedures

- Creating a Slab
- Creating a Slab with User-specified Settings
- Creating a Slab Tool

Creating a Slab

Use this procedure to add a new slab that has the properties specified in the slab tool. To specify settings when you add a slab, see "Creating a Slab with User-specified Settings" on page 1704.

This procedure creates the slab by specifying points to define the perimeter

- The first point determines the insertion point of the slab and the start of the baseline. This point also locates the default pivot point of the slab.
- The second point determines the end point of the slab baseline.
- Subsequent points establish the vertices of the slab perimeter.

1. Open the Design tool palette, and select the Slab tool.

   If necessary, scroll the palette to display the tool.

2. Specify the start point of the slab.
3. Specify a second point to define the first edge (baseline) of the slab.

4 Specify further points to define the slab:

If you want to . . .	Then . . .
close the slab by drawing two edges that meet at a right angle	specify a point in the direction in which the slab is to close; then enter **Ortho**. The edge is extended until it meets a slab edge perpendicular to the first slab edge.
close the slab by adding an edge from the previous point to the start point of the slab	enter **Close**.

5 Press ENTER.

Creating a Slab with User-specified Settings

Use this procedure to create a slab with settings that you specify.

1 Open the Design palette, and select the Slab tool.

If necessary, scroll the tool palette to display the tool you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Select a slab style.

4 Select Projected or Direct for Mode.

If you select Projected, the *X*,*Y* coordinates of the first point you specify are projected to a Z value of the current base height. This establishes the insertion point. The second point establishes the baseline. All subsequent points are projected onto a plane established by the baseline and the specified slope angle. This mode is provided for architects who wish to lay out a slab by tracing over a plan drawing.

If you select Direct, the points you specify become the vertices of the slab perimeter.

5 Expand Dimensions.

6 Enter a value for Thickness.

7 Enter a value for the vertical offset distance from the insertion point for Vertical Offset.

8 Enter a value for the horizontal offset distance from the insertion point for Horizontal Offset.

9 Select the justification:

If you want to . . .	Then . . .
align the top of the added slab with the first specified point	select Top.
align the center of the added slab with the first specified point	select Center.
align the bottom of the added slab with the first specified point	select Bottom.
align the slopeline of the added slab with the first specified point	select Slopeline.

NOTE This justification is used only for inserting a slab and is not retained as a parameter of the slab. Justification is intended primarily for Direct mode.

The slopeline is the position of the slab baseline relative to its bottom face. The thickness offset in the slab style determines the distance between the slab baseline and the bottom face of the slab.

10 Enter a value for the height of the slab insertion point for Base Height.

This is available only when you select Projected mode.

11 Select a direction, or define how the slab is drawn relative to the baseline.

12 Enter a value for the depth of the overhang for Overhang.

13 Select a style for Perimeter edge.

14 Expand Slope, and enter values for Rise, Run, or Angle to define the slope of the slab.

This is available only when you select Projected mode.

15 Specify the start point of the slab.

The start point determines the insertion point of the slab and the start of the baseline. This point also locates the default pivot point of the slab.

16 Specify a second point to define the first edge (baseline) of the slab.

17 Specify further points to establish the vertices of the slab perimeter:.

If you want to . . .	Then . . .
close the slab by drawing two edges that meet at a right angle	specify a point in the direction in which the slab is to close; then enter **Ortho**. The edge is extended until it meets a slab edge perpendicular to the first slab edge.
close the slab by adding an edge from the previous point to the start point of the slab	enter **Close**.

18 Continue to place slabs, and press ENTER when finished.

Creating a Slab Tool

Use this procedure to create a slab tool and add it to a tool palette. You may want to create your own slab tools if you are placing multiple slabs of specific styles that have the same properties.

You can use any of the following methods to create a slab tool:

- Drag a slab that has the properties you want to a tool palette.
- Drag a slab style from the Style Manager to a tool palette, and then customize the properties of the new tool.
- Copy an existing slab tool, and then customize the properties of the new tool.
- Drag a slab tool from a tool catalog in the Content Browser, and then customize the properties of the tool.

1 Open the tool palette on which you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a slab in the drawing	select the slab, and drag it to the tool palette. **TIP** Select the slab, not a slab grip, to drag it to the tool palette.

If you want to . . .	Then . . .
create a tool from a slab style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current palette	right-click the tool, click Copy, and click Paste.
copy a tool from another palette	open the other tool palette. Right-click the tool, and click Copy. Open the other palette, and click Paste.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.

   This description is used as the tool's tooltip on the tool palette, and to describe the tool if it is stored in a tool catalog.
6. Expand Basic, and expand General.
7. Enter a description of the tool.
8. If you do not want to use the default layer key for slabs, select a layer key.
9. If you want to override the default layer name for slabs, select a layer override.
10. Select a slab style.
11. For Style location, select the drawing file containing the style used for this slab, or select Browse and use a standard file selection dialog box to select the file.
12. Select Projected or Direct for Mode.
13. Expand Dimensions.
14. Enter a value for Thickness.
15. Enter a value for the vertical offset distance from the insertion point for Vertical Offset.
16. Enter a value for the horizontal offset distance from the insertion point for Horizontal Offset.

17 Select the justification:

If you want to . . .	Then . . .
align the top of the added slab with the first specified point	select Top.
align the center of the added slab with the first specified point	select Center.
align the bottom of the added slab with the first specified point	select Bottom.
align the slopeline of the added slab with the first specified point	select Slopeline.

NOTE This justification is used only when inserting the slab and is not retained as a parameter of the slab. Justification is intended primarily for Direct mode.

The slopeline is the position of the slab baseline relative to its bottom face. The thickness offset in the slab style determines the distance between the slab baseline and the bottom face of the slab.

18 Select a direction, or define how the slab is drawn relative to the baseline.

19 Enter a value for the depth of the overhang for Overhang.

20 Select a style for Perimeter edge.

21 For Edge style location, select the drawing file containing the edge style used for this slab, or select Browse and use a standard file selection dialog box to select the file.

22 Click OK.

Creating a Slab from Walls

Use this procedure to create a rectangular slab from one or more walls. This is useful when you want a specific alignment between the slab baseline and the wall baseline. When creating a slab from a single wall, the base height of the wall defines the baseline edge of the slab. When creating a slab from multiple walls, the top of the first selected wall defines the baseline edge of the slab.

You can create a flat slab that follows the outline of multiple walls by specifying a zero slope. If you select multiple walls and a non-zero slope, multiple slabs are created.

If the closed polyline intersects one of the selected walls, the slab is invalid and you must select the walls again.

1. Open the Design palette, right-click the Slab tool, and click Apply Tool Properties to ➤ Linework and Walls.
2. Select one or more walls, and press ENTER.
3. Enter **y** (Yes) to erase the walls, or **n** (No) to keep the walls in the drawing.
4. Specify a justification method:

If you want to . . .	Then . . .
align the top of the slab with the wall base height	enter **t** (Top).
align the center of slab with the wall base height	enter **c** (Center).
align the bottom of slab with the wall base height	enter **b** (Bottom).
align the slopeline of slab with the wall base height	enter **s** (Slopeline).

NOTE This justification is used only for the insertion of a slab. It is not retained as a parameter of the slab object.

The slopeline is the position of the slab baseline relative to its bottom face. The thickness offset in the slab style determines the distance between the slab baseline and the bottom face of the slab.

5. Specify the justification for edge alignment:

If you want to . . .	Then . . .
align the baseline edge of the slab to the left side of the wall, based on the direction the wall was drawn	enter **l** (Left).
align the baseline edge of the slab to the center of the wall	enter **c** (Center).

If you want to . . .	Then . . .
align the baseline edge of the slab to the right side of the wall, based on the direction the wall was drawn	enter **r** (Right).
align the baseline edge of the slab to the baseline of the wall	enter **b** (Baseline).

6 To specify the slope direction, enter **l** (Left) or **r** (Right).

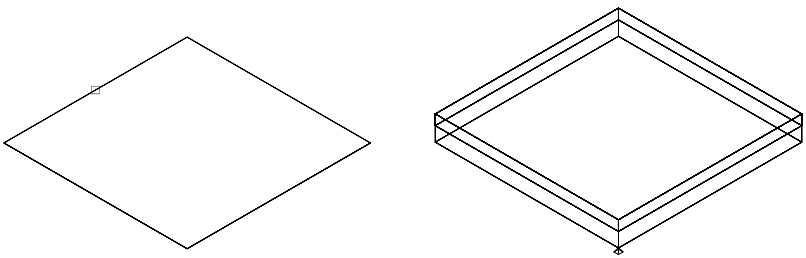
This is based on the direction the wall was drawn.

Creating a Slab from a Polyline

Use this procedure to create a single slab from a closed polyline. The first line drawn in the polyline becomes the baseline edge of the slab.

Creating slabs from polylines is useful when you need to create a complex slab shape or a slab with curved edges. The smoothness (tessellation) of curved edges is controlled by the FACETDEV variable. For more information, see "AEC Facet Deviation" on page 1409.

Converting a polyline to a slab



select polyline resulting slab

1 Open the Design palette, right-click the Slab tool, and click Apply Tool Properties to ➤ Linework and Walls.

2 Select a closed polyline, and press ENTER.

3 Enter **y** (Yes) to erase the polyline, or **n** (No) to keep the polyline in the drawing.

4 Enter **p** (Projected) or **d** (Direct) for Mode.

If you specify Projected, the *X*,*Y* coordinates of the first point are projected onto a Z value of the current base height. This establishes the insertion

point. The second point establishes the baseline. All subsequent points are projected to a plane established by the baseline and the specified slope angle. This mode is provided for architects who wish to create a sloped floor slab.

If you specify Direct, the points specified become the vertices of the slab perimeter.

5 Enter a value for Base Height.

(This is available only if you specified Projected mode.)

6 Specify a justification method:

If you want to . . .	Then . . .
align the slab top with the polyline (or base height, when using projected mode)	enter **t** (Top).
align the slab center with the polyline (or base height, when using projected mode)	enter **c** (Center).
align the slab bottom with the polyline (or base height, when using projected mode)	enter **b** (Bottom).
align the slab slopeline with the polyline (or base height, when using projected mode)	enter **s** (Slopeline).

NOTE This justification is used only for the insertion of a slab. It is not retained as a parameter of the slab object.

Editing Slabs

You can change the style, dimensions, edge properties, and location of a slab. You can use other editing functions, such as adding a vertex to a slab, adding a hole, or adding objects to a slab. You can also edit each slab edge individually. Through the slab tools, you can trim, extend, miter and cut slabs into the shape you need.

Autodesk® Architectural Desktop offers several methods for editing slabs:

- Edit slabs directly using grips for dimensions and other physical characteristics
- Change slab settings on the Properties palette

- Select editing commands from the shortcut menu for a selected slab

Related Topics and Procedures

- Using Grips to Edit Slabs
- Changing the Slab Style
- Changing the Perimeter of a Slab
- Changing the Thickness of a Slab
- Changing the Offsets of a Slab
- Changing the Overhang of a Slab Edge
- Changing the Slope of a Slab
- Changing the Pivot Point of a Slab
- Changing the Edges of a Slab
- Applying Tool Properties to an Existing Slab
- Trimming a Slab
- Extending a Slab
- Cutting a Slab
- Adding a Vertex to a Slab
- Deleting a Vertex from a Slab
- Adding a Hole to a Slab
- Removing a Hole from a Slab
- Adding Objects to a Slab (Boolean)
- Subtracting Objects from a Slab (Boolean)
- Removing Objects from a Slab (Boolean)
- Changing the Location of a Slab
- Attaching Hyperlinks, Notes, or Files to a Slab

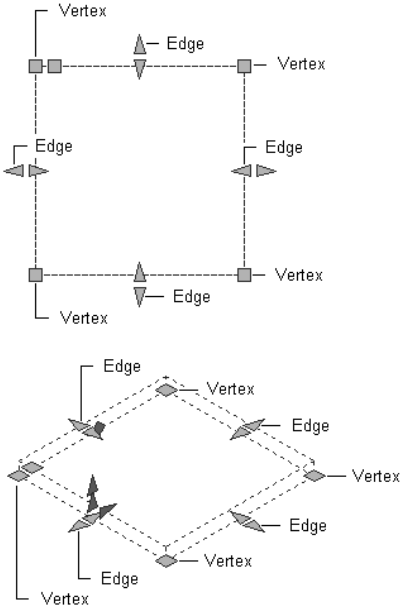
Using Grips to Edit Slabs

Refer to the illustrations and steps in this topic to use slab grips to edit slabs.

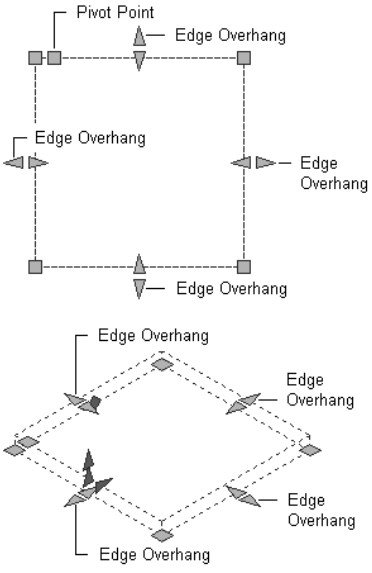
Editing Slab Dimensions

1. Select the slab.
2. Select the grip for the dimension you want to change.

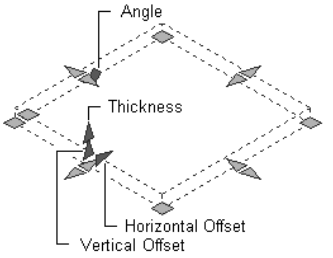
Viewing Slab Vertex and Edge grips



Viewing Slab Edge Overhang and Pivot point grips



Viewing Slab Angle, Thickness, Horizontal Offset, and Vertical Offset grips



3 Either move the grip until the dimension value you want is displayed and then click once, or else enter a value.

Changing the Slab Style

Use this procedure to change the style for a slab or group of slabs.

1 Select one or more slabs, and double-click one of them.

2 Select a slab style.

Changing the Perimeter of a Slab

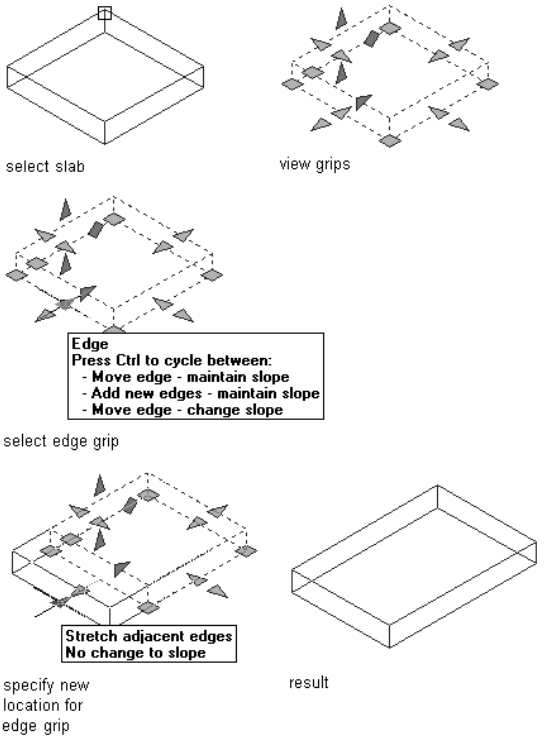
Use this procedure to change the perimeter boundaries of a slab. (You can also add two new edges to the slab as you change its perimeter.)

The perimeter of the slab is a planer polygon defined by the *X*,*Y*,*Z* coordinates of its vertices.

1 Select the slab.

2 Select an Edge grip and resize the perimeter as desired:

Using grips to edit Slab edge



If you want to . . .	Then . . .
maintain the plane and the angles of the adjacent sides of the slab	move the grip until the perimeter is the desired size.
create two new slab edges when you extend the perimeter	press and hold CTRL, and then move the grip until the new perimeter edge is the desired size.

3 Click Once.

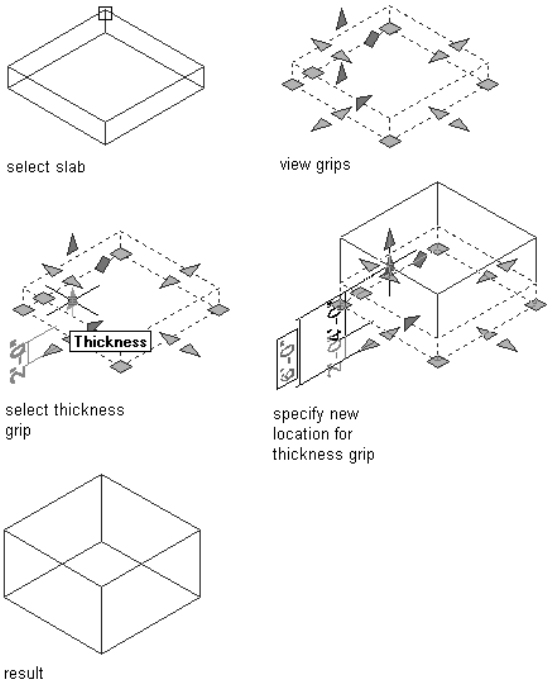
Changing the Thickness of a Slab

Use this procedure to change the thickness of a slab. (You can also use the Properties palette to change the thickness of a slab or group of slabs.)

1 Select the slab.

2 Select the Thickness grip, and either move the grip until the thickness value you want is displayed, or enter a value.

Using grips to edit Slab thickness



3 Click Once.

Changing the Offsets of a Slab

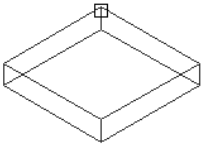
Use this procedure to change the vertical and horizontal offsets of a slab. (You can also use the Properties palette to change the thickness of a slab or group of slabs.)

The offsets are the vertical and horizontal distances from the insertion point of the slab.

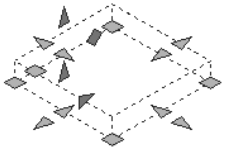
1 Select the slab.

2 Select the Vertical Offset or Horizontal Offset grip, as needed, and either move the grip until the offset value you want is displayed, or enter a value.

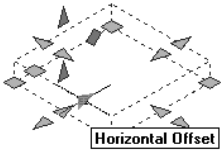
Using grips to edit Slab horizontal offset



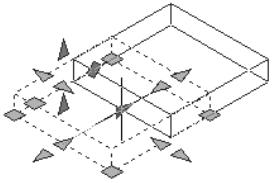
select slab



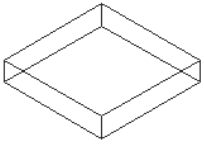
view grips



select horizontal offset grip

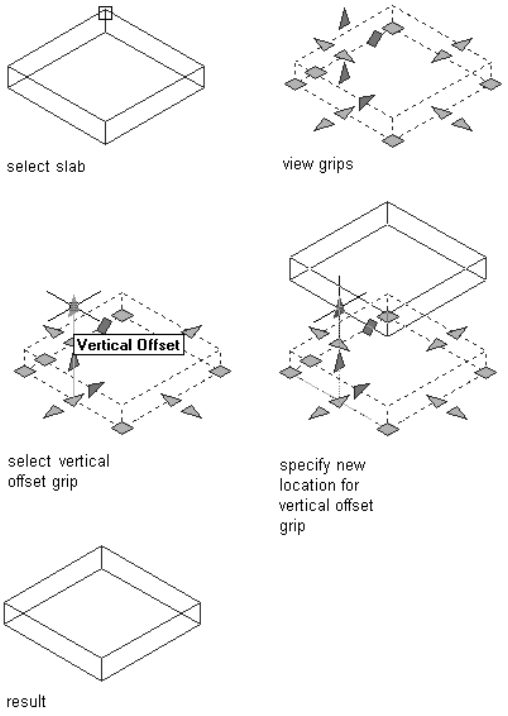


specify new location for horizontal offset grip



result

Using grips to edit Slab vertical offset



3 Click Once.

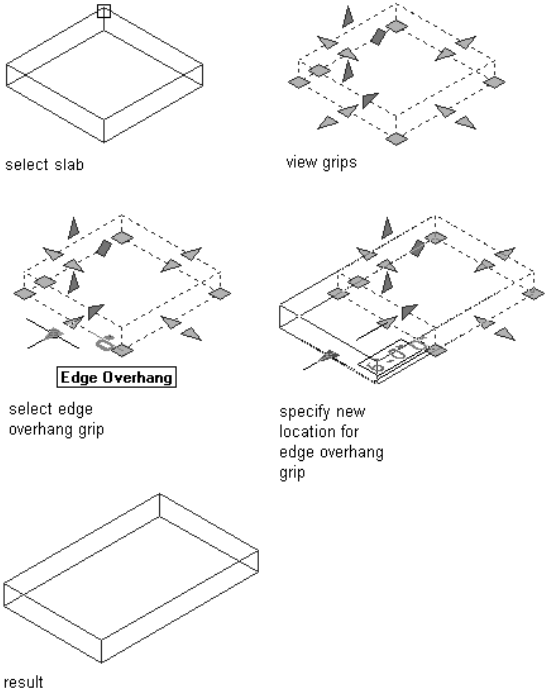
Changing the Overhang of a Slab Edge

Use this procedure to change the overhang of a slab edge. (You can also specify the overhang of slab edges in the Edit Edges worksheet. For more information, see "Changing the Edges of a Slab" on page 1722.)

1 Select the slab.

2 Select an Edge Overhang grip, and either move the grip until the length value you want is displayed, or enter a value.

Using grips to edit Slab edge overhang



3 Click Once.

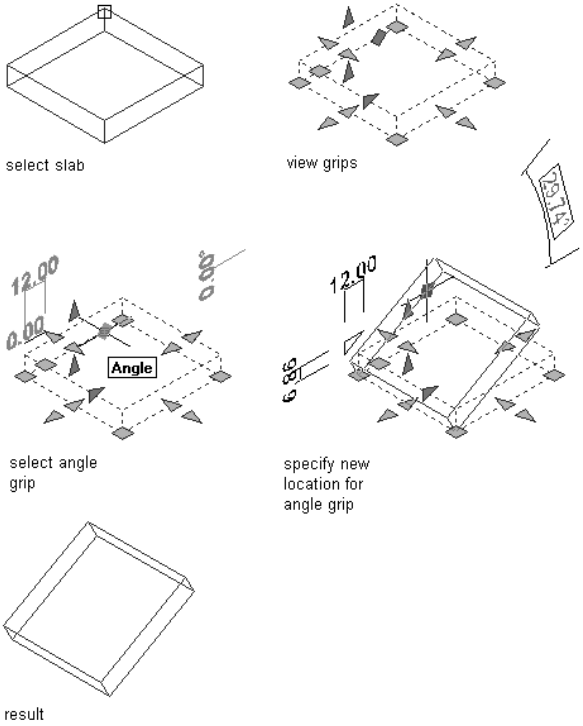
Changing the Slope of a Slab

Use this procedure to change the slope of a slab by changing the rise or angle value. (You can also use the Properties palette to adjust the slope and control the automatic alignment of the fascia. For more information, see "Changing Slab Slope Settings" on page 1720.)

1 Select the slab.

2 Select the Angle grip.

Using grips to edit Slab angle



3 Adjust the slope:

If you want to . . .	Then . . .
adjust the slope by changing the angle of the slab	move the grip until the desired angle is displayed, or enter a value.
adjust the slope by changing the rise of the slab	press TAB until the rise value is highlighted, and then either move the grip until the desired rise is displayed, or enter a value.

4 Click once.

Changing Slab Slope Settings

Use this procedure to change the slope settings of a slab, and to specify whether the fascia is to be aligned when the slope is changed.

You can also control the adjustment of the overhang or baseline height of the slab. This constraint applies only to the baseline edge, and it works only when the baseline is horizontal.

1. Double-click the slab you want to change.
2. Expand Dimensions, and expand Slope.
3. Enter a value for Rise, Run, or Angle to define the slope.
4. Select options for fascia alignment when changing the slope:

If you want to . . .	Then . . .
force the fascia to align with other slab fascias, regardless of style, by adjusting the slab overhang	select By adjusting overhang for Hold fascia elevation.
force the fascia to align with other slab fascias, regardless of style, by adjusting the roof slab baseline height	select By adjusting baseline height for Hold fascia elevation.
ignore fascia alignment	select No for Hold fascia elevation.

Changing the Pivot Point of a Slab

Use this procedure to change the pivot point of the slab. (You can also use the Properties palette to change the *X*, *Y*, and *Z* values of the pivot point.)

By default, the pivot point is the first vertex of the baseline. However, you can move the pivot point to any other point, either on or off the slab.

NOTE If a Hold fascia elevation constraint was set for the slab, the pivot point is ignored. For information about setting this option, see "Changing Slab Slope Settings" on page 1720.

1. Select the slab.
2. Select the Pivot Point grip, and move the grip until the pivot point is in the desired location.
3. Click once.

Changing the Edges of a Slab

Use this procedure to edit an individual edge of a slab. You can change the overhang, edge style, edge orientation, and the angle for the edge. A viewer box shows you which edge of the slab you are editing.

1. Select the slab to be modified, right-click, and click Edit Slab Edges.
2. Select the edges to be modified, and press ENTER.
3. In the list of slab edges, select the edge to edit. To modify multiple edges using the same values, press and hold CTRL while selecting each edge.

   The selected edges are highlighted in the viewer in the right pane of the Edit Slab Edges dialog box.
4. Enter a value for Overhang.
5. Select a slab edge style.
6. Select Square or Plumb for Edge Cut.
7. Enter a value for Angle.

   To reset the angle to the slab style defaults, right-click the edge number and click Reset to Style Defaults. Reset to Style Defaults is available only if an edge style has been assigned and the value for Angle is different than the default.
8. To modify additional edges, continue from step 3.
9. Click OK.

Applying Tool Properties to an Existing Slab

Use this procedure to apply the properties of a slab tool to one or more existing slabs. The properties include the slab style and any other settings specified in the tool you select.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.
2. Right-click a slab tool, and click Apply Tool Properties to ➤ Slab.
3. Select the slabs, and press ENTER.
4. Edit the properties of the slabs in the Properties palette, if necessary.

Trimming a Slab

Use this procedure to trim a slab using a polyline, wall, roof slab, or slab that defines a trim plane through the slab. The trimming object does not need to

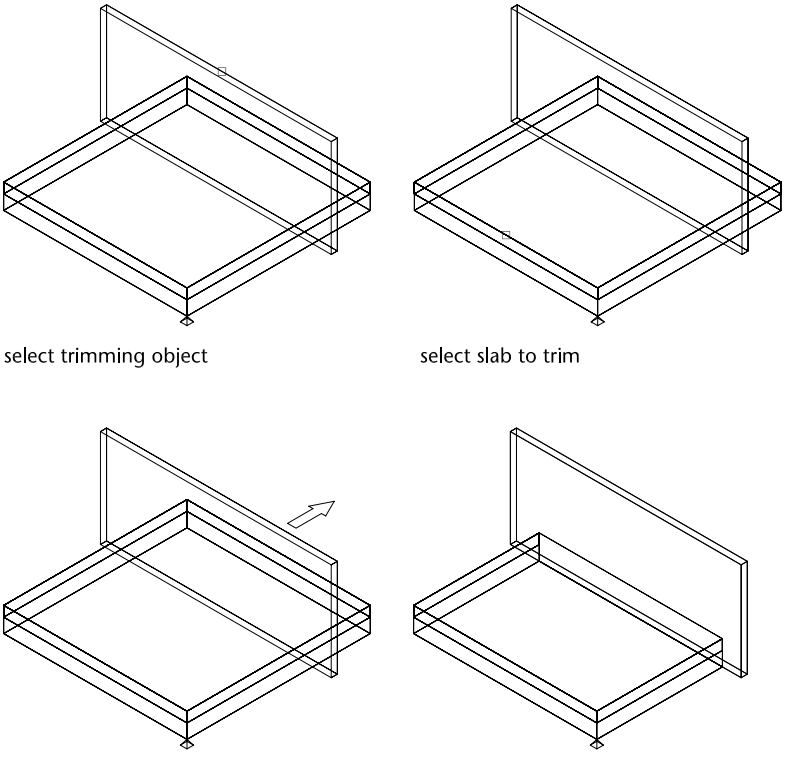
intersect the slab, as long as it provides an intersection in the current user coordinate system (UCS).

Any fascia or soffit profile that intersects the trim plane is trimmed at the same angle as the slab.

If the trimming object is a wall or a slab, the trim plane is at the closest surface. The new slab edge at the trim plane has its edge angle defined by the trim plane.

The trim line must intersect the slab perimeter line. You cannot trim only the overhang.

Trimming a slab to a wall



1. Select the slab to be trimmed, right-click, and click Trim.
2. Select a wall, another slab, or a polyline for the trimming object.
3. Select the side of the slab to be trimmed.

Extending a Slab

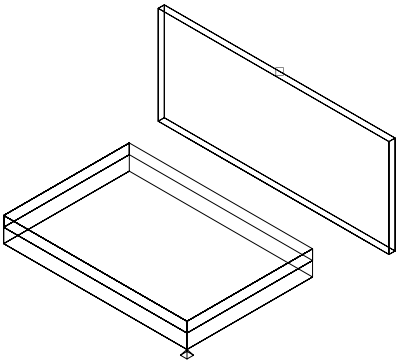
Use this procedure to extend a slab to another slab or to a wall. The object to which the slab projects does not need to intersect the plane of the slab, as long as it projects an intersection in the current user coordinate system (UCS).

Because multiple edges may need to move in an extend operation, you are prompted to select the adjacent edges to lengthen, rather than the specific edges to move. These selected edges retain their current vector (angle) and are stretched until they intersect the plane of the target object.

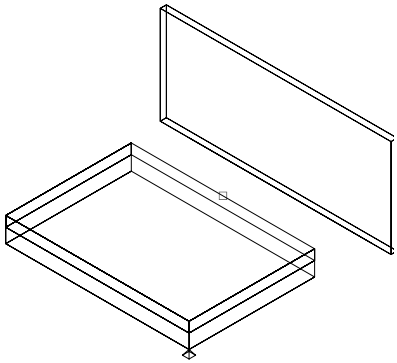
If multiple edges exist between the selected edges, they are joined to form a single edge. The new edge is set to the angle of the target surface.

Any fascia or soffit profile on the adjacent edges is extended to the target surface and trimmed to its angle.

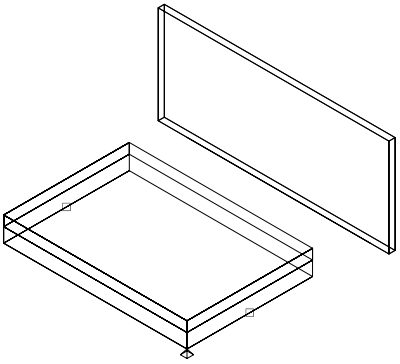
Extending a slab to a wall



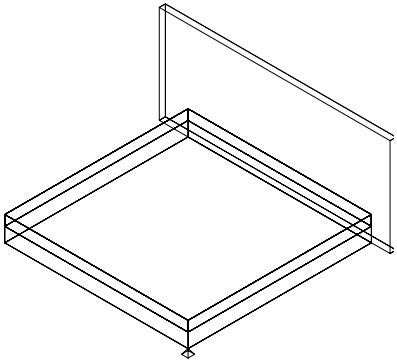
select object to extend to



select slab to extend



select edges to lengthen



resulting slab extended to wall

1. Select the slab to be extended, right-click, and click Extend.
2. Select the wall or slab to extend to.
3. Select the slab to be extended.
4. Select the first edge to lengthen.
5. Select the second edge to lengthen.

Cutting a Slab

Use this procedure to cut a slab into two or more slabs. You can use any 3D object or polyline to define the cutting geometry. If you use a 3D body, such as a wall, slab, mass element, or closed polyline, the slab is cut along the intersection lines of the surfaces.

The slab is cut only when the 3D body or closed polyline intersects the perimeter line of the slab. If you use an open polyline, the slab is cut along the projection to the slab surface.

In either case, when the intersection line crosses the slab multiple times, multiple slabs are created. If the intersection line has multiple edges, multiple edges are added to the new slabs.

The smoothness (tessellation) of curved edges is controlled by the FACETDEV variable. For more information, see "AEC Facet Deviation" on page 1409.

1. Draw an object or polyline for defining the cutting geometry.
2. Select the slab to be cut, right-click, and click Cut.
3. Select the objects or polylines that represent the cutting geometry, and press ENTER.
4. Enter **n** (No) to keep the geometry, or enter **y** (Yes) to erase the geometry.

Adding a Vertex to a Slab

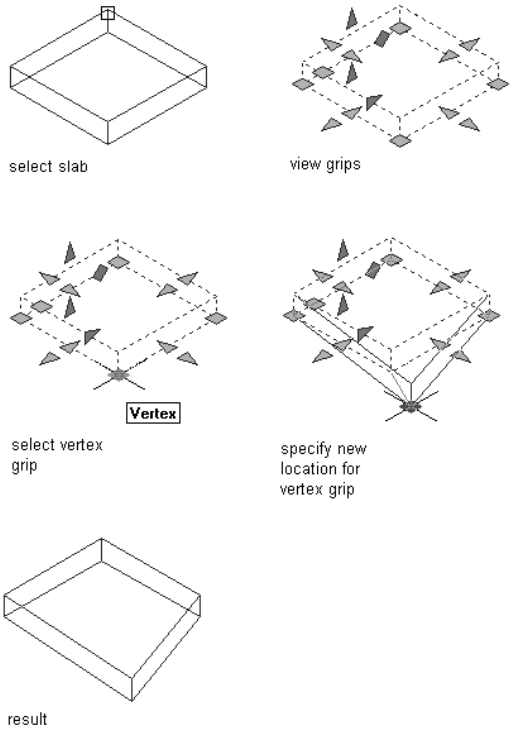
Use this procedure to add a vertex to a slab edge. Adding a vertex creates two slab edges from one edge.

1. Select a slab, right-click, and click Add Vertex.
2. Specify a point for the new vertex.

   To place a new vertex at a precise intersection point, use Intersection or Apparent Intersection object snaps.

   The new vertex is added to the nearest slab edge, perpendicular to the specified point. If there is no point perpendicular to the slab, no vertex is added.

Adding a vertex to a Slab



3 To see the new vertex, select the slab.

A new grip point is displayed where you specified a new vertex.

Deleting a Vertex from a Slab

Use this procedure to delete a vertex from a slab. After deleting a vertex, the two adjacent vertices connect in a straight line.

1 Select the slab, right-click, and click Remove Vertex.

2 Select the vertex to remove.

Adding a Hole to a Slab

Use this procedure to add a hole to a slab. The hole adds new vertices and edges to the slab that you can edit as you do other slab vertices and edges.

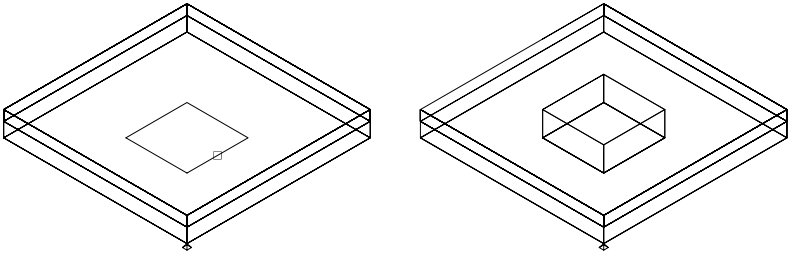
You can use polylines or three-dimensional (3D) objects, such as walls and mass elements, to create holes in a slab

- Holes generated by a closed polyline are projected from the polyline to the slab, using the current user coordinate system (UCS).
- 3D objects must intersect the slab without any projection.

If the objects contain an interior void, you are prompted to use the inside or outside surface to create the hole. For example, if you create a chimney using four wall objects, you can cut the hole at the inside or outside of the chimney. The new hole faces are aligned with the surfaces of the cutting bodies, and are not necessarily parallel to each other.

The smoothness (tessellation) of curved edges is controlled by the FACETDEV variable. For more information, see "AEC Facet Deviation" on page 1409.

Adding a hole to a slab



select closed polyline to cut hole

resulting hole added to slab

1. Draw a closed polyline in the shape and location for the hole, or add an object in the location for the hole.
2. Select the slab, right-click, and click Hole ➤ Add.
3. Select the closed polyline or the connected objects that define the hole, and press ENTER.
4. Enter **n** (No) to keep the geometry, or enter **y** (Yes) to erase the geometry.
5. If you select 3D objects, you are prompted to create the hole at the inside or outside surface of the cutting objects. This prompt is displayed even if the bodies do not contain an inner void, in which case the Inside option does not create a hole.

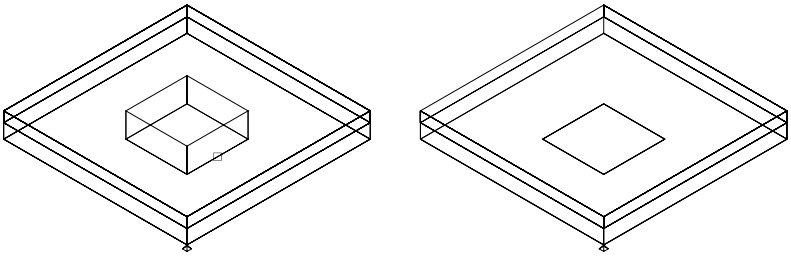
NOTE If you create a hole that is outside or which overlaps the slab baseline or perimeter line at a slab overhang, the body of the slab is cut but the fascia and

soffit remain. In this case, it is better to create a hole by cutting the slab. For more information, see "Cutting a Slab" on page 1725.

Removing a Hole from a Slab

Use this procedure to remove a hole from a slab.

Removing a hole from a slab



select edge of hole

resulting hole removed from slab

1 Select the slab, right-click, and click Hole ➤ Remove.

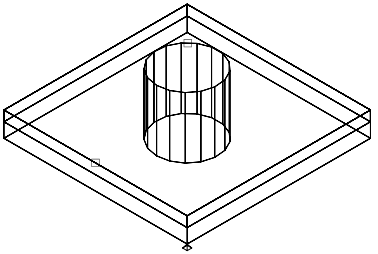
2 Select any edge of the hole to remove.

Adding Objects to a Slab (Boolean)

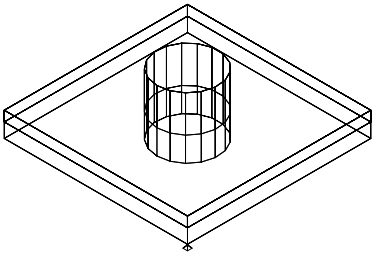
Use this procedure to add three-dimensional (3D) geometry (such as rib joists, curbs, or cornice returns) that cannot be defined by the perimeter, style, or edge profiles. This procedure fuses 3D geometry of selected objects with the slab, so that a section cut through the slab is displayed as a single outline. Typically, after adding objects to a slab, you freeze the layer where the objects are placed. If you move or edit the objects, the slab updates accordingly.

NOTE The object added to the slab is not included for the Area in the LIST command or in a Schedule Query result.

Adding an object to a slab



select slab and object to attach



resulting object attached to slab

1. Create one or more objects to add to a slab in its actual location.
2. Select the slab, right-click, and click Boolean ➤ Add.
3. Select the objects to add to the slab, and press ENTER.

Subtracting Objects from a Slab (Boolean)

Use this procedure to subtract three-dimensional (3D) geometry that cannot be defined by the perimeter, style, or edge profiles. This procedure carves out the body of the slab using the geometry of the selected objects, so that a section cut through the slab produces a single outline. For example, you can create a curb cut in a slab by subtracting the shape of a freeform mass element from the slab. Typically, after subtracting objects from a slab, you freeze the layer on which the objects are placed. If you move or edit the objects, the slab updates accordingly.

NOTE The object subtracted from the slab is not included for the Area in the LIST command or in a Schedule Query result.

1. Create one or more objects to subtract from a slab in its actual location.
2. Select the slab, right-click, and click Boolean ➤ Subtract.
3. Select the objects to subtract from the slab, and press ENTER.

Removing Objects from a Slab (Boolean)

Use this procedure to remove Boolean geometry from a slab. The objects are detached from the slab but are not removed from the drawing.

1. Select the slab, right-click, and click Boolean ➤ Detach.
2. Select the objects to remove from the slab, and press ENTER.

Changing the Location of a Slab

Use this procedure to relocate a slab by changing the coordinate values of its insertion point. The slab also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the slab are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the slab by aligning its normal with another axis. You can also rotate the slab on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Double-click the slab you want to move.
2. Expand Basic, and expand Location.
3. Click Additional Information.
4. Specify the location of the slab:

If you want to . . .	Then . . .
relocate the slab	enter new coordinate values under Insertion Point.
locate the slab on the *XY* plane	make the normal of the slab parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the slab on the *YZ* plane	make the normal of the slab parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the slab on the *XZ* plane	make the normal of the slab parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the slab	enter a new value for Rotation Angle.

5. Click OK.

Attaching Hyperlinks, Notes, or Files to a Slab

Use this procedure to attach hyperlinks, enter notes, or attach reference files to a slab. You can also edit notes and edit or detach reference files from a slab.

1. Double-click the slab to which to attach information.
2. On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD®2004 Command Reference*.

4 To add or edit a note, click next to Notes, enter text, and click OK.

5 To attach, detach, or edit a reference file, click next to Reference documents, and then do any of the following:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6 Click OK.

Slab Styles

A slab style is a group of properties assigned to a slab that determines the appearance and other characteristics of the slab. Slab styles control the following parameters:

- default dimensions, including slab thickness
- default edge conditions, including fascia and soffit styles
- default display properties, including fascia and soffit
- materials assigned to slabs

Creating Tools from Slab Styles

You can create a slab tool from any slab style. You can drag the style from the Style Manager onto a tool palette and then specify default settings for the slabs created with that tool. For more information, see "Using Slab Tools to Create Slabs" on page 1703.

Managing Slab Styles

To create, copy, or edit styles, you access the Style Manager. The Style Manager provides a central location in Autodesk®Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager."

Related Topics and Procedures

- Creating a Slab Style
- Specifying the Fixed Thickness of a Slab Style
- Specifying the Materials of a Slab Style
- Specifying the Display Properties of a Slab Style
- Attaching Notes and Files to a Slab Style
- Adding Classifications to a Slab Style

Creating a Slab Style

Use this procedure to create a slab style. You can create a style using default style properties or by copying an existing style. You then edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Slab Styles.
3. Create a slab style:

If you want to . . .	Then . . .
create a style with default properties	right-click Slab Styles, and click New.
create a style from an existing style	right-click the slab style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new slab style, and press ENTER.
5. To edit the style properties of the new slab style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.

If you want to . . .	Then . . .
specify default fixed thickness for the style	see "Specifying the Fixed Thickness of a Slab Style" on page 1734.
assign materials to the components of the slab style	see "Assigning Materials to a Slab Style" on page 1736 and "Turning on Materials for a Slab Style" on page 1739.
add classifications to a slab style	see "Adding Classifications to a Slab Style" on page 1742.
specify slab hatching, cut plane properties, and other display properties of the style	see "Specifying the Display Properties of a Slab Style" on page 1737.
add notes and files to the style	see "Attaching Notes and Files to a Slab Style" on page 1742.

6 If you want to assign the style to a slab tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating a Slab Tool" on page 1706.

7 Click OK.

Specifying the Fixed Thickness of a Slab Style

Use this procedure to specify a fixed thickness and thickness offset of a slab style. If you specify a fixed thickness in the slab style, you cannot specify a thickness when you add or modify slabs of this style.

1 Open a tool palette that has a slab tool.

2 Right-click a slab tool, and click Slab Styles.

3 Select the slab style, right-click, and click Edit.

4 Click the Design Rules tab.

5 Select Has Fixed Thickness, and enter a value for Thickness.

6 Enter a value for Thickness Offset.

A negative value drops the slab bottom below the baseline.

7 Click OK twice.

Specifying the Materials of a Slab Style

A slab object consists of a number of components whose display properties can be determined by the materials assigned to each component.

You assign one material to each display component of a slab. For example, you assign a floor tile material to the slab body and a concrete material to a slab edge.

If you want to use the display properties of a slab object or slab style, instead of using material display properties, you can turn off the material assignments in the display properties of the slab or the slab style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in Plan view. The Surface Hatch component of a material is used to hatch all object surfaces in 3D model views and elevations.

For a complete list of material components and their description, see "Material Components and Display Properties" on page 498.

Related Topics and Procedures

- Slab Materials and Display Components
- Assigning Materials to a Slab Style

Slab Materials and Display Components

The following table identifies the material component that corresponds to each slab component.

Slab Component	Material Component
Plan, Plan High Detail, Plan Low Detail, Reflected Plan, Screened	
Below Cut Plane Body	No Material
Above Cut Plane Body	No Material
Below Cut Plane Outline	No Material
Above Cut Plane Outline	No Material
Cut Line	Linework
Hatch	No Material
Baseline	No Material

Slab Component	Material Component
Fascia	LInework
Soffit	Linework
Pivot Point	No Material
Warning	No Material
Model	
Warning	No Material
Baseline	No Material
Slab	3D Body
Fascia	3D Body
Soffit	3D Body
Pivot Point	No Material

Assigning Materials to a Slab Style

Use this procedure to assign materials to the individual components of a slab style. The components will then use the display properties of the materials instead of the style display properties.

You can assign a material to any physical component of the slab. Custom components and components that are only symbolic do not use materials for their display properties. For example, the slab body is a physical component, while the pivot point is a symbolic component.

NOTE Although fascias and soffits are physical components of slabs, they are defined in the slab edge style, and not in the slab style. For information on assigning materials to slab edge styles, see "Assigning Materials to a Slab Edge Style" on page 1752.

NOTE If a material assignment does not determine the display properties of a slab component, you can change the display properties of the slab style as described in "Specifying the Display Properties of a Slab Style" on page 1737.

1 Open a tool palette that has a slab tool.

2. Right-click a slab tool, and click Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Click the component you want to change, click its current material definition, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.
11. Click OK twice.

Specifying the Display Properties of a Slab Style

In most cases, you want the appearance of slabs that use the same style to be consistent throughout a drawing. To achieve this, you specify the following display properties in each slab style:

- The layer, color, and linetype of slab components
- The hatching used for the surface of the slab in plan views
- The cut plane height

Slab components with display properties include dimensions for slab thickness, edge conditions for the fascia and soffit, line work, cut planes, cut lines, 3D shading factors, and a warning, baseline, slab, and pivot point. The display properties of the fascia and soffit are also controlled by slab style,

although the geometry of these components is controlled through slab edge styles.

You can also use materials to control the display properties of the physical components of a slab. Symbolic components, such as the slab pivot point, are not controlled by materials. For more information about using materials in slabs, see "Specifying the Materials of a Slab Style" on page 1735.

Related Procedures

- Specifying the Layer, Color, and Linetype of a Slab Style
- Turning on Materials for a Slab Style
- Specifying the Hatching of a Slab Style
- Specifying the Cut Plane Height of a Slab Style

Specifying the Layer, Color, and Linetype of a Slab Style

Use this procedure to change the following display properties of the components including the fascia and soffit of a slab style:

- Visibility (component is on or off)
- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype Scale

NOTE If a material assignment determines the properties of components in the slab style, you can change the properties of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Assigning Materials to a Slab Style" on page 1736.

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1. Open a tool palette that has a slab tool.
2. Right-click a slab tool, and click Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to display the changes, and select Style Override.
6. If necessary, click .

7 Click the Layer/Color/Linetype tab.

8 Select the component to change, and select a different setting for the property.

9 Click OK twice.

Turning on Materials for a Slab Style

Use this procedure to turn on material assignments for individual display representations in a slab style.

For more information about using materials to control the display of slab components, see "Specifying the Materials of a Slab Style" on page 1735.

1 Open a tool palette that has a slab tool.

2 Right-click a slab tool, and click Slab Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation in which to display the changes, and select Style Override.

6 If necessary, click .

7 Click the Layer/Color/Linetype tab.

8 Select By Material for each component to be controlled by the material. The By Material check box is unavailable for components that cannot be assigned a material.

   When you select By Material for a display component, all other settings in the dialog box are unavailable. Since the display properties are now taken from the material definition, you can no longer set them directly in the display properties of the slab style.

9 Click OK twice.

Specifying the Hatching of a Slab Style

Use this procedure to specify the hatching of a slab style. Slab hatching is displayed only in display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

1 Open a tool palette that has a slab tool.

2 Right-click a slab tool, and click Slab Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation in which to display the changes, and select Style Override.

6 If necessary, click .

7 Click the Hatching tab.

8 Click the setting for Pattern.

9 Select the hatching pattern:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and then clear Double Hatch.
select double hatching	select User-defined for Type, and then select Double Hatch.
select solid fill	select Solid Fill for Type.

10 Click OK.

11 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

12 Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is to be oriented:

If you want to . . .	Then . . .
orient the hatching to the slab, regardless of the slab rotation	select object.
orient the hatching to the World Coordinate System	select global.

14 Click OK three times.

Specifying the Cut Plane Height of a Slab Style

Use this procedure to specify the cut plane height of a slab style.

If you specify a value greater than zero, you must specify the layer, color, and, linetype for the elements above and below the cut plane height. This is especially important if you added or subtracted Boolean objects that changed the thickness of the slab.

1. Open a tool palette that has a slab tool.
2. Right-click a slab tool, and click Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. Select Override Display Configuration Cut Plane, and enter a value for Cut Plan Height.
9. Click OK three times.

Adding Classifications to a Slab Style

Use this procedure to specify classifications for any classification definition applied to a slab style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Open a tool palette that has a slab tool.
2. Right-click a slab tool, and click Slab Styles.
3. Right-click the style that you want to change, and click Edit.
4. Click the Classifications tab.

   By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to slab styles.
5. For each classification definition, select the classification you want to apply to the current slab style.
6. Click OK twice.

Attaching Notes and Files to a Slab Style

Use this procedure to enter notes and attach reference files to a slab style. You can also edit notes and edit or detach reference files from a slab style.

1. Open a tool palette that has a slab tool.
2. Right-click a slab tool, and click Slab Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the General tab.
5. To add a description to the slab, enter it under Description.
6. Click Notes.
7. To add or edit a note, click the Notes tab, and enter the note.
8. To attach, edit, or detach a reference file, click the Reference Docs tab:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK when you are finished editing.
detach a reference file	select the file name, click Delete, and click OK.

9. Click OK twice.

Adding Classifications to a Slab Style

Use this procedure to specify classifications for any classification definition applied to a slab style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Open a tool palette that has a slab tool.
2. Right-click a slab tool, and click Slab Styles.
3. Right-click the style that you want to change, and click Edit.
4. Click the Classifications tab.

By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to slab styles.

5 For each classification definition, select the classification you want to apply to the current slab style.

6 Click OK twice.

Slab Edge Styles

A roof slab edge style can be applied to edges of roof slabs. You can set the overhang length, orientation, and angle of the orientation, and add a fascia and soffit for each edge style.

Components of Slab Edge Styles

The slab edge style defines the appearance of slab edges. Each style consists of two optional components: a fascia and a soffit.

A fascia is a shape applied to the outside face of a slab edge. A soffit is a shape applied to the underside of an edge overhang.

You can create fascia and soffit components by defining profiles that provide the two-dimensional (2D) geometry of the component whose shape is then extruded along the slab edge.

The fascia component follows the orientation of the slab edge, plumb, or square cut. The soffit component, however, is always oriented to the horizontal. Either component can have a positive or negative angle, relative to its base orientation.

The +/- directions for edge component angles remain the same regardless of their orientation in the *XY* plane. They always follow the slab slope, so that, for example, a +30° soffit and a +30° slab would be parallel to each other. Similarly, a +10° (plumb cut) fascia and a -10° soffit would meet at a right angle. Mirroring a slab maintains the same angle signs for all components.

Controlling the Placement of the Fascia and Soffit on Slab Edges

The fascia profile is drawn at actual size, except when you select Auto-Adjust. If the slab edge is sloped relative to the ground plane, then the length is measured parallel to that slope, and not plumb with the ground. When you select Auto-Adjust to Edge Height, the fascia profile is scaled about its insertion point so that its lowest *Y* axis point aligns with the bottom of the slab edge.

NOTE Slope offsets are measured relative to the slab edge angle from the ground plane, and not relative to the world UCS.

The soffit profile is drawn at actual size, except when you select Auto-Adjust. The soffit angle is measured about its insertion point, using the local *X* axis of the profile.

When you select Auto-Adjust to Overhang Depth, the soffit profile is scaled about the insertion point, so that the furthest *X* axis point aligns with a plumb line from the slab baseline or perimeter line. Auto-Adjust scaling is adjusted by the horizontal offset from the slab baseline dimension.

Display Properties of the Fascia and Soffit

In most cases, you want the appearance of the fascia or soffit that use the same style to be consistent throughout a drawing. To achieve this, you specify the following display properties in each slab edge style:

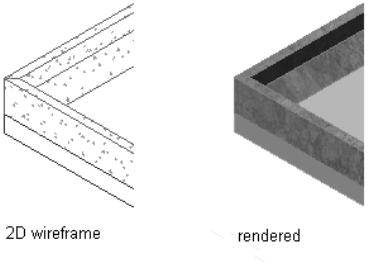
- The layer, color, and linetype of slab edge components
- The hatching used for the surface of slab edges in plan views
- The cut plane height

Slab edge components with display properties include dimensions for slab thickness, fascia and soffit, vertical and horizontal offsets, line work, cut planes, cut lines, 3D shading factors, and a warning, baseline, slab, and pivot point. The display properties of the fascia and soffit are also controlled by slab style, although the geometry of these components is controlled through slab edge styles.

Materials in Slab Edges

You can assign materials to a roof slab edge. These materials are then displayed in wireframe or rendered views. Materials have specific settings for individual components of a roof slab edge, such as the fascia and soffit.

Viewing Slab Edge detail in 2D wireframe and rendered views



Autodesk®Architectural Desktop provides predefined materials for common design purposes. These materials contain settings for slabs and slab edges that you can use "as is" or modify for special designs. You can also create materials from scratch. For more information, see "Specifying the Materials of a Slab Style" on page 1735.

Managing Slab Edge Styles

When you create, import, export, or edit styles, you access the Style Manager. The Style Manager provides a central location where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager."

Related Procedures

- Creating a Slab Edge Style
- Specifying the Overhang, Edge Cut, and Angle of a Slab Edge Style
- Creating Profiles for the Fascia and Soffit
- Specifying a Fascia and a Soffit for a Slab Edge Style
- Assigning Materials to a Slab Edge Style
- Turning on Materials for a Slab Edge Style
- Attaching Notes and Files to a Slab Edge Style

Creating a Slab Edge Style

Use this procedure to create a new slab edge style. You can create a style using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Slab Edge Styles.
3. Create a slab edge style:

If you want to . . .	Then . . .
create a style with default properties	right-click Slab Edge Styles, and click New.
create a style from an existing style	right-click the slab edge style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new slab edge style, and press ENTER.

5 To edit the new slab edge style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.
specify the overhang, edge cut, and angle for the style	see "Specifying the Overhang, Edge Cut, and Angle of a Slab Edge Style" on page 1746.
specify soffits and fascias for the style	see "Specifying a Fascia and a Soffit for a Slab Edge Style" on page 1749.
assign materials to slab edge styles	see "Assigning Materials to a Slab Edge Style" on page 1752.
turn on materials for a slab edge style	see "Turning on Materials for a Slab Edge Style" on page 1753.
add notes and files to the style	see "Attaching Notes and Files to a Slab Edge Style" on page 1753.

6 When you finish specifying the properties of the slab edge style, click OK twice.

Specifying the Overhang, Edge Cut, and Angle of a Slab Edge Style

Use this procedure to specify the default overhang depth, edge cut, and edge angle for slab edges using this edge style.

1 Select a slab, right-click, and click Edit Slab Edge Style.

2 Select an edge of the slab.

3 Click the Defaults tab.

4 Specify the overhang, edge cut, and angle of the slab:

If you want to . . .	Then . . .
specify the overhang of the slab	enter a value for Overhang.
specify the edge cut of the slab	select a setting for Edge Cut: ■ Select Square to cut the edge 90 degrees with the plane of the slab. ■ Select Plumb to cut the edge perpendicular with the ground.

If you want to . . .	Then . . .
specify the angle of the slab	enter a value for Angle. A positive value moves the bottom of the edge out and a negative value moves the bottom of the edge in.

5 Click OK.

Creating Profiles for the Fascia and Soffit

Use this procedure to create a profile for the fascia and soffit.

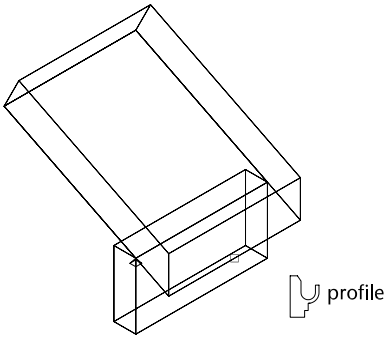
The profile is made up of closed polylines. These polylines can be concentric to show voids, for example, for aluminum extrusions. The outer polyline, or ring, becomes the exposed shape, and the inner polyline, if used, becomes the void. You can create multiple voids by adding more inner closed polylines. The polylines are proportional in size and shape to each other and to the slab.

You can draw these polylines anywhere in the drawing and use any convenient scale relative to your final fascia or soffit size. One method for sizing the polylines relative to the slab edge is to draw them by snapping to an existing fascia, and then move your completed polylines to the side.

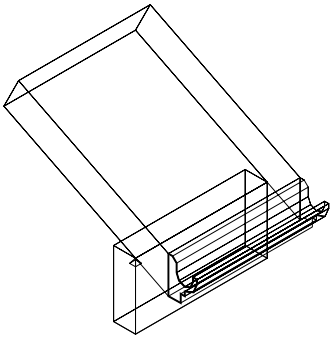
The options for creating the profiles are as follows:

- Use one or more polylines.
- Use open or closed polylines, or a combination of open and closed polylines.
- Orient the polylines in the same plane as the fascia or soffit sectional view.
- Create the polylines at the actual size for the fascia or soffit size.
- Provide an insertion point for each profile.
- Scale the fascia or soffit profile about the insertion point (Auto-Adjust to edge height or overhang depth).

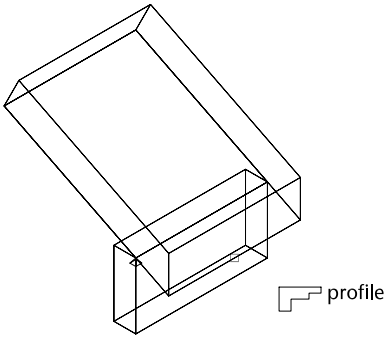
Assigning a profile as a fascia



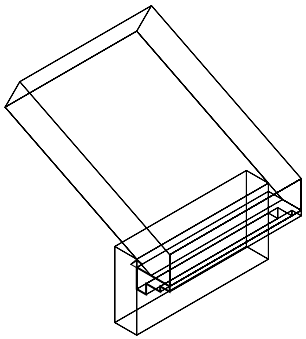
select roof slab edge



resulting profile assigned as fascia



select roof slab edge



resulting profile assigned as soffit

1. Draw closed or open polylines representing the fascia or soffit.
2. Select the polylines, right-click, and click Convert to ➤ Profile Definition.
3. Select the outermost polyline.
4. Enter **a** (Add ring) as needed.
5. Select an inner polyline as needed.
6. Repeat steps 3 and 4 as needed to add more voids to the profile.
7. Specify the insertion point for the fascia or soffit. (The insertion point is typically the lower-left corner.)
8. Enter **n** (New), enter a name for the profile, and click OK.

Specifying a Fascia and a Soffit for a Slab Edge Style

Use this procedure to specify a fascia and a soffit for a slab edge style. The drawing must contain profiles for the fascia and soffit. For more information, see "Creating Profiles for the Fascia and Soffit" on page 1747.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Slab Edge Styles.
3. Right-click the slab edge style that you want to change, and click Edit.
4. Click the Design Rules tab.
5. Select Fascia, and select a profile that defines the geometry of the fascia.

   If you select *NONE*, display component settings apply to the slab edge line or plane where the fascia is located.

6. Specify how the fascia is to be scaled on the slab edge:

If you want to . . .	Then . . .
scale the fascia to fit the height of the slab edge	select Auto-Adjust to Edge Height to scale the fascia to edge height.
use the fascia at its drawn size	clear Auto-Adjust to Edge Height.

7. Select Soffit, and select a profile that defines the geometry of the soffit.

   If you select *NONE*, display component settings apply to the slab edge line or plane where the soffit is located.

8. Specify how the soffit is to be scaled on the slab overhang:

If you want to . . .	Then . . .
scale the soffit to fit the depth of the overhang	select Auto-Adjust to Overhang Depth.
use the soffit at its drawn size	clear Auto-Adjust to Overhang Depth.

9 Specify the placement of the soffit:

If you want to . . .	Then . . .
specify the soffit angle of the slab edge	enter a value for the Angle, with zero being horizontal. A positive value slopes the soffit up from the insertion point, and a negative value slopes the soffit down.
specify the horizontal offset from the slab baseline or perimeter line for the slab edge	enter a value for Horizontal Offset from Slab Baseline. (This option is available only if you select Auto-Adjust to Overhang Depth.)
specify the soffit offsets from the insertion point of the fascia	enter a value for "X" Direction and "Y" Direction.

10 Click OK twice.

Editing the Geometry of Fascia and Soffits

Use this procedure to edit the geometry of the profile used to define the fascia and soffit of a slab edge style. You can also add a profile to the fascia or soffit of a slab edge style that does not currently use a profile to define its shape.

NOTE If you want to replace the geometry of the profile with newly drawn polylines, draw them before you start this procedure.

1 Add a slab object that has the style you want to change.

2 Add or edit a profile:

If you want to . . .	Then . . .
add an existing profile to the style	select the slab, right-click, and click Add Edge Profiles. Select an edge. Select the name of the profile for the fascia or soffit, and click OK.
create a profile and add it to the style	select the slab, right-click, and click Add Edge Profiles. Select an edge. Select Start from scratch for Fascia or Soffit Profile Definition, enter a name for the new profile, and click OK. A rectangle profile is created for you to edit.

If you want to . . .	Then . . .
edit the existing profile for the style	select the slab, right-click, and click Edit Edge Profile in Place.

NOTE If you are prompted about the selected edge not having an edge style and overhang, click Yes.

3 If you receive a message that the profile is not drawn to size, click Yes.

The area of the slab edge defined by the profile is selected and hatched in the drawing.

NOTE After you perform an editing task from the shortcut menu, you may need to select the profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select the profile, and right-click to display the shortcut menu.

4 Edit the profile as necessary:

If you want to . . .	Then . . .
change the shape of the perimeter of the profile or its rings	select the profile, and use grips to adjust the shape.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace an existing ring of the profile with new geometry	select the profile, right-click, and click Replace Ring. Select the ring to replace, and select the new geometry. Press ENTER to keep the geometry, or enter **n** (No) to erase it.

5 Save or discard the changes:

If you want to . . .	Then . . .
restore the profile to its original shape	select the profile, and click .
save the changes to the current profile	select the profile, and click . The slab style uses the edited profile to define its geometry. Any other objects or styles that use this profile are also updated with the edited geometry.
save the changes to a new profile definition	select the profile, right-click, and click Save as New Profile. Enter a name for the new profile definition, and click OK. The slab uses the new profile to define its geometry. Any roof slabs of this style are updated with the new geometry. Other styles or objects that use the original profile are not affected.

Assigning Materials to a Slab Edge Style

Use this procedure to assign materials to individual components of a slab edge style.

1 On the Format menu, click Style Manager.
2 Expand Architectural Objects, and expand Slab Edge Styles.
3 Right-click the style to which to assign materials, and click Edit.
4 Click the Materials tab.
5 Select the slab edge component to which to assign a material, and click its current material definition.
6 Select a material definition from the list.

   You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make apply to all objects that are assigned the material.

7 Click OK twice.

Turning on Materials for a Slab Edge Style

Use this procedure to turn on material assignments for individual display representations in a slab edge style. Display components for slab edges are not turned on in the slab edge style, but rather in the slab style that uses them.

For information on creating and assigning materials, see "Specifying the Materials of a Slab Style" on page 1735.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Slab Styles.
3. Select the slab style that contains the slab edges you want to turn on, right-click, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which to display the changes, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for each component to be controlled by the material.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click OK three times.

Attaching Notes and Files to a Slab Edge Style

Use this procedure to enter notes and attach reference files to a slab edge style. You can also edit notes and edit or detach reference files from a slab edge style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Slab Edge Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the General tab.
5. To add a description to the slab edge style, enter it under Description.
6. Click Notes.
7. To add or edit a note, click the Notes tab, and enter the note.

8 To attach, edit, or detach a reference file, click the Reference Docs tab:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK when you are finished editing.
detach a reference file	select the file name, click Delete, and click OK.

9 Click OK twice.

Walls

25

A wall is an AEC object that represents the real-world features of an interior or exterior wall. The wall object contains all the geometry needed to represent a wall in two-dimensional (2D) and three-dimensional (3D) views.

Understanding Wall Components and Wall Styles

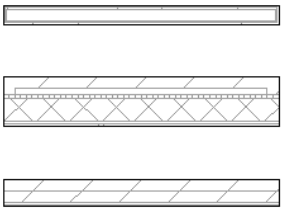
A wall has one or more components, which are the materials used to construct the wall. Components include brick, CMU, concrete, studs, air gaps, and insulation. The components of walls can also have modifiers, which change the shape of the component or its surface.

Wall styles control the appearance of wall objects. Using wall styles, you can specify components, endcaps, materials, and other characteristics to create new types of walls, such as concrete walls, masonry walls, and brick cavity walls. Catalogs provided with Autodesk® Architectural Desktop include sample wall styles for common wall types, such as concrete walls with footings or furring, CMU and brick cavity walls, and various stud partition walls.

In this chapter

- Specifying Drawing Defaults for Walls
- Creating Walls Using Wall Tools
- Creating a Wall
- Creating a Wall with User-Specified Settings
- Creating a Wall from Linework
- Creating a Wall from a 3D Object
- Creating a Wall Tool
- Editing Walls
- Specifying the Cleanup of Walls
- Adding Objects to Walls
- Creating Special Conditions and Customized Wall Surfaces
- Wall Styles
- Wall Endcap Styles
- Opening Endcap Styles

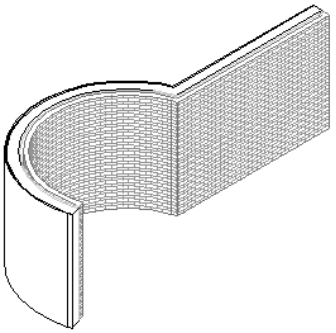
Wall styles that use various components



Placing Walls

When you add a wall to a drawing, you select a wall tool and then specify the points that define each wall segment. A wall can have both straight and curved segments.

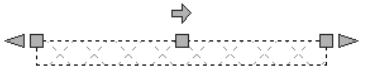
Straight and curved wall segments



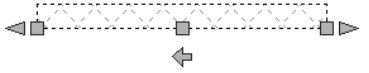
Determining Wall Direction

Wall direction is significant for some modifications to walls. Sample wall styles provided with Autodesk Architectural Desktop were created with the intent that you place perimeter walls in clockwise fashion. After placing a wall, you can determine the wall direction by selecting the wall. The wall direction grip indicates the wall direction. You can also reverse the direction of a wall.

Determining wall direction



wall segment drawn left to right

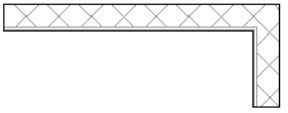


wall segment drawn right to left

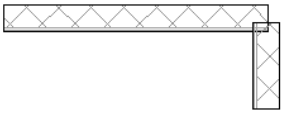
Cleaning up Wall Intersections

You can specify that specific walls intersect and clean up only with certain other walls by assigning the walls to a cleanup group. Walls that belong to the same group clean up where they intersect. Walls that belong to different cleanup groups do not clean up where they intersect. You can also specify how walls in xref drawings clean up with walls in the host drawing.

Wall segments that do and do not clean up



wall segments clean up at intersection



wall segments do not clean up at intersection

Adding Doors, Windows, and Other Objects to Walls

When you add doors, windows, door/window assemblies, and openings to a wall, the wall automatically adjusts to accommodate the object and adds endcaps where needed. By default, these objects are anchored to the wall. The objects remain with the wall if you move it. If you remove an object from a wall, the wall repairs itself in the space where the object was located.

Related Topics and Procedures

- Specifying Drawing Defaults for Walls
- Creating a Wall
- Creating a Wall with User-Specified Settings

- Creating a Wall from Linework
- Creating a Wall from a 3D Object
- Creating a Wall Tool
- Editing Walls
- Specifying the Cleanup of Walls
- Adding Objects to Walls
- Creating Special Conditions and Customized Wall Surfaces
- Wall Styles
- Wall Endcap Styles
- Opening Endcap Styles

Specifying Drawing Defaults for Walls

Use this procedure to specify the default settings in the current drawing for dimensioning walls and for wall cleanup. The cleanup settings apply only to new walls that you add to the drawing and do not affect existing walls.

1. On the Format menu, click Options.
2. Click the AEC Object Settings tab.
3. Under Wall Settings, select an option for wall dimensions: Dimension to Center of Opening or Dimension to Outer Frame of Opening.
4. To force the endpoint of a new wall that is drawn within the Autosnap Radius of the baseline of an existing wall to snap to that baseline, select Autosnap New Wall Baselines.
5. To force the endpoint of a wall that you grip edit within the Autosnap Radius of the baseline of an existing wall to snap to that baseline, select Autosnap Grip Edited Wall Baselines.
6. Enter a value for Autosnap Radius.
7. Select Do Not Display Opening Endcap Styles if you want to suppress the display of endcaps applied to openings in walls.

   Selecting this option speeds drawing performance when the drawing contains many complex endcaps.
8. Click OK.

Creating Walls Using Wall Tools

Tools provided with Autodesk Architectural Desktop let you quickly place walls by selecting a wall tool with a specific wall style and other predefined properties. You can also use wall tools to convert linework to walls and to apply the settings of a wall tool to existing walls.

The default tool palettes in the workspace contain sample wall tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain wall tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- My Tool catalog

Custom palettes created by your CAD manager or other users may also contain wall tools with wall styles and properties that are customized for your projects or office standards.

When you place walls using wall tools, you can use the default settings of the tool, or you can change settings for any wall properties that are not controlled by the style.

Related Procedures

- Creating a Wall
- Creating a Wall with User-Specified Settings
- Creating a Wall from Linework
- Creating a Wall from a 3D Object
- Creating a Wall Tool

Creating a Wall

Use this procedure to add a new wall that has the properties specified in the wall tool that you select. To specify settings when you add a wall, see "Creating a Wall with User-Specified Settings" on page 1760.

1. Open the tool palette that you want to use, and select a wall tool.
   If necessary, scroll to display the tool that you want to use.
2. Specify the insertion point of the wall.

You can move or hide the Properties palette to expose more of the drawing area.

3 Specify the endpoint of the wall segment.

4 Continue adding wall segments.

5 Specify the endpoint of the wall:

If you want to . . .	Then . . .
close the wall by drawing two wall segments that meet the start point at a right angle	enter **or** (Ortho Close), and then specify a point in the direction you want the wall to close. The wall segment is extended until it meets a wall segment perpendicular to the first wall segment.
close the wall by adding a wall segment from the previous point to the start point of the wall	enter **c** (Close).
complete the wall segment at a point that you specify	specify the endpoint of the wall, and press ENTER.

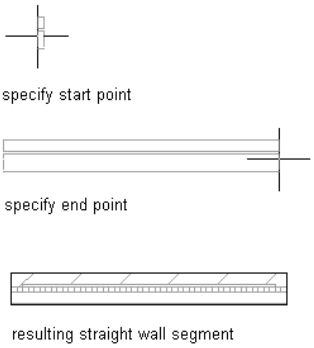
For more information about Ortho Close and Close, see "Using Ortho Close and Close with Walls" on page 1897.

Creating a Wall with User-Specified Settings

Use this procedure to create a wall with straight segments, curved segments, or both with settings that you specify.

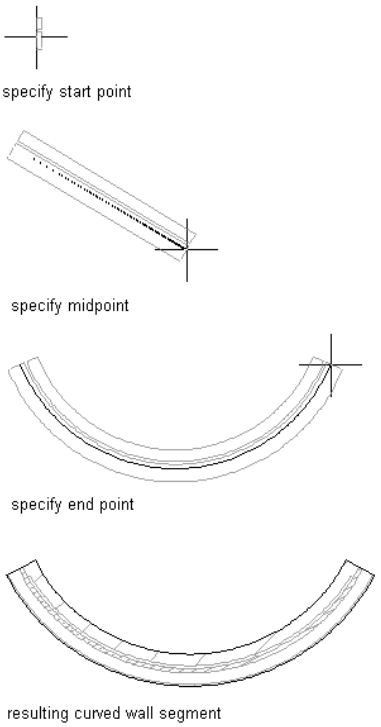
Straight segments have a start point and an endpoint. For more information about straight wall segments, see "About Wall Lengths" on page 1897.

Drawing a straight wall segment



Curved segments have a start point, a midpoint, and an endpoint. For more information about curved wall segments, see "About Curved Walls" on page 1898.

Drawing a curved wall segment



1 Open the tool palette that you want to use, and select a wall tool.

   If necessary, scroll to display the tool that you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Select a style.

4 Select Yes for Cleanup Automatically if you want the wall to clean up with other walls, and select a cleanup group.

5 Expand Dimensions.

6 Specify wall dimensions:

If you want to . . .	Then . . .
specify the thickness of the wall	enter a value for Width. If Width is not available, the wall style you selected determines the width of the wall.
specify the height of the wall from the floor to the ceiling	enter a value for Base height.
specify the length of the wall from the start and end points	enter a value for Length.

7 Specify the wall justification, which places the wall in relation to the points you specify and the direction in which you draw the wall:

If you want to . . .	Then . . .
specify points that define the left side of the wall	select Left for Justify.
specify points that define the right side of the wall	select Right for Justify.
specify points that define the center line of the wall	select Center for Justify.
select points that define the baseline of the wall	select Baseline for Justify.

8 Specify offsets:

If you want to . . .	Then . . .
offset the location of the wall from the points you specify	enter a value for Baseline offset.
offset the roof line from the specified base height	enter a value for Roof line offset from base height.
offset the floor line from the baseline	enter a value for Floor line offset from baseline.

9 Draw a wall segment:

If you want to . . .	Then . . .
draw a straight segment	select Line. In the drawing area, specify the start point and the endpoint of the straight segment.
draw a curved segment	select Arc. In the drawing area, specify the start point, the midpoint, and the endpoint of the curved segment.

You can move or hide the Properties palette to expose more of the drawing area.

10 Continue adding wall segments.

You can enter **u** (Undo) to undo any point except the start point.

11 Specify the endpoint of the wall:

If you want to . . .	Then . . .
close the wall by drawing two wall segments that meet the start point at a right angle	enter **or** (Ortho Close), and then specify a point in the direction you want the wall to close. The wall segment is extended until it meets a wall segment perpendicular to the first wall segment.
close the wall by adding a wall segment from the previous point to the start point of the wall	enter **c** (Close).

If you want to . . .	Then . . .
complete the wall segment at a point that you specify	specify the endpoint of the wall, and press ENTER.

For more information about Ortho Close and Close, see "Using Ortho Close and Close with Walls" on page 1897.

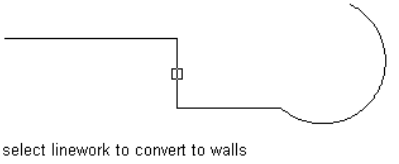
Creating a Wall from Linework

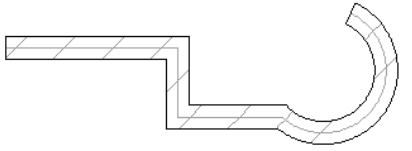
Use this procedure to convert any of the following objects to walls:

- Polylines
- Lines
- Arcs
- Circles

For example, you can create line diagrams or sketches of walls using lines, arcs, circles, and polylines to create the building exterior and rooms, and convert these objects to walls. You can edit the wall properties after creating the wall.

Creating a wall from a polyline





1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a wall tool, and click Apply Tool Properties to ➤ Linework.

3 Select the linework to convert, and press ENTER.

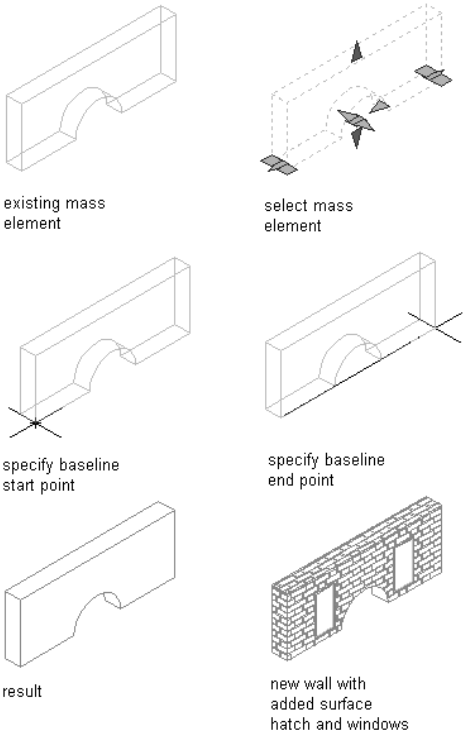
4 When prompted to erase the original geometry, press ENTER to keep the linework, or enter **y** (Yes) to erase it.

5 Edit the properties of the new walls in the Properties palette, if needed.

Creating a Wall from a 3D Object

Use this procedure to convert a three-dimensional (3D) object, such as a mass element, or an AutoCAD®ACIS solid into a single-component wall.

Converting a 3D object to a wall



1 Select the object you want to convert to a wall, right-click, and click Convert to Wall.

2 Enter **y** (Yes) to erase the original object, or enter **n** (No) to retain the object.

3 Specify the baseline of the wall:

If you want to . . .	Then . . .
specify the baseline of the wall by specifying the start point and the endpoint of the wall	specify the start point, and then specify the endpoint when prompted.
specify the baseline of the wall from an existing line or arc in the drawing	enter **p** (Pick), and select the line or the arc you want to define for the baseline.

NOTE Specifying a baseline away from the object you are converting to a wall affects the insertion of anchored objects, such as doors, windows, and openings. Anchored objects are inserted in a wall relative to the baseline of the wall.

4 Select a wall style.

The wall style you select must be a single-component style.

5 Click OK.

Creating a Wall Tool

Use this procedure to create a wall tool and add it to a tool palette. You may want to create your own wall tools if you are placing multiple walls of specific styles with additional properties that you want to be the same each time you add a wall of each type.

For example, you are creating an office floor plan with partition walls for cubicles. Although all partition walls use the same wall style in your floor plan, the walls in administrative areas are lower than the walls in office areas. To work efficiently, you can quickly create a wall tool for each wall height. You can then select the appropriate tool to place the walls with the correct height in each area of the floor plan.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a wall in the drawing	select the wall, and drag it to the tool palette.
create a tool from a wall style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	right-click the tool, and click Copy; open the other palette, and click Paste.
copy a tool from a tool catalog	open the tool catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 Expand Basic, and expand General.

7 Enter a description of the walls that you can create using this wall tool.

8 Specify a layer key and any layer key overrides, if you do not want to use the layer assignments specified in the layer key style used in the drawing.

9 Select a wall style, and select a style location, if not the current drawing.

10 Select Yes for Cleanup Automatically if you want the wall to clean up with other walls, and select a cleanup group.

11 Expand Dimensions.

12 Specify wall dimensions:

If you want to . . .	Then . . .
specify the thickness of the wall	enter a value for Width. If Width is not available, the wall style you selected determines the width of the wall.

If you want to . . .	Then . . .
specify the height of the wall from the floor to the ceiling	enter a value for Base height.

13 Specify the wall justification, which places the wall in relation to the points you specify and the direction in which you draw the wall:

If you want to . . .	Then . . .
specify points that define the left side of the wall	select Left for Justify.
specify points that define the right side of the wall	select Right for Justify.
specify points that define the center line of the wall	select Center for Justify.
specify points that define the baseline of the wall	select Baseline for Justify.

14 Specify offsets:

If you want to . . .	Then . . .
offset the location of the wall from the points you specify	enter a value for Baseline offset.
offset the roof line from the specified base height	enter a value for Roof line offset from base height.
offset the floor line from the baseline	enter a value for Floor line offset from baseline.

15 Expand Advanced.

16 Expand Cleanups, and specify cleanup options:

If you want to . . .	Then . . .
specify the line that the Graph display representation uses for the wall graphline	select Wall Justification Line, or select Wall Center Line.
specify a cleanup radius	enter a value for Cleanup radius.
override the default cleanup radius at the start or the end of the wall	expand Cleanup Radius Overrides, and a value for Override start cleanup radius or Override end cleanup radius.

17 Expand Style Overrides, and select a wall endcap style to override the style currently assigned to the start or the end of the wall.

NOTE Each wall endcap style is generally created for use with a specific wall style. Overriding the wall endcap style for an individual wall may cause a defect marker to display on the wall.

18 Click OK.

Editing Walls

After placing walls, you can edit any characteristics of the wall that you specified when you drew the wall and make additional modifications. You can change the shape of a wall, the basic geometry of a wall, apply a different wall style, and override the component priorities and the endcap styles of the wall. You can also move a wall, merge or join walls, and reverse the direction of a wall. In addition, you can change the shape of the roof line and the floor line of a wall.

Autodesk® Architectural Desktop offers several methods for editing walls:

- You can directly edit walls using grips for dimensions and other physical characteristics.
- You can change wall settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected wall.

Related Procedures

- Using Grips to Edit Walls
- Changing the Shape of a Wall
- Changing the Wall Width
- Changing the Wall Base Height
- Changing the Wall Justification
- Moving a Wall
- Offsetting New Walls from Existing Walls
- Applying Tool Properties to an Existing Wall
- Changing the Style of a Wall
- Overriding Individual Wall Endcaps
- Offsetting New Walls from Existing Walls
- Repositioning a Wall
- Adjusting the Position of Wall
- Changing the Location of a Wall
- Merging Walls
- Removing Individual Merge Conditions
- Removing All Merged Walls
- Joining Walls
- Filleting Walls
- Chamfering Walls
- Trimming Walls at L and T Intersections
- Using AutoCAD Commands to Edit Walls
- Reversing the Direction of a Wall
- Changing the Roof Line and the Floor Line of a Wall
- Specifying the Materials of Individual Walls
- Changing the Display Properties of Individual Walls
- Attaching Notes and Files to a Wall

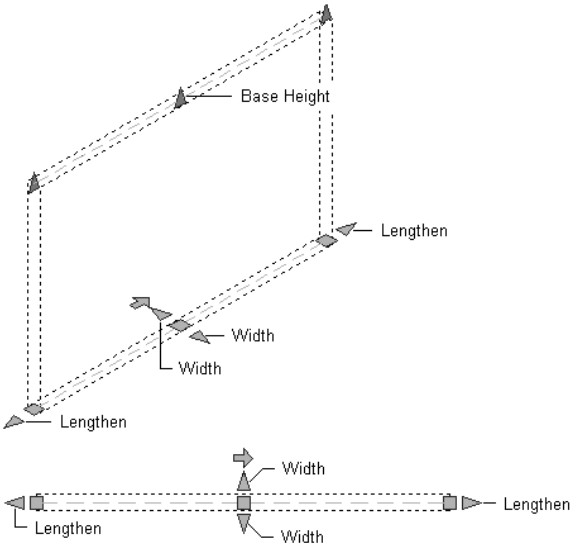
Using Grips to Edit Walls

Refer to the illustrations and steps in this topic to use wall grips to edit walls.

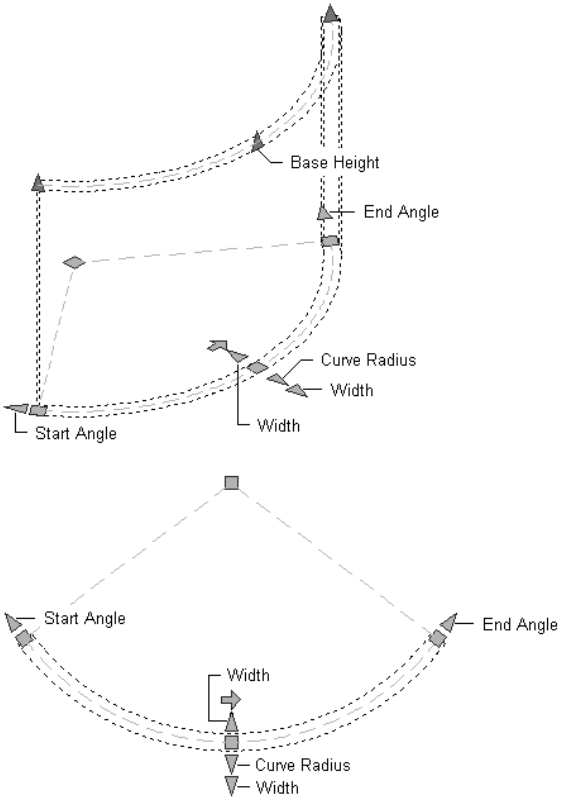
Editing Wall Dimensions

1. Select the wall.
2. Select the grip for the dimension you want to change.

Wall grips for length, width, and base height of a straight wall



Wall grips for start and end angles, radius, width, and base height of a curved wall



3 Move the grip until the dimension value you want is displayed and click once, or enter a value.

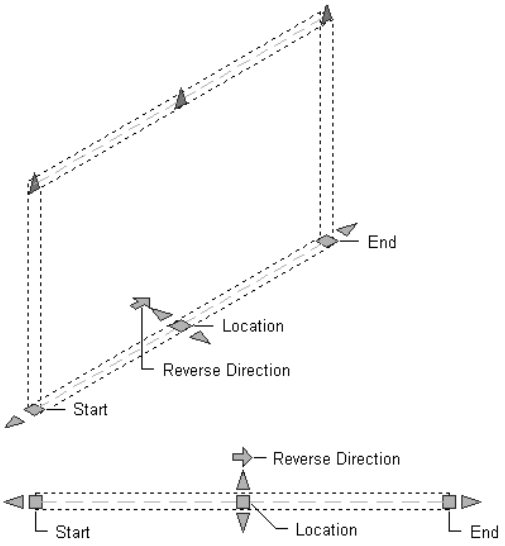
If no Width grip is displayed, the width is controlled by the wall style, and you cannot change it for individual walls.

Changing the Location or Position of a Wall

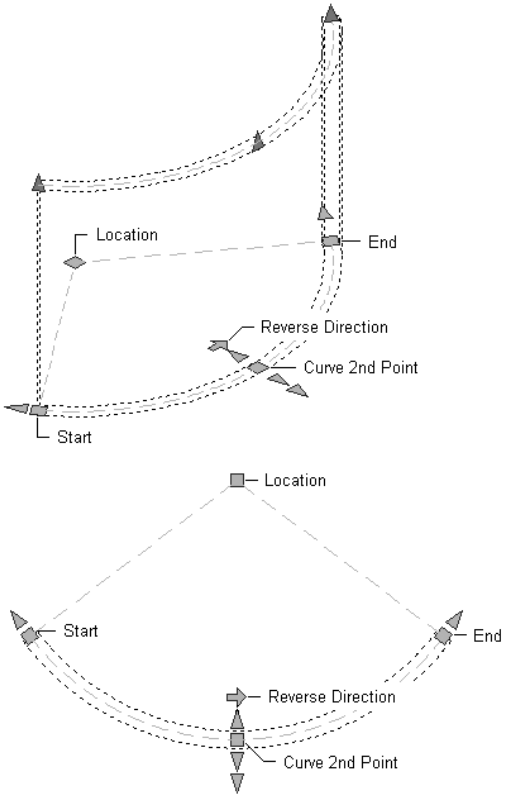
1 Select the wall.

2 Move the appropriate grip to change the location of the wall, its start point, its endpoint, or its direction.

Wall location and direction grips for a straight wall



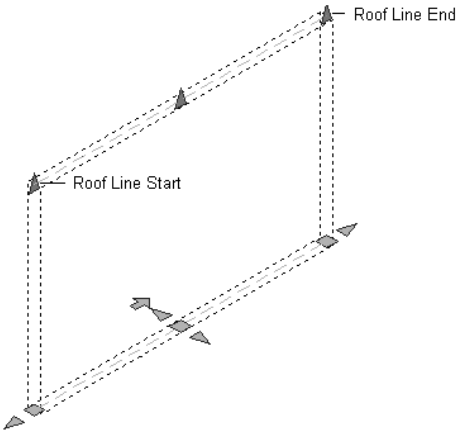
Wall location and direction grips for a curved wall



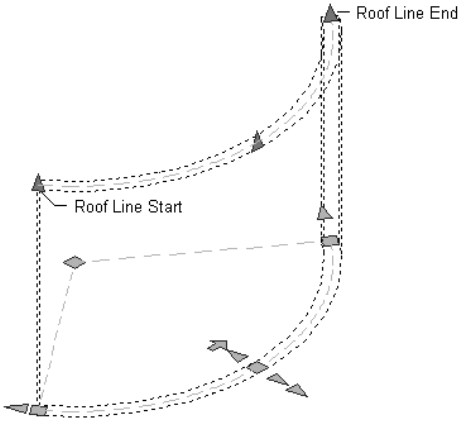
Changing the Height of the Roof Line Start and Endpoints

1. Select the wall.
2. Move the Roof Line Start grip or the Roof Line End grip until the dimension value you want is displayed and click once, or enter a value.

Grips for the start and end of a roof line and floor line for a straight wall



Grips for the start and end of a roof line for a curved wall



Changing the Shape of a Wall

Use this procedure to change a straight wall to a curved wall, or to change a curved wall to a straight wall:

- When you change a straight wall to a curved wall, the software adds a curve second point at the midpoint of the of the wall segment. You can use grips to change the shape of the arc. For more information about curved walls, see "About Curved Walls" on page 1898.

- When you change a curved wall to a straight wall, the software creates a straight segment between the start and endpoints of the curve. You can use grips to adjust the length and location of the wall.

1. Select the walls you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand General.
3. Select Arc or Line for Segment type.

Changing the Wall Width

Use this procedure to change the thickness of a wall. You can also change the wall width on the Properties palette.

If the wall width is defined in the wall style applied to the wall, you cannot change the thickness of an individual wall.

For more information about wall grips, see "Using Grips to Edit Walls" on page 1770.

1. Select the wall.
2. Select a Width grip, move the grip until the width value you want is displayed, and click once.

   After selecting a grip, you can also enter a precise value to increase or decrease the width of the wall. For center and baseline justified walls, you can press CTRL to maintain the baseline or the width of the opposite face of the wall when you change the wall width.

Changing the Wall Base Height

Use this procedure to change the base height of one or more walls. The base height is the height of the wall from floor to ceiling. You can also change the base height on the Properties palette.

For more information about wall grips, see "Using Grips to Edit Walls" on page 1770.

1. Select the wall.
2. Select the Base Height grip, move the grip until the height value you want is displayed, and click once.

   After selecting the grip, you can also enter a precise value to increase or decrease the base height of the wall.

Changing the Wall Length

Use this procedure to change the length of one or more walls. You can also change the length on the Properties palette.

For more information about wall grips, see "Using Grips to Edit Walls" on page 1770.

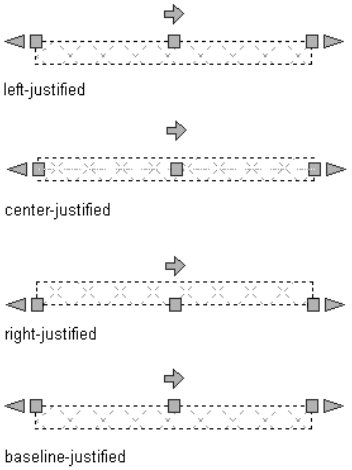
1. Select the wall.
2. Select a Lengthen grip, move the grip until the length value you want is displayed, and click once.

   After selecting the grip, you can also enter a precise value to increase or decrease the length of the wall.

Changing the Wall Justification

Use this procedure to change the justification of a wall. You can also change the justification on the Properties palette.

Justification options



Justification determines the location of the wall in relation to the direction in which the wall was drawn and the points used to draw the wall. Changing the justification of an existing wall moves the wall and can affect how the wall cleans up with other walls.

For more information about wall grips, see "Using Grips to Edit Walls" on page 1770.

1 Select the wall, right-click, and click Edit Justification.

Four grips appear, indicating the justification options: Left Right, Center, and Baseline. The gray grip identifies the current justification.

Wall justification grips

2 Select the grip that corresponds to the justification you want.

Moving a Wall

Use this procedure to move a wall. You can also move a wall by changing its coordinates. For more information, see "Changing the Location of a Wall" on page 1783.

For more information about wall grips, see "Using Grips to Edit Walls" on page 1770.

1 Select the wall you want to move.

2 Select the Location grip, and move the wall to a new location.

Offsetting New Walls from Existing Walls

Use this procedure to add copies of an existing wall that are offset from a component of the wall at a distance that you specify.

This offset command enables you to copy walls by offsetting them a clear distance from the face or center of a specific wall component, such as the stud or the wall finish.

1 Select the wall you want to copy or move, right-click, and click Offset ➤ Copy.

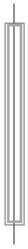
TIP A tooltip is displayed to help you identify the position of the cursor on each wall component.

---

2 Specify the location of the offset point:

If you want to . . .	Then . . .
offset the wall from the face of a wall component	move the cursor over the wall until the face of the component you want is highlighted with a red line, and click once.
offset the wall from the center of a wall component	press CTRL, and move the cursor over the wall until the center of the component you want is highlighted. Click once.

Specifying the center of a wall component to offset new walls

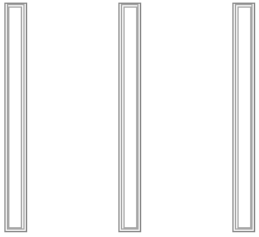


3 Specify the offset distance.

4 Continue adding walls, each new wall offset from the face or center of the wall you added before it.

You can specify a different offset distance each time you add another wall.

New walls placed by offsetting from the center of the stud component



5 Press ENTER.

Repositioning a Wall

Use this procedure to move a wall by offsetting the wall from the center or face of a wall component to a point or distance that you specify.

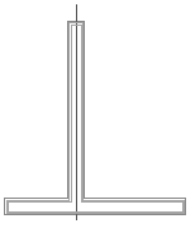
1 Select the wall you want to move, right-click, and click Offset ➤ Move.

TIP A tooltip is displayed to help you identify the position of the cursor on each wall component.

2 Specify the location of the offset point:

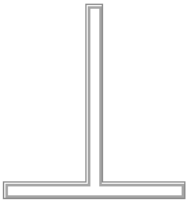
If you want to . . .	Then . . .
offset the wall from the face of a wall component	move the cursor over the wall until the face of the component you want is highlighted with a red line, and click once.
offset the wall from the center of a wall component	press CTRL, and move the cursor over the wall until the center of the component you want is highlighted. Click once.

Specifying the center of a wall component to move the wall



3 Specify the distance from the component face or center to its new position.

Wall moved a specified distance from the center of the stud



Adjusting the Position of Wall

Use this procedure to adjust the position of a wall by aligning or offsetting the center or face of a wall component from a reference point that you specify. For example, you can adjust the placement of a stud partition wall by defining the distance from stud to stud on center.

1 Select the wall you want to move, right-click, and click Offset ➤ Set From.

TIP A tooltip is displayed to help you identify the position of the cursor on each wall component.

2 Specify the location of the offset point:

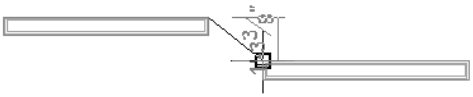
If you want to . . .	Then . . .
offset the wall from the face of a wall component	move the cursor over the wall until the face of the component you want is highlighted with a red line, and click once.
offset the wall from the center of a wall component	press CTRL, and move the cursor over the wall until the center of the component you want is highlighted. Click once.

Specifying the face of wall finish component for the offset point

3 Specify the reference point you want to measure to.

For example, if you want to move a wall so that its exterior face is aligned with the exterior face of another wall, specify a point on the face of the other wall.

Specifying the reference point



4 Specify the new distance from the wall component face or center to the reference point.

Enter **0** (zero) to align the selected wall with the reference point.

Component face aligned with the face of another wall

Applying Tool Properties to an Existing Wall

Use this procedure to apply the properties of a wall tool to one or more existing walls. The properties include the wall style and any other settings specified in the tool you select.

1 Open the tool palette that you want to use.

If necessary, scroll to display the tool that you want to use.

2 Right-click a wall tool, and click Apply Tool Properties to ➤ Wall.

3 Select the walls, and press ENTER.

4 Edit the properties of the walls in the Properties palette, if needed.

Changing the Style of a Wall

Use this procedure to select a different wall style for one or more walls.

1 Select the walls to change, and double-click one of them.

2 Expand Basic, and expand General.

3 Select a different style.

Overriding Individual Wall Endcaps

Use this procedure to select a different wall endcap style for each end of an individual wall. By default, a wall uses the endcap styles specified in the wall style. You can also override wall endcaps on the Properties palette.

To modify the current endcap style or to create a new endcap style from the current style, see "Wall Endcap Styles" on page 1886.

NOTE Each wall endcap style is generally created for use with a specific wall style. Overriding the endcap style for an individual wall may create defect markers in the wall.

1. Select a wall, right-click, and click Endcaps ➤ Override Endcap Style.
2. Select a point close to the wall end where you want assign a different endcap.
3. Select an endcap style, and click OK.

Changing the Location of a Wall

Use this procedure to relocate a wall by changing the coordinate values of its insertion point. The wall also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the wall are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the wall by aligning its normal with another axis. You can also rotate the wall on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1. Double-click the wall you want to change.
2. In the Properties palette, expand Basic, and expand Location.
3. Select Additional information.
4. Specify the location of the wall:

If you want to . . .	Then . . .
relocate the wall	enter new coordinate values under Insertion Point.
locate the wall on the *XY* plane	make the normal of the wall parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.

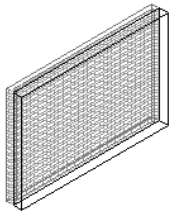
If you want to . . .	Then . . .
locate the wall on the *YZ* plane	make the normal of the wall parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the wall on the *XZ* plane	make the normal of the wall parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the wall	enter a new value for Rotation Angle.

5 Click OK.

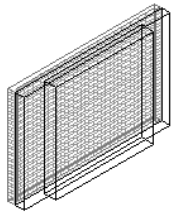
Merging Walls

Use this procedure to merge the profile of selected walls. This does not provide automatic wall cleanup, but merging walls is useful in tight situations that involve short wall segments.

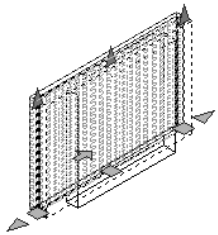
Merging wall segments



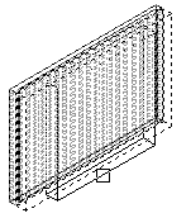
draw first wall segment



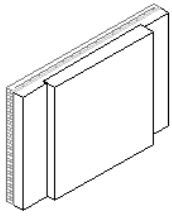
draw second wall segment



select first wall segment, right click and click Cleanups -> Add Wall Merge Condition



select second wall segment to merge



resulting merged wall segments

1. Select a wall to merge, right-click, and click Cleanups ➤ Add Wall Merge Condition.
2. Select other walls to merge with the first wall, and press ENTER.

TIP To identify merged walls, turn on the Graph display representation. Select a wall, right-click, and click Cleanups ➤ Toggle Wall Graph Display. Select the wall to which you added merge conditions. An arc connects the original wall to each wall it is merged with.

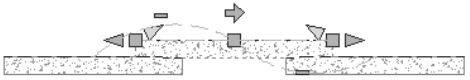
Removing Individual Merge Conditions

Use this procedure to selectively remove merge conditions from a wall.

1. Select a wall, right-click, and click Cleanups ➤ Toggle Wall Graph Display.
2. Select the wall that was selected first when the walls were merged.

   An arc connects the wall to each wall merged with it.

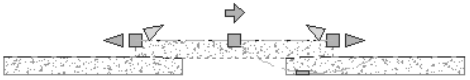
   Wall with two merge conditions applied to it



3. Select the Remove Wall Merge Condition grip for the wall you want to remove from the original wall.

   The arc and grip are removed to indicate that a merge condition with the wall no longer exists.

   One of two merge conditions removed from a wall



Removing All Merged Walls

Use this procedure to remove all merged wall conditions from a group of merged walls.

TIP To identify merged walls, turn on the Graph display representation. Select a wall, right-click, and click Cleanups ➤ Toggle Wall Graph Display. Select the wall to which you added merge conditions. An arc connects the original wall to each wall it is merged with.

- Select the wall that was selected first when the walls were merged, right-click, and click Cleanups ➤ Remove All Wall Merge Conditions.

If a message at the command line indicates that no merge conditions were removed, the wall you selected was not the first wall when the merge condition was created. You can press ENTER to repeat the command, and then select a different wall.

Joining Walls

Use this procedure to combine the baselines of two walls to create one wall segment. Walls that you join must meet the following requirements:

- Linear walls must have colinear baselines and be touching at one endpoint.
- Arc walls must have the same center, radius, and be touching at one end.
- Walls must have the same style and width.
- Walls must belong the same cleanup group.

Joining walls also transfers all sub-objects and anchored objects from one wall to the other. Sub-objects include roofline, floorline, anchors, wall modifiers, wall style overrides, and interference conditions. Anchored objects include doors, windows, and openings anchored to the walls.

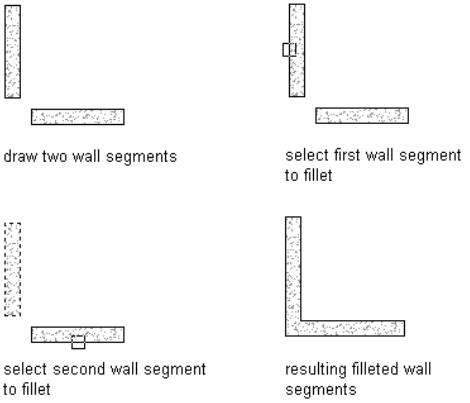
1. Select the first wall, right-click, and click Join.
2. Select the second wall.

Filleting Walls

Use this procedure to fillet two walls. Filleting walls creates a curved wall segment with a specified radius that is tangent to the baselines of the selected walls.

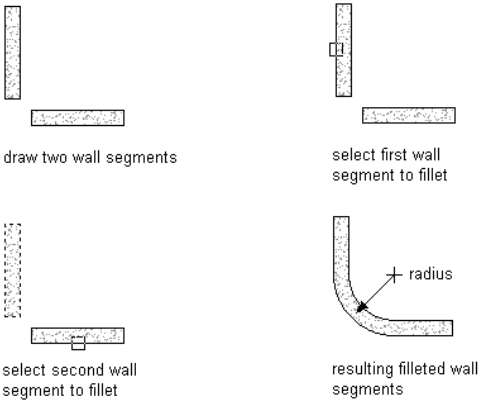
If you specify zero for the fillet radius, the walls are trimmed or extended until they intersect, but no curved wall segment is created. Using a radius of zero enables you to force odd-angled walls to meet. If you select parallel wall segments, the fillet radius is ignored, and a curved wall segment is created that is tangent to the baselines of the selected walls.

Filleting wall segments using zero radius



Trim mode options enable you to specify whether the walls are trimmed or extended to the new segment (trim option) or whether their endpoints remain unchanged (no trim option). If you select no trim, the fillet radius must be greater than zero.

Filleting wall segments using a radius greater than zero



Before filleting walls, ensure that the following conditions exist:

- The walls have the same style and baseline justification.
- The fillet radius is not a negative value.

Defect symbols can appear when you fillet the walls if these conditions are not met.

1 Open a tool palette that contains the Fillet tool.

   The Fillet tool is located with the Basic Drafting Tools in the Stock Tool Catalog. You can add this tool to any tool palette, and then use the tool to fillet walls and other objects.

2 Select the Fillet tool.

3 Verify trim mode and radius settings:

If you want to . . .	Then . . .
trim or extend wall segments to meet each other or to meet the endpoints of the resulting curved wall segment	enter **t** (Trim), and then enter **t** (Trim).
keep the endpoints of the wall segments in their original locations and fit the curved wall segment between them	enter **t** (Trim), and then enter **n** (No trim).
specify a new fillet radius	enter **r** (Radius), and then enter a value for the radius. Enter 0 for the radius if you want the wall segments to meet each other without creating a curved wall segment.
fillet multiple walls	enter **u** (Multiple).

4 Select the first wall.

5 Select the second wall.

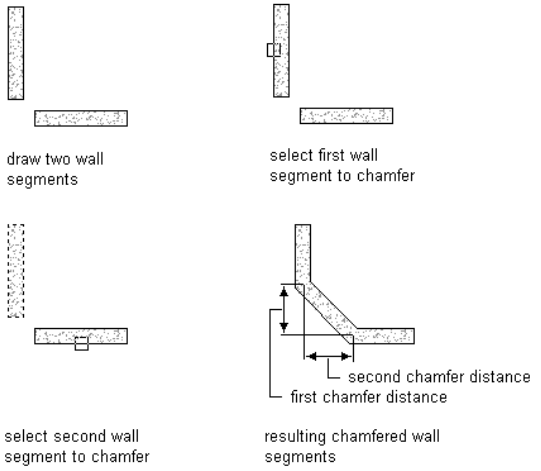
Chamfering Walls

Use this procedure to chamfer two walls. Chamfering walls creates a new wall segment between two walls that are not parallel. Chamfering is useful when you are working with unique wall angles or architectural details.

You can chamfer walls by specifying distance or angle:

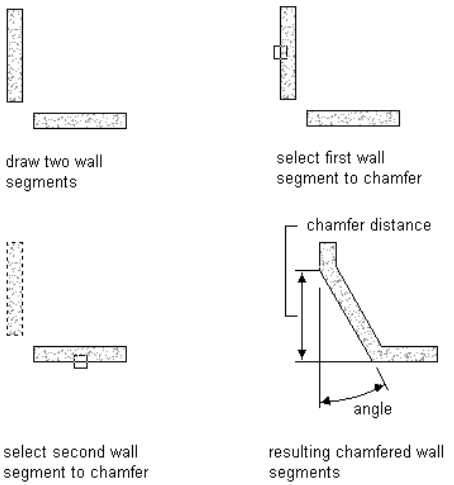
- Using the distance option, you specify the length that each wall should be trimmed or extended until it meets the new wall segment or the other wall. If both chamfer distances are zero, the walls are extended until they intersect, but a new wall segment is not created.

Chamfering walls using the distance option



- Using the angle option, you specify the length of the chamfer and the angle it forms with the first wall.

Chamfering walls using the angle option



Trim mode options enable you to specify whether the walls are trimmed or extended to the new wall segment (trim option) or whether their endpoints remain unchanged (no trim option). If you select no trim, chamfer distances must be greater than zero.

Before chamfering walls, ensure that the walls have the same style and baseline justification. Defect symbols can appear when you chamfer the walls if these settings are not the same for each wall.

1 Open a tool palette that contains the Chamfer tool.

   The Chamfer tool is located with the Basic Drafting Tools in the Stock Tool Catalog. You can add this tool to any tool palette, and then use the tool to chamfer walls and other objects.

2 Select the Chamfer tool.

3 Specify default settings for chamfering walls:

If you want to . . .	Then . . .
trim or extend wall segments to meet each other or to meet the endpoints of the new wall segment	enter **t** (Trim), and then enter **t** (Trim).
keep the endpoints of the wall segments in their original locations and fit the new wall segment between them	enter **t** (Trim), and then enter **n** (No trim).
specify the default length and angle values for the angle option	enter **a** (Angle). Enter the distance from the endpoint to the point on the wall where you want the chamfer to begin. Enter the angle of the chamfer.
specify the default distances for the distance option	enter **d** (Distance). Enter values for Distance 1 and Distance 2. Enter 0 for both distances if you want the walls to meet without creating a new wall segment.
specify the distance option as the default option for chamfering walls	enter **m** (Method), and then enter **d** (Distance).
specify the angle option as the default option for chamfering walls	enter **m** (Method), and then enter **a** (Angle).
chamfer multiple walls	enter **u** (Multiple).

4 Select the first wall.

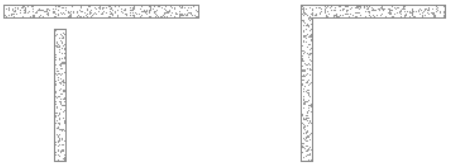
5 Select the second wall.

Trimming Walls at L and T Intersections

Use this procedure to trim or extend walls so that they meet and clean up at T-shaped or L-shaped intersections. If walls do not belong to the same cleanup group, they are trimmed but do not clean up with each other.

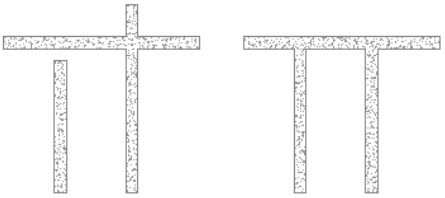
When you create an L-shaped intersection, the wall endpoints that are closest to each other extend or trim so that their wall graphlines meet exactly.

L-shaped cleanup, before and after



When you create a T-shaped intersection, the walls you select are extended or trimmed to a boundary wall that you specify.

T-shaped cleanup, before and after



1 Select the cleanup method you want to use:

If you want to . . .	Then . . .
create an L-shaped intersection between two walls	select the walls, right-click, and click Cleanups ➤ Apply L Cleanup.
create a T-shaped intersection between two walls	select the walls to be extended or trimmed to a boundary wall, right-click, and click Cleanups ➤ Apply T Cleanup. Select the boundary wall.

Reversing the Direction of a Wall

Use this procedure to change the direction in which a wall is drawn by reversing the start point and the endpoint of the wall. Walls are drawn from the first specified point to the last point. Some commands and properties are affected by that order. For example, you can add wall modifiers to the left or right side of a wall. Left and right sides are west and east, respectively, when a wall is drawn from south to north, regardless of how the wall is displayed in the current view.

To determine the direction in which a wall was drawn, select the wall. The Reverse Direction grip shows the orientation of the wall. For more information about wall grips, see "Using Grips to Edit Walls" on page 1770.

1. Select the wall.
2. Click the Reverse Direction grip.

   The outside faces of the wall remain in place, and the baseline shifts, if necessary. Press CTRL when you select the grip to maintain the baseline when reversing direction.

TIP To reverse the direction of multiple walls, select the walls, right-click, and click Reverse. The wall baselines are maintained.

Using AutoCAD Commands to Edit Walls

You can use the following standard AutoCAD®commands to edit walls:

- BREAK
- EXTEND
- TRIM

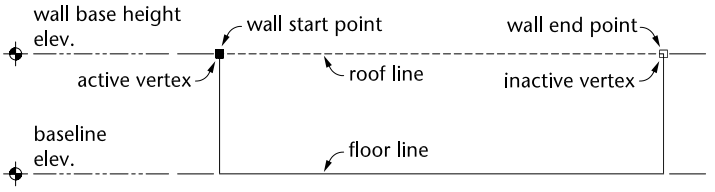
For more information about these commands, see the *AutoCAD 2004 Command Reference*.

Changing the Roof Line and the Floor Line of a Wall

You can modify the roof and floor lines of a wall to create a nonrectangular wall.

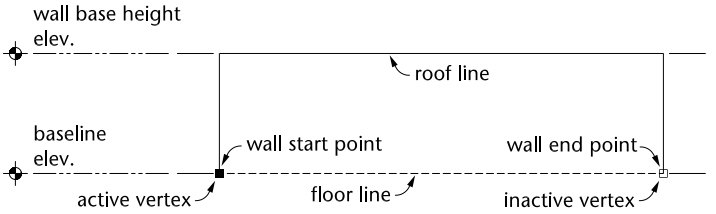
- You edit vertex locations on the roof line to create steps, gables, and other roof conditions.

Modifying the roof line of a wall



- You edit vertex locations on the floor lines to create steps and other floor conditions.

Modifying the floor line of a wall



You can also create nonrectangular roof and floor conditions by projecting to polylines.

Autodesk Architectural Desktop offers multiple methods of editing roof lines and floor lines. You may want to begin by graphically creating a custom roof line or floor line condition. You can then fine-tune that condition by specifying precise values in the Roof/Floor Line worksheet on the Properties palette.

Related Procedures

- Offsetting or Projecting the Roof Line of a Wall
- Offsetting or Projecting the Floor Line of the Wall
- Adding a Gable to the Roof Line of a Wall
- Adding a Step to the Roof Line or Floor Line of a Wall
- Editing the Roof Line or the Floor Line of a Wall
- Reversing the Roof Line or Floor Line of a Wall
- Changing Vertices in the Roof Line or Floor Line of a Wall

Offsetting or Projecting the Roof Line of a Wall

Use this procedure to change the height or the shape of the roof line of a wall:

- Offset the roof line from the current height of the wall.
- Project the roof line of the wall to a polyline.
- Project the roof line of the wall to another object, such as a roof or stairs.

You can also create a polyline that represents the current roof line of the selected walls. You can then use this polyline to change the roof line of other walls.

NOTE To project the roof line to a polyline, draw the polyline first in elevation view. For best results, the polyline should be parallel to the wall. The polyline does not need to be in the same plane as the wall.

1 Select a wall, right-click, and click Roof/Floor Line ➤ Modify Roof Line.

2 Change the roof line of the wall:

If you want to . . .	Then . . .
offset the roof line from the current height of the wall	enter **o** (Offset), and enter an offset distance. Enter a negative value to project the roof line below the current wall height.
project the roof line to a polyline	enter **p** (Project), and select the polyline.
project the roof line to another object, such as a roof or stairs	enter **a** (Auto-project), and select the object to project to. When projecting to stairs, make sure that the bottom riser or the stringer does not create a zero-height segment of wall.
generate a polyline of the current roof line	enter **g** (Generate), and select the walls for the polyline to be created from.
remove any changes to the roof line	enter **r** (Reset), and select the walls to change.

3 Press ENTER.

Offsetting or Projecting the Floor Line of the Wall

Use this procedure to change the height or the shape of the floor line of a wall:

- Offset the floor line from the current baseline of the wall.
- Project the floor line of the wall to a polyline.

- Project the floor line of the wall to another object, such as a floor slab or stairs.

You can also create a polyline that represents the current floor line of the selected walls. You can then use this polyline to change the floor line of other walls.

NOTE To project the floor line to a polyline, draw the polyline first in elevation view. For best results, the polyline should be parallel to the wall. The polyline does not need to be in the same plane as the wall.

1. Select a wall, right-click, and click Roof/Floor Line ➤ Modify Floor Line.
2. Change the floor line of the wall:

If you want to . . .	Then . . .
offset the roof line from the current height of the wall	enter **o** (Offset), and enter an offset distance. Enter a negative value to project the roof line below the current wall height.
project the roof line to a polyline	enter **p** (Project), and select the polyline.
project the roof line to another object, such as a roof or stairs	enter **a** (Auto-project), and select the object to project to. When projecting to stairs, make sure that the bottom riser or the stringer does not create a zero-height segment of wall.
generate a polyline of the current roof line	enter **g** (Generate), and select the walls for the polyline to be created from.
remove any changes to the roof line	enter **r** (Reset), and select the walls to change.

3. Press ENTER.

Adding a Gable to the Roof Line of a Wall

Use this procedure to add a gable to the roof line of a wall. You can also add a gable on the Roof/Floor Line worksheet on the Properties palette.

NOTE This option is available only if the roof line has not been edited. After the roof line changes, you cannot add a gable using this option. To add a gable

to a roof line that has been edited, see "Changing Vertices in the Roof Line or Floor Line of a Wall" on page 1802.

1 Select the wall, right-click, and click Roof/Floor Line ➤ Edit in Place.

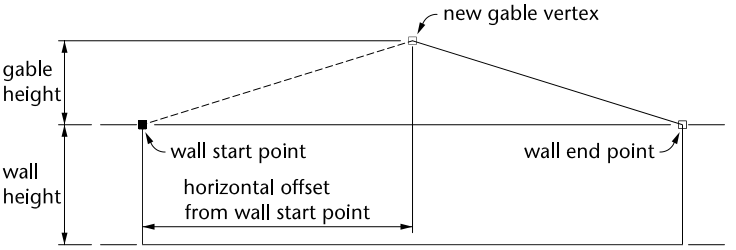
A temporary profile is created for you to edit the geometry of the Roof line.

2 Right-click, and click Add Gable.

If Add Gable is not listed on the menu, the roof line was previously edited.

3 Select the roof line.

Modifying a wall roof line by adding a gable



A third vertex is added to the roof line halfway between the two ends of the roof line and eight feet up from the roof line.

4 Continue editing the roof line or the floor line, if needed.

For more information, see "Editing the Roof Line or the Floor Line of a Wall" on page 1799.

5 Save or discard the changes:

If you want to . . .	Then . . .
restore the roof line to its previous shape	click .
save the changes to the roof line	click .

Adding a Step to the Roof Line or Floor Line of a Wall

Use this procedure to add a step to the roof line or the floor line of a wall. You can also add a step on the Roof/Floor Line worksheet on the Properties palette.

NOTE This option is available only when the roof line or the floor line has not been edited. After the line has been changed, you cannot automatically add a step using this option. To add a step to a roof line or a floor line that has been edited, see "Changing Vertices in the Roof Line or Floor Line of a Wall" on page 1802.

---

1 Select the wall, right-click, and click Roof/Floor Line ➤ Edit in Place.

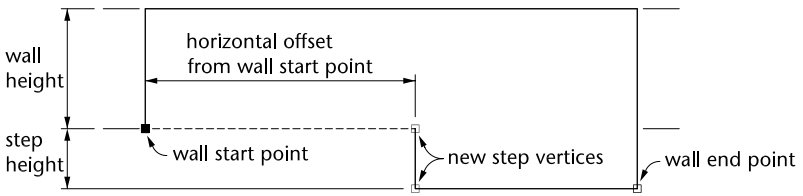
A temporary profile is created for you to edit the geometry of the roof line or the floor line.

2 Right-click, and click Add Step.

If Add Step is not listed on the menu, the roof line or the floor line was previously edited.

3 Select the roof line or the floor line.

Modifying a wall floor line by adding a step



A third vertex is added to the line halfway between the two ends of the line and four feet from the line. A step is created from the selected vertex to the second vertex.

4 Continue editing the roof line or the floor line, if needed.

For more information, see "Editing the Roof Line or the Floor Line of a Wall" on page 1799.

5 Save or discard the changes:

If you want to . . .	Then . . .
restore the roof line or the floor line to its previous shape	click .
save the changes to the roof line or the floor line	click .

Editing the Roof Line or the Floor Line of a Wall

Use this procedure to edit the geometry of the roof line or the floor line of a wall:

- Add, modify, or remove gables.
- Add, modify, or remove steps.
- Project the roof line or the floor line to a polyline or to other objects, such as roofs, roof slabs, slabs, and stairs.
- Create custom roof line or floor line conditions by adding and adjusting vertices and edges.
- Reverse the roof line or the floor line of the wall without reversing the wall itself.
- Remove all changes to the roof line or the floor line of a wall.

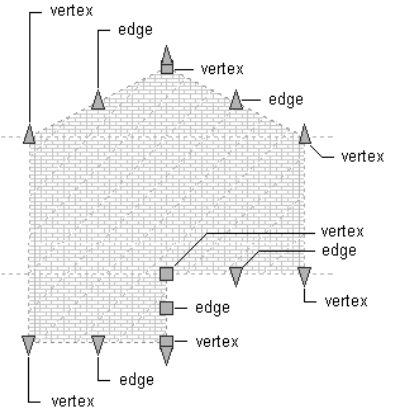
You can also edit the roof line and the floor line on the Roof/Floor Line worksheet on the Properties palette. For more information, see "Changing Vertices in the Roof Line or Floor Line of a Wall" on page 1802.

NOTE If you want to project the roof line or the floor line to a polyline, draw the polyline before you start this procedure.

1 Select the wall that has the roof line or floor line you want to change, right-click, and click Roof/Floor Line ➤ Edit in Place.

A temporary profile is created for you to edit the geometry of the roof line and floor line.

Profile of the roof line and floor line of a wall



NOTE After you perform an editing task from the shortcut menu, you may need to select the profile again to perform another editing task. If you do not see the editing commands that you expect on the menu, select the profile, and right-click to display the shortcut menu.

2 Edit the profile:

If you want to . . .	Then . . .
add a gable to the roof line or the floor line	select the profile, right-click, and click Add Gable. Select the roof line or the floor line.
add a step to the roof line or the floor line	select the profile, right-click, and click Add Step. Select the roof line or the floor line.
change the shape of the roof line or the floor line	select the profile, and use Move Roof Line, Move Floor Line, Vertex, and Edge grips to adjust the shape.
add vertices to the roof line or the floor line	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the roof line or the floor line	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.

If you want to . . .	Then . . .
project the roof line or the floor line to a polyline	select the profile, right-click, and click Project to Polyline. Select the roof line or the floor line, and select the polyline. Press ENTER to keep the geometry, or enter **y** (Yes) to erase it.
project the roof line or the floor line to another object, such as a stair or a roof	select the profile, right-click, and click Auto Project. Select the roof line or the floor line, and select the object.
reverse the roof line or the floor line	select the profile, right-click, and click Reverse. Select the roof line or the floor line.
restore the roof line to the base height of the wall, or restore the floor line to the baseline of the wall	select the profile, right-click, and click Remove. Select the roof line or the floor line.

NOTE To add a gable or a step to a roof line or a floor line that has been edited, first use the Remove option on the shortcut menu to remove an existing roof line or floor line condition.

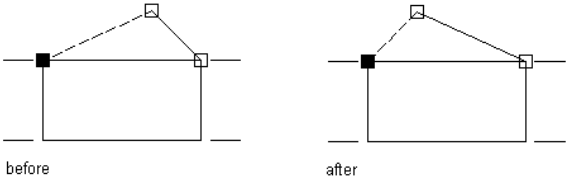
3 Save or discard the changes:

If you want to . . .	Then . . .
restore the roof line and the floor line to their shape before editing	click .
save the changes	click . The wall uses the edited profile to define its geometry.

Reversing the Roof Line or Floor Line of a Wall

Use this procedure to reverse the conditions applied to the roof line or the floor line of a wall. Reversing the roof line or the floor line does not reverse the start point and endpoint of the wall.

Reversing the roof line of a wall



1 Select the wall that has the roof line or floor line you want to change, right-click, and click Roof/Floor Line ➤ Edit in Place.

   A temporary profile is created for you to edit the geometry of the roof line or the floor line.

2 Select the profile, right-click, and click Reverse.

3 Select the roof line or the floor line.

   The selected line is reversed; the condition is applied to the opposite end of the line.

4 Save or discard the changes:

If you want to . . .	Then . . .
restore the roof line and the floor line to their shape before editing	click .
save the changes	click . The wall uses the edited profile to define its geometry.

Changing Vertices in the Roof Line or Floor Line of a Wall

Use this procedure to perform the following tasks on the Roof/Floor Line worksheet on the Properties palette:

- Add, move, or remove vertices in the roof line or the floor line of a wall.
- Add gables or steps to a roof line or steps to a floor line that was previously edited by adding vertices that define these conditions.

You can also edit the roof line and the floor line graphically. For more information, see "Editing the Roof Line or the Floor Line of a Wall" on page 1799.

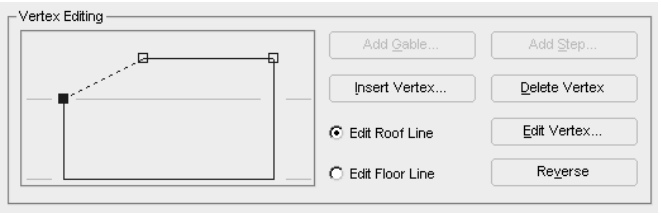
1 Double-click the wall you want to change.

2 Expand Advanced, and expand Worksheets.

3 Select Roof/Floor Line.

4 Select Edit Roof Line, or select Edit Floor Line.

Changing the vertices of a roof line

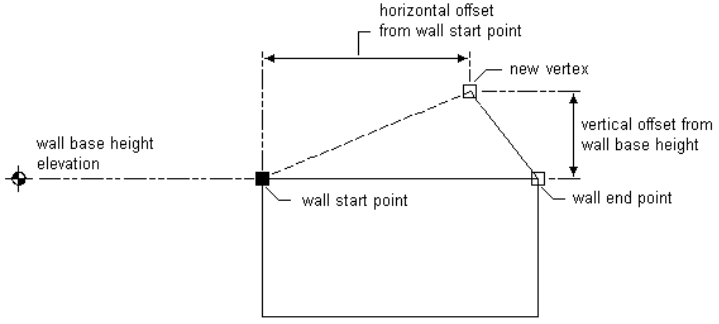


The active vertex in the illustration changes when you select a different line to edit. Any changes you make to the wall are reflected in the illustration.

5 To add a vertex, click Insert Vertex. Specify the horizontal offset and vertical offset for the new vertex and each offset distance, and click OK.

For more information about specifying the location of a vertex, see "Specifying Offsets for Roof Line and Floor Line Vertices" on page 1898.

Modifying a roof line of a wall by adding a vertex



6 To move a vertex, select the vertex from the table or the illustration, and click Edit Vertex. Specify the horizontal offset and vertical offset for the new vertex and each offset distance, and click OK.

For more information about specifying the location of a vertex, see "Specifying Offsets for Roof Line and Floor Line Vertices" on page 1898.

7 To delete a vertex, select a vertex, and click Delete Vertex.

The selected vertex is deleted, and the line automatically connects the two adjacent vertices.

8 To reverse the roof line or the floor line, click Reverse.

9 Click OK.

Specifying the Materials of Individual Walls

Use this procedure to select a different material for components of an individual wall.

To change the materials assigned to all walls of the same wall style, see "Specifying the Materials of a Wall Style" on page 1876.

NOTE If a material assignment does not determine the display properties of a wall component, you can change the properties of the display component as described in "Changing the Display Properties of Individual Walls" on page 1805.

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1 Select the wall you want to change, right-click, and click Edit Object Display.

2 To verify that the material assignment determines the display properties of the component, click the Display Properties tab, select the display representation where you want the changes to appear, and click .

3 Click the Layer/Color/Linetype tab, verify that By Material is selected for the component, and click OK.

4 Click the Materials tab.

5 Select the component you want to change, and select a different material definition.

You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.

---

6 Click OK.

Changing the Display Properties of Individual Walls

In most cases, you want the appearance of walls that belong to the same style to be consistent throughout a drawing. To achieve this, you specify the material assigned to each wall component or you specify the display properties of the walls in each wall style. However, in certain instances, you may need to override a display property for an individual wall to achieve a specific result. All the display properties that you can specify in wall styles are available for individual walls:

- Whether the display properties of wall components are determined by material assignments
- The layer, color, and linetype of the display components of the wall
- The hatching used with each component
- The cut plane height and the display of components relative to the cut plane
- Other specific wall display information, such as whether complex endcaps are displayed and whether the wall is cut around door and window frames

When you change the display properties of an individual wall, the changes apply only to that wall. Other walls of the same style are not affected. To change the display properties of all walls of a specific wall style, see "Wall Styles" on page 1865.

Related Procedures

- Specifying the Layer, Color, and Linetype of a Wall
- Specifying the Hatching for Components of a Wall
- Specifying the Cut Plane Display of a Wall
- Specifying the Display of Other Characteristics of a Wall

Specifying the Layer, Color, and Linetype of a Wall

Use this procedure to change the following display properties of the components of an individual wall:

- Visibility (component is on or off)
- By material (a material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

To change these display properties for all walls of the same wall style, see "Specifying the Display Properties of a Wall Style" on page 1879.

NOTE If a material assignment determines the properties of a wall display component, you can change the properties of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Specifying the Materials of Individual Walls" on page 1804.

1. Select the wall you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Specifying the Hatching for Components of a Wall

Use this procedure to specify the hatching of the components of an individual wall. Wall hatching is displayed only in display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

To change the hatching for all walls of the same wall style, see "Specifying the Hatching for Components of a Wall Style" on page 1881.

NOTE If a material assignment determines the hatching properties of a wall component, you can change the hatching of the component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Specifying the Materials of Individual Walls" on page 1804.

1. Select the wall you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.

3 Select the display representation where you want the changes to appear, and select Object Override.

The display representation in bold is the current display representation.

4 If necessary, click .

5 Click the Hatching tab.

6 Select a component, and click the setting for Pattern.

7 Select the hatching for the component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

8 Click OK.

9 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

10 Click Angle, and enter the angle for the selected pattern.

11 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

12 Click OK twice.

Specifying the Cut Plane Display of a Wall

Use this procedure to specify the properties of one or more cut planes for an individual wall. Cut plane display properties apply only to display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

To better visualize the elements of a wall in plan view, you can create cut planes. The main cut plane is where the shrinkwrap and hatching are applied. The plan display shows the components and objects in the wall as they are displayed at the height of each cut plane.

To change the cut plane display properties for all walls of the same wall style, see "Specifying the Hatching for Components of a Wall Style" on page 1881.

1. Select the wall you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Cut Plane tab.
6. To specify the cut plane where shrinkwrap, component boundaries, and hatching take effect, enter a value for Cut Plane Height.
7. To show the components above and below the cut plane height, select Automatically Choose Above and Below Cut Plane Heights.
8. To specifically define a cut plane, select Manual Above and Below Cut Plane Heights, click Add, and enter the height of the new cut plane.

If you add a cut plane . . .	Then . . .
at a height that is lower than the value for Cut Plane Height	objects are displayed using the properties specified for the Below Cut Plane component on the Layer/Color/Linetype tab.
at a height that is higher than the value for Cut Plane Height	objects are displayed using the properties specified for the Above Cut Plane component on the Layer/Color/Linetype tab.

   You can click Remove to delete a cut plane that you added.

9. Click OK twice.

Specifying the Display of Other Characteristics of a Wall

Use this procedure to specify other display properties for an individual wall, such as whether to display complex endcaps, to show door and window frames, or whether to show the miter of specific wall components. These display properties apply only to display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

To change these display properties for all walls of the same wall style, see "Specifying the Display Properties of a Wall Style" on page 1879.

1. Select the wall you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Other tab.
6. Select the display properties for the wall:

If you want to . . .	Then . . .
display the component lines within the wall above the cut plane (for example, through a window or door in the wall)	select Display Inner Lines Above. Clear this option if you do not want to display these lines.
display the component lines within the wall below the cut plane (for example, through a window or door in the wall)	select Display Inner Lines Below. Clear this option if you do not want to display these lines.
turn off lines above a window, door, or opening at the cut plane	select Hide Lines Below Openings Above Cut Plane. Clear this option if you want to display the lines.
turn off lines beneath a window or an opening at the cut plane	select Hide Lines Below Openings at Cut Plane. Clear this option if you want to display the lines.
display complex endcaps	select Display Endcaps. Clear this option to display complex endcaps as a single line.

If you want to . . .	Then . . .
display door openings cutting the wall at the outer edge of the door frame	select Cut Door Frames. Clear this option if you want door openings to cut the wall at the inside of the door frame.
display window openings cutting the wall at the outer edge of the window frame	select Cut Window Frames. Clear this option if you want window openings to cut the wall at the inside of the window frame.
draw wall components by their priority number to control the display of a component over another component	select Component Draw Order by Priority. Clear this option if you want to draw the components in the order that they were created.
perform a slice of the actual three-dimensional (3D) model at each cut plane to obtain more accurate views of walls with sweeps or body modifiers	select Do True Cut. Clear this option if the wall does not have sweeps or body modifiers, or if they do not change along the height of the wall.
display miter lines at wall corners for selected wall components	select Draw Miter for Components, and select each component whose miter lines you want to display.

7 Click OK twice.

Attaching Notes and Files to a Wall

Use this procedure to enter notes and attach reference files to a wall. You can also edit notes and edit or detach reference files from a wall.

1 Double-click the wall.

2 On the Properties palette, click the Extended Data tab.

3 Click the setting for Notes.

4 Enter the note, and click OK.

5 Click the setting for Reference documents, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click OK.
edit the description of a reference file	select the file, and click the description. Edit the description.

If you want to . . .	Then . . .
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6 Click OK twice.

Specifying the Cleanup of Walls

You can control how walls join and clean up with other walls by using cleanup groups. Walls must be in the same cleanup group to clean up properly. By default, walls belong to the Standard cleanup group. You can create new wall cleanup groups for specific sets of walls. You can assign walls to a cleanup group when you create the walls or after you create the walls.

Within the same cleanup group, the priority of each wall component determines how the wall cleans up with the components of the intersecting wall. You can control wall cleanup with several features designed for this purpose:

- Specifying a cleanup group and cleanup radius in wall tools for adding new walls to a drawing
- Specifying a cleanup group and the cleanup radius for individual walls
- Specifying the priority of each wall component in wall styles or for individual walls
- Specifying cleanup settings that apply to the entire drawing to specify how close together walls must be to join and clean up (Autosnap radius and Cleanup radius)

Related Topics and Procedures

- Cleanup Circles and Wall Graphlines
- Wall Cleanups and Priorities
- Guidelines for Successful Wall Cleanup
- Troubleshooting Wall Cleanups
- Assigning a Different Wall Cleanup Group Definition to Existing Walls
- Specifying Cleanup for Individual Walls
- Overriding the Wall Cleanup Radius
- Overriding Component Priorities
- Cleanup Group Definitions

Cleanup Circles and Wall Graphlines

Cleanup circles and wall graphlines are features of wall objects that are the basis for how Autodesk®Architectural Desktop calculates wall cleanup. These features appear for walls only in the Graph display representation.

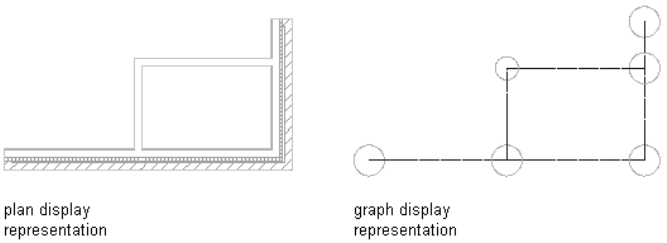
Displaying Cleanup Circles and Wall Graphlines

The Graph display representation shows the cleanup radius and the graphline of walls to help you troubleshoot wall cleanup.

Select a wall, right-click, and click Cleanups ➤ Toggle Wall Graph Display.

Cleanup circles and graphlines appear on all walls in the drawing. In addition, when you select the wall, Cleanup Radius grips are displayed at each cleanup circle. You can move the grip to increase or decrease the cleanup radius. Cleanup circles do not appear if the cleanup radius for the wall is zero.

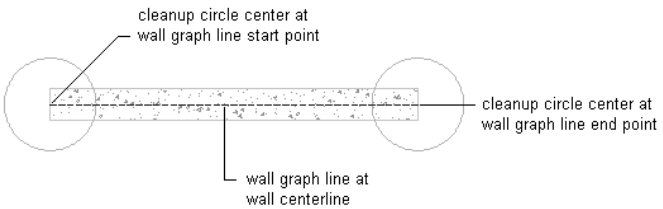
Graph display representation adds cleanup circles and the wall graphline to the display of walls



Cleanup Circles and Wall Graphline

A cleanup circle is located at the start point and the endpoint of each wall segment. The center point of each cleanup circle is the start or endpoint of the wall graphline.

Cleanup circles and wall graphline



The cleanup radius determines the size of the cleanup circle. You can specify a cleanup radius in the wall tools you use to add walls to a drawing. If needed,

you can override the default cleanup radius at each end of a wall segment. This enables you to adjust the cleanup radius for particular wall styles and for individual situations. If the cleanup radius is zero, the cleanup circle is not displayed, and walls must touch to cleanup.

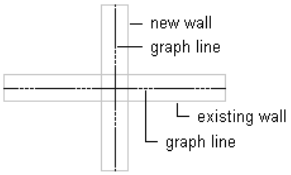
A wall graphline is coincident with the center line of the wall or the wall justification, depending on the cleanup settings specified for the wall.

Wall Cleanup Conditions

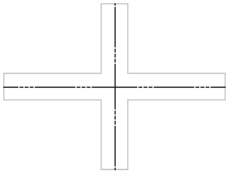
Walls in the same cleanup group cleanup when one of the following conditions applies:

- The cleanup circle of one wall overlaps the center point of the cleanup circle of another wall.
- The cleanup circle of one wall overlaps the wall graphline of another wall.
- The wall graphline of one wall intersects the wall graphline of another wall.

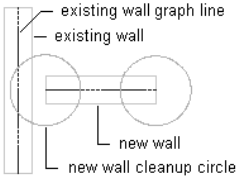
Wall cleanup conditions



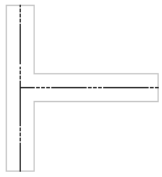
existing and new wall graph lines intersect



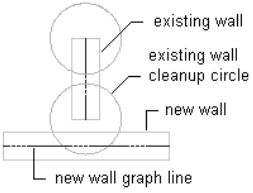
result



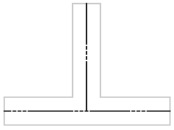
new wall cleanup circle intersects existing wall graph line



result



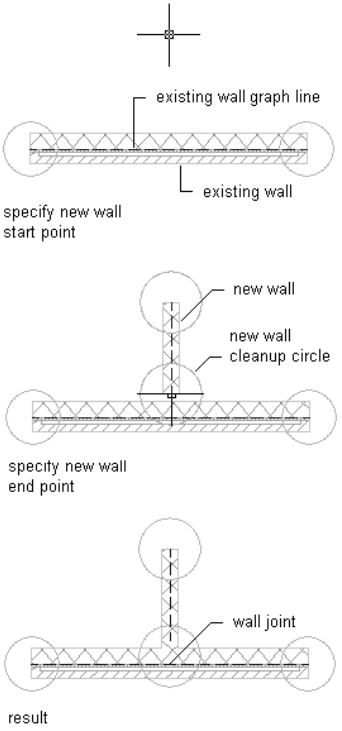
new wall graph line intersects existing wall cleanup circle



result

When walls intersect and clean up properly, a new wall joint is created at the intersection of the wall graphlines. The exact location of the wall joint depends on the location of the new wall segment endpoint. In many cases, the wall joint location does not coincide with the existing wall segment center line. The location of the wall joint is based on a weighted average distance between wall segment endpoints, as well as the thickness of the wall segments.

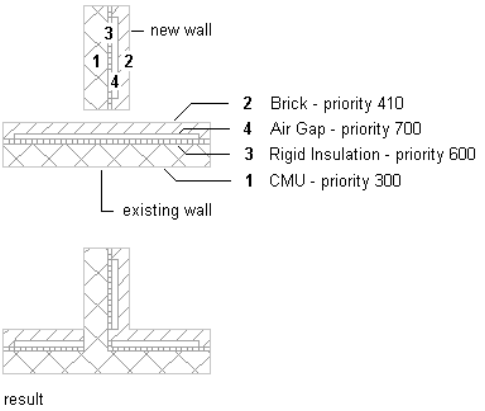
Wall joints and wall graphlines at wall intersections



Wall Cleanups and Priorities

Walls with multiple components clean up based on the priority assigned to each component and the location of each component within the wall. Matching component edges with the same priority are extended or trimmed to their intersection points. Components with a higher priority (a low priority number) cut through components with a lower priority (a high priority number).

Wall cleanup priorities



To identify the default cleanup priorities for the components used in the sample wall styles provided with Autodesk Architectural Desktop, see "Default Cleanup Priorities of Wall Components" on page 1871.

The software calculates and performs wall cleanups in the following sequence:

1. Component information is gathered from the wall graph:
   - Endcaps are calculated. Endcaps that do not fit in the section may also produce a defect marker.
   - Sides of components are combined with endcaps to produce a component profile (like a two-dimensional region).
   - When this profile is self-intersecting, the red defect marker is displayed.
2. Adjacent higher priority components are gathered from the wall graph from neighboring wall segments.
3. Higher-priority component profiles are subtracted from the lower-priority component profiles.
4. Doors, windows, openings, and interferences are cut and/or applied.
5. Shrinkwrap may be calculated and hatching applied.

   A failed shrinkwrap calculation may also result in the defect marker.
6. Graphics are drawn to an output device (for example, the AutoCAD® screen, Object Viewer, Osnap stream, explode stream, and a plotter).
7. Solutions are cached for subsequent draw requests until the wall is modified again.

Guidelines for Successful Wall Cleanup

Red circles that appear in a drawing when using wall cleanups are defect symbols that indicate that cleanup settings or placement of a wall segment are preventing correct cleanup. Here are some recommendations for actions you can take to achieve successful wall cleanup:

- Review the wall cleanup radius settings for each wall segment. A good starting point is to set the wall cleanup radius equal to half of the wall width. However, this may not apply to every situation and you may need to adjust the value to achieve the desired effect.

  NOTE A wall segment must be longer than its cleanup radius.

- Use a smaller cleanup radius. A small cleanup radius also makes the graph display more readable. The length of the cleanup circle radius should be a value that is between one-half the wall width and the wall width.
- Look for very short wall segments. You can find these short segments by turning on the Graph display representation. You can fix them by adjusting the baselines or by increasing the cleanup radius.
- Draw walls with center justification on and use an offset to simulate right or left justification. Using this method, you can draw very short segments and tight wall jogs, provided the appropriate cleanup radius is used.
- Be precise with baselines.

Use the following procedure to verify that the wall segments are inserted at a common *Z* elevation:

1. Freeze all layers except for the designated wall layer.
2. Select all the walls, and double-click one of them.
3. On the Properties palette, expand Basic, and expand Location.
4. Click Additional information.
5. Under Insertion Point, verify that the *Z* value is consistent.

   If *VARIES* is displayed, at least one of the walls is inserted at a different *Z* elevation than the other walls. Change this value to the desired elevation, and click OK.

6. Under Normal, verify that the *Z* value is consistent.

   If walls do not clean up properly, even though the *Z* value for the insertion point is the same for all walls on the Location tab, a wall may be at an angle. This can occur when the normal *Z* value varies. You can use the Properties window to see both the start and endpoint *Z* values of the

selected walls. In the Properties window, an entry is left blank when the values vary.

Assigning a Different Wall Cleanup Group Definition to Existing Walls

Use this procedure to change the wall cleanup group assigned to existing walls. Assigning different cleanup groups is useful when you want to prevent two walls from cleaning up with each other. To create a new cleanup group, see "Cleanup Group Definitions" on page 1826.

1. Select the walls to change, and double-click one of them.
2. Expand Basic, and expand General.
3. Select a cleanup group for Cleanup group definition.

Specifying Cleanup for Individual Walls

Use this procedure to specify the following cleanup settings for one or more walls:

- Whether the wall cleans up with other walls
- The cleanup group for the wall
- Whether the graphline position corresponds to the center line of the wall or to the wall justification
- The cleanup radius for both ends of the wall, or separate values for the start and endpoints of the wall

1. Select the walls you want to change, and double-click one of them.
2. Expand Basic, and expand General.
3. Turn wall cleanup on or off:

If you want to . . .	Then . . .
turn off wall cleanup so that the walls do not clean up with any other walls	select No for Cleanup automatically. If you select this option, you do not need to specify other settings.
turn on wall cleanup and specify cleanup settings	select Yes for Cleanup automatically, and proceed to step 4.

4. Select a cleanup group definition.

   The walls will clean up with other walls that also belong to the cleanup group definition that you select.

5 Expand Advanced, expand Cleanups, and expand Cleanup Radius Overrides.

6 For Graphline position, select the line that the Graph display representation uses to represent the graphline of the walls: the center line of the wall or the wall justification.

7 Specify the cleanup radius for the walls:

If you want to . . .	Then . . .
specify the same cleanup radius for the start and endpoints of the walls	enter a value for Cleanup radius, and verify that No is selected for Override start cleanup radius and Override end cleanup radius.
specify a cleanup radius for the start point of the walls	select Yes for Override start cleanup radius, and enter a value for Start cleanup radius.
specify a cleanup radius for the endpoint of the walls	select Yes for Override end cleanup radius, and enter a value for End cleanup radius.

Start and End are based on the direction the wall was drawn. If you enter zero for any cleanup radius, the wall graphlines need to touch for the walls to clean up with other walls.

Changing the Position of the Wall Graphline

Use this procedure to specify the line used to represent the wall graphline for wall cleanups: the center line of the wall or the wall justification. The wall graphline appears only when the Graph display representation is turned on. The graphline you select does not affect the justification of the wall. However, it does affect how the wall cleans up with other walls.

1 If the wall graphline is not displayed, select a wall, right-click, and click Cleanups ➤ Toggle Wall Graph Display.

2 Select the wall you want to change, right-click, and click Edit Graphline Position.

Displaying the Graphline Position grip

3 Select the grip that corresponds to the graphline you want.

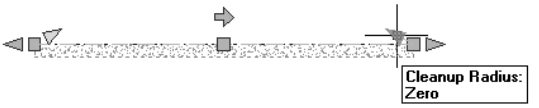
Changing the wall graphline to the center line

Overriding the Wall Cleanup Radius

Use this procedure to override the default wall cleanup radius at one end of a wall. You can also override the cleanup radius on the Properties palette and using the shortcut menu for the selected wall.

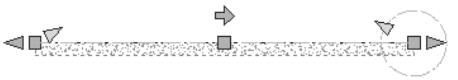
1 If the wall graphline is not displayed, select a wall, right-click, and click Cleanups ➤ Toggle Wall Graph Display.

Cleanup radius grip



2 Select a cleanup radius grip, and move the grip until the dimension you want is displayed.

Changing the cleanup radius at one end of a wall



Overriding Component Priorities

Use this procedure to change the priority of a wall component so that when it intersects with another wall, it has higher or lower priority than its counterpart on the other wall. The lower the priority number you enter, the higher the priority of the component when the wall intersects with another wall.

For the list of default priorities of the wall components used in sample wall styles provided with Autodesk® Architectural Desktop, see "Default Cleanup Priorities of Wall Components" on page 1871.

1 Double-click the wall you want to change.
2 Expand Advanced, and expand Style Overrides.
3 Click the setting for Priority overrides.
4 Add or edit a priority override for a wall component:

If you want to . . .	Then . . .
add a new priority override	click , and proceed to step 5.
edit a priority override	proceed to step 5.
delete a priority override	select the priority override you want to delete, and click .

5 Specify the override settings:

If you want to . . .	Then . . .
change the component to which you assigned the override	select a different component.
specify a priority override at the start of the wall	select the component, select At start of wall, and enter a value for Priority.
specify a priority override at the end of the wall	select the component, select At end of wall, and enter a value for Priority.
change the priority of an existing override	select the value for Priority, and enter a new value.

6 Click OK.

Troubleshooting Wall Cleanups

This topic answers common questions associated with wall cleanups.

- Why do some short walls display the defect marker?
- Why do some walls that are close together display the defect marker?
- While using small cleanup radii, wall joints clean up incorrectly or not at all. How can I fix this?
- When I try to copy or move doors, windows, and openings from one wall to another, the command doesn't always work. Why?

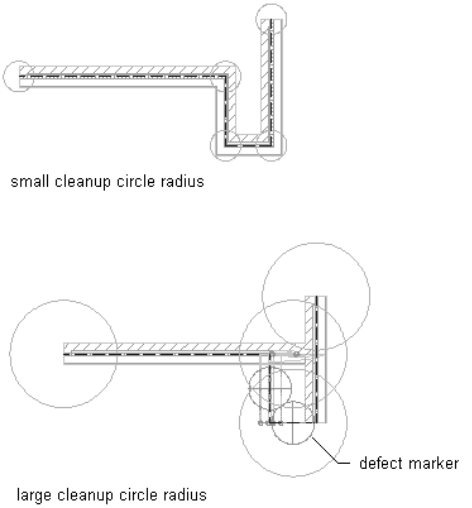
- When I closed my drawing, all the wall cleanups looked fine. Now when I open the drawing, there are defect markers in the drawing. What causes this, and how can I fix it?
- When I work with drawings that were created Release 1 or Release 2 of Autodesk®Architectural Desktop, some walls no longer clean up correctly. Why?
- How can I get walls to clean up with walls in xref drawings?
- My xref drawing contains copies of walls that are in my host drawing. How did this happen?
- I added a wall in an xref drawing and then added a door to the wall. The door does not center correctly. What causes this, and how I can correct it?

Why do some short walls display the defect marker?

The cleanup radius is too large. Reduce the cleanup radius of all walls at the wall graph joint, or adjust the baselines so that the ends of all graphlines fall within the wall graph joint radii.

NOTE This situation can also occur if a door, window, opening, or door/window assembly is placed too close to the end of the wall and the wall or the objects in it use elaborate endcaps. In such cases, there may not be enough room for these conditions to be drawn correctly.

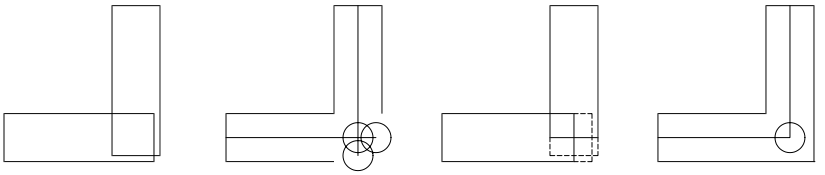
Varying wall circle cleanup radii



Why do some walls that are close together display the defect marker?

The cleanup radius is too large. Reduce the cleanup radius of all walls at the wall graph joint, or adjust the baselines so that the ends of all graphlines fall within the wall graph joint radii.

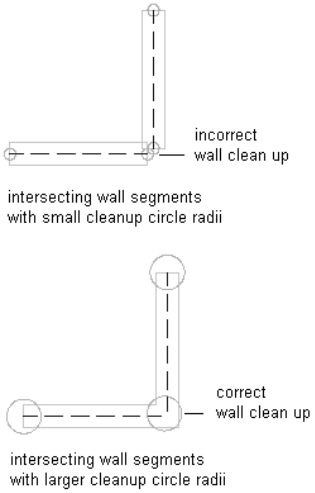
Adjusting wall segment lengths for correct clean up



While using small cleanup radii, wall joints clean up incorrectly or not at all. How can I fix this?

Turn on the Graph display representation and adjust the baselines or increase the cleanup radii until the problem is fixed. Also, make sure that there are no short wall segments in the wall. These can occur where center lines intersect, or when a segment is too short to produce a full profile. Delete the short wall segment to fix the cleanup problem.

Adjusting wall cleanup circle radii for correct clean up



When I try to copy or move doors, windows, and openings from one wall to another, the command doesn't always work. Why?

This situation can occur if the cleanup group for the destination wall does not allow objects from walls assigned to other cleanup groups to be copied to this wall. This design rule is intended to prevent placing objects in walls, such as cubicle partitions, that should not have objects added to them.

You can address this situation in two ways:

- Turn off this design rule in the cleanup group definition. For more information, see "Creating a Wall Cleanup Group Definition" on page 1827.
- Temporarily assign the walls to the same cleanup group, copy or move the objects, and then reassign the walls to their correct cleanup groups.

When I closed my drawing, all the wall cleanups looked fine. Now when I open the drawing, there are defect markers in the drawing. What causes this, and how can I fix it?

Under some circumstances, the order in which walls are cleaned up affects the display.

When troubleshooting this condition, select the walls in question, and double-click one of them. In the Properties palette, select No for Cleanup automatically, and then select Yes. Try this on different walls to see whether you can locate the unstable wall. Usually, adjusting the baseline of the unstable wall fixes this problem. For more information about verifying baselines, see "Guidelines for Successful Wall Cleanup" on page 1817.

When I work with drawings that were created Release 1 or Release 2 of Autodesk® Architectural Desktop, some walls no longer clean up correctly. Why?

This situation can occur because walls in earlier releases of the software always used the center line as the wall graphline while in the current release, you can use the center line or the wall justification for the wall graphline. If the cleanup radius for walls is zero, walls that are not center-justified may not clean up correctly.

You can correct this situation by changing the wall graphline so that all walls use the same graphline. For more information, see "Changing the Position of the Wall Graphline" on page 1819.

How can I get walls to clean up with walls in xref drawings?

There are several actions you can take to improve wall cleanup when you work with xref drawings that contain walls:

- Verify the design rules of the cleanup groups used in the xref drawings. If the cleanup group in the xref drawing does not allow cleanup with the walls in the host drawing, walls in the two drawings do not clean up, even when their cleanup groups have the same name. For more information about the design rules of cleanup groups, see "Creating a Wall Cleanup Group Definition" on page 1827.
- When adding new walls during a RefEdit session, add the existing walls to the current working set. Select the Xref cleanup group of the existing walls for the walls you are adding. Otherwise, the new walls do not clean up with the existing walls until you save changes to the drawings.
- Use the **Regenall** (Regenerate All) and **ObjRelUpdate** (Object Relationship Update) commands to update the relationships among walls in the drawing, especially if you move or transform walls involving xref drawings, or if you undo edits to walls in an xref drawing.
- For more information about xref drawings and wall cleanup, see additional troubleshooting topics in "Troubleshooting Wall Cleanups" on page 1821.

My xref drawing contains copies of walls that are in my host drawing. How did this happen?

If you added objects, such as doors or windows, to a wall in the host drawing while you had a Refedit session open for an xref drawing, a copy of the selected wall is added to the xref drawing. This occurs because any objects added during a Refedit session are always added to the xref drawing and not to the host drawing. Because the object you added was anchored to a wall, the wall is also added to the xref drawing.

To correct the drawings, review both the host drawing and the xref drawing for duplicate objects. Remove the duplicates from the incorrect drawing files. Allowing the duplicates to remain can create problems with the cutting of walls around doors, windows, door/window assemblies, and openings. Hidden line and shaded views are also affected.

To avoid creating duplicate objects in xref drawings, do not add or edit objects in the host drawing when a Refedit session is open for an xref drawing. Also, instead of opening a Refedit session, you can open the xref itself, and make edits directly. You can then save the xref drawing, and reload the updated drawing in the host drawing.

I added a wall in an xref drawing and then added a door to the wall. The door does not center correctly. What causes this, and how I can correct it?

Some changes that you make during Refedit sessions of xref drawings do not take effect until you save the changes to the xref drawing. When you add

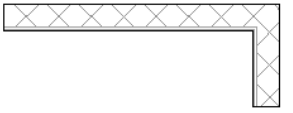
doors, windows, door/window assemblies, and openings to a new wall in an xref drawing, their placement is affected by whether the new wall cleans up with other walls in the drawing. Clean up does not occur between walls in xref and host drawings until you save the changes in the Refedit session.

For best results, if you add walls during a Refedit session, save and close the session before adding objects to those walls. Open a new Refedit session (or open the xref drawing directly, outside of the host drawing), verify that the walls clean up as you intend them to, and then add objects to the walls.

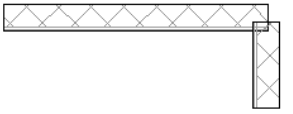
Cleanup Group Definitions

A wall cleanup group definition is a designation that you can assign to wall styles and individual walls to control how intersecting walls clean up. Walls that belong to the same cleanup group clean up where they intersect according to the priority assigned to each component in each wall. Walls that belong to different cleanup groups do not clean up when they meet at corners or intersections.

Walls that do and do not clean up



wall segments clean up at intersection



wall segments do not clean up at intersection

Controlling Wall Cleanup through Design Rules

You use the design rules of a cleanup group definition to determine how walls assigned that cleanup group cleanup when you Xref them in other drawings. The setting for this design rule in the cleanup group definition in the xref drawing controls whether those walls clean up with walls in the host drawing.

Design rules also determine whether you can move or copy objects from walls assigned to other groups to walls assigned to the current cleanup group. Preventing copying or moving objects to walls in a certain cleanup group helps you avoid inadvertently placing objects in walls that should not contain them.

Managing Cleanup Group Definitions

To create, edit, copy, or purge cleanup group definitions, you access the Style Manager. The Style Manager provides a central location in Autodesk®Architectural Desktop where you can work with definitions and styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager".

Related Procedures

- Creating a Wall Cleanup Group Definition
- Attaching Notes and Files to a Wall Cleanup Group Definition

Creating a Wall Cleanup Group Definition

Use this procedure to create a wall cleanup group definition. A cleanup group definition must exist in the drawing before you can assign walls and wall styles to the cleanup group.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Architectural Objects, and expand Wall Cleanup Group Definitions.
3. Create a cleanup group definition:

If you want to . . .	Then . . .
create a cleanup group definition with default properties	right-click Wall Cleanup Group Definitions, and click New.
create a cleanup group definition from an existing definition	right-click the cleanup group definition you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new cleanup group definition, and press ENTER.
5. Right-click the new cleanup group definition, and click Edit.
6. Click the General tab, and enter a description of the cleanup group.
7. Click the Design Rules tab.

8 Specify the design rules:

If you want to . . .	Then . . .
allow walls assigned to this cleanup group to clean up with walls in a host drawing when the current drawing is inserted as an Xref	Select Allow wall cleanup between host and xref drawings. Clear this option if you do not want the walls to cleanup with walls in the host drawing. **NOTE** The cleanup group definition in the xref drawing controls cleanup with walls in the host drawing.
allow objects anchored to walls assigned to other cleanup groups to be moved or copied to walls assigned to this cleanup group	Select Allow objects anchored to walls in other cleanup groups to be moved or copied to walls in this cleanup group. Clear this option if you do not want objects anchored to walls in other cleanup groups to be moved or copied to walls assigned to this cleanup group.

9 Click OK twice.

If you want to add notes, files, or documents to a cleanup group definition, see "Attaching Notes and Files to a Wall Cleanup Group Definition" on page 1828.

Attaching Notes and Files to a Wall Cleanup Group Definition

Use this procedure to enter notes and attach reference files to a cleanup group definition. You can also edit notes and edit or detach reference files attached to the definition.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Architectural Objects, and expand Wall Cleanup Group Definitions.

3 Select the cleanup group definition that you want to change, right-click, and click Edit.

4 Click the General tab.

5 To add a description to the cleanup group definition, enter it for Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK twice.

Adding Objects to Walls

When you add doors, windows, window assemblies, and openings to a wall, the wall automatically adjusts to accommodate the object and adds endcaps where needed. By default, these objects are anchored to the wall. The objects remain with the wall if you move it. If you remove an object from a wall, the wall repairs itself in the space where the object was located. You can control how the objects are anchored to the start or the end of a wall, within the wall width, and vertically.

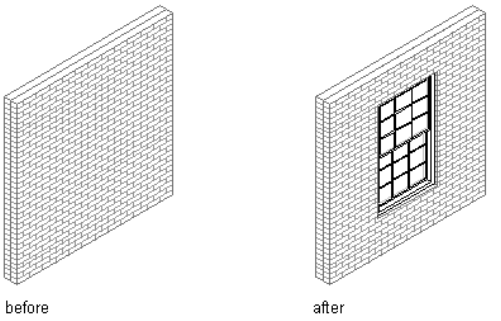
Related Procedures

- Adding a Window to a Wall
- Adding an Opening to a Wall
- Adding a Door to a Wall
- Adding a Door/Window Assembly to a Wall
- Removing Windows, Openings, Doors, or Door/Window Assemblies from a Wall
- Anchoring an Object to a Wall
- Detaching Objects from a Wall

Adding a Window to a Wall

Use this procedure to place one or more windows in a wall.

Inserting a window in a wall



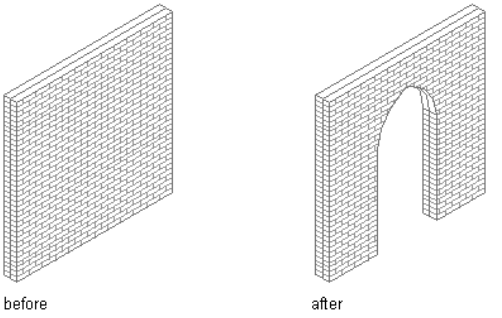
1. Select a wall, right-click, and click Insert ➤ Window.
2. Specify the settings for the window.

   For more information about adding windows, see "Creating a Window with User-Specified Settings" on page 1905.
3. Specify an insertion point along the wall.
4. Continue to place windows in the wall, and press ENTER.

Adding an Opening to a Wall

Use this procedure to place one or more openings in a wall.

Inserting an opening in a wall



1. Select a wall, right-click, and click Insert ➤ Opening.
2. Specify the settings for the opening.

   For more information about adding openings, see "Creating an Opening with User-specified Settings" on page 1278.

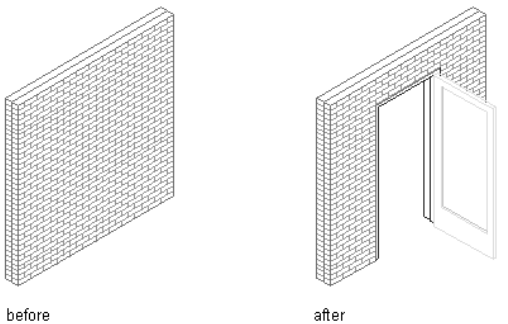
3 Specify an insertion point along the wall.

4 Continue to place openings in the wall, and press ENTER.

Adding a Door to a Wall

Use this procedure to place one or more doors in a wall.

Inserting a door in a wall



1 Select a wall, right-click, and click Insert ➤ Door.

2 Specify the settings for the door.

For more information about adding doors, see "Creating a Door" on page 1004.

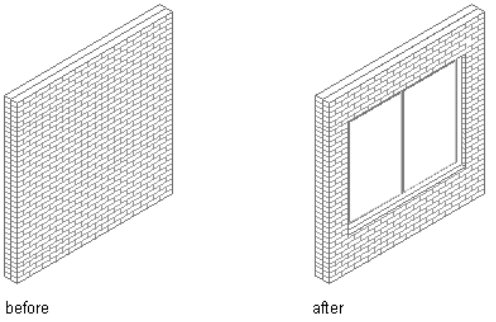
3 Specify an insertion point along the wall.

4 Continue to place doors in the wall, and press ENTER.

Adding a Door/Window Assembly to a Wall

Use this procedure to place one or more door/window assemblies in a wall.

Inserting a door/window assembly in a wall



1. Select a wall, right-click, and click Insert ➤ Door/Window Assembly.
2. Specify the settings for the door/window assembly.
3. Specify an insertion point along the wall.
4. Continue to place door/window assemblies in the wall, and press ENTER.

Removing Windows, Openings, Doors, or Door/Window Assemblies from a Wall

Select the objects you want remove from the wall, and press DELETE. The wall repairs itself where the objects were located.

Anchoring an Object to a Wall

Use this procedure to move objects to a different wall by anchoring the objects.

An anchored object is constrained by the wall. You can move the object along the wall, but the object does not move from the wall unless you detach the object. Objects anchored to walls follow connected wall segments.

The center of the bottom face of the object is anchored to the insertion point on the bottom face of the wall, which is midway in the wall width.

NOTE By default, doors, openings, windows, and window assemblies are anchored to the walls these objects are added to.

---

1. Select the object to attach to the wall, right-click, and click Wall Anchor ➤ Set Wall.
2. Select the wall to attach the object to.

Detaching Objects from a Wall

Use this procedure to detach an object that is anchored to a wall. When you detach an object, the object is no longer constrained by the wall and can be moved off the wall.

- Select the object to release from the wall, right-click, and click Wall Anchor ➤ Release.

  The object remains in place but is no longer constrained to the wall. The wall no longer cleans up around the object.

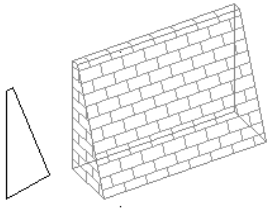
Creating Special Conditions and Customized Wall Surfaces

Wall sweeps, wall (plan) modifiers, body modifiers, and interference conditions are features that you can use to create special conditions, such as chases, and to customize wall surfaces.

Wall Sweeps Created from Profiles

A wall sweep is a wall or a wall component whose shape is extruded horizontally from a profile that was created from a closed polyline. The profile "sweeps" along the length of the wall to define the shape of the wall or the wall component.

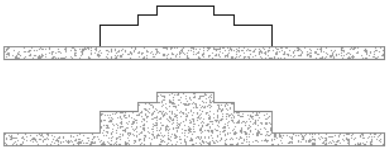
Profile and resulting wall sweep



Wall (Plan) Modifiers Created from Polylines

Wall modifiers use the two-dimensional (2D) geometry of an open polyline to customize the shape of a wall or a wall component. To use wall modifiers, you draw a polyline in the shape you need and create a wall modifier style from the polyline. You can then add wall modifiers of that style to any wall.

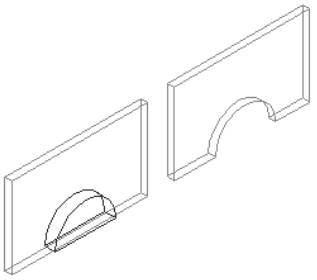
Polyline and resulting wall modifier



Body Modifiers Created from 3D Objects

Body modifiers use the three-dimensional (3D) geometry of an object, such as a mass element or a mass group, to add to, subtract from, or completely replace one component in a wall. If the wall has only one component, the body modifier applies to the entire wall. If the wall has multiple components, the modifier applies only to the component that you specify.

Barrel Vault mass element and resulting body modifier subtracted from a wall



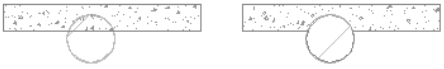
Interference Conditions Created from 3D Objects

Interference conditions use the geometry of 3D objects to create custom openings or cutouts in walls. You can specify how the interference condition is applied to the wall: added to the wall, subtracted to the wall, or ignored.

Interference conditions apply to all wall components that the interfering object touches. The wall stops at the interference condition. The way in which you apply the interference condition to the wall determines how the shrinkwrapping of the wall is affected by the condition in plan view. In model views, the interference condition is always subtractive, regardless of the shrinkwrapping option you selected.

When you edit the object that acts as the interference condition, the wall changes to accommodate the changes to the geometry of the object. For example, you can move the interfering object to change its location on the wall.

A Cylinder mass element added as an additive interference condition



Related Topics

- Working with Wall Sweeps
- Working with Wall Modifiers
- Working with Body Modifiers
- Working with Interference Conditions

Working with Wall Sweeps

A wall sweep is a wall or a wall component whose shape is extruded horizontally from a profile that was created from a closed polyline. The profile "sweeps" along the length of the wall to define the shape of the wall.

The height and the width of the polyline you use to create the profile define the height and the width of the wall component.The profile is not scaled when swept on the wall. The insertion point of the profile becomes the lower-left corner of the wall component.

After you create wall sweeps, you can miter wall sweeps that meet at a corner. You can also change how the sweep is applied to the wall:

- You can edit the geometry that defines a sweep.
- You can assign a sweep profile to a different wall component.
- You can adjust the miter angles at each end of a wall that has a sweep profile.
- You can remove a sweep profile from a wall or a wall component.

Related Procedures

- Creating a Profile for a Wall Sweep
- Adding a Sweep to a Wall
- Editing the Geometry of a Wall Sweep
- Mitering Walls with Sweeps
- Managing Wall Sweeps

Creating a Profile for a Wall Sweep

Use this procedure to create a profile from a closed polyline. You can then sweep the profile along the length of a wall or a wall component to create a wall with a custom shape.

The height and the width of the polyline you use to create the profile define the height and the width of the wall component. The profile is not scaled when swept on the wall. The insertion point of the profile becomes the lower-left corner of the wall component.

You can also define the shape of a wall sweep as you add it to a wall, using the Start from Scratch option. You may find that option easier to use because you can define the shape in place on the wall. You may want to separately create a profile as described in this procedure if the shape is highly complex or contains many arcs.

1. Draw a closed polyline of the shape needed for the resulting wall component.
2. Select the polyline, right-click, and click Convert to ➤ Profile Definition.
3. Specify the insertion point of the profile.

   The point you specify becomes the lower-left corner of the wall component.

4. Press ENTER.
5. Enter a name for the profile, and click OK.

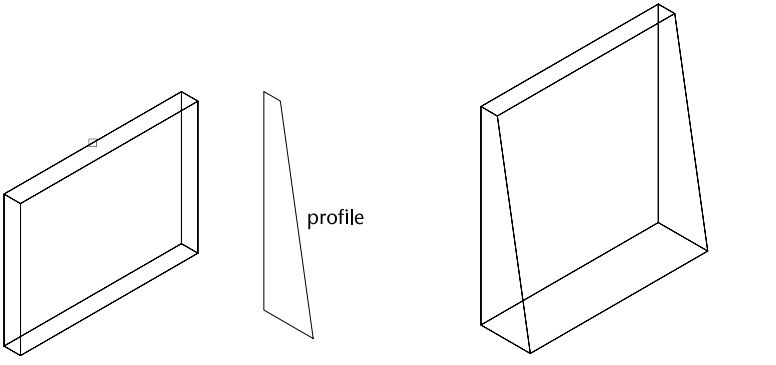
   You can now use the profile as a wall sweep to replace a wall component. For more information, see "Adding a Sweep to a Wall" on page 1836.

Adding a Sweep to a Wall

Use this procedure to create a custom wall or a wall component by defining its shape from a profile.

You can create the profile as you add it to a wall. However, if the shape you need is elaborate and has curved segments, you may find it easier to create the profile from a polyline first. You can then add the profile to the wall. For more information, see "Creating a Profile for a Wall Sweep" on page 1836.

Adding a sweep profile to a wall



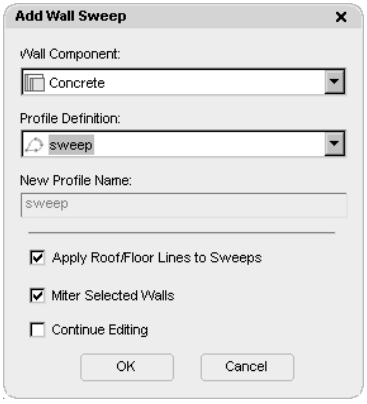
1 Select the walls to sweep, right-click, and click Sweeps ➤ Add.

2 Select the component to which to apply the sweep.

3 Select the profile to use for the sweep.

If you want to define the sweep after you apply it to the component, select Start from scratch, and enter a name for the profile.

Specifying settings for a wall sweep



4 Specify how the sweep is applied to the wall:

If you want to . . .	Then . . .
apply existing roof line or floor line conditions to the sweep	select Apply Roof/Floor Lines to Sweeps.

If you want to . . .	Then . . .
use the geometry of the sweep to define the roof line and the floor line	clear Apply Roof/Floor Lines to Sweeps.
miter the intersection of the wall containing the sweep and other walls	select Miter Selected Walls.
prevent mitering the intersection of the wall containing the sweep and other walls	clear Miter Selected Walls. You can miter the walls later, if needed. You can also adjust the miter angles.
change the geometry of the sweep when it is applied to the wall	select Continue Editing. For more information about editing the profile, see "Editing the Geometry of a Wall Sweep" on page 1838.
use the existing geometry of the profile to define the sweep	clear Continue Editing.

5 Click OK.

TIP To create additional walls with the same sweep condition, select the wall with the sweep, right-click, and click Add Selected. Add walls with the sweep condition where you need them in the drawing.

Editing the Geometry of a Wall Sweep

Use this procedure to change the shape of a wall component that was defined with a wall sweep. You can select a different profile to change the appearance of the sweep, or you can edit the current profile.

If you want to remove a wall sweep, apply the sweep to a different wall component, or change how the sweep cleans up with intersecting walls, see "Managing Wall Sweeps" on page 1840.

1 Select the wall that has the sweep you want to change, right-click, and click Sweeps ➤ Edit Profile in Place.

2 Select a location on the wall where the shape of the sweep will be convenient to edit.

A temporary profile is created for you to edit the geometry of the sweep.

NOTE After you perform an editing task from the shortcut menu, you may need to select the profile again to perform another editing task. If you do not

see the editing commands that you expect on the shortcut menu, select the profile, and right-click to display the shortcut menu.

3 Edit the profile:

If you want to . . .	Then . . .
change the location of the sweep	select the Insertion Point grip, and move it to the desired position.
change the shape of the perimeter of the profile or its rings	select the profile, and use grips to adjust the shape.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace an existing ring of the profile with new geometry	select the profile, right-click, and click Replace Ring. Select the ring to replace, and select the new geometry. Press ENTER to keep the geometry, or enter **n** (No) to erase it.
add a ring to the profile to subtract an area from the profile	draw the linework in place on the temporary profile. Select the profile, right-click, and click Add Ring. Select the geometry to define the ring. Press ENTER to keep the geometry, or enter **y** (Yes) to erase it.
remove a ring from the profile	select the profile, right-click, and click Remove Ring. Select the ring to remove, and press ENTER. This option does not appear if the profile has only one ring.

4 Save or discard the changes:

If you want to . . .	Then . . .
restore the sweep to its original shape	click .

If you want to . . .	Then . . .
save the changes to the current profile	click . The sweep uses the edited profile to define its geometry. Any other objects or styles that use this profile are also updated with the edited geometry.
save the changes to a new profile	select the profile, right-click, and click Save as New Profile. Enter a name for the new profile, and click OK. The sweep uses the new profile to define its geometry. Other styles or objects that use the original profile are not affected.

Mitering Walls with Sweeps

Use this procedure to miter intersecting walls whose shape is defined by a wall sweep.

NOTE If you miter the end of walls, no endcaps are drawn.

1. Select a wall with a sweep that you want to miter, right-click, and click Sweeps ➤ Miter.
2. Select the second wall.

To adjust the angles of the mitered walls, see "Managing Wall Sweeps" on page 1840.

Managing Wall Sweeps

Use this procedure to edit or remove a wall sweep from an individual wall. You can change the component the sweep is applied to. You can also change the miter angles at each end of the sweep and the offsets in the wall.

1. Double-click the wall you want to change.
2. On the Properties palette, expand Advanced, and expand Worksheets.
3. Select the setting for Sweeps.

4 Select a wall sweep, and change its settings:

If you want to . . .	Then . . .
change the profile used to define the geometry of the sweep	select a different profile for Profile.
apply the sweep to a different wall component	select a different component for Component.
change the miter angles at each end of the wall	enter different values for Start Miter and End Miter.
offset the sweep within the wall	enter a value for Offset Within.
vertically offset the sweep	enter a value for Offset Vertical.
delete the sweep from the wall component	click .

5 Click OK.

Working with Wall Modifiers

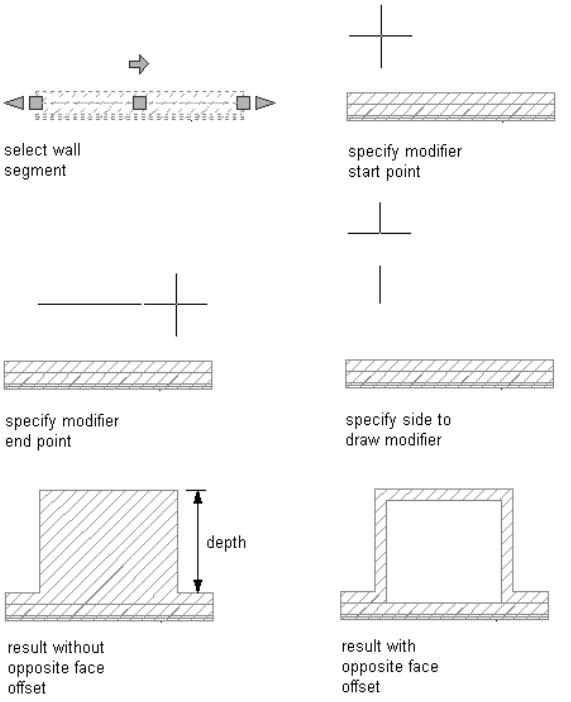
Wall modifiers (also called plan modifiers) use the two-dimensional (2D) geometry of an open polyline to customize the shape of a wall or a wall component. To use wall modifiers, you draw a polyline in the shape you need and create a wall modifier style from the polyline. You can then add wall modifiers of that style to any wall. A wall can have more than one wall modifier attached to it.

Placing a Wall Modifier on a Wall

You specify the placement of a wall modifier, including its vertical and horizontal position and its depth. The wall modifier can be added at the drawn size of the polyline or scaled to a specific size. The wall modifier is then extruded vertically along the wall surface.

You can add the wall modifier to one or both sides of the wall. When you select the face, you can also offset the wall modifier from the opposite face to create a bump-out, such as for pipe chases or interior columns.

Applying wall modifiers to a wall



Editing a Wall Modifier

After placing a wall modifier, you can adjust its placement, or assign the modifier to a different wall component. You can also edit the geometry of the wall modifier, and save the changes to the current wall modifier style or to a new style.

Display Properties and Materials for Wall Modifiers

Wall modifiers take on the material assignment and the display properties of the wall component they are assigned to. This enables you to use the same wall modifier on different types of walls.

Wall Modifier Styles

You save the geometry of a wall modifier as a wall modifier style. You can create the style when you add the wall modifier to a wall. You can also create a wall modifier first and then apply it to walls as needed.

To create, edit, copy, or purge wall modifier styles, you access the Style Manager. The Style Manager provides a central location in Autodesk® Architectural Desktop to work with styles from multiple drawings and templates. For

more information about using the Style Manager, see “Style Manager” on page 531.

Related Topics and Procedures

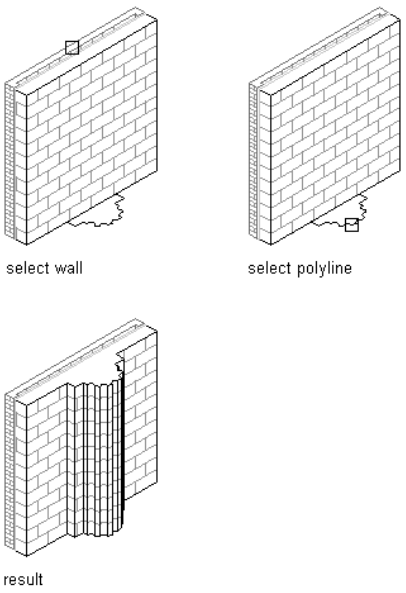
- Converting a Polyline to a Wall Modifier
- Adding an Existing Wall Modifier to a Wall
- Editing the Geometry of a Wall Modifier
- Changing the Horizontal and Vertical Offsets of a Wall Modifier
- Adjusting the Placement of a Wall Modifier
- Removing Wall Modifiers
- Creating a Wall Modifier Style
- Attaching Notes or Files to a Wall Modifier Style

Converting a Polyline to a Wall Modifier

Use this procedure to create a wall modifier from an open polyline. You can draw the polyline in the location for the wall modifier, or you can project the modifier you create to the wall. The polyline cannot be closed.

The wall modifier you create is added to the selected wall and is also saved as a wall modifier style that you can apply to other walls.

Converting a polyline to a wall modifier

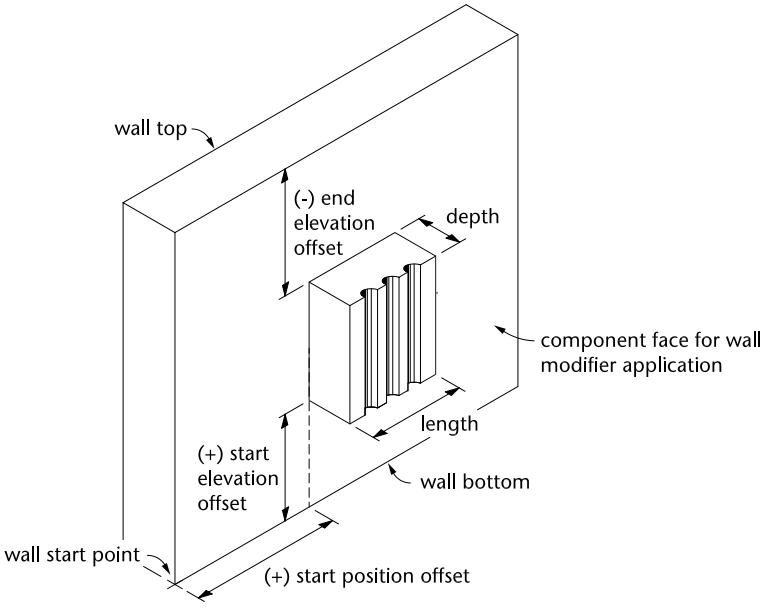


1. Draw the polyline in the shape of the wall modifier.
2. Select a wall to which you want to apply a wall modifier, right-click, and click Plan Modifiers ➤ Convert Polyline to Wall Modifier.
3. Select the polyline.
4. Enter **y** (Yes) to erase the selected polyline, or enter **n** (No) to keep the polyline in the drawing.
5. Enter a name for the wall modifier style created from the polyline, and click OK.
6. Select the wall component to which the wall modifier applies.
7. To offset the opposite face of the selected component in the shape of the wall modifier, select Offset Opposite Face.
8. Specify the vertical position of the modifier on the wall component:

If you want to . . .	Then . . .
specify the beginning height of the wall modifier	enter a value for Start Elevation Offset, and specify whether the offset occurs from the wall top, the wall base height, the wall baseline, or the wall bottom.
specifying the ending height of the wall modifier	enter a value for End Elevation Offset, and specify whether the offset occurs from the wall top, the wall base height, the wall baseline, or the wall bottom.

Enter a negative offset value to specify a location toward the ground.

Placing a wall modifier offset from the wall start point, the wall bottom, and the wall top

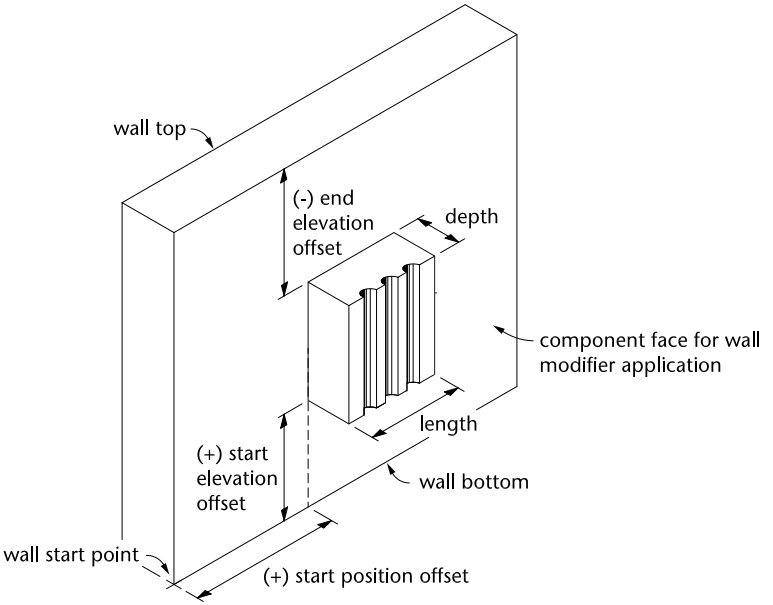


9 Click OK.

Adding an Existing Wall Modifier to a Wall

Use this procedure to add a wall modifier of an existing wall modifier style to a wall. You can apply the modifier to one or both sides of the wall or the component. The left and right sides of the wall are determined from the start and endpoints of the wall.

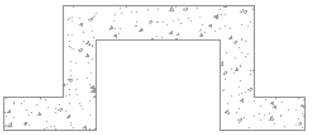
Placing a wall modifier offset from the wall start point, the wall bottom, and the wall top



1. Select the wall to which you want to apply a wall modifier, right-click, and click Plan Modifiers ➤ Add.
2. Select the start point for the wall modifier.

   After you select the first point, a temporary line is displayed to show you the length of the modifier.
3. Select the endpoint for the modifier.
4. Select the side of the wall to draw the modifier.
5. Enter the depth for the wall modifier.
6. Select the wall modifier style.
7. Select the name of the component to apply the modifier to.
8. To offset the opposite face of the selected component in the shape of the wall modifier, select Offset Opposite Face.

Offsetting a wall modifier from the opposite face of a wall component



9 Specify the vertical position of the modifier on the wall component:

If you want to . . .	Then . . .
specify the beginning height of the wall modifier	enter a value for Start Elevation Offset, and specify whether the offset occurs from the wall top, the wall base height, the wall baseline, or the wall bottom.
specifying the ending height of the wall modifier	enter a value for End Elevation Offset, and specify whether the offset occurs from the wall top, the wall base height, the wall baseline, or the wall bottom.

Enter a negative offset value to specify a location toward the ground.

10 Click OK.

After you add a wall modifier, you can edit its geometry or adjust its placement.

Editing the Geometry of a Wall Modifier

Use this procedure to edit the geometry of a wall modifier that is applied to a wall. You can edit the vertices and edges of the wall modifier or replace the geometry with that of another polyline. You can save the changes to the current wall modifier style or to a new style.

To move a wall modifier horizontally or change the vertical offsets of a wall modifier, see "Changing the Horizontal and Vertical Offsets of a Wall Modifier" on page 1849.

1 Select the wall that has the wall modifier you want to change, right-click, and click Plan Modifiers ➤ Edit in Place.

2 If prompted that the modifier is not drawn to size, click Yes.

A temporary profile is created for you to edit the geometry of the wall modifier. If the wall contains multiple wall modifiers, a profile is created for each wall modifier.

NOTE After you perform an editing task from the shortcut menu, you may need to select a profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select a profile, and right-click to display the shortcut menu.

3 Edit the profile:

If you want to . . .	Then . . .
change the shape of the perimeter of the profile	select the profile, and use grips to adjust the shape.
hide one or more edges of the profile (plan view only)	select the profile, right-click, and click Hide Edges. Select the edges you want to hide, and press ENTER.
display an edge that you hid	select the profile, right-click, and click Show Edges. Select the edges you want to show, and press ENTER.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace a profile with new geometry	select the profile, right-click, and click Replace Modifier. Select the modifier to replace, and select a polyline to define the new geometry. Press ENTER to keep the polyline in the drawing, or enter **y** (Yes) to erase it. The start and endpoints of the new polyline must be the same as those for the original wall modifier.
remove a wall modifier	select the profile, right-click, and click Remove Modifier. If the wall has multiple wall modifiers, select the wall modifier to remove, and press ENTER.

4 Save or discard the changes:

If you want to . . .	Then . . .
restore the wall modifier to its original shape	select the profile, and click .
save the changes to the current wall modifier style	select the profile, and click . The wall modifier and the wall modifier style use the edited profile to define its geometry. Any other walls that use this wall modifier style are also updated with the edited geometry.
save the changes to a new wall modifier style	select the profile, right-click, and click Save as New Wall Modifier Style. Enter a name for the new wall modifier, and click OK. The wall modifier uses the new style to define its geometry. Other walls that use the original style are not affected.

Changing the Horizontal and Vertical Offsets of a Wall Modifier

Use this procedure to change the horizontal position of a wall modifier applied to a wall, or to change its vertical position on a wall.

1 Select the wall that has the wall modifier you want to change, right-click, and click Plan Modifiers ➤ Edit in Place.

2 If prompted that the modifier is not drawn to size, click Yes.

A temporary profile is created for you to edit the geometry of the wall modifier. If the wall contains multiple wall modifiers, a profile is created for each wall modifier.

NOTE After you perform an editing task from the shortcut menu, you may need to select a profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select a profile, and right-click to display the shortcut menu.

3 Change the placement of the wall modifier:

If you want to . . .	Then . . .
move the wall modifier horizontally along the wall	select the Move grip, and move the grip to reposition the wall modifier. After you select the grip, you can also enter a value to move the wall modifier a specified distance.
position the wall modifier relative to the top of the wall	select an isometric view. Select the Offset from top of wall grip, and move the grip to reposition the wall modifier. After you select the grip, you can also enter a value to move the wall modifier a specified distance from the top of the wall.
position the wall modifier relative to the bottom of the wall	select an isometric view. Select the Offset from bottom of wall grip, and move the grip to reposition the wall modifier. After you select the grip, you can also enter a value to move the wall modifier a specified distance from the bottom of the wall.

4 If necessary, continue editing the wall modifier as described in "Editing the Geometry of a Wall Modifier" on page 1847.

5 Save or discard the changes:

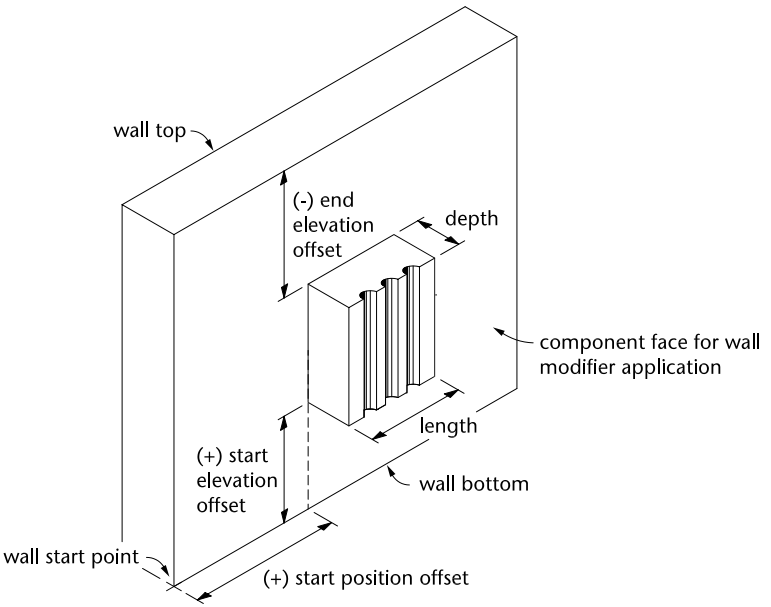
If you want to . . .	Then . . .
restore the wall modifier to its original position	select the profile, and click .
save the changes to the current wall modifier style	select the profile, and click The wall modifier and the wall modifier style use the edited profile to define its geometry. Any other walls that use this wall modifier style are also updated with the edited geometry.
save the changes to a new wall modifier style	select the profile, right-click, and click Save as New Wall Modifier Style. Enter a name for the new wall modifier, and click OK. The wall modifier uses the new style to define its geometry. Other walls that use the original style are not affected.

Adjusting the Placement of a Wall Modifier

Use this procedure to adjust the placement of a wall modifier that you added to a wall. You can also add or remove wall modifiers using this procedure. You can also graphically adjust the placement of a wall modifier. For more information, see "Changing the Horizontal and Vertical Offsets of a Wall Modifier" on page 1849.

To edit the shape of a wall modifier, see "Editing the Geometry of a Wall Modifier" on page 1847.

Placing a wall modifier offset from the wall start point, the wall bottom, and the wall top



1. Double-click the wall that has the modifier you want to change.
2. On the Properties palette, expand Advanced, and expand Worksheets.
3. Select the setting for Plan Modifiers.
4. Under Style, select the wall modifier you want to change.
5. If needed, select a different modifier style or component name, and specify which sides to apply the modifier to.
6. Enter a value for Start Position Offset and specify whether the offset occurs from the wall start point, the wall endpoint, or the midpoint of the wall.

These settings specify the start point of the modifier along the length of the wall. You can enter a negative value to specify an offset in the reverse wall direction.

7 Edit the vertical position of the modifier on the wall component:

If you want to . . .	Then . . .
specify the beginning height of the wall modifier	enter a value for Start Elevation Offset, and specify whether the offset occurs from the wall top, the wall base height, the wall baseline, or the wall bottom.
specifying the ending height of the wall modifier	enter a value for End Elevation Offset, and specify whether the offset occurs from the wall top, the wall base height, the wall baseline, or the wall bottom.

Enter a negative offset value to specify a location toward the ground.

8 Edit settings to control the size and placement of the modifier:

If you want to . . .	Then . . .
place the modifier at the size it was defined in the modifier style	select Use Drawn Size.
specify the length and the depth of the modifier on the wall	clear Use Drawn Size, and enter values for Length and Depth.
mirror the modifier in the *X* direction	select Mirror X.
mirror the modifier in the *Y* direction	select Mirror Y.
measure the modifier to the center of the wall	select Measure to Center.

9 To remove a modifier, select the modifier, and click .

10 Click OK.

Removing Wall Modifiers

Use this procedure to remove a wall modifier from an individual wall or a wall component.

NOTE If you offset the modifier to the opposite face of the wall or the wall component when you applied the modifier, you must remove the wall modifier from each face.

---

1. Select the wall that has the wall modifier you want to remove, right-click, and click Plan Modifiers ➤ Remove.
2. Select the modifier.
3. Enter **y** (Yes) to create a polyline in the shape of the modifier, or enter **n** if you do not want to create a polyline.

Creating a Wall Modifier Style

Use this procedure to create a wall modifier style from a polyline. The shape of the polyline defines the shape of the wall modifier. After you create the style, you can add it to a wall or a component of a wall. To create a wall modifier style and apply it to a wall at the same time, see "Converting a Polyline to a Wall Modifier" on page 1843.

To edit a wall modifier style, add the wall modifier to a wall, and then edit the geometry of the wall modifier. For more information, see "Adding an Existing Wall Modifier to a Wall" on page 1845 and "Editing the Geometry of a Wall Modifier" on page 1847.

1. Draw an open polyline in the shape you want to use for the wall modifier.
2. On the Format menu, click Style Manager.
3. Expand Architectural Objects.
4. Right-click Wall Modifier Styles, and click New.
5. Enter a name for the new style.
6. Right-click the new style, and click Set From.
7. Select the polyline.
8. Click OK.

Attaching Notes or Files to a Wall Modifier Style

Use this procedure to enter notes and attach reference files to a wall modifier style. You can also edit notes and edit or detach reference files attached to the style.

1. On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Wall Modifier Styles.

3 Right-click the wall modifier style that you want to change, and click Edit.

4 Click the General tab.

5 To add a description to the style, enter it for Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK three times.

Working with Body Modifiers

Body modifiers use the three-dimensional (3D) geometry of an object, such as a mass element or a mass group, to add to, subtract from, or completely replace one component in a wall. If the wall has only one component, the body modifier applies to the entire wall. If the wall has multiple components, the modifier applies only to the component that you specify.

If you add the body modifier to a wall component, or use a body modifier to replace the component, the body modifier uses the material assignment and display properties of the wall component.

After you create a body modifier from an object, you can delete the original object. However, if you have created a complex object, such as a mass group comprising many mass elements, you may want to retain the object in the drawing until you are sure you have the results you want for the wall.

Related Procedures

- Adding a Body Modifier to a Wall
- Subtracting a Body Modifier from a Wall

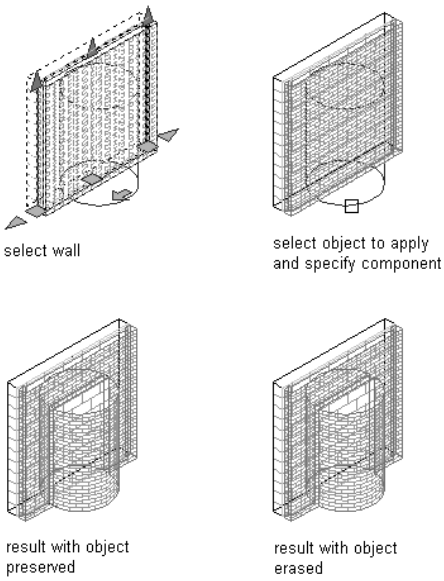
- Replacing a Wall with a Body Modifier
- Managing Body Modifiers
- Restoring a Body Modifier to a Mass Element

Adding a Body Modifier to a Wall

Use this procedure to create a body modifier and add it to a wall. You can apply the modifier to a single-component wall, or to a component in a multi-component wall.

You can create a three-dimensional (3D) body modifier from a mass element, a mass group, or any other AEC object with mass. You can also create body modifiers from ACIS solids or blocks that form 3D bodies. You must place the object in the location you want in the drawing before defining the object as a body modifier.

Adding a body modifier to a wall component



1. Place the object in the location where you want to add the body modifier to the wall.
2. Select the wall to which you want to add the body modifier, right-click, and click Body Modifiers ➤ Add.
3. Select the object to add to the wall.
4. Select the wall component to add the object to.

5 Select Additive or Additive - Cut Openings for Operation.

6 Enter a description for the body modifier.

7 Select Erase Selected Object(s) if you do not want to keep the original object, or clear this option to keep the object in the drawing.

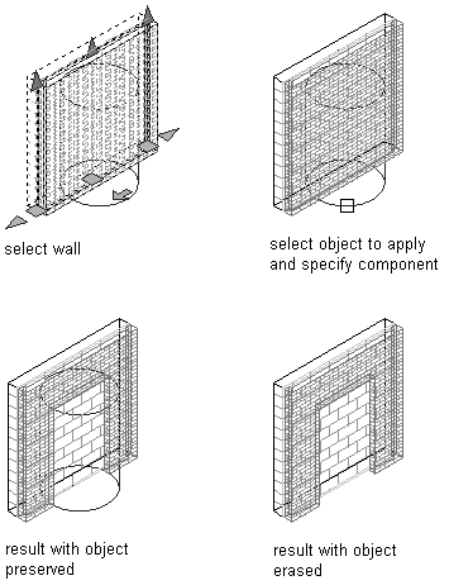
8 Click OK.

Subtracting a Body Modifier from a Wall

Use this procedure to create a three-dimensional (3D) body modifier and subtract it from a wall. You can apply the modifier to a single-component wall, or to a component in a multi-component wall.

You can create a body modifier from a mass element, a mass group, or any other AEC object with mass. You must place the object in the location you want in the drawing before defining the object as a body modifier.

Subtracting a body modifier from a wall component



1 Place the object in the location where you want to subtract the body modifier from the wall.

2 Select the wall to which you want to add the body modifier, right-click, and click Body Modifiers ➤ Add.

3 Select the object to subtract from the wall.

4 Select the wall component to subtract the object from.

5 Select Subtractive for Operation.

6 Enter a description for the body modifier.

7 Select Erase Selected Object(s) if you do not want to keep the original object, or clear this option to keep the object in the drawing.

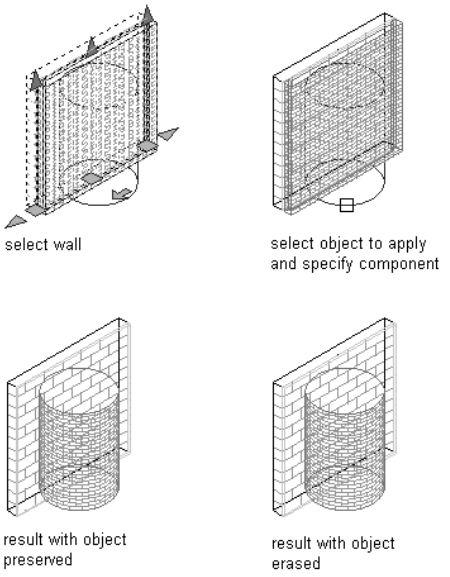
8 Click OK.

Replacing a Wall with a Body Modifier

Use this procedure to create a three-dimensional (3D) body modifier and replace a wall or a wall component with the modifier. You can apply the modifier to a single-component wall, or to a selected component in a multi-component wall.

You can create a 3D body modifier from a mass element, a mass group, or any other AEC object with mass. You must place the object in the location you want in the drawing before defining the object as a body modifier.

Replacing a wall component with a body modifier



1 Place the object in the location where you want to replace the wall with the body modifier.

2 Select the wall to which you want to replace with the body modifier, right-click, and click Body Modifiers ➤ Add.

3 Select the object to replace the wall or wall component.

4 Select the wall component you want the object to replace.

5 Select Replace for Operation.

6 Enter a description for the body modifier.

7 Select Erase Selected Object(s) if you do not want to keep the original object, or clear this option to keep the object in the drawing.

8 Click OK.

Editing the Geometry of a Body Modifier

Use this procedure to edit the shape of a body modifier that is attached to a wall. You can edit the body using grips to edit faces, using Boolean commands to add or remove other objects from the body modifier, and other editing commands to change its shape.

1 Select the wall that has the body modifier you want to change, right-click, and click Body Modifiers ➤ Edit in Place.

A temporary mass element is created for you to edit the geometry of the body modifier. If the wall contains multiple body modifiers, a mass element is created for each body modifier. If object was not originally a mass element (for example, if you used a slab as a body modifier), the object becomes a temporary Free Form mass element with faces that you can edit.

NOTE After you perform an editing task from the shortcut menu, you may need to select a profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select a profile, and right-click to display the shortcut menu.

2 Edit the body modifier:

If you want to . . .	Then . . .
change the shape of a body modifier that is a Free Form mass element	select the body modifier. Select a Face grip to activate edge grips for the face. Move the grips to the desired locations. Continue editing other faces in the same manner.
change the shape of a body modifier that is a conventional mass element	select the body modifier. Select grips and move them to change the shape of the body modifier. The grips that are available depend on the type of mass element used as a body modifier and the current view direction.

If you want to . . .	Then . . .
add an object to a body modifier	place the object in the location where it is needed. Select the body modifier, right-click, and click Boolean ➤ Union. Select the object, and press ENTER. Enter **y** (Yes) to keep the object in the drawing, or press ENTER to erase it.
subtract an object from a body modifier	place the object in the location where it is needed. Select the body modifier, right-click, and click Boolean ➤ Subtract. Select the object, and press ENTER. Enter **y** (Yes) to keep the object in the drawing, or press ENTER to erase it.
create a body modifier that is the intersection of the original body modifier with another object	place the object in the location where it is needed. Select the body modifier, right-click, and click Boolean ➤ Intersect. Select the object, and press ENTER. Enter **y** (Yes) to keep the object in the drawing, or press ENTER to erase it.
trim a body modifier	select the body modifier, right-click, and click Trim. Specify the points that define the trim plane, and select the side of the body modifier to be trimmed. The trimmed body modifier is converted to a Free Form mass element.
divide the face of a body modifier into two faces	select the body modifier, right-click, and click Split Face. Specify the points that define the edge created by splitting the faces.
join two faces that are on the same plane into a single face	select the body modifier, right-click, and click Join Faces. Select the edge that separates the coplanar faces.
remove a body modifier	select the object that forms the body modifier, and press DELETE.

3 Save or discard the changes:

If you want to . . .	Then . . .
restore the body modifier to its original shape	select the body modifier, and click .

If you want to . . .	Then . . .
save the changes to the body modifier	select the body modifier, and click . The body modifier uses the edited mass element to define its geometry.

Managing Body Modifiers

Use this procedure to edit or remove three-dimensional (3D) body modifiers from an individual wall. You can change the component the body modifier is added to and select a different operation. You can also enter or edit the descriptions of body modifiers.

NOTE To remove a body modifier from a wall component and restore the modifier as a mass element that you can edit or apply to other walls, see "Restoring a Body Modifier to a Mass Element" on page 1861.

1. Double-click the wall you want to change.
2. Expand Advanced, and expand Worksheets.
3. Click the setting for Body modifiers.
4. Select a body modifier, and change its settings:

If you want to . . .	Then . . .
apply the body modifier to a different wall component	select a different component for Component.
change the operation used to apply the body modifier to the wall	select a different operation for Operation: ■ Select Additive or Additive - Cut Openings to add the body modifier to the wall component. ■ Select Subtract to subtract the shape of the body modifier from the wall component. ■ Select Replace to replace the wall component with the body modifier.
delete the body modifier from the wall component	select the body modifier, and click .
enter a description of the body modifier	click Description, enter text, and press ENTER.

5 Click OK.

Restoring a Body Modifier to a Mass Element

Use this procedure to remove a body modifier from a wall and add it to the drawing as a mass element. Restoring a body modifier to a mass element enables you to modify the shape as a mass element and then add it to the wall again as a body modifier. You can also restore the body modifier to a mass element while leaving the body modifier still applied to the wall. This is useful if you want to create other walls with the same shape.

If the object used to create the body modifier was a conventional mass element, it is restored to that mass element. For example, a Gable mass element is restored as a Gable mass element. However, if the body modifier was created from another object, such as a slab, or was edited using Boolean operations or face editing commands, the body modifier is restored as a Free Form mass element.

1 Select the walls you want to change, right-click, and click Body Modifiers ➤ Restore.

NOTE This procedure restores all body modifiers attached to a wall.

2 Create mass elements from the body modifiers:

If you want to . . .	Then . . .
create mass elements from the body modifiers while keeping the body modifiers attached to the wall	press ENTER.
remove *all* body modifiers from the wall, and create mass elements from their shapes	enter **y** (Yes), and press ENTER.

Working with Interference Conditions

Interference conditions use the geometry of three-dimensional (3D) objects to create custom openings or cutouts in walls. You can specify how the interference condition is applied to the shrinkwrapping of a wall: added to the wall, subtracted to the wall, or ignored.

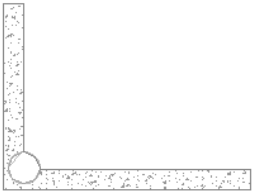
How Interference Conditions Affect the Display of Walls

Unlike wall modifiers and body modifiers, which apply to a selected wall component, interference conditions apply to all wall components that the interfering object touches. The wall stops at the interference condition. The way in which you apply the interference condition to the wall determines how the shrinkwrapping of the wall is affected by the condition in plan view:

- Add the interference condition to include the condition in the shrinkwrapping.

- Subtract the interference condition to exclude the object from the shrinkwrapping.

- Ignore the interference condition to draw the shrinkwrapping as if the object were not there. You also use the ignore option to add interference conditions applied to one wall to subsequent walls.



In model views, the interference condition is always subtractive, regardless of the shrinkwrapping option you selected.

Editing Interference Conditions

When you edit the object that acts as the interference condition, the wall changes to accommodate the changes to the geometry of the object. For example, you can move the interfering object to change its location on the wall. Moving the object off the wall does not remove the interference condition for the object.

You can also change how interference conditions are applied to a wall, and you can delete interference conditions.

Related Procedures

- Adding an Interference Condition
- Removing an Interference Condition
- Managing Wall Interference Conditions

Adding an Interference Condition

Use this procedure to place objects, such as mass elements, in walls to create custom openings or cutouts in the wall. An example is a column grid structure where columns are connected by walls.

When you define the interference condition, you specify how the wall shrinkwrapping in plan views is affected by the interfering object. You can specify that the object be added to the wall, subtracted from it, or ignored. The option you select affects the wall only in plan views. In model display representations, interference is always subtracted from a wall, regardless of the option you select in this procedure.

NOTE If you want to apply the same object as the interference condition for multiple walls, such as walls that meet at a corner, use the ignore option for subsequent walls after the first wall. In plan views, the effect is additive for all the walls to which you apply the interference condition.

The shrinkwrap display component must be turned on in the display properties of the wall or the wall style for interference to be visible. In most sample wall styles provided with Autodesk® Architectural Desktop, shrinkwrap is turned on in plan display representations. For more information about specifying shrinkwrapping for a wall style, see "Specifying the Display Properties of a Wall Style" on page 1879.

1. Place the object in the location where you want to specify the interference condition.
2. Select the wall you want to change, right-click, and click Interference Condition ➤ Add.
3. Select walls affected by the interference condition, and press ENTER.
4. Select the object intersecting the wall, and press ENTER.

5 Specify how shrinkwrapping in plan view is applied to the interference condition:

If you want to . . .	Then . . .
add the interference condition to the shrinkwrapping	enter **a** (Additive).
take the object shape out of the shrinkwrapping	enter **s** (Subtractive).
ignore the object when shrinkwrapping is applied	enter **i** (Ignore).

Removing an Interference Condition

Use this procedure to remove an object that was added to a wall as an interference condition.

1 Select the walls you want to change, right-click, and click Interference Condition ➤ Remove.

2 Select one or more objects to remove, and press ENTER.

3 Enter **r** (Remove) to continue removing interference conditions from other walls, or press ENTER to end the command.

Managing Wall Interference Conditions

Use this procedure to change the shrinkwrap effect for an interference condition, or to remove an interference condition from a wall.

1 Double-click a wall with interference conditions.

2 On the Properties palette, expand Advanced, and expand Worksheets.

3 Click the setting for Interference conditions.

4 Select an interference condition.

5 In the Shrinkwrap Effect column, specify the way shrinkwrap is applied to the interference object:

If you want to . . .	Then . . .
add the interference condition to the shrinkwrapping	select Add.

If you want to . . .	Then . . .
take the object shape out of the shrinkwrapping	select Subtract.
ignore the object when shrinkwrapping is applied	select Ignore.

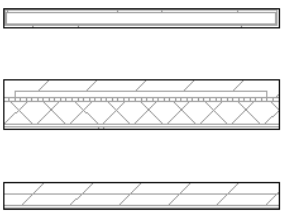
6 To delete the interference condition, select the condition, and click .

7 Click OK.

Wall Styles

Wall styles control the appearance of wall objects. Using wall styles, you can specify dimensions, components, endcaps, materials, and other characteristics to create new types of walls, such as concrete walls, masonry walls, and brick cavity walls. Catalogs provided with Autodesk® Architectural Desktop include sample wall styles for common wall types, such as concrete walls with footings or furring, CMU and brick cavity walls, and various stud partition walls.

Wall styles that use various components



Using Materials in Wall Styles

You can use materials to control how walls of each style are displayed in a drawing. You assign materials to the wall components in the style. The components are then displayed using the display properties of the assigned materials.

Autodesk Architectural Desktop provides a large number of predefined materials for common design purposes. You can use these materials, modify them

for your project requirements, and define new materials. For more information about materials and how to define them, see "Materials" on page 491.

Creating Tools from Wall Styles

You can create a wall tool from any wall style. You can drag the style from the Style Manager onto a tool palette. You can then specify default settings for any walls created from the tool. For more information, see "Creating a Wall Tool" on page 1766.

Managing Wall Styles

To create, edit, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

Related Topics and Procedures

- Creating a Wall Style
- Specifying the Endcap Styles Used in a Wall Style
- Specifying the Components of a Wall Style
- Specifying the Materials of a Wall Style
- Specifying the Display Properties of a Wall Style
- Adding Classifications to a Wall Style
- Attaching Notes and Files to a Wall Style

Creating a Wall Style

Use this procedure to create a wall style. By copying an existing style, you can create a style using default style properties. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Architectural Objects, and expand Wall Styles.
3. Create a wall style:

If you want to . . .	Then . . .
create a style with default properties	right-click Wall Styles, and click New.

If you want to . . .	Then . . .
create a style from an existing style	right-click the wall style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new wall style, and press ENTER.

5 To edit the new wall style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.
specify the endcap styles used for wall openings and the ends of walls of the style	see "Specifying the Endcap Styles Used in a Wall Style" on page 1868.
specify the structural components of the style	see "Specifying the Components of a Wall Style" on page 1868.
specify materials for the components of the style	see "Specifying the Materials of a Wall Style" on page 1876.
specify wall hatching, cut plane properties, and other display properties of the style	see "Specifying the Display Properties of a Wall Style" on page 1879.
add classifications to a wall style	see "Adding Classifications to a Wall Style" on page 1884.
add notes and files to the style	see "Attaching Notes and Files to a Wall Style" on page 1885.

6 When you finish specifying the properties of the wall style, click OK.

7 If you want to assign the style to a wall tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating a Wall Tool" on page 1766.

8 Click OK.

Specifying the Endcap Styles Used in a Wall Style

Use this procedure to specify the endcap styles used in a wall style. You can select one wall endcap style that is applied to the start and end of walls of this wall style. You can specify opening endcap styles that are applied separately to doors, openings, windows, and door/window assemblies that are added to walls of this wall style.

For more information about creating wall endcap styles and opening endcap styles, see "Wall Endcap Styles" on page 1886 and "Opening Endcap Styles" on page 1894.

1. Open a tool palette that has a wall tool.
2. Right-click a wall tool, and click Wall Styles.
3. Right-click the wall style you want to change, and click Edit.
4. Click the Endcaps/Opening Endcaps tab.
5. Select an endcap style to apply to the ends of the walls for Wall Endcap Style.
6. Select opening endcap styles to apply to each of the following objects: doors, openings, windows, and door/window assemblies.
7. Click OK twice.

Specifying the Components of a Wall Style

Wall components are the physical structures of a components of a wall, such as concrete, CMU, studs, GWB, insulation, and air gaps.

Wall Components and Their Properties

Each component in a wall style corresponds to a structural component of a wall or a wall material, including air gaps in cavity walls. When you create a wall component, you specify the following characteristics of the component:

- The component name, which usually identifies the material used, such as brick, concrete, CMU, or insulation
- The component cleanup priority, which determines how the component cleans up with the components of intersecting walls
- The width (thickness) of the component
- The vertical offset of the component at the bottom and the top of the wall
- The position of the component within the wall, relative to the baseline of the wall and adjacent wall components

Using Components from Other Wall Styles

In addition to creating a wall component by specifying its individual properties, you can also copy components from other wall styles into a wall style.

The Wall Component Browser is a utility that lets you view the components of other wall styles and copy components into the wall style you are editing.

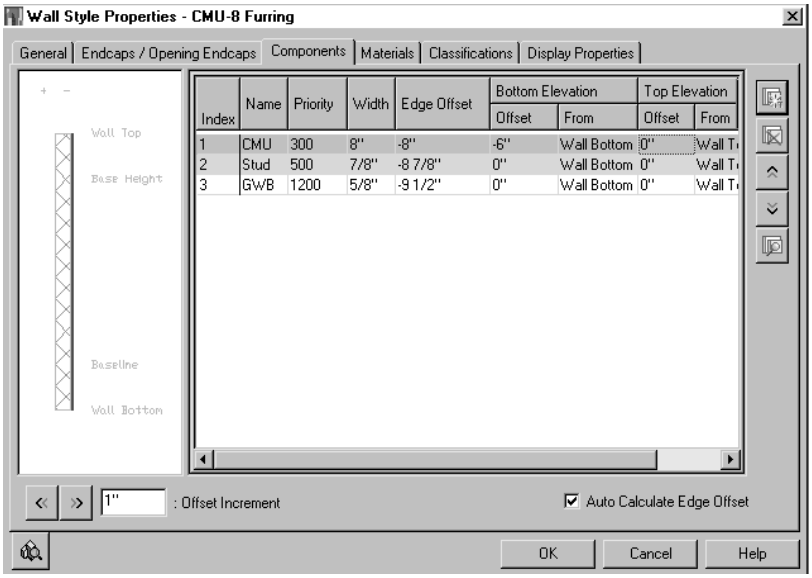
Related Topics and Procedures

- Components Tab
- Wall Style Components Browser
- Default Cleanup Priorities of Wall Components
- Creating or Editing a Component in a Wall Style
- Adding a Component from Another Wall Style
- Removing a Component from a Wall Style

Components Tab

The Components tab of the Wall Styles dialog box lets you view wall components as you specify them.

Specifying the properties of wall components



Use the features of the Components tab for the following tasks:

- Add, remove, and edit the properties of wall components for wall style.
- View the components as you specify them.
- Change the order of components relative to other components in the wall style.

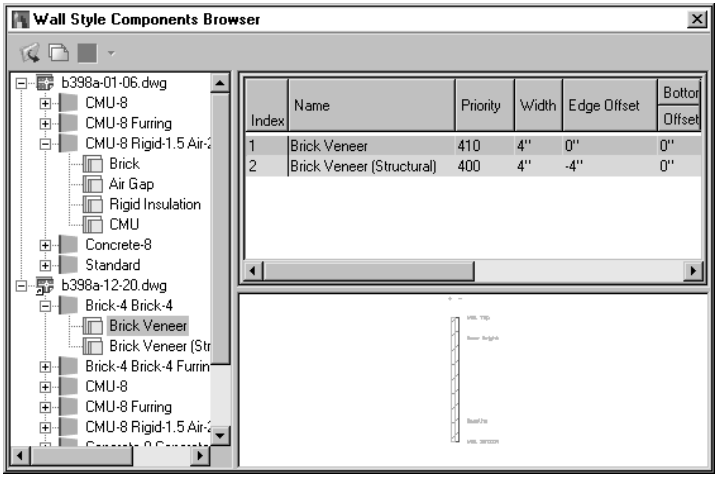
- Access the Wall Style Components Browser, which lets you view and copy components from other wall styles in the current drawing and in other drawings.

For more information about the components browser, see "Wall Style Components Browser" on page 1870.

Wall Style Components Browser

The Wall Style Components Browser is a utility that lets you view and copy wall components from wall styles in the current drawing and in other drawings. You can copy components from these styles to the current wall style. After you add them to the wall style, you can change their properties as needed for the style you are editing.

Viewing wall components from multiple styles and drawings



The Wall Style Components Browser has the following features:

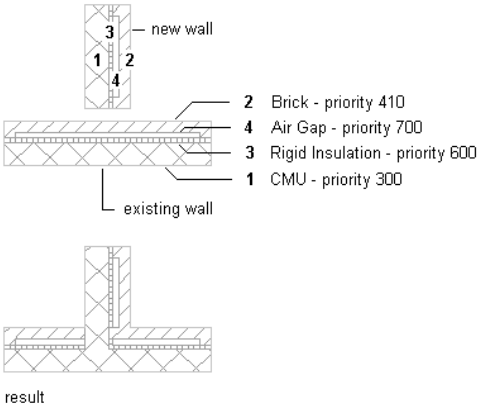
Use this feature . . .	To . . .
icons	open other drawings, copy wall components, and change the view options for the right pane of the browser.

Use this feature . . .	To . . .
tree structure in the left pane of the browser	expand wall styles to view the list of components in the style. Select a wall style in the left pane to view the properties of its components and see the wall style in the right pane. You can use the shortcut menu to copy an individual component or all components of a selected style. You can then paste the component(s) in the style you are editing.
right pane of the browser	view the component properties of a selected style, and preview the style in the viewer area of the pane.

Default Cleanup Priorities of Wall Components

The component priority determines how each wall component cleans up with the components of an intersecting wall. The lower the component index number, the higher the priority of the component when it intersects other walls.

Wall cleanup priorities



The following table lists the default cleanup priority for each component used in sample wall styles provided in Autodesk® Architectural Desktop catalogs. You can assign different priorities to wall components in wall styles and individual walls to control cleanup with other walls.

Component	Index
Air Gap	700

Component	Index
Air Gap (Brick/Brick)	805
Air Gap (CMU/CMU)	305
Air Gap (Stud/Stud)	505
Brick	800
Brick Veneer	810
Bulkhead	1800
Casework - Backsplash	2030
Casework - Base	2010
Casework - Counter	2020
Casework - Upper	2000
CMU	300
CMU Veneer	350
Concrete	200
Concrete (Footing)	200
Glass	1200
GWB	1200
GWB (X)	1200,1210,1220,1230
Insulation (CMU/Brick, Stud/Brick)	600
Metal Panel	1000
Precast Panel	400
Rigid Insulation (Brick)	404
Siding	900
Stucco	1100
Stud	500
Toilet Partition	3000

Creating or Editing a Component in a Wall Style

Use this procedure to create a wall component, or to edit existing wall components in a wall style.

You can also add components to a wall style by copying them from other wall styles. For more information, see "Adding a Component from Another Wall Style" on page 1875.

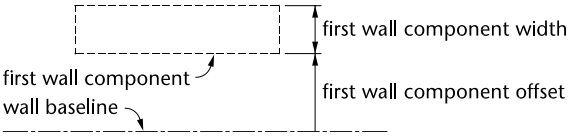
NOTE Only the first 20 components of a wall style are controlled by the display system. Although you can specify more than 20 components in a wall style, it is suggested that you limit the number of components to 20. Components 21 and higher are controlled by material assignment only.

1. Open a tool palette that has a wall tool.
2. Right-click a wall tool, and click Wall Styles.
3. Right-click the wall style that you want to change, and click Edit.
4. Click the Components tab.
5. Click .
6. Enter a name for the new component.
7. Enter the cleanup priority for the component when walls intersect.

   The lower the priority number, the higher the priority of the component when it intersects with the components of other walls. For more information, see "Default Cleanup Priorities of Wall Components" on page 1871.
8. Specify the width of the component:

If you want to . . .	Then . . .
specify a fixed width that cannot be edited when you add or edit walls of this style	enter a value for Width.
specify a variable width that can be edited when you add or edit walls of this style	select the setting for Width. Enter a formula that defines how the component width is calculated. For more information, see "Specifying the Width and Edge Offset of a Wall Component" on page 1899.

Adding the first wall component



9 Specify the edge offset, which is the offset of the exterior edge of the component from the baseline:

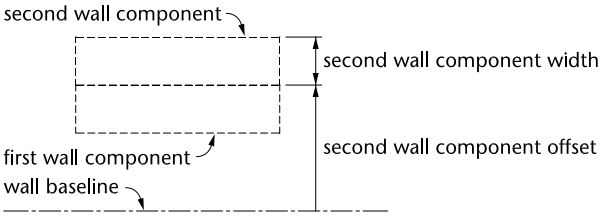
If you want to . . .	Then . . .
graphically specify the offset	select the component, select « or » to offset the component by an increment that you specify. The viewer shows the position of the wall component as you click the icons. The selected component is highlighted in green.
let the software calculate the offset	select Auto Calculate Edge Offset.
specify a fixed offset	enter a value for Edge Offset.
specify a variable offset that is calculated from values that you specify	select the setting for Edge Offset. Enter a formula that defines how the edge offset is calculated for this component. For more information, see "Specifying the Width and Edge Offset of a Wall Component" on page 1899.

10 To specify the top elevation offset or bottom elevation offset, enter a new value, and select from where the distance is to be measured: Wall Top, Base Height, Baseline, or Wall Bottom.

NOTE Do not define wall components with elevation offsets that are above Wall Top or below Wall Bottom. Walls that have components that are defined this way do not clean up correctly and may not be displayed correctly if you edit their roof line or floor line. To avoid cleanup and display problems, you can define wall components with elevation offsets that are above Base Height or below Baseline.

11 Repeat steps 5 through 10 to add more components to the wall style.

Adding the second wall component



12 To change the order of components in the wall style, select a wall component, and click or to move the component to the desired position relative to the other wall components.

13 Click OK.

Adding a Component from Another Wall Style

Use this procedure to copy one or more wall components from another wall style into the wall style you are editing.

NOTE Only the first 20 components of a wall style are controlled by the display system. Although you can specify more than 20 components in a wall style, it is suggested that you limit the number of components to 20. Components 21 and higher are controlled by material assignment only.

---

1 Open a tool palette that has a wall tool.

2 Right-click a wall tool, and click Wall Styles.

3 Right-click the wall style that you want to change, and click Edit.

4 Click the Components tab.

5 Click .

The Wall Style Components Browser lists the wall styles and their components in the current drawing.

6 Locate the wall components you want to copy:

If you want to . . .	Then . . .
view the wall components for wall styles in the current drawing	in the left pane, select a wall style. The right pane lists the components and their properties and displays the style in the viewer.
view the wall components in wall styles in other drawings	click . Navigate to the drawing you want, and click Open. In the left pane, select a wall style.
close a drawing that you opened in the browser	select the drawing name, right-click, and click Close. You cannot close the current drawing.

For more information about the information shown in the Wall Styles Component Browser, see "Wall Style Components Browser" on page 1870.

7 Copy wall components, and add them to the wall style you are editing:

If you want to . . .	Then . . .
copy all components in a wall style	select the wall style, and drag the style to the list of components in the Wall Styles Properties dialog box. All the components are added to the wall style.
copy an individual wall component	select the wall component, and drag the component to the list of components in the Wall Styles Properties dialog box. The component you selected is added to the wall style.

8 Click to close the Wall Style Components Browser.

9 After you copy wall components to the current wall style, you can edit or delete the new components as needed.

For more information, see "Creating or Editing a Component in a Wall Style" on page 1872.

10 Click OK.

Removing a Component from a Wall Style

Use this procedure to delete a component from a wall style. When you remove a component from a wall style, the component is also removed from all existing walls that use this style.

1 Open a tool palette that has a wall tool.

2 Right-click a wall tool, and click Wall Styles.

3 Right-click the wall style that you want to change, and click Edit.

4 Click the Components tab.

5 Select the wall component you want to remove, and click .

6 Click OK.

Specifying the Materials of a Wall Style

A wall consists of a number of components whose display properties can be determined by the materials assigned to each component. When you assign materials to a wall style, you assign one material to each physical component of the wall. For example, you assign a wood or metal material to studs, concrete to a concrete component, and so on. You assign materials to compo-

nents in each display representation where you want the materials to be used.

If you want to use the display properties of the wall style, instead of using material display properties, you can turn off the material assignments in the display properties of the wall style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in plan view. The Surface Hatch component of a material is used to hatch all object surfaces in three dimensional (3D) model views and in elevations.

Related Topics and Procedure

- Wall Materials and Display Components
- Assigning Materials to a Wall Style

Wall Materials and Display Components

The following table identifies the material component that corresponds to each wall component.

Wall Component	Material Component
Plan, Plan Low Detail, Plan High Detail, Plan Presentation, Plan Screened	
Below Cut Plane	No Material
Above Cut Plane	No Material
Shrink Wrap	2D Linework
Shrink Wrap Hatch	Plan Hatch
Defect Warning	No Material
Boundary 1 - 20	Plan Linework
Hatch 1 - 20	Plan Hatch
Reflected, Reflected Screened	
Below Cut Plane	No Material
Above Cut Plane	No Material
Shrink Wrap	2D Linework

Wall Component	Material Component
Shrink Wrap Hatch	Plan Hatch
Defect Warning	No Material
Boundary 1 - 20	Plan Linework
Hatch 1 - 20	Plan Hatch
Model, Model High Detail, Model Low Detail	
Defect Warning	No Material
Shrinkwrap Body	3D Body
Boundary 1 - 20	3D Body
Sketch	
Baseline	No Material
Marker	No Material
Center Line	No Material
Graph	
Radius	No Material
Edge	No Material

Assigning Materials to a Wall Style

Use this procedure to assign materials to the individual components of a wall style. When you assign a material to a wall component, the component uses the display properties of the material instead of the style display properties.

You can assign a material to any physical component of the wall. Custom components and components that are only symbolic graphics do not use materials for their display properties. For example, all structural components, such as brick and other masonry, studs, insulation, and air gaps, are physical components that you can assign materials. The defect marker is a symbol, and you cannot assign a material to it.

NOTE If a material assignment does not determine the display properties of a wall component, you can change the display properties of the wall style as described in "Specifying the Display Properties of a Wall Style" on page 1879.

1. Open a tool palette that has a wall tool.
2. Right-click a wall tool, and click Wall Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Select the component you want to change, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.
11. Click OK twice.

Specifying the Display Properties of a Wall Style

In most cases, you can assign materials to wall components so that the appearance of walls that belong to the same style is consistent throughout a drawing and with other walls and objects that use the same materials.

If a component cannot be assigned a material, or if you do not want to use materials but still want consistency among walls of the same style, you can specify the display properties of the wall components in the wall style:

- The layer, color, and linetype of wall components
- The hatching used with each component
- The cut plane height and the display of components relative to the cut plane

- Other specific wall display information, such as whether complex endcaps are displayed and whether the wall is cut around door and window frames

Related Procedures

- Specifying the Layer, Color, and Linetype of a Wall Style
- Specifying the Hatching for Components of a Wall Style
- Specifying the Cut Plane Display of a Wall Style
- Specifying the Display of Other Characteristics of a Wall Style

Specifying the Layer, Color, and Linetype of a Wall Style

Use this procedure to change the following display properties of the components of a wall style:

- Visibility (component is on or off)
- By material (material assigned to the display component determines its display properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

To change these display properties for an individual wall, see "Changing the Display Properties of Individual Walls" on page 1805.

NOTE If a material assignment determines the display properties of components in the wall style, you can change the properties of the display component by clearing By Material. You can also override the material assignment with a different material. For more information, see "Assigning Materials to a Wall Style" on page 1878.

---

1. Open a tool palette that has a wall tool.
2. Right-click a wall tool, and click Wall Styles.
3. Right-click the wall style that you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.

8 Select the component to change, and select a different setting for the property.

9 Click OK twice.

Specifying the Hatching for Components of a Wall Style

Use this procedure to specify the hatching of the components of a wall style. Wall hatching is displayed only in display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

1 Open a tool palette that has a wall tool.

2 Right-click a wall tool, and click Wall Styles.

3 Right-click the wall style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Style Override.

6 If necessary, click .

7 Click the Hatching tab.

8 Select a component, and click the setting for Pattern.

9 Select the hatching for the component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

10 Click OK.

11 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

12 Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

14 Click OK twice.

Specifying the Cut Plane Display of a Wall Style

Use this procedure to specify the properties of one or more cut planes for a wall style. Cut plane display properties apply only to display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

To better visualize the elements of a wall in plan view, you can create cut planes. The main cut plane is where the shrinkwrap and hatching are applied. The plan display shows the components and objects in the wall as they are displayed at the height of each cut plane.

The cut plane settings you specify in the wall style override the cut plane settings in any display configuration applied to a viewport. When you add doors, windows, openings, or door/window assemblies to a wall, you can specify in the display properties of those objects or their styles whether they respect the cut plane of the wall or of the display configuration.

1 Open a tool palette that has a wall tool.
2 Right-click a wall tool, and click Wall Styles.
3 Right-click the wall style that you want to change, and click Edit.
4 Click the Display Properties tab.
5 Select the display representation where you want the changes to appear, and select Style Override.
6 If necessary, click .
7 Click the Cut Plane tab.
8 Select Override Display Configuration Cut Plane.
9 To specify the cut plane where shrinkwrap, component boundaries, and hatching take effect, enter a value for Cut Plane Height.
10 Select Automatically Choose Above and Below Cut Plane Heights to show the components above and below the cut plane height.

11 To specifically define a cut plane, select Manual Above and Below Cut Plane Heights, click Add, and enter the height of the new cut plane.

If you add a cut plane . . .	Then . . .
at a height that is lower than the value for Cut Plane Height	objects are displayed using the properties specified for the Below Cut Plane component on the Layer/Color/Linetype tab.
at a height that is higher than the value for Cut Plane Height	objects are displayed using the properties specified for the Above Cut Plane component on the Layer/Color/Linetype tab.

You can click Remove to delete a cut plane that you added.

12 Click OK twice.

Specifying the Display of Other Characteristics of a Wall Style

Use this procedure to specify other display properties for the wall style, such as whether to display complex endcaps, to show door and window frames, or whether to show the miter of specific wall components. These display properties apply only to display representations, such as Plan, that are used in the Top view (plan view) of a drawing.

1 Open a tool palette that has a wall tool.

2 Right-click a wall tool, and click Wall Styles.

3 Right-click the wall style that you want to change, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Style Override.

6 If necessary, click .

7 Click the Other tab.

8 Select the display properties for the wall style:

If you want to . . .	Then . . .
display the component lines within the wall above the cut plane (for example, through a window or door in the wall)	select Display Inner Lines Above. Clear this option if you do not want to display these lines.

If you want to . . .	Then . . .
display the component lines within the wall below the cut plane (for example, through a window or door in the wall)	select Display Inner Lines Below. Clear this option if you do not want to display these lines.
turn off lines below a window, door or opening at the cut plane	select Hide Lines Below Openings at Cut Plane. Clear this option if you want to display the lines.
turn off lines below a window, door or opening above the cut plane	select Hide Lines Below Openings Above Cut Plane. Clear this option if you want to display the lines.
display complex wall and opening endcaps	select Display Endcaps. Clear this option to display complex endcaps as a single line.
display door openings cutting the wall at the outer edge of the door frame	select Cut Door Frames. Clear this option if you want door openings to cut the wall at the inside of the door frame.
display window openings cutting the wall at the outer edge of the window frame	select Cut Window Frames. Clear this option if you want window openings to cut the wall at the inside of the window frame.
draw wall components by their priority number to control the display of a component over another component	select Component Draw Order by Priority. Clear this option if you want to draw the components in the order that they were created.
perform a slice of the actual three-dimensional (3D) model at each cut plane to obtain more accurate views of walls with sweeps or body modifiers	select Do True Cut. Clear this option if the wall does not have sweeps or body modifiers, or if they do not change along the height of the wall.
display miter lines at wall corners for selected wall components	under Draw Miter for Components, select each component whose miter lines you want to display.

9 Click OK twice.

Adding Classifications to a Wall Style

Use this procedure to specify classifications for any classification definition applied to a wall style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Open a tool palette that has a wall tool.
2. Right-click a wall tool, and click Wall Styles.
3. Right-click the style that you want to change, and click Edit.
4. Click the Classifications tab.

   By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to wall styles.

5. For each classification definition, select the classification you want to apply to the current wall style.
6. Click OK twice.

Attaching Notes and Files to a Wall Style

Use this procedure to enter notes and attach reference files to a wall style. You can also edit notes and edit or detach reference files from a wall style.

1. Open a tool palette that has a wall tool.
2. Right-click a wall tool, and click Wall Styles.
3. Right-click the wall style you want to change, and click Edit.
4. Click the General tab.
5. To add a description to the wall style, enter it for Description.
6. Click Notes.
7. To add a note, click the Notes tab, and enter the note.
8. Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9. Click OK.

Wall Endcap Styles

You can define different wall endcap styles to control the shape, the width and the depth of starting and ending wall segments. Generally, you create a wall endcap style to use with a specific wall style. You create a wall endcap style from one or more open polylines that each correspond to the end condition of a component in the wall style.

When necessary, you can override the wall endcap style assigned in a wall style. When you override the assigned endcap style, you can select a different endcap style for one or both ends of a wall segment.

Wall Endcap Styles and Opening Endcap Styles
Wall endcap styles are also used as a basis to define wall opening endcap styles. When a wall has an opening, such as a window or a door, the shape of the wall endcap at each edge of the opening needs to be defined. You use opening endcap styles to specify the wall endcap style applied to each edge. For more information about opening endcap styles, see "Opening Endcap Styles" on page 1894.

NOTE When you change a wall endcap style, all opening endcap styles based on the wall endcap style are modified, too.

Managing Wall Endcap Styles
To create, edit, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk® Architectural Desktop to work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

Related Topics and Procedures

- About Polylines Used in Wall Endcap Styles
- Creating and Applying a Wall Endcap Style
- Creating a Wall Endcap Style
- About Editing Wall Endcap Styles
- Editing the Geometry of a Wall Endcap Style
- Attaching Notes and Files to a Wall Endcap Style

About Polylines Used in Wall Endcap Styles

When you draw polylines to use in wall endcap styles, each polyline corresponds to the shape of the endcap for one wall component. Each polyline is

scaled to fit its assigned component. You can assign the same polyline to wall components that you want to have the same endcap condition.

Here are some guidelines for drawing polylines to use in endcap styles:

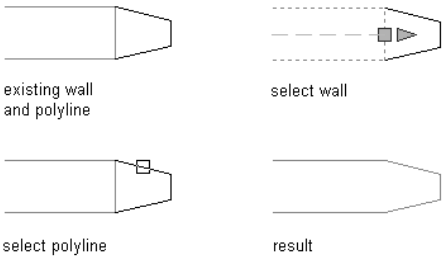
- Use only two-dimensional (2D) open polylines.
- Draw the polylines in plan view. You may want to draw the polylines on top of a wall of the wall style you are creating the endcaps for. This helps you visualize how the endcap should appear for each component of the wall.
- Draw each polyline counterclockwise.
- Ensure that the *X* value of the start point and the *X* value of the endpoint of a polyline are the same. If the *X* values are different, the endcap will be skewed.

Creating and Applying a Wall Endcap Style

Use this procedure to convert one or more polylines into an endcap, and simultaneously create or modify an endcap style. You place these endcaps on walls by modifying the wall style or applying a wall style override.

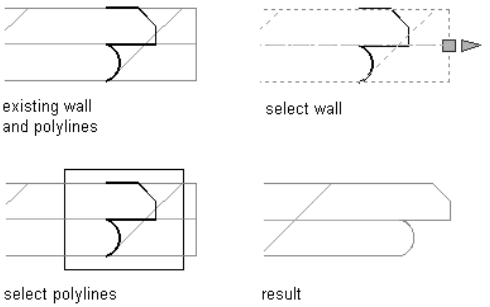
When you create and apply endcaps as described in this procedure, the wall segment is trimmed or extended to the shape of the endcap and defines a new wall start point. When openings, such as doors and windows, exist in a wall to which you apply an endcap, the end of the wall is trimmed or extended to the endcap without moving the openings.

Creating an endcap for a single-component wall



You can use a crossing window to select multiple polylines to create an endcap for a multi-component wall.

Creating an endcap for a multi-component wall



NOTE When creating an endcap for multiple component walls that contain components at different elevations, this method of creating and applying endcaps may produce undesirable results. It is based on the cut plane height of the wall and does not respond to manual above or below cut plane heights.

1. In plan view, draw open polylines on top of or near the end of a wall segment to define the shape of the end condition for each wall component.

   The location of the polyline determines how the wall is extended or trimmed when the endcap is added or modified. For more information about drawing polylines for endcaps, see "About Polylines Used in Wall Endcap Styles" on page 1886.

2. Select the wall, right-click, and click Endcaps ➤ Calculate Automatically.
3. Select the polyline(s) to define the shape of the endcap, and press ENTER.
4. Enter **y** (Yes) to erase the polyline(s), or enter **n** (No) to keep the polyline(s).

   If the current wall endcap style is not the Standard style, you are prompted to modify the current style.

5. Specify the wall endcap style to modify and apply to the wall:

If you want to . . .	Then . . .
modify the wall endcap style that is currently assigned to the wall	press ENTER. The selected wall and any other walls in the drawing that use the wall endcap style are updated with the new geometry.
create a different endcap style	enter **n** (No).

6 If you created a style from the polylines, specify how to apply the new endcap style to the selected wall:

If you want to . . .	Then . . .
apply the new wall endcap style as an override to the current wall style	enter **o** (Override). The new wall endcap style is applied only to the selected end of the wall.
apply the new wall endcap style as the default wall endcap style for the current wall style	press ENTER. The same wall style is updated with the new wall endcap style. Any walls in the drawing of the same wall style are also updated with the new wall endcap style.

7 Enter a name for the new wall endcap style, and click OK.

Creating a Wall Endcap Style

Use this procedure to create a wall endcap style from one or more polylines. For more information about drawing polylines for wall endcap styles for single- and multi-component walls, see "About Polylines Used in Wall Endcap Styles" on page 1886.

1 Draw polyline(s) in the shape of the wall endcap you want to create.

2 On the Format menu, click Style Manager.

3 Expand Architectural Objects.

4 Right-click Wall Endcap Styles, and click New.

5 Enter a name for the new wall endcap style, and press ENTER.

6 Right-click the new style, and click Set From.

7 Select a polyline, and enter the index number for the wall component to which the polyline applies.

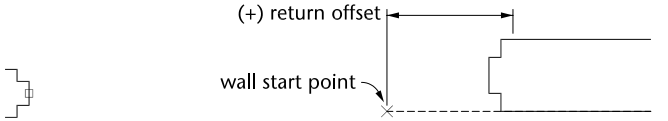
Wall components are numbered from exterior to interior. Component index 1 corresponds to the outermost exterior component.

8 When prompted, enter **y** (Yes) to specify the endcap condition of the next component, or enter **n** (No) if there are no more components.

9 When you finish specifying endcap conditions for wall components, enter the return offset for the endcap.

A positive value offsets the endcap from the wall start point in the positive *X* direction.

Specifying the return offset for an endcap



select polyline to define as endcap

new endcap applied to wall style

10 Click OK.

After you create a wall endcap style, you can apply it to a wall style, an opening endcap style, or to individual walls.

About Editing Wall Endcap Styles

After you assign a wall endcap style to a wall, you can edit the endcap directly. You can save the changes to the current wall endcap style, or to a new wall endcap style. You can also discard changes.

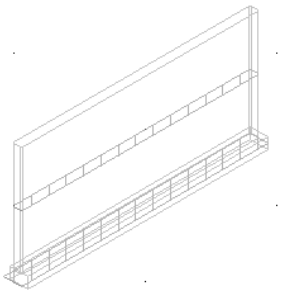
Editing the Standard Wall Endcap Style

The Standard wall endcap style is a special case. While you can use the Standard style as a starting point for creating a new wall endcap style, the Standard style itself cannot be changed. The Standard style is used when no other endcap style is specified for a wall. It is also used when you remove all components from a wall endcap style.

The Wall Endcap Profile

When you edit a wall endcap, a temporary profile with grips for vertices and edges is created for each component of the endcap. You can edit this profile in both plan and model views. In model views, the profile is inserted at the mid-height of the wall. If the wall has components that do not extend to that height, such as a footing, additional profiles are created at the vertical midpoint of these components. Use model views to edit wall endcaps that lie in different planes.

Editing endcaps for wall components in different planes



Use the location grip on the temporary profile to move the profile away from the wall, if needed. You may want to do this if the profile is very complex or is obscured by the linework of other objects. Changes to the profile are saved at its original location.

Editing the Geometry of a Wall Endcap Style

Use this procedure to edit the geometry of a wall endcap style that is applied to a wall. You can edit the vertices and edges of the wall endcap or replace the geometry with that of other polylines. You can save the changes to the current wall endcap style or to a new style.

1. Select the wall that has the wall endcap style you want to change, right-click, and click Endcaps ➤ Edit in Place.
2. Select a point near the endcap.

   A temporary profile is created for you to edit the geometry of the wall endcap. If the wall contains multiple components, a profile is created for each wall component.

NOTE After you perform an editing task from the shortcut menu, you may need to select a profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select a profile, and right-click to display the shortcut menu.

---

3 Edit the profile:

If you want to . . .	Then . . .
change the shape of the perimeter of the profile	select the profile, and use grips to adjust the shape. If the profile has no grips, the Standard style, which you cannot edit, is the current endcap style.
hide one or more edges of the profile (plan view only)	select the profile, right-click, and click Hide Edge. Select the edges you want to hide, and press ENTER.
display an edge that you hid	select the profile, right-click, and click Show Edge. Select the edges you want to show, and press ENTER.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace the geometry of an endcap component with new polyline that lies on the end of the wall exclusive of existing endcaps	select the profile for the component you want to replace, right-click, and click Replace Endcap. Select the endcap component to replace, and select a polyline to define the new geometry. Press ENTER to keep the polyline in the drawing, or enter **y** (Yes) to erase it.
remove an endcap component	select the profile for the component you want to remove, right-click, and click Remove Endcap.

4 Save or discard the changes:

If you want to . . .	Then . . .
restore the wall endcap to its original shape	click .

If you want to . . .	Then . . .
save the changes to the current wall endcap style	click . The wall endcap and the wall endcap style use the edited profile(s) to define its geometry. Any other walls or opening endcap styles that use this wall endcap style are also updated with the edited geometry.
save the changes to a new wall endcap style	select the profile, right-click, and click Save as New Endcap Style. Enter a name for the new wall endcap style, and click OK. The wall endcap uses the new style to define its geometry. Other walls, wall styles, or opening endcap styles that use the original style are not affected.

Attaching Notes and Files to a Wall Endcap Style

Use this procedure to enter notes and attach reference files to a wall endcap style. You can also edit notes and edit or detach reference files from a wall endcap style.

1. Open a tool palette that contains a wall tool.
2. Right-click a wall tool, and click Wall Styles.
3. Select the wall style you want to change, right-click, and click Edit.
4. Click the General tab.
5. To add a description to the endcap style, enter it for Description.
6. Click Notes.
7. To add a note, click the Notes tab, and enter the note.
8. Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK.

Opening Endcap Styles

Opening endcaps styles define the end conditions of walls into which doors, windows, openings, or door/window assemblies have been added. Opening endcap styles let you specify which wall endcap style is applied to each edge of an opening.

Opening Endcap Styles and Wall Endcap Styles

Wall endcap styles are typically created for specific wall styles. When you create an opening endcap style, you can select the wall endcap style that is appropriate for each edge of the opening. You can therefore create an opening endcap style for each type of object that you can add to a wall of a specific wall style.

NOTE When you change a wall endcap style, all opening endcap styles based on the wall endcap style are modified, too.

Applying Opening Endcap Styles

After you create the opening endcap styles you want to use with a particular wall style, you edit the wall style to specify which opening endcap style is used with the following objects: doors, windows, openings, and door/window assemblies. For more information, see "Specifying the Endcap Styles Used in a Wall Style" on page 1868.

When necessary, you can override the opening endcap style assigned in a wall style. When you override the assigned opening endcap style, you can select a different endcap style for the start and the end of the object, such as a door, on the Properties palette.

Managing Opening Endcap Styles

To create, edit, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk® Architectural Desktop to work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

Related Procedures

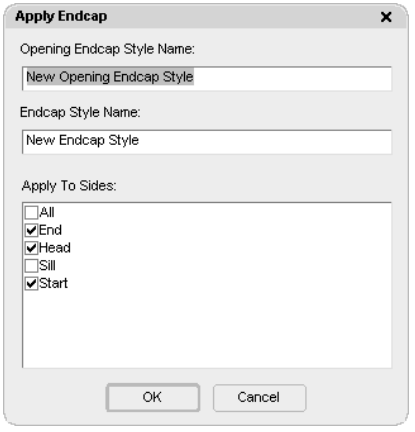
- Creating and Applying Opening Endcap Styles
- Creating and Editing an Opening Endcap Style
- Attaching Notes and Files to an Opening Endcap Style

Creating and Applying Opening Endcap Styles

Use this procedure to create an opening endcap style and immediately apply it to an opening in a selected wall.

1. Draw the polylines for the new endcap.
2. Select the wall where you want to create the new endcap, right-click, and click Endcaps ➤ Calculate Automatically.
3. Select the linework to define the new endcap, and press ENTER.
4. Press ENTER to keep the polyline(s) in the drawing, or enter y (Yes) to erase them.
5. When prompted, specify whether you want to modify the current opening endcap style, or to create a new style.
6. If you create a new style, specify the edges where the endcap you created is applied.

   Specifying the edges where new endcaps are applied



7. Click OK.

   The new endcaps are applied to the edges of the current opening as you specified.

Creating and Editing an Opening Endcap Style

Use this procedure to create an opening endcap style. You can create a style using default style properties, by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

The wall endcap styles you use in the opening endcap style must exist in the drawing before you can add them to the style. For more information, see "Opening Endcap Styles" on page 1894.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Wall Opening Endcap Styles.
3. Create an opening endcap style:

If you want to . . .	Then . . .
create a style with default properties	right-click Wall Opening Endcap Styles, and click New.
create a style from an existing style	right-click the opening endcap style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new opening endcap style, and press ENTER.
5. To edit the new wall style, right-click the style, and click Edit.
6. Click the Design Rules tab.
7. Select a wall endcap style for each edge of the opening: jamb start, jamb end, head, and sill.

   Select the Standard wall endcap style for an edge that does not require an endcap, such as the sill for a door.
8. Click OK twice.

Attaching Notes and Files to an Opening Endcap Style

Use this procedure to enter notes and attach reference files to an opening endcap style. You can also edit notes and edit or detach reference files from an opening endcap style.

1. On the Format menu, click Style Manager.
2. Expand Architectural Objects, and expand Wall Opening Endcap Styles.
3. Select the opening endcap style you want to change, right-click, and click Edit.
4. Click the General tab.
5. To add a description to the endcap style, enter it for Description.
6. Click Notes.
7. To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 Click OK.

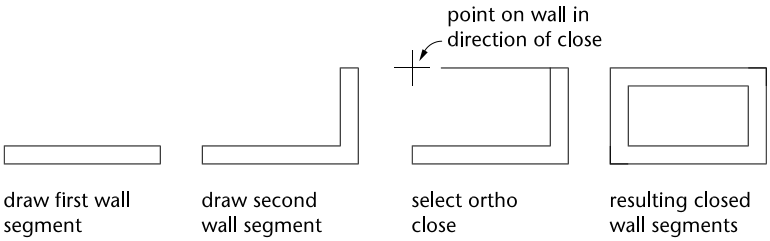
Using Ortho Close and Close with Walls

Ortho Close and Close are command-line options that let you efficiently create a closed space when you add walls.

Ortho Close

This option closes the space by drawing two walls based on the direction you specify. The direction is extended until it meets a line perpendicular to the initial edge of either the wall. You enter **or** (Ortho) at the command line to use this option when placing walls.

Closing walls with Ortho Close



Close

This option closes the wall by creating a wall segment from the last point specified for the walls to the first point specified in this group of walls. You enter **c** (Close) at the command line to use this option when placing walls.

About Wall Lengths

When you draw a wall, the "true" length of the wall is the distance between the two end grips. The wall can appear to have a different length when it

cleans up with other walls; the difference can be twice the cleanup radius longer or shorter than the "true" length. The "true" length is the length reported by properties and schedules. To get the most accurate information about wall length in schedules, always make sure that walls that clean up with each other have end grips that coincide.

About Curved Walls

The smoothness (tesselation) of curved edges is controlled by the FACETDEV variable. This variable sets the number of facets to display on curved AEC objects. The default value is 1/2" for drawings created from imperial templates and is 12.7 mm for drawings created from metric templates.

The number you specify for facet deviation defines the maximum distance from the chord to the arc, the chord being an edge that is created from faceting the curve, to the true mathematical arc. The facet deviation has a range of greater than zero (0) and no upper limit.

The minimum number of facets is 8. For example, if you create a cylinder mass element to have a 1' radius, and specify 1' for facetdev, the cylinder has 8 faces.

To specify the facet deviation values for the current drawing, see "Specifying the Display Resolution of Objects with Facets" on page 564. The settings apply to all curved objects in the drawing, including curved walls.

Specifying Offsets for Roof Line and Floor Line Vertices

When you add or move a vertex on the roof line or the floor line of a wall, you specify the horizontal and vertical offset of the vertex. You can specify the offset relative to other vertices or to the base height or the baseline of the wall. The following table identifies the locations you can specify for the horizontal offset of a vertex. The offset distance is measured in the direction the wall was drawn.

This setting . . .	Defines the horizontal offset from . . .
From Wall Start	the wall start point.
From Wall End	the wall end point.
From Wall Midpoint	the midpoint of the wall.
From Previous Point	the vertex that is one position closer to the wall start point than the vertex you are adding or moving.

This setting . . .	Defines the horizontal offset from . . .
From Next Point	the vertex that is one position closer to the wall endpoint than the vertex you are adding or moving.
From Midpoint of Neighbors	the midpoint of the distance between the current vertex and the vertex that is one position closer to the wall endpoint.

The following table identifies the locations you can specify for the vertical offset of a vertex. You can enter a negative distance for the vertical offset to position a vertex toward the ground.

This setting . . .	Defines the vertical offset from . . .
From Wall Base Height	the base height of the wall.
From Next Point.	the vertex that is one position closer to the wall endpoint than the vertex you are adding or moving.
From Previous Point	the vertex that is one position closer to the wall start point than the vertex you are adding or moving.
From Baseline	the baseline of the wall.

Specifying the Width and Edge Offset of a Wall Component

You can specify the width and edge offset of a wall component by entering values, creating a component with a fixed width and offset. You can also specify a formula for determining these values. The formula can include a value for Base Width. By including the Base Width variable in the formula, you can specify the width of the wall when you add or edit walls of this style to a drawing.

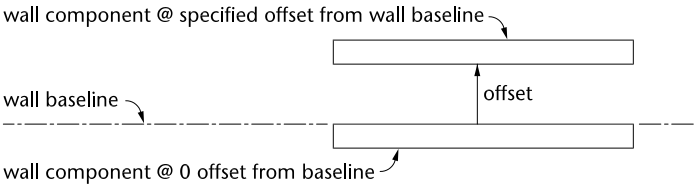
Specifying a formula to determine component width or edge offset

To calculate the edge offset or the width based on the base width, select Base Width and select an operator and an operand:

- If you select Base Width for any component, you can enter a width for walls of this style when you add or modify them in a drawing.

- If all components in the wall style use absolute values, you cannot change the width of individual walls of this style when you add or modify them.

Wall component baseline offset parameters



Windows

26

A window is an AEC object that interacts with walls and space boundaries. After a window is placed in a wall or space boundary, the window is constrained to the object and cannot move outside it. Windows can be anchored to specific locations in walls or space boundaries; when the wall or space boundary moves or changes size, the location of the window in that object stays constant. Windows can also be freestanding objects.

In this chapter

- Using Window Tools to Create Windows
- Creating a Window
- Creating a Window with User-Specified Settings
- Creating a Window Tool
- Editing Windows
- Window Styles

Creating Windows

You can create windows using all of the typical design parameters for style, standard size, width and height, threshold height, head height, and vertical alignment. You can choose styles with glass shapes that receive standard muntins patterns, and create your own custom glass shapes from profiles.

Working with Window Styles

Templates provided with Autodesk®Architectural Desktop contain ready-to-use window styles. The design rules of a window style determine the default dimensions of windows created from the style. The window style also determines the window shape and the window type:

- The window shape determines the geometry of the window frame, such as rectangular, half round, and arch. You can also create custom window shapes from profiles.
- The window type determines the number of panels and the method of opening the window, such as glider, pass-through, hopper, or picture.

You can also define standard sizes in a window style and then select the size you want to use when you place the window in a drawing.

Anchoring Windows

After a window is placed in a wall or space boundary, the window is constrained to the object and cannot move outside it.

Windows can also be anchored to specific locations in walls or space boundaries, so that when the wall or space boundary moves or changes size, the location of the window in that object stays constant.

Window Dimensions

Some window dimensions depend on the window shape and type specified in the window style.

Rise is the height from the top of the rectangular portion of a window to the peak of the window opening for Gothic, Arch, and Peak Pentagon window shapes.

Vertical Alignment of Windows

To control how you place the window in the wall, the location of the working point vertically in the wall, and how the window responds to modifications in height, use the vertical alignment settings. To determine the working point on the window, use the threshold and head height settings. You can place the working point at the sill or at the head.

The threshold height is maintained. For example, if you specify the vertical alignment as 0" and the window height as 7'–0", the window opening height

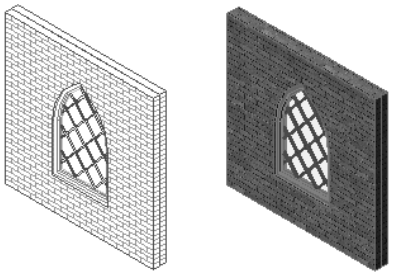
is 7’–0". If you next specify the height of the window as 6'–8", the window threshold remains at 0" and the window opening height becomes 6’–8".

The window head work point is maintained. For example, if you specify the vertical alignment as 7'–0" and the window height as 7'–0", the window opening height is 7–0". If you specify the window height as 6'–8", the window head remains at 7'–0" and the window threshold becomes 4".

Materials in Windows

In Autodesk Architectural Desktop, you can assign materials to a window. These materials then are displayed in wireframe or rendered views. Materials have specific settings for individual components of a window, such as the frame, the sash, or the muntins. For more information, see “Material Components and Display Properties” on page 498.

Window in 2D wireframe and rendered views



Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes, which contain settings for windows. You can use these predefined materials, or modify them to your special designs. You can also create your own materials. If you create a material that should specifically be used only for windows, it is recommended that you name it accordingly; for example, Window - Wood Frame or Window Sill - Marble. For more information, see “Creating and Editing Materials” on page 517.

Related Topics and Procedures

- Using Window Tools to Create Windows
- Creating a Window
- Creating a Window with User-Specified Settings
- Creating a Window Tool
- Editing Windows
- Window Styles

Using Window Tools to Create Windows

Tool palettes provided with Autodesk Architectural Desktop let you quickly place windows by selecting a window tool with a specific window style and other predefined properties. You can also use window tools to apply the settings of a window tool to existing windows. The following table lists the tool palettes containing one or more window tools:

Tool palette . . .	Contains . . .
Design	a window tool for the Standard window style and default settings for other window properties
Windows	a window tool for sample window styles, with default properties appropriate for each window style
Custom tool palettes created by your CAD manager	window tools with window styles and properties that are customized for your projects or office standards

When you place windows using windows tools, you can use the default settings of the tool, or you can change settings for any windows properties that are not controlled by the style.

Related Procedures

- Creating a Window with User-Specified Settings

Creating a Window

Use this procedure to add a new window that has the properties specified in the window tool that you select. To specify settings when you add a window, see "Creating a Window with User-Specified Settings" on page 1905.

1. Open the tool palette that you want to use, and select a window tool.

   If necessary, scroll the palette to display the tool that you want to use.

2. Select a wall or space boundary in which to insert the window, or press ENTER to add a freestanding window.

   You can move or hide the Properties palette to expose more of the drawing area.

3. Specify the insertion point of the window.

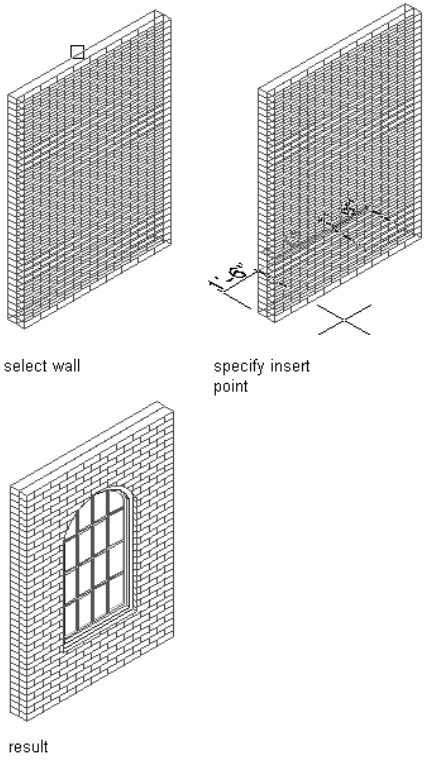
4 Continue adding windows, and press ENTER.

Creating a Window with User-Specified Settings

Use this procedure to create any of the following, with settings that you specify:

- Freestanding windows
- Windows in walls
- Windows in space boundaries

Adding a window to a wall



TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1. Open the tool palette that you want to use, and select a Window tool.
   If necessary, scroll the tool palette to display the tool you want to use.
2. On the Properties palette, expand Basic, and expand General.
3. Select a window style.
4. Expand Dimensions.
5. Specify a window size:

If you want to . . .	Then . . .
use a standard window size	click Standard Sizes, and then select a window size.
use a custom window size	enter values for Width and Height.

6. Enter a value for Rise, if applicable to the selected style and window type.
7. Specify where the window width and height are measured to:

If you want to measure to . . .	Then . . .
the outside of the window frame	Select Outside of frame for Measure to.
the inside of the window frame	Select Inside of frame for Measure to.

8. Enter a value for Opening percent or Swing angle.
   Zero indicates a closed window.
9. Expand Location.
10. If you are placing the window in a wall or a space boundary, specify the position of the window:

If you want to . . .	Then . . .
position the window at a specific distance between the edge of the opening and the end of a wall segment or space boundary	select Offset/Center for Position along wall, and enter a value for Automatic offset.

If you want to . . .	Then . . .
center the window on a wall segment or space boundary	select Offset/Center for Position along wall, and specify a point near the center of the wall segment or space boundary.
position the window anywhere along the wall or space boundary	click Position along wall, and select Unconstrained.

11 Specify whether you want the window aligned vertically by sill height or by head height:

If you want to align the window . . .	Then . . .
by sill height	select Sill for Vertical alignment, and enter a value for Sill height.
by head height	select Head for Vertical alignment, and enter a value for Head height.

12 Specify the insertion point for a freestanding window or a window in a wall or space boundary:

If you want to insert . . .	Then . . .
a freestanding window	press ENTER, and specify an insertion point and a rotation angle for the window.
the window in a wall	select the wall and specify an insertion point along the wall.
the window in a space boundary	select the space boundary and specify an insertion point in the space boundary.

13 Continue to place windows by selecting window styles and specifying insertion points, or press ENTER to end the command.

Creating a Window Tool

Use this procedure to create a window tool and add it to a tool palette. You may want to create your own window tools if you are placing multiple win-

dows of specific styles with additional properties that you want to be the same each time you add a window of each type.

For example, you are creating an office floor plan that contains two custom window styles: fixed casement for conference rooms and operable casement for offices. To work efficiently, you can create a window tool for each style. You can then select the appropriate tool to place windows in offices and conference rooms.

You can use any of the following methods to create a window tool:

- Drag a window that has the properties you want to a tool palette.
- Drag a window style from the Style Manager to a tool palette, and then customize the properties of the new tool.
- Copy an existing tool, and then customize the properties of the new tool.
- Drag a tool from a tool catalog in the Content Browser, and then customize the properties of the tool.

  For information about using the Content Browser to create a tool, see "Using Tool Catalog Items in Autodesk Architectural Desktop" on page 199.

1. Open the tool palette where you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a window in the drawing	select the object, and drag it to the tool palette.
create a tool from a window style in the Style Manager.	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK.
copy a tool in the current palette	right-click the tool, click Copy, and click Paste.
copy a tool from another palette	right-click the tool and click Copy; open the other palette, and click Paste.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.

This description is used as the tool's tooltip on the tool palette, and to describe the tool if it is stored in a tool catalog.

6 Expand Basic, and expand General.

7 Enter a description of the tool.

8 If you do not want to use the default layer key for windows, select a layer key.

9 If you want to override the default layer name for windows, select a layer override.

10 Select a window style.

11 For Style location, select the drawing file containing the style used for this window, or select Browse and use a standard file selection dialog box to select the file.

12 Expand Dimensions.

13 Specify a window size:

If you want to . . .	Then . . .
use a standard window size	click Standard Sizes, and then select a window size.
use a custom window size	enter values for Width and Height.

14 Specify where the window width and height are measured to:

If you want to measure to . . .	Then . . .
the outside of the window frame	Select Outside of frame for Measure to.
the inside of the window frame	Select Inside of frame for Measure to.

15 Enter a value for Rise, if applicable to the selected style and window type.

16 Enter a value for the Opening percent or Swing angle.

Zero indicates a closed window.

NOTE Defining the opening percent in display properties overrides this setting on the Tool Properties palette. For more information, see "Specifying the Display Properties of a Window Style" on page 1946.

17 Expand Location.

18 Specify the position of the window when it is placed in a wall or a space boundary:

If you want to . . .	Then . . .
position the window at a specific distance between the edge of the opening and the end of a wall segment or space boundary	select Offset/Center for Position along wall, and enter a value for Automatic offset.
center the window on a wall segment or space boundary	select Offset/Center for Position along wall, and specify a point near the center of the wall segment or space boundary.
position the window anywhere along the wall or space boundary	click Position along wall, and select Unconstrained.

19 Enter a value for the head height.

20 Enter a value for the sill height.

21 Click OK.

Editing Windows

After you create a window, you can change the size, height, width, rise, and opening. You can also move the window within the wall, flip the hinge or swing, and change the swing opening.

You can change the properties of existing windows in your drawing by changing the window style, changing the dimensions of the window, moving the anchor location of the window, and specifying the endcap conditions of the window.

Autodesk®Architectural Desktop offers several methods for editing windows:

- You can directly edit windows using grips for dimensions and other physical characteristics.
- You can change window settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected window.

Related Procedures

- Using Grips to Edit Windows
- Changing the Window Style
- Changing How Window Width is Measured
- Changing the Window Swing Angle or Opening Percent
- Changing the Vertical Alignment of a Window
- Moving a Window Along a Wall or Space Boundary
- Moving a Window Within a Wall or Space Boundary
- Using Anchors to Change the Horizontal Position of a Window
- Using Anchors to Change the Vertical Position of a Window
- Using Anchors to Change the Position of a Window Within a Wall or Space Boundary
- Changing the Orientation of a Window to a Wall or Space Boundary
- Changing the Opening Endcap Assigned to a Window
- Changing the Location of a Freestanding Window
- Attaching Hyperlinks, Notes, and Files to a Window

Using Grips to Edit Windows

You can use grips to modify the following window properties:

- Dimensions (width and height)
- Location in a wall or space boundary
- Hinge side (left- or right-hand)
- Swing direction
- Rise

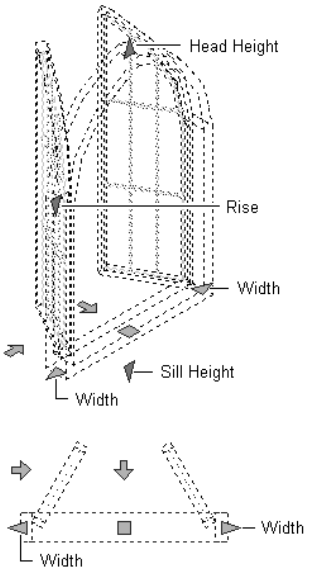
  Rise applies to Peak Pentagon, Arch, and Gothic window shapes. For more information, see "Specifying the Design Rules of a Window Style" on page 1940.

Refer to the illustrations and steps in this topic to use window grips to edit windows.

Editing the Dimensions of a Window That Has Standard Sizes

1. Select the window.

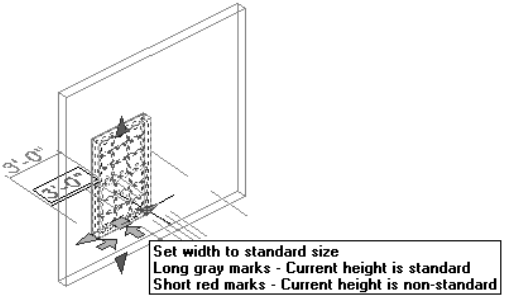
Window Dimension Grips



2 Select the grip for the dimension you want to change.

The grip is initially set to constrain the sizing to one of the standard values defined for the style of window. For example, if you select the width grip, the grip is set to constrain the width to one of the standard values defined for that style of window.

Standard height window with width grip selected



The CTRL key acts as a toggle between standard and custom sizing.

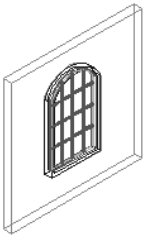
A series of tick marks indicates the standard sizes for the selected dimension. As you move the grip, it snaps to each tick mark and displays the measurement at that mark.

The size and color of the grip tick marks indicate whether setting a standard value for the dimension results in a standard window size. For example, if the height of the window is set to a non-standard value, the window is still not a standard size even if you set the window width to one of the standard width values for that window style. Long grey tick marks indicate that a standard size is possible; short red marks indicate that another dimension is already set to a non-standard value.

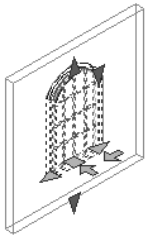
3 Resize the dimension:

If you want to change the dimension . . .	**Then . . .**
using a standard size	move the grip until the value you want is displayed, and click once.
using a non-standard size	press CTRL, and either move the grip until the value you want is displayed and then click once, or else enter a value.

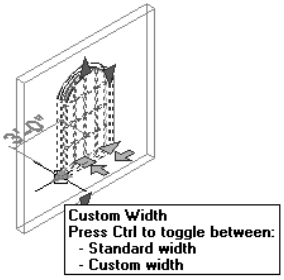
Changing a window width



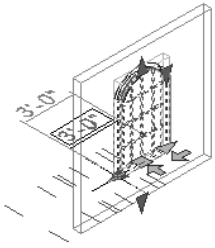
window with
initial width



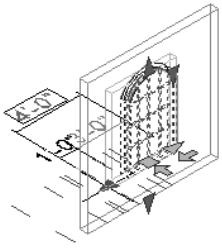
select window



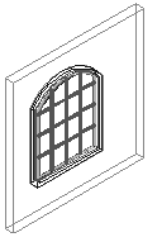
select Width grip



view standard
size width markers

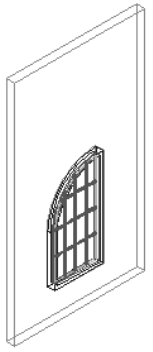


specify new width

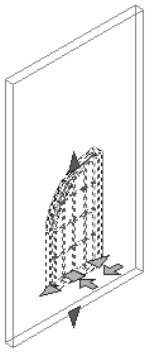


result

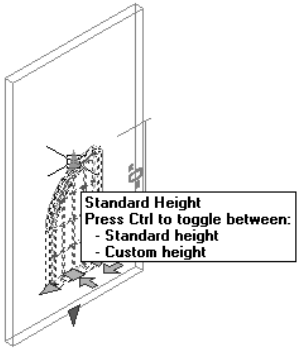
Changing a window height



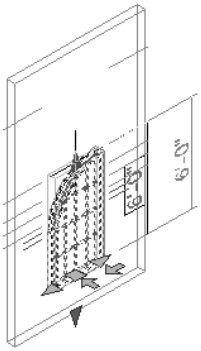
window with
initial height



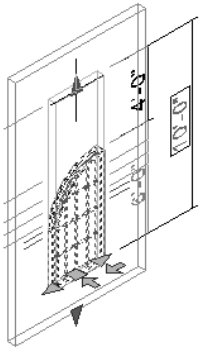
select window



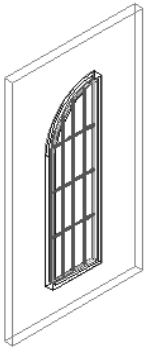
select Height
grip



view standard
size height markers



specify new
height



result

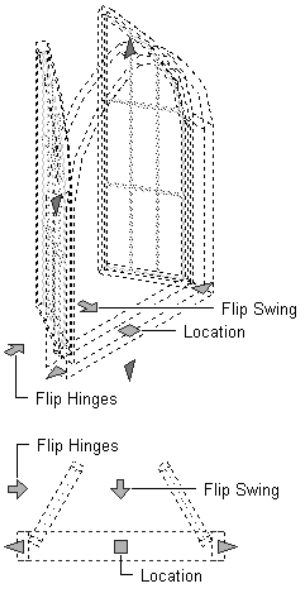
Editing the Dimensions of a Window That Does Not Have Standard Sizes

1. Select the window.
2. Select the grip for the dimension you want to change.
3. Either move the grip until the dimension value you want is displayed and then click once, or else enter a value.

Moving a Window Anchored to a Wall or Space Boundary

1. Select the window.
2. Select the Location grip.

   Window Location and Flip Grips



3. With the grip selected, press the CTRL key to switch the direction of movement.

   You can move along the wall, within the wall, and vertically.

4. Move the grip until the window is in the desired location, and click once.

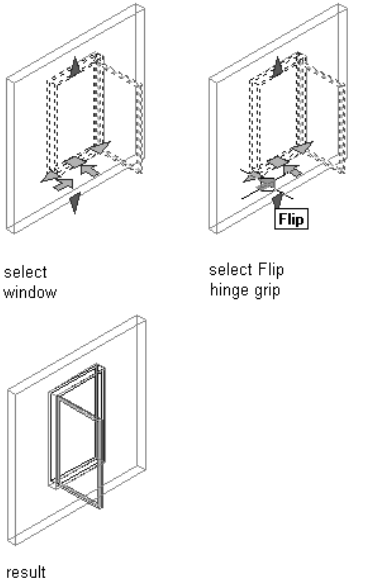
Moving a Freestanding Window

1. Select the window.
2. Select the Location grip.
3. Move the window to the appropriate location, and click once.

Changing the Hinge Side of a Window

1. Select the window.
2. Select the Flip grip to reverse the side of the window that hinges are located on.

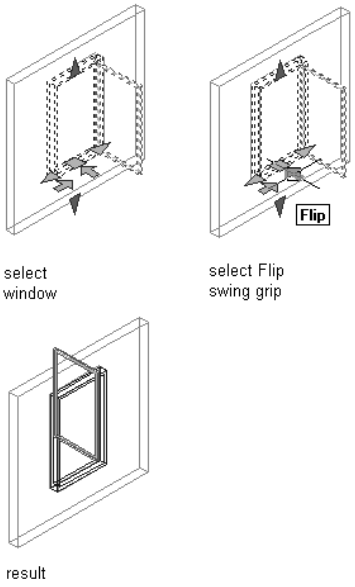
Flipping a window hinge



Changing the Swing Direction of a Window

1. Select the window.
2. Select the Flip grip to reverse the swing direction of the window.

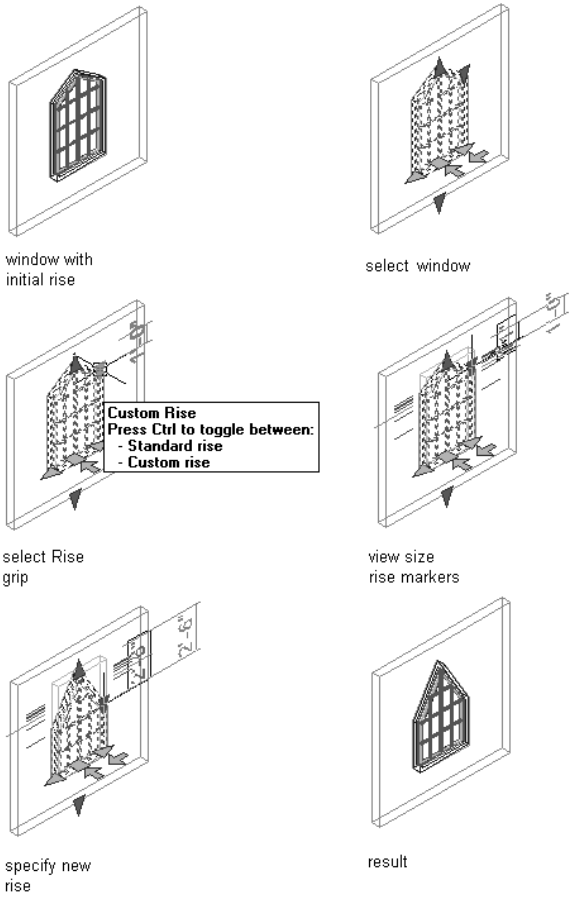
Flipping a window swing



Changing the Rise of a Window

1. Select the window.
2. Select the Rise grip.

Changing a window rise



3 Move the grip until the rise value you want is displayed and click once, or enter a value.

Changing the Window Style

Use this procedure to change the style for a window or group of windows.

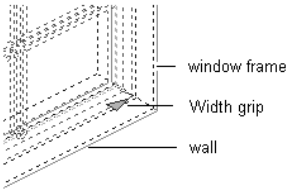
1 Select one or more windows, and double-click one of them.
2 On the Properties palette, expand Basic, and expand General.
3 Select a window style.

Changing How Window Width is Measured

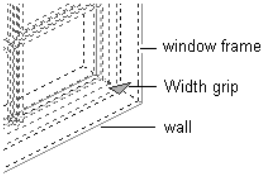
Use this procedure to change how the width of a window or windows is measured.

1. Select the windows you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand Dimensions.

Specifying window frame measurement



measuring to
inside of frame



measuring to
outside of frame

3. Specify the location to which window width is measured:

If you want to size the windows . . .	Then . . .
to the inside frame	select Inside of frame for Measure to.
to the outside frame	select Outside of frame for Measure to.

Changing the Window Swing Angle or Opening Percent

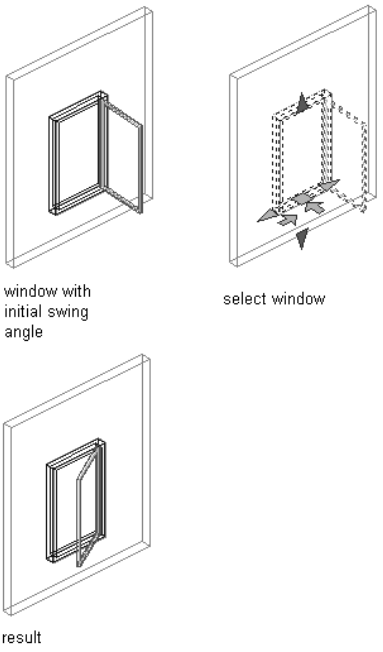
Use this procedure to change the swing angle or opening percent of a window or group of windows.

A window with an opening percent of zero is closed.

NOTE Defining the opening percent in display properties overrides this setting on the Properties palette. For more information, see "Specifying the Display Properties of a Window Style" on page 1946.

1. Select the windows you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand Dimensions.
3. Enter a value for Swing angle or Opening percent.

Changing a window swing angle



Changing the Vertical Alignment of a Window

Use this procedure to change the vertical alignment of a window or group of windows.

1. Select the windows you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand Location.

3 Specify whether you want the window aligned vertically by sill height or by head height:

If you want to align the windows . . .	Then . . .
by sill height	select Sill for Vertical alignment, and enter a value for Sill height.
by head height	select Head for Vertical alignment, and enter a value for Head height.

Moving a Window Along a Wall or Space Boundary

Use this procedure to change the location of one or more windows along a wall or space boundary by offsetting the windows from a reference location.

This feature is useful when you want to position a window at a specified distance from another object. For example, you may want to specify an exact distance between a series of windows along a wall.

NOTE If the defect marker appears in the wall after you move a window, the window is too close to other objects in the wall or to the end of the wall for the endcaps to fit. Adjust the position of the window until the defect marker disappears.

1 Select the window you want to move, right-click, and click Reposition Along Wall.

A marker indicates the current location within the opening.

2 Specify where to measure the offset from:

If you want to measure the offset . . .	Then . . .
from the center of the window	select a point near the center of the window.
from an end of the window	select a point on the end of the window you want to measure from.

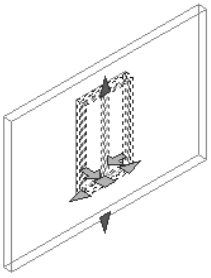
3 Select a point to measure to (the reference point).

You can select a point along the wall.

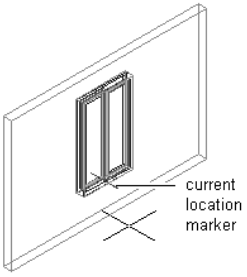
4 Specify the distance between the points you selected:

If you want to . . .	Then . . .
move the window to the reference point	enter 0.
move the window a specified distance from the reference point	enter a value for the offset distance.
specify the distance as a measurement between two points, such as the distance between the centers of two windows that are correctly positioned	select the two points measuring the distance.

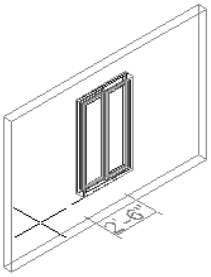
Repositioning a window along a wall



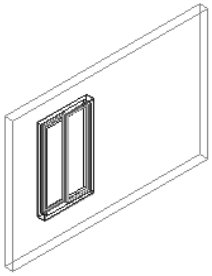
select window



select position
on the opening



select reference
point



result

Moving a Window Within a Wall or Space Boundary

Use this procedure to move one or more windows within a wall or space boundary by offsetting the windows from a reference location.

This feature allows you to align windows within the thickness of a wall or space boundary. You can set an offset distance from any point within a wall, or center the windows between the faces of a wall or space boundary. You can select doors, windows, and openings and reposition them at the same time. If you select more than one object, you can select only one side to offset.

1 Select the windows you want to move, right-click, and click Reposition Within Wall.

   A marker indicates the current location within the opening. This may be the center of the frame, the interior face of the frame, or the exterior face of the frame.

2 Specify where to measure the offset from:

If you want to . . .	Then . . .
center the windows between the faces of the wall or space boundary	select a point near the center of the window.
offset the windows from the interior or exterior face	select a point on the side of the face you want to measure from.

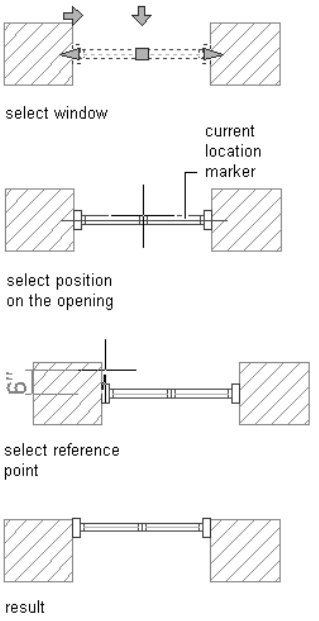
3 Select a point to measure to.

4 Specify the offset distance from the selected point:

If you want to . . .	Then . . .
center the windows between the faces of the wall or space boundary	use the Midpoint osnap to select the midpoint of the end of the wall.
move the windows to the reference point	enter 0.
move the windows a specified distance	enter a value for the offset distance.

If you want to . . .	Then . . .
specify the distance as a measurement between two points	select the two points measuring the distance.

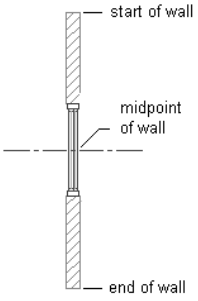
Repositioning a window within a wall



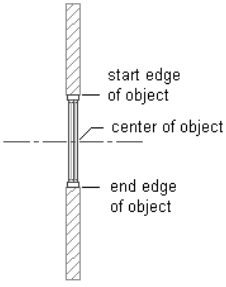
Using Anchors to Change the Horizontal Position of a Window

Use this procedure to change the horizontal position of windows along a wall or space boundary to which the windows are anchored.

Window position along the *X* axis parameters



x-axis wall parameters



x-axis window parameters

1 Select the windows you want to change, and double-click one of them.

2 On the Properties palette, expand Basic, and expand Location.

For space boundaries, expand Location on space boundary.

3 Click Anchor.

4 Select the reference point for the anchor along the *X* axis:

If you want to . . .	**Then . . .**
use the start of the wall as the reference point	under Position Along (X), select Start of wall for From.
use the start of the space boundary as the reference point	under Position Along (X), select Start of curve for From.
use the midpoint of the wall as the reference point	under Position Along (X), select Midpoint of wall for From.
use the midpoint of the space boundary as the reference point	under Position Along (X), select Midpoint of curve for From.

If you want to . . .	Then . . .
use the end of the wall as the reference point	under Position Along (X), select End of wall for From.
use the end of the space boundary as the reference point	under Position Along (X), select End of curve for From.

5 Enter the distance from the reference point at which to place the windows.

Use a negative value to measure from endpoint to start point.

6 Select the position of the windows to measure to:

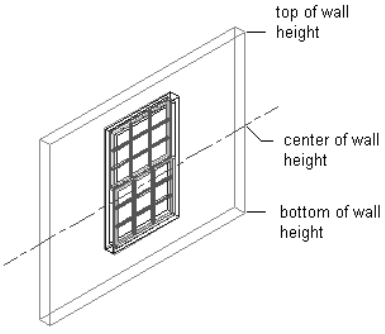
If you want to measure to . . .	Then . . .
the start edge of the windows	select Start Edge of object for To.
the center of the windows	select Center of object for To.
the end edge of the windows	select End Edge of object for To.

7 Click OK.

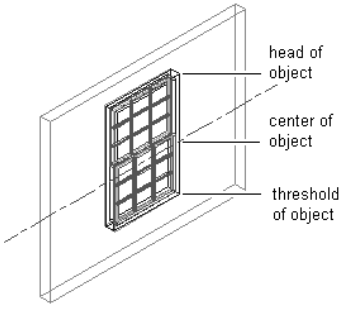
Using Anchors to Change the Vertical Position of a Window

Use this procedure to change the vertical position of windows in a wall or space boundary to which the windows are anchored.

Window position along the *Z* axis parameters



z-axis wall parameters



z-axis window parameters

1 Select the windows you want to change, and double-click one of them.

2 On the Properties palette, expand Basic, and expand Location.

3 Click Anchor.

4 Select the reference point for the anchor along the *Z* axis:

If you want to . . .	**Then . . .**
use the bottom of the wall height as the reference point	under Position Along (Z), select Bottom of wall height for From.
use the bottom of the space boundary height as the reference point	under Position Along (Z), select Bottom of curve height for From.
use the center of the wall height as the reference point	under Position Along (Z), select Center of wall height for From.

If you want to . . .	Then . . .
use the center of the space boundary height as the reference point	under Position Along (Z), select Center of curve height for From.
use the top of the wall height as the reference point	under Position Along (Z), select Top of wall height for From.
use the top of the space boundary height as the reference point	under Position Along (Z), select Top of curve height for From.

5 Enter the distance from the reference point at which to place the windows.

Use a negative value to measure from endpoint to start point.

6 Select the position of the windows to measure to:

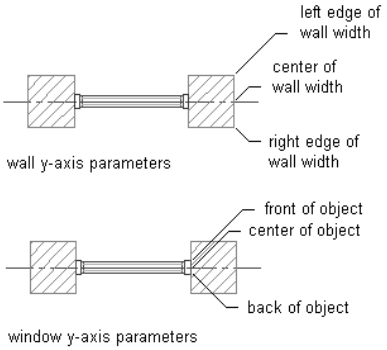
If you want to measure to . . .	Then . . .
the bottom of the windows	select Sill (Bottom) of object for To.
the center of the windows	select Center of object for To.
the top of the windows	select Head (Top) of object for To.

7 Click OK.

Using Anchors to Change the Position of a Window Within a Wall or Space Boundary

Use this procedure to change the position of windows horizontally within a wall or space boundary to which the windows are anchored.

Window position along the *Y* axis parameters



1 Select the windows you want to change, and double-click one of them.

2 On the Properties palette, expand Basic, and expand Location.

3 Click Anchor.

4 Select the reference point for the anchor along the Y axis:

If you want to . . .	Then . . .
use the left edge of the wall as your reference point	select Left edge of wall width for From.
use the left edge of the space boundary as your reference point	select Left edge of curve width for From.
use the center of the wall as your reference point	select Center of wall width for From.
use the center of the space boundary as your reference point	select Center of curve width for From.
use the right edge of the wall as your reference point	select Right edge of wall width for From.
use the right edge of the space boundary as your reference point	select Right edge of curve width for From.

5 Enter the distance from the reference point at which to place the windows.

Use a negative value to measure from endpoint to start point.

6 Select the position of the windows to measure to:

If you want to measure to . . .	Then . . .
the front of the windows	select Front of object for To.
the center of the windows	select Center of object for To.
the back of the windows	select Back of object for To.

7 Click OK.

Changing the Orientation of a Window to a Wall or Space Boundary

Use this procedure to change the vertical orientation of windows in a wall or space boundary to which the windows are anchored.

1 Select the windows you want to change, and double-click one of them.
2 On the Properties palette, expand Basic, and expand Location.
3 Click Anchor.
4 Enter the X and Z rotation angles of the windows.
5 Indicate if you want to reverse the flip direction of the windows in the X, Y, and Z axes:

If you want to reverse . . .	Then . . .
the direction the windows open to	select Flip X.
the side of the wall the windows open to	select Flip Y.
the top and bottom of the windows	select Flip Z.

6 Click OK.

Changing the Opening Endcap Assigned to a Window

Use this procedure to change the opening endcap style assigned to windows.

NOTE Each opening endcap style is generally created for use with a specific wall style. Changing the opening endcap style used for individual windows may cause the wall to display a defect marker.

For more information, see "Opening Endcap Styles."

1. Select the windows whose endcaps you want to change, and double-click one of them.
2. On the Properties palette, expand Basic, and expand Location.
3. Expand Endcaps.
4. Select the opening endcap style.

Changing the Location of a Freestanding Window

Use this procedure to relocate a freestanding window by changing the coordinate values of its insertion point. The window also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the window are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the window by aligning its normal with another axis. You can also rotate the window on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD User's Guide*.

1. Double-click the window you want to move.
2. On the Properties palette, expand Basic, expand Location, and click Additional Information.
3. In the Location dialog box, specify the window location:

If you want to . . .	Then . . .
relocate the window	enter new coordinate values under Insertion Point.
locate the window on the *XY* plane	make the normal of the window parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the window on the *YZ* plane	make the normal of the window parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.

If you want to . . .	Then . . .
locate the window on the *XZ* plane	make the normal of the window parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the window	enter a new value for Rotation Angle.

4 Click OK.

Attaching Hyperlinks, Notes, and Files to a Window

Use this procedure to enter notes and attach reference files to a window. You can also edit notes and edit or detach reference files from a window.

1 Double-click the window you want to attach notes or files to.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD Command Reference*.

4 To add a note, click next to Notes, enter text, and click OK.

5 Click next to Reference documents, and then attach, detach, or edit a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6 Click OK.

Window Styles

A window style is a group of properties assigned to a window that determines the appearance and other characteristics of the window.

You can use window styles to represent standard window types for specific jobs and drawings or for office standards. When you create or modify a window style, the windows using the style have the settings and characteristics of the style. Templates provided with Autodesk Architectural Desktop contain window styles for many standard windows. You can create your own window styles and window types for custom windows.

Each window you create has a window style associated with it. The window style controls window properties such as dimensions, design rules, and standard sizes for windows. Style control means that when you change a window style, the windows in the current drawing that use that style change globally.

The design rules are window-style properties that determine the predefined or custom shape and window type. Window shapes such as Arch, Gothic, Rectangular, and Round are the geometric configurations of the window. Custom shapes, such as Hinged-Single-Full Lite, are available for particular window types, for example a Single Casement window type. Window types, such as Awning, Pass Through, or Casement, describe window opening characteristics of closure, swing, and hinging.

You can create a style using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

Creating Tools from Window Styles

You can create a window tool from any window style. You can drag the style from the Style Manager onto a tool palette. You can then specify default settings for any window created with that tool. For more information, see "Using Window Tools to Create Windows" on page 1904.

Related Topics and Procedures

- Creating a Window Style
- Specifying the Dimensions of a Window Style
- Specifying the Standard Sizes of a Window Style
- Creating a Custom Window Shape
- Specifying the Design Rules of a Window Style
- Editing the Geometry of a Window Style
- About Window Display Components and Materials

- Assigning Materials to a Window Style
- Adding Classifications to a Window Style
- Specifying the Display Properties of a Window Style
- Attaching Notes and Files to a Window Style
- Creating Muntins in a Window Style

Creating a Window Style

Use this procedure to create a window style.

You can create a new style with default style properties, or you can create a new style by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1 On the Format menu, click Style Manager.

2 Expand Architectural Objects, and expand Window Styles.

3 Create a window style:

If you want to create a new style . . .	Then . . .
with default properties	right-click Window Styles, and click New.
from an existing style	right-click the window style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new window style, and press ENTER.

5 To edit the style properties of your new window style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.
change dimension properties of the style	see "Specifying the Dimensions of a Window Style" on page 1937.
change the design rules of the style	see "Specifying the Design Rules of a Window Style" on page 1940.
change the standard window sizes of the style	see "Specifying the Standard Sizes of a Window Style" on page 1938.

If you want to . . .	Then . . .
assign materials to the components of the window style,	see "Assigning Materials to a Window Style" on page 1944 and "Turning on Materials for a Window Style" on page 1947.
add classifications to a window style	see "Adding Classifications to a Window Style" on page 1945.
specify the display properties of the style	see "Specifying the Display Properties of a Window Style" on page 1946.
change the appearance of the display components in the style	see "Changing the Layer, Color, and Linetype of Window Components" on page 1946.
add custom block components to the style	see "Adding Components to a Window Style" on page 1948.
turn off components in the style	see "Turning Off Components in a Window Style" on page 1950.
remove components from the style	see "Removing Components from a Window Style" on page 1951.
override the opening percentage from the style	see "Specifying the Opening Percentage for a Window Style" on page 1951.
change the sill from the style	see "Specifying the Display of Window Sills in a Window Style" on page 1952.
add muntins to the style	see "Creating Muntins in a Window Style" on page 1953.
add notes, files, or documents to the style	see "Attaching Notes and Files to a Window Style" on page 1953.

6 If you want to assign the style to a window tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating a Window Tool" on page 1907.

7 Click OK.

Specifying the Dimensions of a Window Style

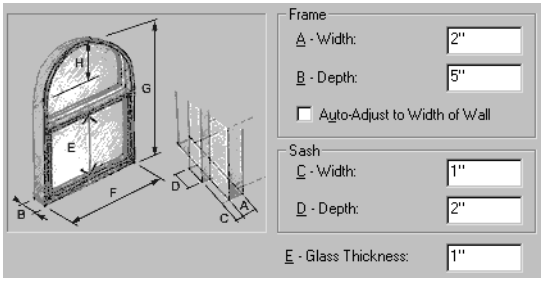
Use this procedure to change the default dimensions of a window style.

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Dimensions tab.



5 Change dimension values:

If you want to . . .	Then . . .
change the frame width and depth	under Frame, enter values for Width and Depth.
set the frame width to the wall thickness	under Frame, select Auto-Adjust to Width of Wall.
change the sash dimensions	under Sash, enter values for Width and Depth.
change the window thickness	enter a value for Glass Thickness.

6 Click OK twice.

Specifying the Standard Sizes of a Window Style

Use this procedure to create the standard window sizes in a window style.

Standard sizes ensure consistency by allowing designers to select sizes from a predefined list specific to the window style. You can also enter custom sizes when you add or modify individual windows.

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the window style you want to edit, and click Edit.

4 Click the Standard Sizes tab, and add, change, or remove window-size values:

If you want to . . .	Then . . .
create standard sizes	click Add. Under Standard Sizes, enter values for Description, Width and Height; if applicable, enter values for Rise and Bottom Sash.
change a size	select the size, and click Edit. Enter new values as needed.
delete a size	select a size, and click Remove.

Description can be used to identify standard window sizes in window schedules. For example, you can specify a manufacturer's size or model code for Description.

Rise applies to Arch, Gothic, and Peak Pentagon window shapes. Bottom Sash applies to Uneven Single Hung and Uneven Double Hung windows. For more information on window types and shapes, see "Specifying the Design Rules of a Window Style" on page 1940

5 Click OK twice.

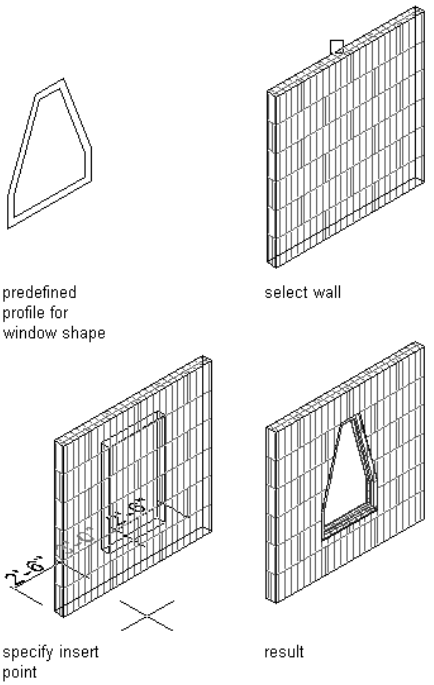
Creating a Custom Window Shape

Use this procedure to create a profile for a custom window shape. You can make custom shapes for windows and apply them to window styles.

The profile is made up of two concentric, closed polylines. The outer polyline, or ring, becomes the window shape, and the inner polyline creates a void for the inside shape of the window frame. You can create multiple voids by adding more inner polylines. The inner polyline must be entirely within the polyline representing the outer shape of the window frame. The polylines are proportional in size and shape to each other and also to the windows created from the window style.

You can draw these polylines anywhere in the drawing and use any convenient scale relative to your final window frame size. One method for sizing the polylines relative to the window is to draw them by snapping to an existing window, and then moving the completed polylines to the side.

Adding a profile-based window to a wall



1. Draw concentric, closed polylines representing the outer and inner lines of the window frame.
2. Select the outer polyline, right-click, and click Convert To ➤ Profile Definition.
3. Enter **a** (Add ring).
4. Select the inner polyline.
5. Specify the insertion point of the profile.

   The insertion point is typically the lower-left corner.
6. Enter a name for the profile, and click OK.

To add the profile to a window style, see "Specifying the Design Rules of a Window Style" on page 1940.

Specifying the Design Rules of a Window Style

Use this procedure to specify the shape and the type of window for a window style.

Window shapes are named geometrical descriptions of a window. You can select predefined and custom window shapes, or create your own shape from profiles. For more information, see "Creating a Custom Window Shape" on page 1939.

The window type describes the method for opening the window. For example, you can use the Rectangular or Half Round predefined shapes for the Double Casement or Single Hopper window types. Or, you can use a custom Hinged-Single-Full Lite shape for a Single Casement with Muntins.

1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the window style you want to edit, and click Edit.
4. Click the Design Rules tab.
5. Select a window shape:

If you want to . . .	Then . . .
use a predefined window shape	under Shape, click Predefined, and select a shape.
use a custom window shape	under Shape, click Use Profile, and select a profile.

6. Select a window type.
7. Click OK twice.

Editing the Geometry of a Window Style

Use this procedure to edit the geometry of the profile used to define a window style. You can also add a profile to a window style that does not currently use a profile to define its shape.

1. Add a window that has the style you want to change.
2. Add or edit a profile:

If you want to . . .	Then . . .
add an existing profile to the style	select the window, right-click, and click Add Profile. Select the name of the profile, and click OK.

If you want to . . .	Then . . .
create a profile and add it to the style	select the window, right-click, and click Add Profile. Select Start from scratch for Profile Definition, enter a name for new profile, and click OK. A rectangular profile is created for you to edit to define the required geometry.
edit the existing profile for the style	select the window, right-click, and click Edit Profile in Place.

3 If prompted that the profile is not drawn to size, click Yes.

The area of the window defined by the profile is selected and hatched in the drawing.

NOTE After you perform an editing task from the shortcut menu, you may need to select the profile again to perform another editing task. If you do not see the editing commands that you expect on the shortcut menu, select the profile, and right-click to display the shortcut menu.

4 Edit the profile:

If you want to . . .	Then . . .
change the shape of the perimeter of the profile or its ring	select the profile, and use grips to adjust the shape.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace an existing ring of the profile with new geometry	select the profile, right-click, and click Replace Ring. Select the ring to replace, and select the new geometry. Press ENTER to keep the geometry, or enter **n** (No) to erase it.

5 Save or discard the changes:

If you want to . . .	Then . . .
restore the profile to its original shape	select the profile and click .
save the changes to the current profile	select the profile, and click . The window style uses the edited profile to define its geometry. Any other objects or styles that use this profile are also updated with the edited geometry.
save the changes to a new profile definition	select the profile, right-click, and click Save as New Profile. Enter a name for the new profile definition, and click OK. The window uses the new profile to define its geometry. Any windows of this style are updated with the new geometry. Other styles or objects that use the original profile are not affected.

About Window Display Components and Materials

A window object consists of a number of components whose display properties can be determined by a material assigned to each component.

When you assign materials to a window, you assign one material to each display component of the window. For example, you assign a wood material to the frame and a glass material to the window glass.

If you want to use the display properties of the window object or window style instead of using material display properties, you can turn off the material assignments in the display properties of the window or the window style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material is used for all linework in Plan view. The Surface Hatch component of a material is used to hatch all object surfaces in 3D model views and elevations.

For a complete list of material components and their description, see "Material Components and Display Properties" on page 498.

The following table lists all window components that can be displayed using materials assigned to them, and identifies the material component of each window component.

Window Component	Material Component
Plan, Plan High Detail, Reflected	
Frame	LInework
Sash	LInework
Glass	Linework
Plan Low Detail	
Window	Linework
Model	
Frame	3D Body
Sash	3D Body
Glass	3D Body
Elevation	
Frame	2D Section/Elevation Linework
Sash	2D Section/Elevation Linework
Glass	2D Section/Elevation Linework

Assigning Materials to a Window Style

Use this procedure to assign materials to the individual components of a window style. When you assign materials to window components, the components use the display properties of the material. For more information, see "About Window Display Components and Materials" on page 1943.

You can specify the materials used to display the following components of a window style:

- Frame
- Sash
- Glass

- Muntin

NOTE If a material assignment does not determine the display properties of a window component, you can change the display properties of the window style as described in "Specifying the Display Properties of a Window Style" on page 1946.

1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which you want changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select By Material for any component to which you want to assign a material, and click OK.

   If the setting for By Material is not available, the display of this component cannot be determined by a material.
9. Click the Materials tab.
10. Click the component you want to change, and select a different material definition.

    You can select any material definition in the current drawing, or click to create a new material definition and assign it to a component.

    WARNING! Although you can edit a material definition from this dialog box, any changes you make to the material definition apply to all objects that are assigned the material.
11. Click OK twice.

Adding Classifications to a Window Style

Use this procedure to specify classifications for any classification definition applied to a window style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style that you want to change, and click Edit.
4. Click the Classifications tab.

   By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to window styles.
5. For each classification definition, select the classification you want to apply to the current window style.
6. Click OK twice.

Specifying the Display Properties of a Window Style

In most cases, you want the appearance of windows that belong to the same style to be consistent throughout a drawing. To achieve this, you specify the display properties of the windows in each window style:

- The layer, color, and linetype of window components
- The hatching used with each component
- The cut plane height and the display of components relative to the cut plane
- Other specific window display information, such as window rise

Related Procedures

- Changing the Layer, Color, and Linetype of Window Components
- Turning on Materials for a Window Style
- Using Custom Blocks to Create Window Components
- Adding Components to a Window Style
- Turning Off Components in a Window Style
- Removing Components from a Window Style
- Specifying the Opening Percentage for a Window Style
- Specifying the Display of Window Sills in a Window Style

Changing the Layer, Color, and Linetype of Window Components

Use this procedure to change the display properties of the window style:

- Visibility (display component is on or off)
- By material (material assigned to the display component determines its layer properties)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE If a material assignment determines the properties of components in the window style, you can change the properties of the display component by clearing By Material or by overriding the material assignment with a different material. For more information, see "Assigning Materials to a Window Style" on page 1944.

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1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which you want changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select the component to change, and select a different setting for the property.
9. Click OK.

Turning on Materials for a Window Style

Use this procedure to turn on material assignments for individual display representations in a window style.

For information on creating and assigning materials, see "About Window Display Components and Materials" on page 1943.

1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation in which you want changes to appear, and select Style Override.

6 If necessary, click .

7 Click the Layer/Color/Linetype tab.

8 Select By Material for each component you want to be controlled by the material. The ByMaterial checkbox is unavailable for components that cannot be assigned a material.

When you select By Material for a display component, all other settings in the dialog are greyed out. The display properties are now taken from the material definition, so you can no longer set them directly in the display properties of the window style.

9 Click OK twice.

Using Custom Blocks to Create Window Components

You can add custom blocks for components, such as window hardware, to the display components or to replace the default display components. For example, you can replace a simple window frame with a custom window frame containing shutters in which you want the custom component to appear. You can have a different custom block for each display representation.

When you add a custom block, you can specify several rules for positioning and scaling the new component. Each custom block also appears in the display properties component list so that you can control its layer, color, and linetype. For more information on adding custom blocks, see "Adding Components to a Window Style" on page 1948.

If you create a custom block from mass elements, you can use the material assignments of the mass elements to determine the display properties of the custom block.

Be sure to set the properties of the objects used to create your custom blocks to ByBlock. Otherwise, you cannot control these objects through the display properties. For more information about ByBlock, see "Work with Layers" in the online *AutoCAD® User's Guide*.

Adding Components to a Window Style

Use this procedure to add or edit custom block components in the display representation of window styles.

1 Create a block for the component to add to the window style.

Create the block in the same plane as the window that you use to represent the style. For more information about custom blocks, see "Using Custom Blocks to Create Window Components" on page 1948.

2 Open a tool palette that has a window tool.

3 Right-click a window tool, and click Window Styles.

4 Right-click the style you want to edit, and click Edit.

5 Click the Display Properties tab.

6 Select the display representation in which you want changes to appear, and select Style Override.

7 If necessary, click .

8 Click the Other tab.

9 Specify whether to add or edit a block component:

If you want to . . .	Then . . .
add a new block component	click Add, and then click Select Block.
edit an existing block component	select the component to edit, and click Edit.

10 Select the block to use, and click OK.

11 Specify whether you want to scale to fit the block component to the object by width, depth, and height, or to lock the *XY* ratio:

If you want to . . .	Then . . .
set the block scale to the width of the object	select Width.
set the block scale to the depth of the object	select Depth.
set the block scale to the height of the object	select Height.
scale the whole block equally, so that one direction is scaled to fit another of the scale criteria	select Lock to XY Ratio.
scale the block to its original size	clear all options under Scale to Fit.

12 Specify whether to mirror the block in the X,Y, or Z direction:

If you want to create a mirror of the block . . .	Then . . .
in the *X* direction	select Mirror X.
in the *Y* direction	select Mirror Y.
in the *Z* direction	select Mirror Z.

13 Specify the *X*, *Y*, and *Z* location of the insertion point.

14 Specify an insertion offset of the block in the *X*, *Y*, and *Z* directions.

15 Specify whether the component is for the window frame or window glass component:

If you want to add the block . . .	Then . . .
to the inside or outside of the frame	click Frame Component, and click either Outside or Inside.
to all window glass components or a single window glass component	click Window Component, and click either All or Single. If you select Single, enter the component number. **NOTE** If you specified Depth for Scale to Fit, the depth is scaled to the glass thickness. You can scale to the window panel thickness instead by selecting Scale Depth to Panel Thickness

Frame and Glass components are not available in some display representations.

16 Click OK four times.

Turning Off Components in a Window Style

Use this procedure to turn off custom blocks in a window style.

You can turn off the display of component blocks without removing them from the style.

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation in which you want to turn off the display of the window component, and select Style Override.

6 If necessary, click .

7 Click the Other tab.

8 Select Disable Custom Blocks.

9 Click OK twice.

Removing Components from a Window Style

Use this procedure to remove components from a window style.

Removing component blocks from a window style deletes them from the style.

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation in which you want to remove the window component, and select Style Override.

6 If necessary, click .

7 Click the Other tab.

8 Select the component to remove, and click Remove.

9 Click OK twice.

Specifying the Opening Percentage for a Window Style

Use this procedure to override the opening percentage in the display representation of a window style. For example, you can specify that a window is displayed closed in model and elevation representations, but open in plan representations.

NOTE This setting overrides other window opening percent settings. If the opening percent is specified here, the opening percent entered on the Properties palette when you add or modify windows is ignored.

---

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation in which you want to override the opening percent, and select Style Override.

6 If necessary, click .

7 Click the Other tab.

8 Select Override Open Percent.

9 Enter a value for the opening percent.

10 Click OK twice.

Specifying the Display of Window Sills in a Window Style

Use this procedure to change the window sill dimensions in the Sill Plan display representation.

You must use a display representation for a window that has a sill. You can turn on the Sill Plan display representation in addition to the Plan display representation.

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

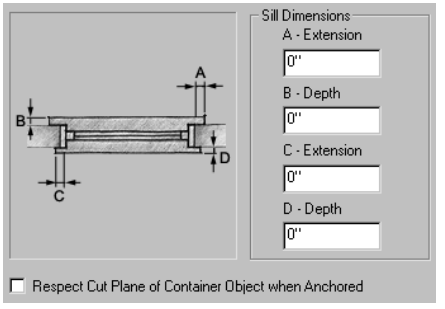
4 Click the Display Properties tab.

5 Select Sill Plan for Display Representations, and select Style Override.

6 If necessary, click .

7 Click the Other tab.

Window Sill Dimensions



8 Under Sill Dimensions, enter the sill extension and depth dimensions.

Sill components A and B are for the swing or outside of the window. Sill components C and D are for the interior side.

9 If you want to use the cut plane of the wall for anchored windows, instead of using the cut plane of the window, select Respect Cut Plane of Container Object when Anchored.

10 Click the Layer/Color/Linetype tab.

11 Under Visible, click the icons to turn on visibility.

12 Click OK three times.

Attaching Notes and Files to a Window Style

Use this procedure to enter notes and attach reference files to a window style. You can also edit reference files attached to the style.

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the General tab.

5 To add a description to the window, enter the description under Description.

6 Click Notes.

7 To add or edit a note, click the Notes tab, and enter the note.

8 To attach, edit, or detach a reference file, click the Reference Docs tab:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK.
detach a reference file	select the file name, click Delete, and click OK.

9 Click OK twice.

Creating Muntins in a Window Style

Window muntins are secondary framing members that hold multiple panes of glass in a window sash. Autodesk®Architectural Desktop provides an easy way to create muntins with different layout patterns.

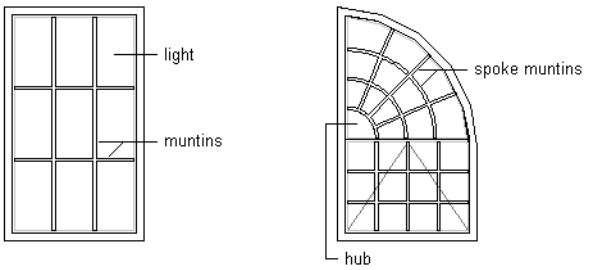
Window muntins are available in several patterns that you can customize into many different styles:

- Rectangular
- Diamond
- Prairie 9 Lights
- Prairie 12 Lights
- Starburst
- Sunburst
- Gothic

Starburst and Sunburst patterns are a combined-rectangular pattern with a half-round or quarter-round spoked top and can be used for half- and quarter-round as well as rectangular muntins. Gothic is similar but has a gothic muntin pattern. The other patterns are primarily rectangular but fit into half-round window sash.

You can make custom shapes for window muntins by creating profiles from polylines and adding them to a new window style. For information about creating profiles and adding them to a window style, see "Creating a Custom Window Shape" on page 1939.

Window muntin components



Related Procedures

- Adding Rectangular Muntins to a Window Style
- Adding Diamond Muntins to a Window Style
- Adding Prairie-9 Lights Muntins to a Window Style
- Adding Prairie-12 Lights Muntins to a Window Style
- Adding Starburst Muntins to a Window Style
- Adding Sunburst Pattern Muntins to a Window Style
- Adding Gothic Muntins to a Window Style
- Editing a Window Muntins Block in a Window Style

- Turning Off the Display of Muntins in a Window Style
- Removing a Window Muntins Block from a Window Style

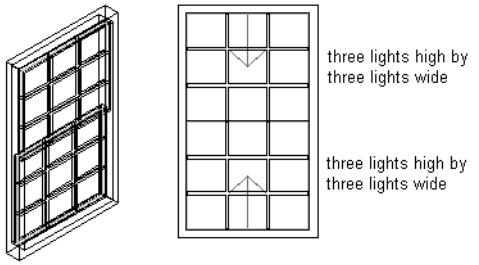
Adding Rectangular Muntins to a Window Style

Use this procedure to add rectangular muntins to a window style.

You add the muntins by editing the display properties of the window style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and automatically apply the muntins to all display representations of that window style. You add the muntins block to the window style in the display properties. Each muntins block becomes a display component of the window style.

You can apply the rectangular pattern to all window shapes and window types except Pass Through.

Specifying rectangular pattern muntins

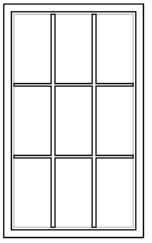


1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Muntins tab.
8. Click Add.
9. Enter a name for the muntins block.

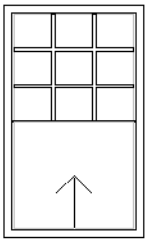
10 If the window style contains multiple sash, specify whether you want muntins applied to the Top, All, or a Single sash component in the window:

If you want to attach muntins to . . .	Then . . .
the top sash only	under Window Pane, select Top. Top also applies to single sash.
all sash	under Window Pane, select Other, and select All.
an individual sash component	under Window Pane, select Other. Select Single, and specify the index number for window sash. Sash is indexed counterclockwise, starting from the lower left corner.

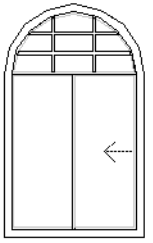
Specifying rectangular muntins for top sash



single pane treated as top pane

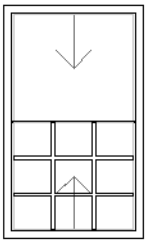


top pane in single-hung window

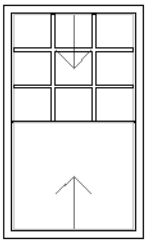


top pane in glider window

Specifying rectangular muntins for an individual sash component



single sash index 1



single sash index 2

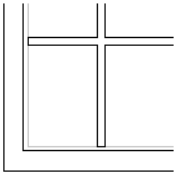
11 Enter a value for the width of all muntins.

12 Enter a value for the depth of all muntins.

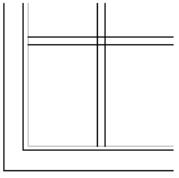
13 Clean up the muntin intersections:

If you want to convert . . .	Then . . .
the muntin intersections to corners	under Muntin, select Clean Up Joints.
all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying rectangular muntin cleanup joints



cleanup muntin joints on



cleanup muntin joints off

14 Under Lights, select Rectangular for Pattern.

15 Enter a value for Lights High to specify the number of light rows in the vertical direction.

16 Enter a value for Lights Wide to specify the number of light columns in the horizontal direction.

17 Click OK.

18 Add additional muntins:

If you want to add muntins to . . .	Then . . .
another window sash in the window style	repeat this procedure from step 8.
another display representation	click OK, and repeat this procedure from step 5.
all display representations of the selected window style	select Automatically Apply to Other Display Representations and Object Overrides.

19 Click OK four times.

After you add a muntins block to a window style, you can assign a material, such as wood, and specify display properties, such as color and linetype, for the muntins. For more information, see "About Window Display Components and Materials" on page 1943, "Specifying the Display Properties of a Window Style" on page 1946, and "Creating and Editing Materials" on page 517 respectively.

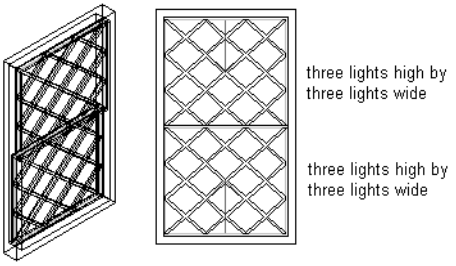
Adding Diamond Muntins to a Window Style

Use this procedure to add diamond muntins to a window style.

You add the muntins by editing the display properties of the window style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and automatically apply the muntins to all display representations of that window style. You add the muntins block to the window style in the display properties. Each muntins block becomes a display component of the window style.

You can apply the diamond pattern to all window shapes and window types except Pass Through.

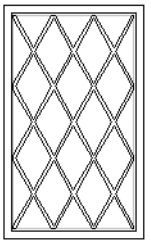
Specifying diamond pattern muntins



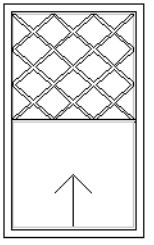
1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Muntins tab.
8. Click Add.
9. Enter a name for the muntins block.
10. If the window style contains multiple sash, specify whether you want muntins applied to the Top, All, or a Single sash component in the window:

If you want to attach muntins to . . .	Then . . .
the top sash only	under Window Pane, select Top. Top also applies to single sash.
all sash	under Window Pane, select Other, and select All.
an individual sash component	under Window Pane, select Other. Select Single, and specify the index number for window sash. Sash is indexed counterclockwise, starting from the lower left corner.

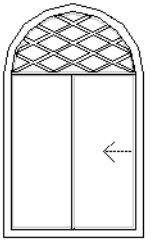
Specifying diamond muntins for top sash



single pane treated as top pane

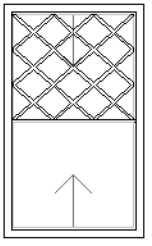


top pane in single-hung window

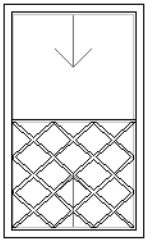


top pane in glider window

Specifying diamond muntins to an individual sash component



single sash index 1



single sash index 2

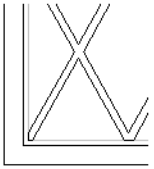
11 Enter a value for the width of all muntins.

12 Enter a value for the depth of all muntins.

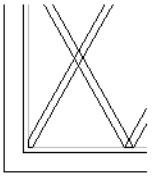
13 Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying diamond muntin cleanup joints



cleanup muntin joints on



cleanup muntin joints off

14 Under Lights, select Diamond for Pattern.

15 Enter a value for Lights High to specify the number of light rows in the vertical direction.

16 Enter a value for Lights Wide to specify the number of light columns in the horizontal direction.

17 Click OK.

18 Add additional muntins:

If you want to add muntins to . . .	Then . . .
another window sash in the window style	repeat this procedure from step 8.

If you want to add muntins to . . .	Then . . .
another display representation	click OK, and repeat this procedure from step 5.
all display representations of the selected window style	select Automatically Apply to Other Display Representations and Object Overrides.

19 Click OK four times.

After you add a muntins block to a window style, you can assign a material, such as wood, and specify display properties, such as color and linetype, for the muntins. For more information, see "About Window Display Components and Materials" on page 1943, "Specifying the Display Properties of a Window Style" on page 1946, and "Creating and Editing Materials" on page 517 respectively.

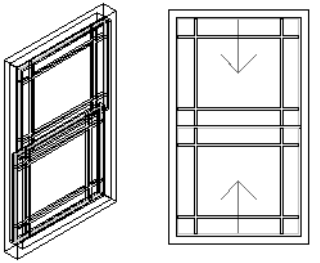
Adding Prairie-9 Lights Muntins to a Window Style

Use this procedure to add prairie-9 lights muntins to a window style.

You add the muntins by editing the display properties of the window style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and automatically apply the muntins to all display representations of that window style. You add the muntins block to the window style in the display properties. Each muntins block becomes a display component of the window style.

You can apply the prairie-9 lights pattern to all window shapes and window types except Pass Through.

Specifying prairie-9 lights pattern muntins



1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Style Override.

6 If necessary, click .

7 Click the Muntins tab.

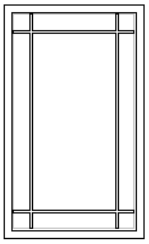
8 Click Add.

9 Enter a name for the muntins block.

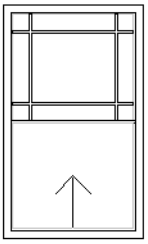
10 If the window style contains multiple sash, specify whether you want muntins applied to the Top, All, or a Single sash component in the window:

If you want to attach muntins to . . .	**Then . . .**
the top sash only	under Window Pane, select Top. Top also applies to single sash.
all sash	under Window Pane, select Other, and select All.
an individual sash component	under Window Pane, select Other. Select Single, and specify the index number for window sash. Sash is indexed counterclockwise, starting from the lower left corner.

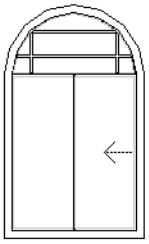
Specifying prairie-9 lights muntins for top sash



single pane treated as top pane

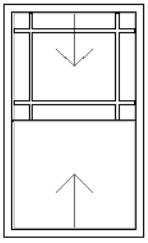


top pane in single-hung window

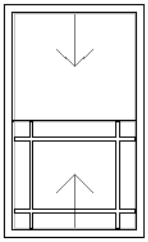


top pane in glider window

Specifying prairie-9 lights muntins to an individual sash component



single sash index 1



single sash index 2

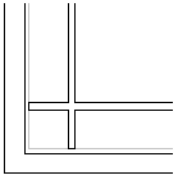
11 Enter a value for the width of all muntins.

12 Enter a value for the depth of all muntins.

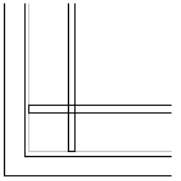
13 Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying prairie-9 lights muntin cleanup joints



cleanup muntin joints on



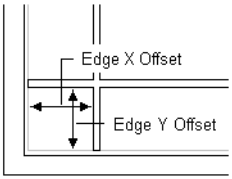
cleanup muntin joints off

14 Under Lights, select Prairie-9 Lights for Pattern.

15 Enter a value for Edge X Offset to specify the horizontal distance of the muntins from the edges of the pane.

16 Enter a value for Edge Y Offset to specify the vertical distance of the muntins from the edges of the pane.

Specifying prairie-9 lights pattern muntin edge X and Y offsets



17 Click OK.

18 Add additional muntins:

If you want to add muntins to . . .	Then . . .
another window sash in the window style	repeat this procedure from step 8.
another display representation	click OK, and repeat this procedure from step 5.
all display representations of the selected window style	select Automatically Apply to Other Display Representations and Object Overrides.

19 Click OK four times.

After you add a muntins block to a window style, you can assign a material, such as wood, and specify display properties, such as color and linetype, for the muntins. For more information, see "About Window Display Components and Materials" on page 1943, "Specifying the Display Properties of a Window Style" on page 1946, and "Creating and Editing Materials" on page 517 respectively.

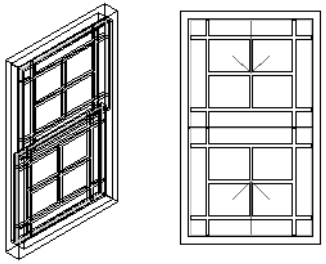
Adding Prairie-12 Lights Muntins to a Window Style

Use this procedure to add prairie-12 lights muntins to a window style.

You add the muntins by editing the display properties of the window style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and automatically apply the muntins to all display representations of that window style. You add the muntins block to the window style in the display properties. Each muntins block becomes a display component of the window style.

You can apply the prairie-12 lights pattern to all window shapes and window types except Pass Through.

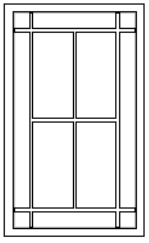
Specifying prairie-12 lights pattern muntins



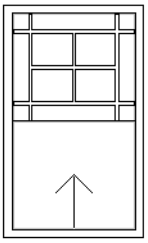
1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Muntins tab.
8. Click Add.
9. Enter a name for the muntins block.
10. If the window style contains multiple sash, specify whether you want muntins applied to the Top, All, or a Single sash component in the window:

If you want to attach muntins to . . .	Then . . .
the top sash only	under Window Pane, select Top. Top also applies to single sash.
all sash	under Window Pane, select Other, and select All.
an individual sash component	under Window Pane, select Other. Select Single, and specify the index number for window sash. Sash is indexed counterclockwise, starting from the lower left corner.

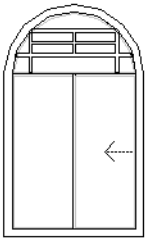
Specifying prairie-12 lights muntins for top sash



single pane treated as top pane

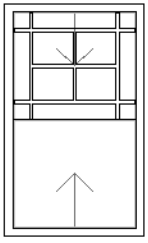


top pane in single-hung window

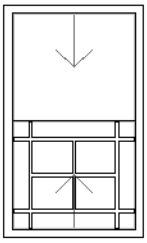


top pane in glider window

Specifying muntins to an individual sash component



single sash index 1



single sash index 2

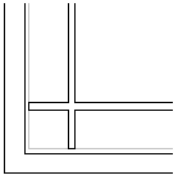
11 Enter a value for the width of all muntins.

12 Enter a value for the depth of all muntins.

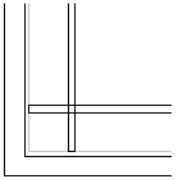
13 Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying muntin cleanup joints



cleanup muntin joints on



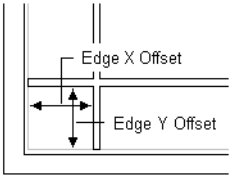
cleanup muntin joints off

14 Under Lights, select Prairie-12 Lights for Pattern.

15 Enter a value for Edge X Offset to specify the horizontal distance of the muntins from the edges of the pane.

16 Enter a value for Edge Y Offset to specify the vertical distance of the muntins from the edges of the pane.

Specifying prairie-12 lights pattern muntin edge X and Y offsets



17 Click OK.

18 Add additional muntins:

If you want to add muntins to . . .	Then . . .
another window sash in the window style	repeat this procedure from step 8.
another display representation	click OK, and repeat this procedure from step 5.
all display representations of the selected window style	select Automatically Apply to Other Display Representations and Object Overrides.

19 Click OK four times.

After you add a muntins block to a window style, you can assign a material, such as wood, and specify display properties, such as color and linetype, for the muntins. For more information, see "About Window Display Components and Materials" on page 1943, "Specifying the Display Properties of a Window Style" on page 1946, and "Creating and Editing Materials" on page 517 respectively.

Adding Starburst Muntins to a Window Style

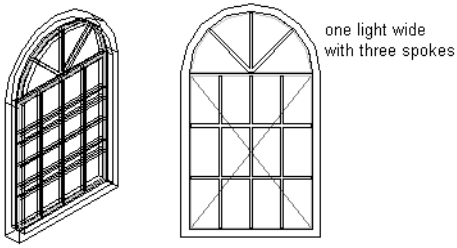
Use this procedure to add starburst muntins to a window style.

You add the muntins by editing the display properties of the window style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and automatically apply the muntins to all display representations of that window style. You add the muntins block to the window style in the display properties. Each muntins block becomes a display component of the window style.

You can add the starburst pattern only to the top window sash. You can apply the starburst pattern to window shapes with a round, half round, or quarter round top.

You can apply the starburst pattern to the following window types: awning, single hopper, single transom, vertical pivot, horizontal pivot, double hung, glider, single hung, single casement, and picture.

Specifying starburst pattern muntins



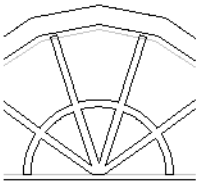
1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Muntins tab.
8. Click Add.
9. Enter a name for the muntins block.
10. Under Window Pane, select Top.

NOTE The Starburst pattern is available only when Top is selected for Window Pane.

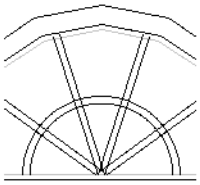
11. Enter a value for the width of all muntins.
12. Enter a value for the depth of all muntins.
13. Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying starburst muntin cleanup joints



cleanup muntin joints on



cleanup muntin joints off

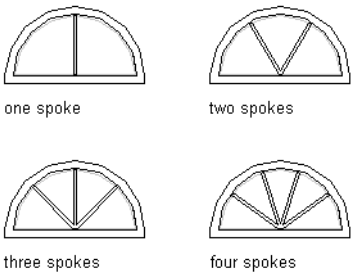
14 Under Lights, select Starburst for pattern.

15 Enter a value for Lights High to specify the number of light rows in a vertical direction.

16 Enter a value for Lights Wide to specify the number of panes in the radial direction.

17 Enter a value for Spokes to specify the number of radial muntin spokes.

Specifying number of spokes for starburst muntins



one spoke

two spokes

three spokes

four spokes

18 Click OK.

19 Add additional muntins:

If you want to add muntins to . . .	Then . . .
another window sash in the window style	repeat this procedure from step 8.
another display representation	click OK, and repeat this procedure from step 5.
all display representations of the selected window style	select Automatically Apply to Other Display Representations and Object Overrides.

20 Click OK four times.

After you add a muntins block to a window style, you can assign a material, such as wood, and specify display properties, such as color and linetype, for the muntins. For more information, see "About Window Display Components and Materials" on page 1943, "Specifying the Display Properties of a Window Style" on page 1946, and "Creating and Editing Materials" on page 517 respectively.

Adding Sunburst Pattern Muntins to a Window Style

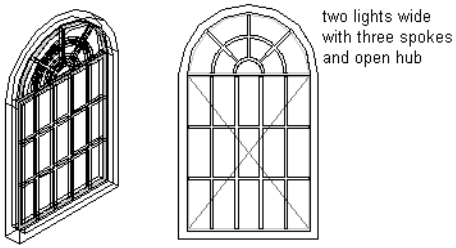
Use this procedure to add sunburst muntins to a window style.

You add the muntins by editing the display properties of the window style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and automatically apply the muntins to all display representations of that window style. You add the muntins block to the window style in the display properties. Each muntins block becomes a display component of the window style.

You can add the sunburst pattern only to the top window sash. You can apply the sunburst pattern to window shapes with a round, half round, or quarter round top.

You can apply the sunburst pattern to the following window types: awning, single hopper, single transom, vertical pivot, horizontal pivot, double hung, glider, single hung, single casement, and picture.

Specifying sunburst pattern muntins



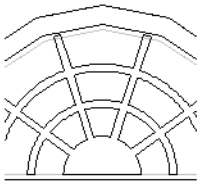
1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Muntins tab.
8. Click Add.
9. Enter a name for the muntins block.
10. Under Window Pane, select Top.

NOTE The Sunburst pattern is available only when Top is selected for Window Pane.

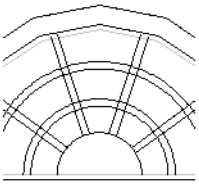
11. Enter a value for the width of all muntins.
12. Enter a value for the depth of all muntins.
13. Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying sunburst muntin cleanup joints



cleanup muntin joints on



cleanup muntin joints off

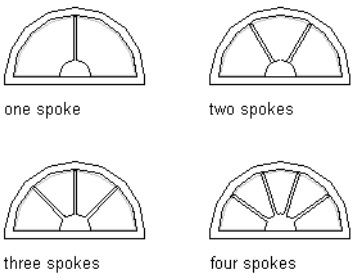
14 Under Lights, select Sunburst for Pattern.

15 Enter a value for Lights High to specify the number of light rows in a vertical direction.

16 Enter a value for Lights Wide to specify the number of panes in the radial direction.

17 Enter a value for Spokes to specify the number of radial muntin spokes.

Specifying number of spokes for sunburst muntins



one spoke

two spokes

three spokes

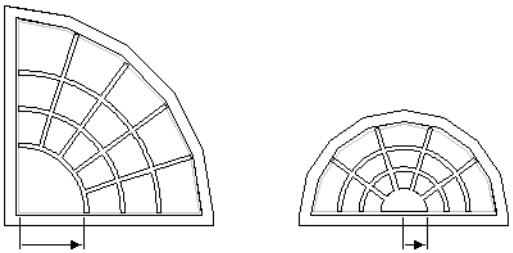
four spokes

18 Under Hub Style, select Closed for no hub pane, or select Open for a hub pane.

Specifying sunburst muntin open and closed hubs

19 Enter a value for Radius to specify the radius for the hub.

Specifying sunburst muntin hub radius



20 Click OK.

21 Add additional muntins:

If you want to add muntins to . . .	Then . . .
another window sash in the window style	repeat this procedure from step 8.
another display representation	click OK, and repeat this procedure from step 5.
all display representations of the selected window style	select Automatically Apply to Other Display Representations and Object Overrides.

22 Click OK four times.

After you add a muntins block to a window style, you can assign a material, such as wood, and specify display properties, such as color and linetype, for the muntins. For more information, see "About Window Display Components and Materials" on page 1943, "Specifying the Display Properties of a Window Style" on page 1946, and "Creating and Editing Materials" on page 517 respectively.

Adding Gothic Muntins to a Window Style

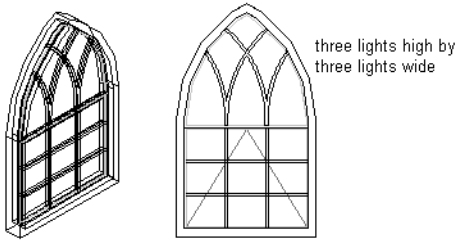
Use this procedure to add gothic muntins to a window style.

You add the muntins by editing the display properties of the window style for a display representation, such as Model or Elevation, where you want the muntins to appear. You can add muntins to display representations individually. You can also add muntins to a single display representation and automatically apply the muntins to all display representations of that window style. You add the muntins block to the window style in the display properties. Each muntins block becomes a display component of the window style.

You can add the gothic pattern only to the top window sash. You can apply the gothic pattern to the following window shapes: round, half round, gothic, peak pentagon, or arch.

You can apply the gothic pattern to the following window types: awning, single hopper, single transom, vertical pivot, horizontal pivot, double hung, glider, single hung, single casement, and picture.

Specifying gothic pattern muntins



1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Muntins tab.
8. Click Add.
9. Enter a name for the muntins block.
10. Under Window Pane, select Top.

NOTE The Gothic pattern is available only when Top is selected for Window Pane.

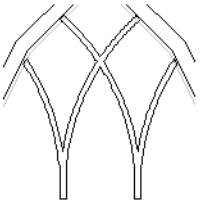
11 Enter a value for the width of all muntins.

12 Enter a value for the depth of all muntins.

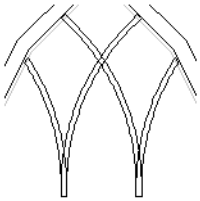
13 Clean up the muntin intersections:

If you want to . . .	Then . . .
convert the muntin intersections to corners	under Muntin, select Clean Up Joints.
convert all the muntins to one body with the joints cleaned up	under Muntin, select Convert to Body.

Specifying gothic muntin cleanup joints



cleanup muntin joints on



cleanup muntin joints off

14 Under Lights, select Gothic for Pattern.

15 Enter a value for Lights High to specify the number of light rows in the vertical direction.

16 Enter a value for Lights Wide to specify the number of panes in the horizontal direction.

Count the panes across the bottom row.

17 Click OK.

18 Add additional muntins:

If you want to add muntins to . . .	Then . . .
another window sash in the window style	repeat this procedure from step 8.
another display representation	click OK, and repeat this procedure from step 5.
all display representations of the selected window style	select Automatically Apply to Other Display Representations and Object Overrides.

19 Click OK four times.

After you add a muntins block to a window style, you can assign a material, such as wood, and specify display properties, such as color and linetype, for the muntins. For more information, see "About Window Display Components and Materials" on page 1943, "Specifying the Display Properties of a Window Style" on page 1946, and "Creating and Editing Materials" on page 517.

Editing a Window Muntins Block in a Window Style

Use this procedure to edit the muntins settings for a window style.

After you create a muntins block, you can change any of its settings by editing the display properties of the window style for each display representation, such as Model or Elevation. You can edit the muntins for display representations individually. You can also edit the muntins for a single display representation and automatically apply the changes to all display representations of that window style.

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and click .

6 Click the Muntins tab.

7 Select the muntins block to edit.

8 Click Edit.

9 Edit any of the settings.

For more information on the settings, see the window muntins type in "Creating Muntins in a Window Style" on page 1953.

10 Select Automatically Apply to Other Display Representations and Object Overrides to apply the changes to all display representations of the selected window style.

Clear this setting to apply the changes to only the selected display representation.

11 When you finish editing the window muntins block in the window style, click OK four times.

After you add a muntins block to a window style, you can assign a material, such as wood, and specify display properties, such as color and linetype, for the muntins. For more information, see "About Window Display Components and Materials" on page 1943, "Specifying the Display Properties of a Window Style" on page 1946, and "Creating and Editing Materials" on page 517 respectively.

Turning Off the Display of Muntins in a Window Style

Use this procedure to turn off the display of muntins in a window style. You can turn off the display of window muntins without removing them from the window.

1 Open a tool palette that has a window tool.

2 Right-click a window tool, and click Window Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want to turn off the display of window muntins, and click .

6 Click the Muntins tab.

7 Select Disable Muntins Blocks.

8 Select Automatically Apply to Other Display Representations and Object Overrides to apply the changes to all display representations of the selected window style.

Clear this setting to apply the changes to only the selected display representation.

9 Click OK three times.

Removing a Window Muntins Block from a Window Style

Use this procedure to remove muntins from a window style. When you remove existing muntins blocks from the window style, they are deleted.

To turn off muntins without deleting them, see "Turning Off the Display of Muntins in a Window Style" on page 1980.

1. Open a tool palette that has a window tool.
2. Right-click a window tool, and click Window Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Props tab.
5. Select the display representation where you want to remove window muntins, and click .
6. Click the Muntins tab.
7. Select the muntins block to remove.
8. Click Remove.
9. Repeat steps 7 and 8 to remove multiple muntins blocks.
10. Select Automatically Apply to Other Display Representations and Object Overrides to apply the changes to all display representations of the selected window style.

    Clear this setting to apply the changes to only the selected display representation.

11. When you finish removing muntins blocks from the window style, click OK three times.

Producing Construction Documents

V

Topics in Part 5

- Area Evaluation
- Sections
- Elevations
- Schedules
- Annotation
- Design Content
- Custom Content
- AEC Dimensions
- Dimension Labels
- Elevation Labels
- Mask Blocks
- Multi-View Blocks
- Cameras
- Napkin Sketch

1983

Area Evaluation

27

The Area feature allows you to define the areas in your drawing, group them, and then calculate the entire building according to various norms. You can use the Area feature for purposes such as delivering plans for government approval, providing cost estimates, and carrying out facilities management activities.

Related Topics

- Areas
- Area Groups
- Area Evaluation

In this chapter

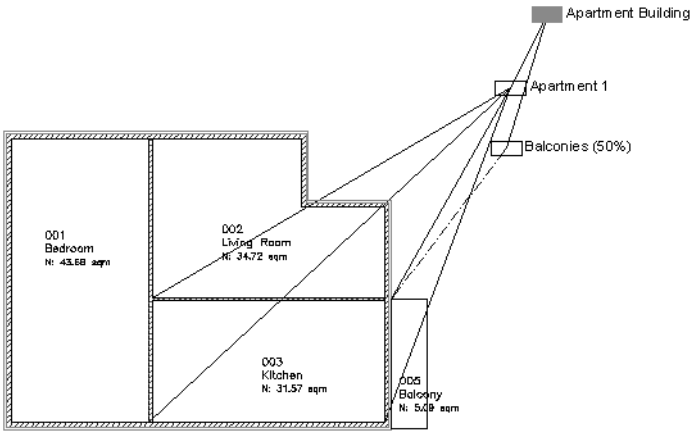
- Creating an Area
- Creating an Area Tool
- Editing Areas
- Attaching Areas to Area Groups
- Detaching Areas from Area Groups
- Area Styles
- Calculation Modifier Styles
- Area Decomposition
- Area Groups
- Creating an Area Group
- Creating an Area Group Tool
- Attaching Area Groups to Other Groups
- Detaching Area Groups from Other Groups
- Editing Area Groups
- Area Group Styles
- Area Name Definitions
- Area Group Templates
- Area Evaluation

Areas

You create areas either freehand or by deriving them from existing walls and building objects. You can add and subtract areas from each other, define area calculation modifier styles, and attach areas to area groups.

Areas and Area Groups

An area is an architectural object describing a two-dimensional room. In Autodesk® Architectural Desktop, it is used to calculate the areas in the floor plan. After designing a floor plan, you create areas from the rooms, construction areas, and other areas, grouping them into functional and hierarchical structures. You then use these group structures to create an area evaluation of the floor plan.



To calculate areas correctly for purposes such as building approval, cost estimates, or rent calculation, you may need to modify their values.

To do this, you attach calculation modifier styles to areas or area groups, which change the calculation result. Calculation modifier styles contain formulas. You can, for example, calculate plaster deductions, subtract areas for columns, or calculate the tiling in a bathroom.

Areas can be grouped into structures. You could, for example, create an area group named Apartment Building, which contains the subgroups First Floor and Second Floor. For information about area groups, see "Area Groups" on page 2034.

Area Evaluation

After creating areas and area groups in the drawing, you can create an area evaluation of the building and export the results into an external document.

The area evaluation is a documentation feature that calculates and evaluates the area information of your finished floor plan. This information is displayed in a separate file that you export from Autodesk® Architectural Desktop to a spreadsheet or a word processing application.

Area evaluation templates ensure that the information is displayed in a consistent, structured way.

Architects can use the area evaluation feature for submitting floor plans to building authorities and customers. This feature can also be used for performing cost estimates, assigning jobs to contractors, or organizing the facility management of buildings.

Uses of Area Evaluations

Following are a number of typical scenarios in which the area evaluation feature can be used. For more detailed examples, see "Examples for Creating Areas" on page 1998.

- As an architect, you have created a plan for a building and want to prepare it for approval by the building administration. This includes the decomposition of areas into area subdivisions, the relation between floor area and site area, and values for the base and calculated areas, construction areas, traffic areas, floor areas, and functional areas of the plan.
- You want to rent an apartment. For this, you need to calculate all balcony and terrace areas—according to national regulations—with 50 percent of their actual value. You also need to calculate the areas under the roof correctly at the 2 m line and the 1 m line.
- You need to determine different zones in an office landscape, such as office cubicles, recreation areas, and walking areas.
- As a facility manager, you need to determine different area types in an office building, such as office rooms, restrooms, or sick rooms.
- You need to categorize of the floor plan into areas that need to be cleaned every week to obtain a cost estimation from a building cleaning service.
- You need an overview of hardware equipment rooms in order to calculate the costs for special ventilation systems.
- As a carpeting contractor, you need the perimeter values of all rooms to make a cost estimate for baseboard material.

Flexible Design Process

The flexible and powerful design of the area evaluation feature gives you optimal freedom to shape the design process according to your needs. To make your workflow as effective as possible, consider the order in which to perform the work before you start.

You can use a workflow similar to the one you use when creating a drawing from a template: first, design the necessary styles, definitions, group templates and modifier styles; then, create areas and area groups.

You can also use a workflow similar to the one you use when starting a new drawing from scratch: first, create the areas and area groups; then, add styles and other definitions as necessary.

Or, you can use a combination of the two methods, creating a number of definitions beforehand, such as, group templates and name definitions, and defining other settings, such as calculation modifier styles, when you need them.

Related Topics and Procedures

- Process Overview: Designing from Definition to Object
- Process Overview: Designing from Object to Definition
- Using Area Tools to Create Areas
- Creating an Area
- Creating an Area with User-Specified Settings
- Creating Areas from Linework and Object Outlines
- Creating Areas from Closed Boundaries
- Creating an Area Tool
- Examples for Creating Areas
- Process Overview: Creating User-Defined Area Tags
- Editing Areas
- Attaching Areas to Area Groups
- Detaching Areas from Area Groups
- Area Styles
- Calculation Modifier Styles
- Area Decomposition

Process Overview: Designing from Definition to Object

This process overview describes a design workflow in which you first create the necessary definition elements such as area styles, area group templates, name definitions, and calculation modifier styles. Then you create a group structure and, finally, you create the areas and attach them to the groups.

The advantage of this approach is that you work in a well-structured environment and can use templates. The drawback is that you have a longer planning phase in the beginning.

NOTE It is good idea to save your calculation modifier styles, area name definitions, and area group templates into a drawing template, so that you can reuse them later.

Step 1: Create the necessary calculation modifier styles.

For example, you might define a plaster deduction of 3 percent for an interior room.

Step 2: Create the necessary area name definitions.

For example, you could create a name definition list according to the names in DIN 277.

Step 3: Create the desired area group structure with an area group template.

For example, you could define an area group template conforming to the structure in DIN 277.

Step 4: Create area groups from the group templates.

Step 5: Create areas and attach them to the area groups.

Step 6: Start the area evaluation.

Related Procedures

- Creating a Calculation Modifier Style
- Creating an Area Name Definition
- Creating Area Groups with User-Specified Settings
- Creating Area Groups from a Group Template
- Creating an Area with User-Specified Settings
- Attaching Areas to Area Groups
- Creating the Area Evaluation Document

Process Overview: Designing from Object to Definition

This process overview describes a design workflow in which you first create your areas and area groups. The necessary structure, styles, and definitions are created "on the fly" as you need them.

The advantage of this approach is that you can start quickly and make decisions in the real project environment. The disadvantage is that the workflow is interrupted more frequently because you need to create not only areas and area groups, but also the logical structures around them, piece by piece.

Step 1: Create areas.

Step 2: Create, groups, group templates, calculation modifier styles, and name definitions as you need them.

Step 3: Start the area evaluation.

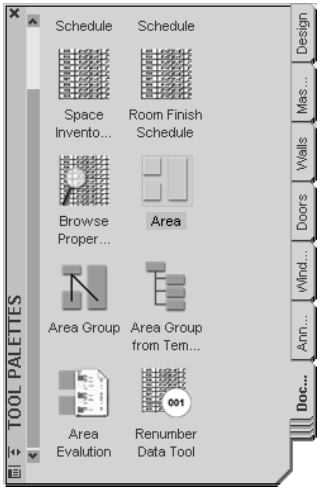
Related Procedures

- Creating an Area with User-Specified Settings
- Creating Area Groups with User-Specified Settings
- Attaching Areas to Area Groups
- Creating the Area Evaluation Document

Using Area Tools to Create Areas

Tools provided with Autodesk® Architectural Desktop let you quickly place areas by selecting an area tool with a specific style and other predefined properties. You can use the default settings of the tool, or you can change settings for the area properties. You can also use area tools to convert linework to areas and to apply the settings of an area tool to existing areas.

Tool palettes containing area tools



The default tool palettes in the workspace contain sample area tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain area tools that you can add to your tool palettes:

- Autodesk Architectural Desktop Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette Catalog
- My Tool Catalog

Custom palettes created by your CAD manager or other users may also contain area tools with styles and properties customized for your projects or office standards.

Related Procedures

- Creating an Area
- Creating an Area with User-Specified Settings
- Creating Areas from Linework and Object Outlines
- Creating Areas from Closed Boundaries
- Creating an Area Tool

Creating an Area

Use this procedure to add a new area that has the properties specified in the area tool that you select. To specify settings when you add an area, see "Creating an Area with User-Specified Settings" on page 1992.

1. Open the tool palette that you want to use, and select an area tool.
   If necessary, scroll to display the tool that you want to use.
2. Specify the starting point of the first area line segment in the drawing.
3. Specify further points to define the area.
4. Press ENTER.

Creating an Area with User-Specified Settings

Use this procedure to add an area with settings that you specify.

1. Open the tool palette that you want to use, and select an area tool.
   If necessary, scroll to display the tool that you want to use.
2. On the Properties palette, expand Basic, and expand General.
3. Select a style.
4. Select a tag for the area.

NOTE If no area tags are contained in the list, you can drag a tag into the drawing from the AutoCAD®DesignCenter. You can also create your own area tags from multi-view blocks. For information about creating your own area tags, see "Process Overview: Creating User-Defined Area Tags" on page 2000.

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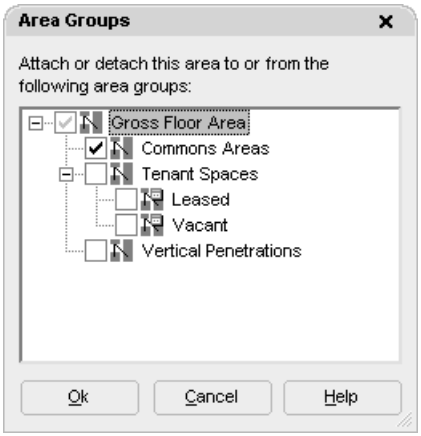
5. To add a calculation modifier style to the area, click the setting for Calculation Modifiers, and select one or more calculation modifiers to the area.
   For information about calculation modifier styles, see "Calculation Modifier Styles" on page 2023.
6. To attach the area to an area group, click the setting for Area Groups, and attach the area to one or more area groups.

Attaching an area to an area group



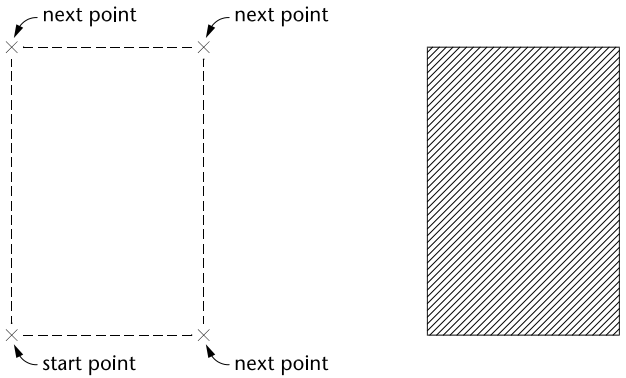
If you are unsure about whether the area should be attached to an area group, or if area groups have not been created yet, you can omit this step and attach the area to a group later.

For information about area groups, see "Area Groups" on page 2034.

7 Specify the start point of the first area line segment in the drawing.

8 Specify further points to define the area.

Creating an area by specifying points



specify bounding points

resulting area

After you specify the third vertex for the area boundary, the Ortho and Close options become available on the shortcut menu.

Ortho closes the area by drawing two line segments based on the direction you specify. The direction is extended until it meets a line perpendicular to the initial edge of the area boundary.

Close closes the area by creating an area line segment from the last point specified for the area to the first point specified in this area boundary.

9 Press ENTER.

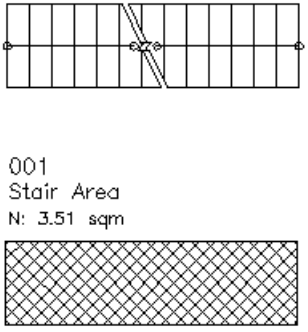
Creating Areas from Linework and Object Outlines

Use this procedure to create new areas by using the outlines of existing objects. This can be useful for defining construction areas that usually consist of walls, columns, stairs, and other building objects.

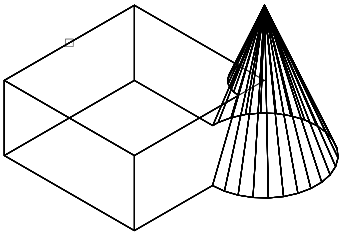
You can use the following objects as area outlines:

- Walls/Curtain Walls
- Columns/Braces/Beams/Slabs
- Doors/Windows/Window Assemblies
- Roofs/Roof Slabs
- Stairs/Railings
- Mass Elements/Mass Groups
- Spaces/Space Boundaries
- AEC Polygons
- Profiles
- Closed AutoCAD® polylines

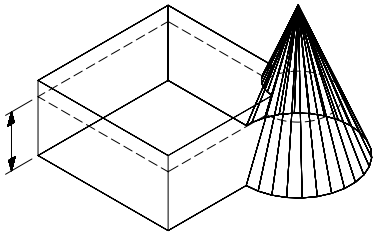
Creating an area from a stair object



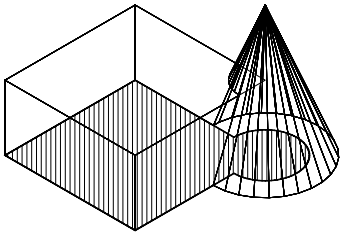
Creating an area from a mass group object



select object to convert



specify cutplane height



resulting area

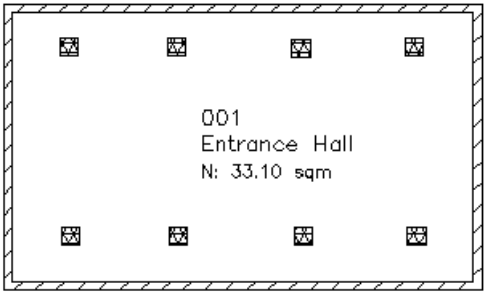
1. Open the tool palette that you want to use.
   If necessary, scroll to display the tool that you want to use.
2. Right-click an area tool, and click Apply Tool Properties to ➤ Linework and AEC Objects.
3. Select the objects and closed polylines to convert, and press ENTER.
4. Enter the height at which the construction area is to be calculated, and press ENTER.
5. Press ENTER to finish the command.
6. Edit the properties of the areas in the Properties palette, if necessary.

Creating Areas from Closed Boundaries

Use this procedure to create areas by selecting the inside of a boundary enclosed by building objects. The boundary can be made up of walls, curtain walls, window assemblies, or any combination of them. Any structural members and mass elements inside the boundary are subtracted from the resulting

area. This is useful for determining the areas of a room.

Area from closed walls with columns subtracted



1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

2. Right-click an area tool, and click Apply Tool Properties to ➤ Auto-Detection.
3. Click the drawing and select the closed walls, curtain walls, or window assemblies from which to create an area.

   NOTE If your selection set is very large, this method of creating areas can slow performance considerably. If you experience performance problems, try using a smaller selection set next time.

4. Press ENTER.
5. Click inside the selected boundaries.
6. Press ENTER.
7. Press ENTER to finish the command.
8. Edit the properties of the areas in the Properties palette, if necessary.

Creating an Area Tool

Use this procedure to create an area tool and add it to a tool palette. You may want to create your own area tools if you are placing multiple areas of specific styles that have the same properties.

For example, you are creating an office floor plan with different functional types of areas. To work efficiently, you can create an area tool for each area

type. You can then select the appropriate tool to add areas with the correct type to the floor plan.

1. Open the tool palette on which to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from an area in the drawing	select the area, and drag it to the tool palette.
create a tool from an area style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	right-click the tool and click Copy; open the other palette, and click Paste.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new area tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.

   This description is used as the tool's tooltip on the tool palette, and to describe the tool if it is stored in a tool catalog.

6. Expand Basic, and expand General.
7. Click the setting for Description, enter a description of the area created from this tool, and click OK.
8. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.
9. Select an area style.
10. Select the drawing file containing the style used for this area.
11. Select a tag for the area tool.
12. Select the drawing file containing the tag used for this area.
13. Click OK.

Examples for Creating Areas

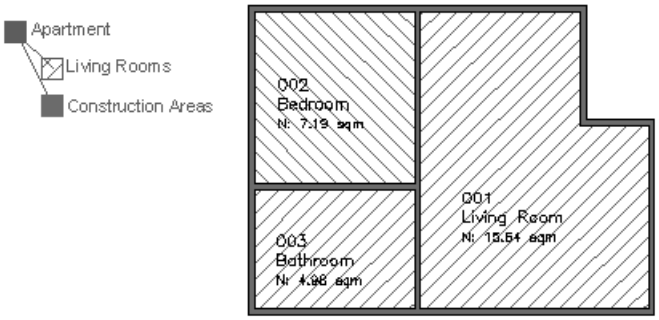
This topic contains the following examples for creating areas:

- Defining Construction Areas in a Ground Plan
- Measuring an Area from the Axis of the Wall

Defining Construction Areas in a Ground Plan

Use this procedure to define the construction areas in a building.

Construction areas in a floor plan



1. Create the floor plan to be calculated.
2. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.
3. Right-click an area tool, and click Apply Tool Properties to ➤ Linework and AEC Objects.
4. Select the objects you want to define as construction areas. For example, you can choose all walls, columns and mass elements in a floor plan. Mass elements are often used to represent construction elements such as heaters or other machines.

NOTE Selecting objects in a large floor plan can be a complex task. Here are tips for simplifying this:

Draw a selection marquee around the plan and then SHIFT-click to deselect the objects not included in the construction areas.

Use the Quick Select command to filter for objects included in construction areas (for example, walls, columns).

5 Press ENTER.

6 Enter the height at which the construction area is to be calculated, and press ENTER.

7 You now have in your drawing a number of areas for every object you selected in step 5. To merge them, do one of the following:

- To retain the single area objects but calculate them together as construction area, create an area group named, for example, "Construction Area," and attach all areas to it.

  For information about attaching areas to area groups, see "Attaching Areas to Area Groups" on page 2017.

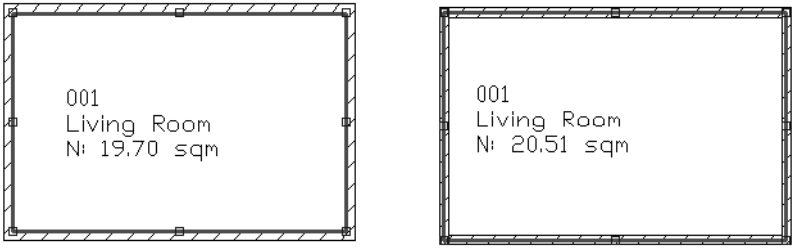
- To merge the single area objects into one area object, use the Join command.

  For information about the Join command, see "Joining Areas" on page 2009.

Measuring an Area from the Axis of the Wall

Use this procedure to measure an area from the wall axis. When you create areas from the boundaries of walls, the resulting area is, by default, measured from the inside of the walls.

Expand the area with grips



For certain calculation standards, however, you must measure rooms from the axis of the enclosing walls. You can do this by stretching the area grips to the correct position.

1 Create an area from closed boundaries as described in "Creating Areas from Closed Boundaries" on page 1995.

2 Use the grips of the area to drag it to the desired size.

Process Overview: Creating User-Defined Area Tags

Autodesk®Architectural Desktop templates offer you a number of predefined area tags. You may, however, want to create specific tags that are not included in the templates.

The process of creating area tags follows these basic steps:

Step 1: Determine the location of the property set definition of the area tag.

Step 2: If necessary, create a new property set definition to use in the area tag.

Step 3: Add attributes from the property set definition to the drawing.

Step 4: Create a block from the attributes.

Step 5: Create a multi-view block from the block.

Step 6: Add the area tag to the AutoCAD®DesignCenter.

Related Procedures

- Determining the Location of Property Set Definitions
- Adding Attributes
- Creating a Block
- Creating a Multi-View Block
- Adding an Area Tag to the AutoCAD®DesignCenter

Determining the Location of Property Set Definitions

Use this procedure to determine the source drawing of the area tag property set definition.

When you create an area tag for the DesignCenter, you must save the used property set definition in a drawing file that the tag can access when it is inserted. There are two possible locations for the source drawing:

- The Autodesk®Architectural Desktop **PropertySetDefs.dwg**. All existing DesignCenter blocks use this default drawing as the container for their

property set definitions. If you have a small number of custom tags, this is the recommended drawing in which to save them.

- Your own property set definition drawing: You can create a property set definition drawing when you have a large number of custom blocks, or if you want to have separate drawings for different tag types; for example, **PropertySetDefsAreas.dwg** or **PropertySetDefsAreaGroup.dwg**, etc.

NOTE The drawing containing the property set definitions for your tags must be located one folder level above the tag drawing. Otherwise, the software cannot find the associated property set definitions. For example, if your tag resides in *//Content/Schedules/UserDefined Tags/*, then the associated property set definitions drawing needs to be in *//Content/Schedules/*.

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1. Either open the Autodesk Architectural Desktop PropertySetDefs.dwg, or create a new property set definitions drawing.

   NOTE For information on the location of support files, see "Styles and Support Files" on page 167.

2. If necessary, create a property set definition for the user-defined tag.
3. Proceed as described in "Adding Attributes" on page 2001.

Adding Attributes

Use this procedure to create attributes for an area tag. An area tag usually contains attributes that display base and calculated area and perimeter values; the number, name, and description of the area; as well as any calculation modifier styles.

Area attributes come from a property set definition. Predefined attributes are available when you either start with a template or start from scratch and drag a predefined area tag from the AutoCAD®DesignCenter into the drawing.

If you want to use different attributes for area tags, create your own property set definition for areas. For more information, see "Property Set Definitions" on page 2241.

Area tag attributes

Attribute/Tag	Description
AREA:NUMBER	Number for the area

Area tag attributes *(continued)*

Attribute/Tag	Description
AREA:NAME	Name of the area
AREA:DESCRIPTION	Description of the area
AREA:BASEAREA	Base area value without taking into account calculation modifier styles
AREA:CALCULATEDAREA	Calculated area value that results from the base area value, plus any calculation modifier styles added to the area
AREA:BASEPERIMETER	Base perimeter value without taking into account calculation modifier styles
AREA:CALCULATED PERIMETER	Calculated perimeter value that results from the base perimeter value, plus any calculation modifier styles added to the area
AREA:CALCULATION MODIFIERSTYLE	Calculation modifier styles attached to the area

1. On the command line, enter **ddattdef**.
2. In the Tag field, enter one of the attributes described above. For example, if you want to add an attribute for the base perimeter of the area, enter AREA:BASEPERIMETER here.
3. Proceed to adding the attribute as described in "Working with Attributes" in the *AutoCAD 2004 User's Guide*.
4. Repeat steps 1–3 for each attribute you want to add to the area tag.

Creating a Block

Use this procedure to combine area attributes into a block.

1. On the Format menu, click Block ➤ Block Definition.
2. Enter the name of the block.
3. Click Select Objects and select the attributes you want to include in the area tag.
4. Select Unitless for Insert Units.
5. Proceed to creating the block as described in "Defining Blocks" in the online *AutoCAD 2004 User's Guide*.

Creating a Multi-View Block

Use this procedure to create a multi-view block for the area tag.

For detailed information about multi-view blocks, see "Multi-View Blocks" on page 2481.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects, and expand Multi-View Block Definitions.
3. Right-click Multi-View Block Definitions, and click New.
4. Enter a name for the new multi-view block definition, and press ENTER.
5. Select the new multi-view block definition, right-click, and click Edit.
6. Click the View Blocks tab.
7. Select a display representation for the elevation label.
8. Click Add.
9. Select the block you defined in "Creating a Block" on page 2002, and click OK.
10. Select the view directions for the block.
11. Repeat steps 6–9 for each display representation in which to display the area tag.
12. Click OK twice.

Adding an Area Tag to the AutoCAD® DesignCenter

Use this procedure to add an area tag to the AutoCAD DesignCenter. To do this, you need to create a **.dwg* file using the AEC Content Wizard.

For a detailed description of the AEC Content Wizard, see "Custom Content" on page 2343.

1. On the Format menu, click AEC Content Wizard.
2. Select Custom Command.
3. Select the multi-view block you created in "Creating a Multi-View Block" on page 2003, and click Add to add it to the Content File.
4. On the command line, enter **AecAnnoScheduleTagAdd**, a space, and the name of the multi-view block and its parameters. The command is built up as follows:

   _AecAnnoScheduleTagAdd <Name of the drawing containing the property set definition>.dwg **_SYMBOL** <name of the multi-view block created>**_LEADER** _None **_DIMSTYLE** Current

In our example, the custom command could look like this:

_AecAnnoScheduleTagAdd AreaPropertySetDefs.dwg **_SYMBOL** AreaTag-MVBlock **_LEADER** _None **_DIMSTYLE** Current

5. Click Next.
6. Select Enable AEC Unit Scaling.
7. Select a layer key for the tag.

NOTE The default layer key for area tags is ROOMNO.

8. Click Next.
9. Enter a file name and directory for the tag.

NOTE Save the custom tag in a folder one level below the used property set definition drawing. For example, if the property set definition drawing is saved in *//Autodesk Architectural Desktop/Content/Schedules/*, then the custom tag could be saved in *//Autodesk Architectural Desktop/Content/Schedules/Area Tags*.

10. Click Finish to exit the AEC Content Wizard.

The new area tag appears in the AutoCAD DesignCenter, at the location you specified in the AEC Content Wizard. From here, you can drag it into your drawing.

Editing Areas

After you have created an area, you can change properties such as calculation modifier styles or the area style. You can also perform geometric operations, such as joining areas, subtracting areas from each other, or adding and removing vertex points from the area profile.

Autodesk® Architectural Desktop offers several methods for editing areas:

- Edit areas directly using grips for dimensions and other physical characteristics.
- Change area settings on the Properties palette.
- Select editing commands from the shortcut menu for a selected area.

Related Procedures

- Grip Editing Areas
- Changing the Area Style
- Attaching and Detaching Calculation Modifier Styles
- Assigning an Area to a Different Area Group
- Changing the Location of an Area
- Joining Areas
- Creating Holes in Areas
- Creating Areas from the Intersection of Other Areas
- Adding Vertices
- Removing Vertices
- Trimming Areas
- Dividing Areas
- Removing Rings from Areas
- Reversing Area Rings
- Reversing All Rings in an Area
- Creating Polylines from Areas
- Attaching Hyperlinks, Notes, or Files to an Area

Grip Editing Areas

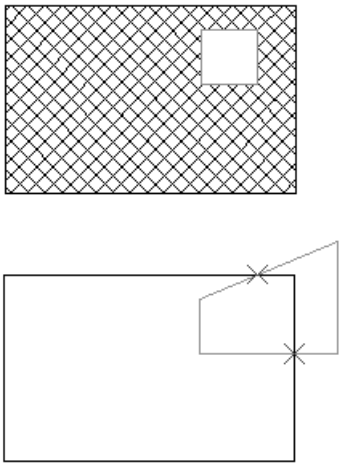
Areas behave like closed AutoCAD®polylines; however, they have additional grip points at the midpoints of each segment for editing.

Editing Area Dimensions

1. Select the area.
2. Select the grip for the edge or vertex you want to change.
3. Move the grip until the dimension value you want is displayed, and click once; or, enter a value.

When you create an area consisting of multiple area rings, each area ring has its own grip points. Be careful when editing these areas. For example, if you have created an area with a hole in it, and you drag the hole boundary over the area's outer boundary, the result is a faulty area. You can see error symbols at positions where the hole boundary crosses the outer boundary. To remove those error symbols, drag the hole boundary back inside the outer boundary.

Grip points of negative boundary dragged incorrectly (bottom)



Changing the Area Style

Use this procedure to change the area style associated with an area. Area styles contain information about the display of the area. For information about how to define area styles, see "Creating an Area Style" on page 2018.

1. Select one or more areas and double-click one of them.
2. Expand Basic, and expand General.
3. Select an area style.

Attaching and Detaching Calculation Modifier Styles

Use this procedure to attach calculation modifier styles to areas, sort them, and detach them.

For information about creating calculation modifier styles, see"Calculation Modifier Styles" on page 2023.

1. Select the areas you want to change, and double-click one of them.
2. Expand Basic, and expand General.
3. Click the setting for Calculation Modifiers.

NOTE This setting can be edited for multiple areas only when these areas have the same modifier styles attached in exactly the same order.

4 Attach or detach calculation modifier styles:

If you want to . . .	Then . . .
attach a calculation modifier style	under Available Calculation Modifiers, select the desired calculation modifier style, and click .
detach a calculation modifier style	under Name, select the desired calculation modifier style, and click .
rearrange the order of attached calculation modifier styles	under Name, select the calculation modifier style you want to move to a different position. Click to move the calculation modifier style up in the list, or click to move the calculation modifier style down in the list. **NOTE** Calculation modifier styles are processed top-down, so that the topmost calculation modifier style is calculated first, then the one below it, and so on until you reach the bottom of the list.

5 Click OK.

Assigning an Area to a Different Area Group

Use this procedure to attach an area to an area group, change the hierarchical position of an area, or detach an area from a group.

For more information about area groups, see "Area Groups" on page 2034.

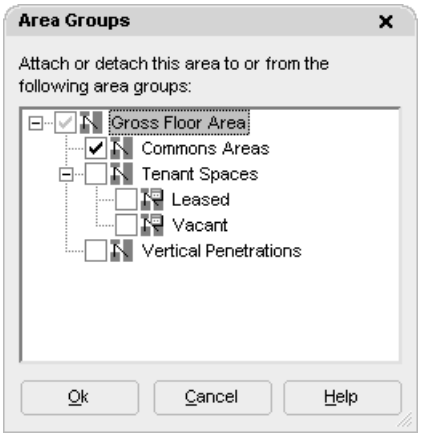
1 Double-click the area to assign to a different group.

2 Expand Basic, and expand General.

3 Click the setting for Area Groups.

NOTE If this setting appears as read-only, no area groups have been added to the drawing yet.

Attaching an area to an area group



4 Attach or detach areas to or from a group:

If you want to . . .	Then . . .
attach an area to a group	select the area group's check box.
detach an area from a group	clear the area group's check box.

NOTE A black check mark means that you have selected this group directly. You can clear the group directly.

A gray check mark means that you have selected a subgroup of the gray-marked group and, by implication, have added the area to all supergroups of the selected group. You cannot clear a gray mark directly; you need to clear the black-marked subgroup to remove it.

5 Click OK.

Changing the Location of an Area

Use this procedure to relocate an area by changing the coordinate values of its insertion point. The area also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the area are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the ori-

entation of the area by aligning its normal with another axis. You can also rotate the area on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1 Select the areas you want to relocate, and double-click one of them.

2 Expand Basic, and expand Location.

3 Enter a value for Rotation.

4 Enter a value for Elevation.

5 Click Additional Information for further location properties:

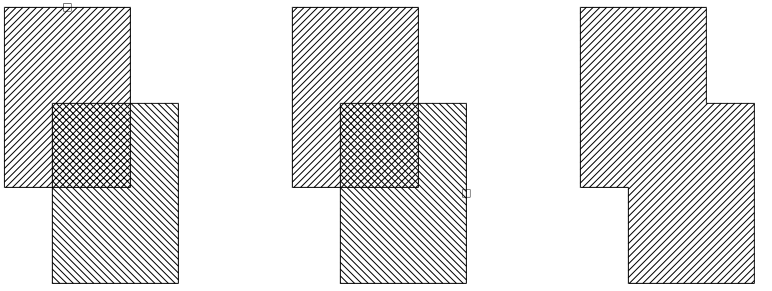
If you want to . . .	**Then . . .**
relocate the area	enter new coordinate values under Insertion Point.
locate the area on the *XY* plane	make the normal of the area parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the area on the *YZ* plane	make the normal of the area parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the area on the *XZ* plane	make the normal of the area parallel to the *Y* axis: enter **1** for Y and enter **0** for X and Z.

6 Click OK.

Joining Areas

Use this procedure to join two or more areas in a drawing. You can join areas that overlap, or areas that do not touch each other.

Joining two areas



select area | select area to join | resulting joined areas

When you join two areas that overlap, their common boundary is combined to form the boundary of the joined area.

When you join two areas that do not overlap, both area rings retain their geometry, but act as one single area. You could do this in a drawing of a shopping mall, where one shop might consist of several rooms.

NOTE When you join two areas, the second area no longer exists as an entity. Thus, you can no longer select or edit it separately. Also, area properties, display properties and attached calculation modifier styles of the second area are deleted and replaced with the corresponding properties of the first area.

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1 Select one of the areas to be joined, right-click, and click Operation ➤ Join.

NOTE You can join only those areas that lie on the same *Z*-plane. Two areas with different *Z*-positions in the same coordinate system cannot be joined.

---

2 Select the areas you want to join.

3 Press ENTER.

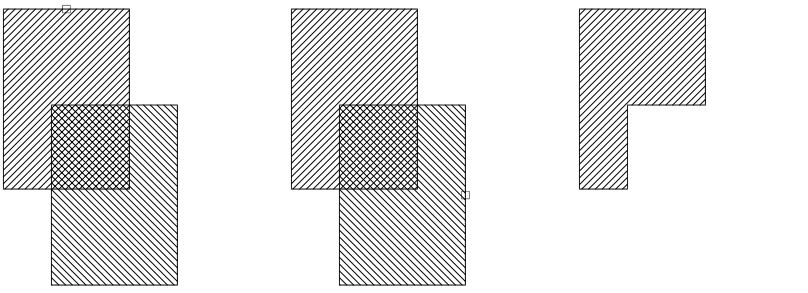
- If the areas overlap, the individual area boundaries are joined into one.
- If the areas do not overlap, the individual area boundaries are retained but act now as different rings of the same area.

Creating Holes in Areas

Use this procedure to subtract areas from each other in order to create a hole in an area. This is useful, for example, when you want to calculate the area

of a room without columns and chimney chases.

Subtracting one area from another



select area | select area to subtract | resulting subtracted area

To perform a subtraction operation, you need to select areas that intersect somewhere. If you choose areas that do not intersect, all areas you have marked for subtraction are deleted from the drawing.

Subtracted areas no longer exist as entities after the subtraction. Thus, you can no longer select or edit them separately. Also, area properties, display properties and attached calculation modifier styles of the subtracted areas are deleted and replaced with the corresponding properties of the first area.

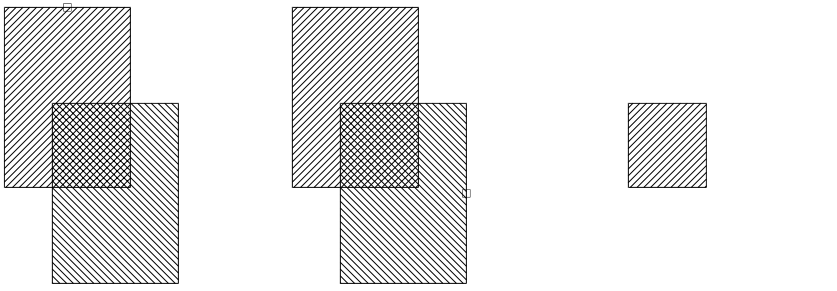
1. Select the area from which to subtract other areas, right-click, and click Operation ➤ Subtract.
2. Select the areas you want to subtract.
3. Press ENTER.

   The resulting area has now been reduced by the amount of the areas subtracted from it.

Creating Areas from the Intersection of Other Areas

Use this procedure to create a new area from the overlapping portion of two intersecting areas. The source areas are deleted in the process.

Intersecting two areas



select area | select area to intersect with | resulting intersection area

To perform an intersection operation, you need to select areas that overlap somewhere. If you choose areas that do not intersect, all areas you have marked for intersecting with the first area are deleted from the drawing.

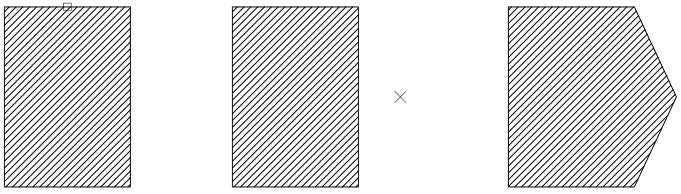
1. Select the first area for the intersection, right-click, and click Operation ➤ Intersect.
2. Select the next intersecting areas.
3. Press ENTER.

   The source areas are removed. The overlapping part is converted to a new area.

Adding Vertices

Use this procedure to add vertices to an area. This can help you to fine-tune the area outline, especially when you have created the area from an existing object or a wall boundary.

Adding a vertex to an area



select area | pick vertex to add | resulting area

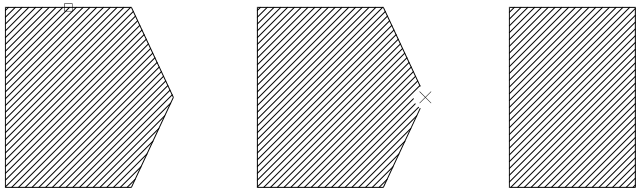
1. Select the area to which to add vertices, right-click, and click Edit Vertices.
2. Click your drawing to specify any vertex points you want to add.

3 Press ENTER.

Removing Vertices

Use this procedure to remove vertices from an area.

Removing a vertex from an area



1 Select the area from which to remove vertices, right-click, and click Edit Vertices.

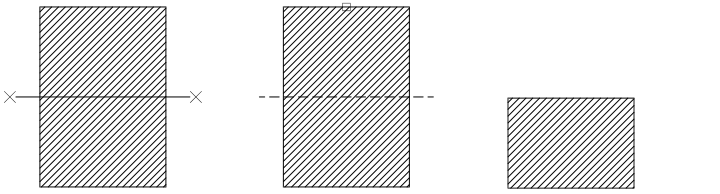
2 Select the vertex points to remove by clicking near them while holding down SHIFT.

3 Press ENTER.

Trimming Areas

Use this procedure to trim areas along a trim line you have defined. Trimming means to cut away part of the area along a defined line.

Trimming an area



1 Select the area from which to trim a part, right-click, and click Operation ➤ Trim.

2 Click to specify the start point of the trim line.

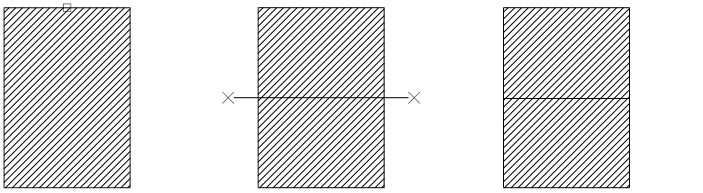
3 Click to specify the endpoint of the trim line.

4 Click the side of the area to be removed after trimming.

Dividing Areas

Use this procedure to divide areas along a divide line you define.

Dividing an area



1. Select the area you want to divide, right-click, and click Operation ➤ Divide.
2. Click to specify the start point of the divide line.
3. Click to specify the endpoint of the divide line.

   You now have two areas next to each other. You can select each area separately to modify it.

NOTE If you attached an area tag from DesignCenter to this area before dividing it, you must specify which area is connected to the existing tag. Specify the start point and endpoint of the dividing line, and the area on the left side in this direction will have the tag attached. To tag both resulting areas, attach a tag to the area on the right side of the division line as well.

Removing Rings from Areas

Use this procedure to remove individual rings from an area with multiple rings.

You cannot remove a ring from an area that has only one ring; and you cannot remove the last ring from an area.

1. Select an area with multiple rings, right-click, and click Edit Rings ➤ Remove Ring.
2. Select the area ring you want to remove from the area.

   The area ring is removed.

3. Press ENTER.

Reversing Area Rings

Use this procedure to reverse the value of an individual area ring, so that a positive ring (area) can be transformed into a negative ring (hole), and a negative ring back into a positive ring.

1. Select an area of which you want to reverse a ring, right-click, and click Edit Rings ➤ Reverse Ring.
2. Select the area ring you want to reverse.

Reversing All Rings in an Area

Use this procedure to reverse all rings of an area in one step.

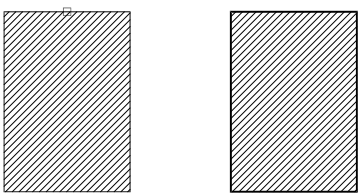
When you reverse the area rings, all positive rings are transformed into negative rings and all negative rings are transformed into positive rings.

1. Select the area you want to reverse, right-click, and click Edit Rings ➤ Reverse Ring.
2. Select further areas for reversing.
3. Press ENTER to end your selection.

Creating Polylines from Areas

Use this procedure to create polylines from an area you have created.

Creating a polyline from an area boundary



select area

resulting polyline created @ area boundary

After converting areas to polylines, you can also reconvert them to areas.

This is useful in these cases:

- You want to export the floor plan to an application that can process only polylines.
- You want to remove a hole from an area.
- You want to create walls or spaces from areas

1 Select the area from which you want to create a polyline, right-click, and click Create Polyline.

   Standard AutoCAD® polylines are created on top of your areas. You can edit them as any other polyline.

TIP When polylines lie above areas, it can be difficult to select the area without the polyline. Try one of the following:

- CTRL-click the boundary. Then click until the area boundary is highlighted.
- If the area hatch is displayed, click the hatch.
- Click Quick Select on the Properties palette.

Attaching Hyperlinks, Notes, or Files to an Area

Use this procedure to attach hyperlinks, text notes, or files to an area.

1 Double-click the area you want to attach information to.

2 Click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD 2004 Command Reference*.

4 Click the setting for Notes, and add a note. Then, click OK.

5 Click the setting for Reference Documents.

6 Attach or detach reference files:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

7 Click OK.

Attaching Areas to Area Groups

Use this procedure to attach areas to area groups in the drawing.

For information about creating area groups, see "Creating Area Groups with User-Specified Settings" on page 2041.

1. Select an area which you want to attach to a group, right-click, and click Attach to Group.
2. Select the area group to which you want to attach your area, and press ENTER.

Detaching Areas from Area Groups

Use this procedure to detach areas from area groups.

1. Select an area which you want to detach from a group, right-click, and click Detach from Group.

TIP When you have attached an area to a group it can be difficult to select the area without the area group. Try one of the following:

- CTRL-click the desired area boundary. Then click until the desired area is highlighted.
- If the area hatch is displayed, click the hatch.
- If area decomposition is displayed, click one of the decomposition lines.
- Drag a selection window around the areas you want to detach.
- Click Quick Select on the Properties palette.

---

2. Select the area group from which you want to detach your area, and press ENTER.

Area Styles

A style is a collection of display and decomposition properties for an area. Decomposition is a method of geometrically dividing an existing area in triangular or trapezoid subparts. In some countries, such as Germany and Japan, the visual decomposition of areas into subdivisions is an important part of the area evaluation. It is needed for the area proof that must be presented to the building administration for approval.

When you apply the style to one or more areas, the settings defined in it are applied automatically.

You can use area styles for differentiating between areas:

- Different area types: You can draw construction areas, calculated areas, base areas, and traffic areas, or areas with different display properties. For example, you might draw all construction areas in green and hatched, and the traffic areas in blue with a solid fill.
- Different decomposition methods: You might create a style for trapezoid decomposition and one for triangular decomposition. For information about area decomposition, see "Area Decomposition" on page 2028.
- Different calculation standards: You might create area styles for areas according to DIN277, areas that are rented, or demolition areas.

You can create an area tool from any area style. You can drag the style from the Style Manager onto a tool palette. You can then specify default settings for any areas created from the tool. For more information, see "Creating an Area Tool" on page 1996.

You can create new area styles, edit area styles, import and export area styles between drawings, and purge area styles that are not in use. The Style Manager provides a central location in Autodesk® Architectural Desktop, where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

Related Topics and Procedures

- Creating an Area Style
- Changing the Area Display Components
- Specifying the Hatching for Components of an Area Style
- Specifying Classifications for an Area Style
- Attaching Notes or Files to an Area Style

Creating an Area Style

Use this procedure to create an area style. You can create a new style with default style properties, or you can create a new style by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand Area Styles.

3 Create a new area style:

If you want to . . .	Then . . .
create a new style with default properties	right-click Area Styles, and click New.
create a new style from an existing style	right-click the area style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new area style, and press ENTER.

5 To edit the style properties of your new area style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.
add classifications to an area style	see "Specifying Classifications for an Area Style" on page 2022.
change the Layer, Color, and Linetype properties	see "Changing the Area Display Components" on page 2019.
change the area style hatching	see "Specifying the Hatching for Components of an Area Style" on page 2021.
add notes, files, or documents to the style	see "Attaching Notes or Files to an Area Style" on page 2022.

6 If you want to assign the style to an area tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating an Area Tool" on page 1996.

7 Click OK.

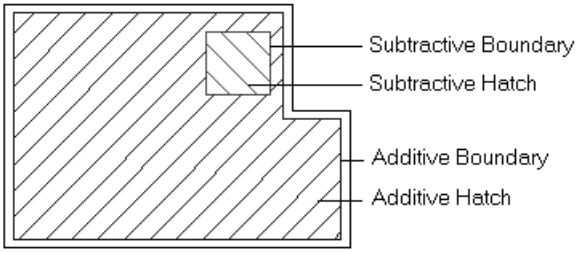
Changing the Area Display Components

Use this procedure to change the properties of display components of an area style:

- Visibility (display component is on or off)
- Layer

- Color
- Linetype
- Lineweight
- Linetype scale

Display components of an area



Display components in plan views

Component	Description
Additive Boundary	Boundary of an area with a positive value, for example, a room area
Subtractive Boundary	Boundary of an area with a negative value (a hole)
Additive Hatch	Hatch of an area with a positive value
Subtractive Hatch	Hatch of an area with a negative value (a hole)
Defect marker	Error symbol that appears when a display component cannot be displayed

1. Open a tool palette that has an area tool.
2. Right-click an area tool, and click Area Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select the component to change, and select a different setting for the property.
9. Click OK three times.

Specifying the Hatching for Components of an Area Style

Use this procedure to specify the hatching of the components of an area style. Area hatching is displayed only in display representations, used in the Top view of a drawing, such as Plan High Detail or Plan Low Detail.

1. Open a tool palette that has an area tool.
2. Right-click an area tool, and click Area Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Hatching tab.
8. Select a component, and click the setting for Pattern.
9. Select the hatching for the component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

10. Click OK.
11. Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.
12. Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

14 Click OK three times.

Specifying Classifications for an Area Style

Use this procedure to specify classifications for any classification definition applied to an area style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1 Open a tool palette that has an area tool.

2 Right-click an area tool, and click Area Styles.

3 Right-click the style that you want to change, and click Edit.

4 Click the Classifications tab.

By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to area styles.

5 For each classification definition, select the classification you want to apply to the current area style.

6 Click OK twice.

Attaching Notes or Files to an Area Style

Use this procedure to attach text notes and files to an area style.

1 Open a tool palette that has an area tool.

2 Right-click an area tool, and click Area Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the General tab.

5 To add a description to the area style, enter the description under Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click Open.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Close the application when you are done editing.
detach a reference file	select the file name, click Delete, and click OK.

9 Click OK three times.

Calculation Modifier Styles

A calculation modifier style is a formula that you can apply to an area to change the calculated result of its associated area or perimeter value. Calculation modifier styles can also be applied to area groups, where they change the calculated results of all areas attached to that group. You can create calculation modifier styles for a number of purposes; for example, to calculate plaster deductions or the tiling in a bathroom.

Calculation modifier styles work in an accumulating structure. When you apply several different styles to an area or area group, they are all applied to it. Therefore, it is important to define the order in which they are used.

Example: You have an area of 25 square meters. You want to apply two different calculation modifier styles to it. Calculation modifier style A deducts a standard value of 0.3 square meters for a column. Calculation modifier style B divides the area by 2 (in some international calculation schemes, this is used for calculating balconies).

- If you apply the plaster deduction first and the division second, you get the following result:

  Calculation Modifier Style A: 25 m2 - 0.3 m2 = 24.7 m2

  Calculation Modifier Style B: 24.7 m2 / 2 = 12.35 m2

- If you apply the division first and the plaster deduction second, you get the following result:

  Calculation Modifier Style B: 25 m2 / 2 = 12.5 m2

  Calculation Modifier Style A: 12.5 m2 - 0.3 m2 = 12.2 m2

The results differ depending on the order in which you apply the calculation modifier styles.

You can set the order of calculation modifier styles in the properties of the area. For information about attaching and ordering calculation modifier styles, see "Attaching and Detaching Calculation Modifier Styles" on page 2006.

Related Topics and Procedures

- Creating a Calculation Modifier Style
- Defining the Calculation Type of the Modifier Style
- Defining the Formula of the Modifier Style
- Attaching Notes and Files to a Calculation Modifier Style

Creating a Calculation Modifier Style

Use this procedure to create a calculation modifier style. You can create a new style with default style properties, or you can create a new style by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand Calculation Modifier Styles.
3. Create a new calculation modifier style:

If you want to . . .	Then . . .
create a new style with default properties	right-click Calculation Modifier Styles, and click New.
create a new style from an existing style	right-click the calculation modifier style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new calculation modifier style, and press ENTER.

5 To edit the style properties of your new calculation modifier style, right-click the style, and click Edit:

If you want to . . .	Then . . .
define the calculation type of the modifier style	see "Defining the Calculation Type of the Modifier Style" on page 2025.
define the formula of the modifier style	see "Defining the Formula of the Modifier Style" on page 2026.
add notes, files, or documents to the modifier style	see "Attaching Notes and Files to a Calculation Modifier Style" on page 2027.

6 Click OK twice.

Defining the Calculation Type of the Modifier Style

Use this procedure to define the calculation type of the modifier style. An AEC area contains two values, Area and Perimeter, to use for applying a calculation modifier style. Depending on the value you choose for the style, it is either for the calculation type Area or the calculation type Perimeter.

NOTE A calculation modifier style can also have both calculation types and can be applied to both the Perimeter and the Area value.

An example of a modifier style of the calculation type Area would be one that calculates an area only with 50 percent of its square meters. (This is obligatory for several area types in various international architectural standards.)

An example of a modifier style of the calculation type Perimeter would be one that deducts length from the perimeter of a room for openings and stairs. This would be helpful in calculating the baseboard material you need for this room.

1 On the Format menu, click Style Manager.

2 Expand Documentation Objects, and expand Calculation Modifier Styles.

3 Select the modifier style for which you want to set the calculation type, right-click, and click Edit.

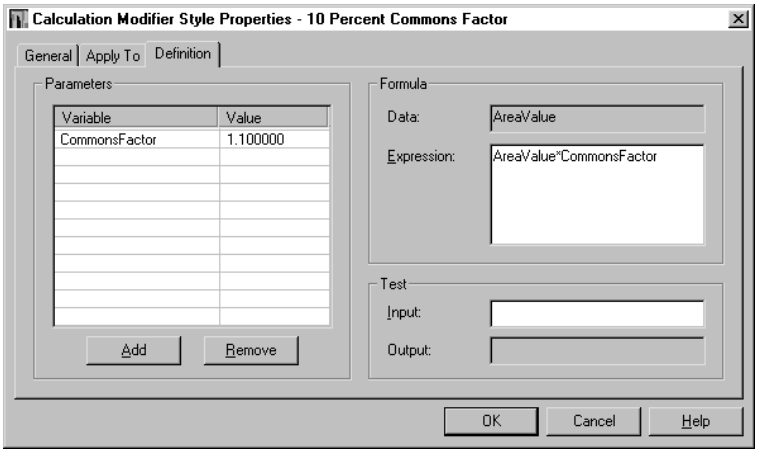
4 Click the Apply To tab.

5 Select whether you want to apply the modifier style to the area or perimeter value. You can also select both values here.

6 Click OK twice.

Defining the Formula of the Modifier Style

Use this procedure to define the formula of the calculation modifier style. You define the rules used to calculate the area and perimeter.



1 On the Format menu, click Style Manager.

2 Expand Documentation Objects, and expand Calculation Modifier Styles.

3 Select the modifier style for which you want to define a formula, right-click, and click Edit.

4 Click the Definition tab.

5 You can add a variable to the calculation modifier style.

A variable consists of the variable name and its value. For example, to create a plaster deduction of 3 percent, click Add, and enter Plaster_Deduction for Variable and 0.97 for Value.

You can use a descriptive name as a variable name and thereby add transparency to your formulas.

To set up formulas, you do not need to work with variables. To set up your formulas, you can enter direct mathematical values.

The following characters and words are not allowed:

- Special characters such as ?()*- You may, however use an underscore (_).
- Spaces

- Accent marks such as ä, ö, ü, ê, è, å
- Key words from Visual Basic®.

For information about Visual Basic key words, refer to the Visual Basic Reference.

6 The Data field displays the value you chose in the Apply To tab for calculation:

- AreaValue = area
- PerimeterValue = perimeter
- Value = area and perimeter

You cannot edit this value; if you want to change the area data, click the Apply To tab and choose different data there.

7 Enter the formula for calculating the modifier style under Expression.

You can enter direct mathematical values and operators, variables you have created, and Visual Basic key words, such as **Mod**, **Exp**, or **Log**.

NOTE It is important to enter the values AreaValue and PerimeterValue exactly as they are displayed in the Area Data field. Alternative spellings, such as "Area Value" or "perimetervalue," are not recognized.

For example, you want to set up a plaster deduction of 3 percent, and you have defined a variable called Plaster_Deduction with a value of 0.97, enter **AreaValue * Plaster_Deduction**.

8 To test your formula, enter an exemplary area value for Input, press ENTER, and check the result under Output.

9 Click OK twice.

Attaching Notes and Files to a Calculation Modifier Style

Use this procedure to enter notes and attach reference files to a calculation modifier style. You can also edit reference files attached to the style.

1 On the Format menu, click Style Manager.

2 Expand Documentation Objects, and expand Calculation Modifier Styles.

3 Select the modifier style to which you want to attach notes or files, right-click and click Edit.

4 Click the General tab.

5 To add a description to the modifier style, enter it for Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click Open.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Close the application when you are done editing.
detach a reference file	select the file name, and click Delete.

9 Click OK twice.

Area Decomposition

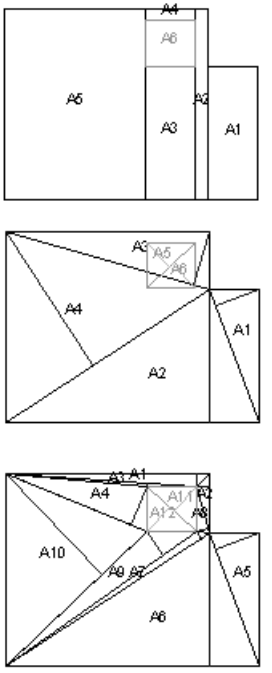
In some countries, such as Germany and Japan, an important part of area evaluation is the visual decomposition of areas into subdivisions. Area decomposition is needed for the area proof that must be presented to the building administration for approval.

Because decomposition is a part of the display properties of the area object, the best way to organize it is with styles.

With styles, you can control how the decomposition is displayed, the decomposition method used, color settings for decomposition components, and tags. The decomposition view of an area is an additional display representation.

For information about area styles, see “Area Styles” on page 2017.

Trapezoid and triangulated area decomposition



Related Topics and Procedures

- Displaying the Area Decomposition
- Specifying Layer/Color/Linetype Settings of the Area Decomposition
- Specifying the Method of Area Decomposition
- Specifying Text Settings for Area Decomposition

Displaying the Area Decomposition

Use this procedure to display the area decomposition view.

An area decomposition is a view in which the areas are displayed as triangles or trapezoids, depending on the decomposition method. Additionally, the decomposition view shows height lines, and edge and height dimensions. Architects need area decomposition for calculation proof, for efforts such as presenting building proposals to building authorities.

The decomposition view is an additional display representation of the area object that you can turn on and off.

In the Plan High Detail and Plan Low Detail display configurations, the area decomposition is not displayed by default, but you can turn it on. For information about changing display configurations, see "Display System" on page 435.

An easier way to display the area decomposition is to turn on the Proof of Areas display configuration.

In the Proof of Areas view, only the area decomposition is visible. You can not see architectural objects such as doors, walls, or windows. If you want to display those objects with the decomposition, switch them on in the Proof of Areas display representation set. For information about display representation sets, see "Display Sets" on page 443.

NOTE To display the Proof of Areas display configuration, you must work with a template that contains this configuration, for example, *Architectural Building Model and View (D A CH - ctb).dwt*.

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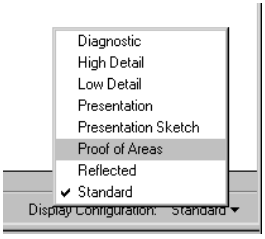
1. In the Autodesk®Architectural Desktop status bar, click the list of available display configurations.
2. Select Proof of Areas.



Specifying Layer/Color/Linetype Settings of the Area Decomposition

Use this procedure to change the properties of the display components of an area decomposition:

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

The following decomposition components are available:

Display components in decomposed view	
Component	**Description**
Additive Edge	Decomposition lines of an area with a positive value, such as a room area
Subtractive Edge	Decomposition lines of an area with a negative value, or a hole
Additive Label	Label for an area subdivision with a positive value
Subtractive Label	Label for an area subdivision with a negative value
Additive Height	Height lines of an area subdivision with a positive value
Subtractive Height	Height lines of an area subdivision with a negative value
Edge Dimension Text	Label for an area edge displaying its length
Height Dimensions	Label for a height line displaying its length
Defect Marker	Marker that appears when a display component cannot be displayed.

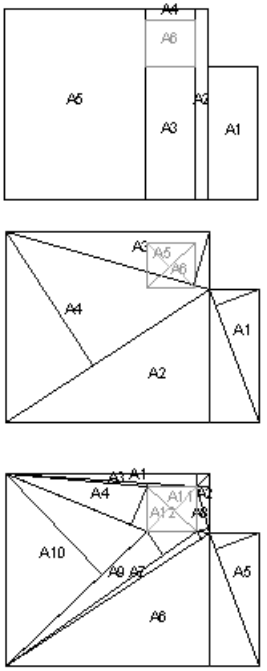
1. Open a tool palette that has an area tool.
2. Right-click an area tool, and click Area Styles.
3. Right-click the style that has the decomposition settings you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the Decomposed display representation, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select the component to change, and select a different setting for the property.
9. Click OK three times.

Specifying the Method of Area Decomposition

Use this procedure to specify the method of decomposing areas.

In the Decomposition tab, you can set the decomposition method you prefer.

Trapezoid and triangulated area decomposition



1. Open a tool palette that has an area tool.
2. Right-click an area tool, and click Area Styles.
3. Right-click the style that has the decomposition settings you want to change, and click Edit.
4. Click the Display Properties tab.
5. Select the Decomposed display representation, and select Style Override.
6. If necessary, click .
7. Click the Decomposition tab.

8 Select a decomposition method for Type:

If you want to . . .	Then . . .
display a trapezoid decomposition	select Trapezoid.
display a triangular decomposition without overlapping triangles	select Triangle.
display a triangular decomposition with overlapping triangles	select Triangle (overlap).

9 Choose an explosion mode:

If you want to . . .	Then . . .
change the decomposed area into single lines after exploding	select Lines.
change the decomposed area into closed polylines for each decomposed part	select Faces.

10 Click OK three times.

Specifying Text Settings for Area Decomposition

Use this procedure to further modify the numbers of the area subdivisions as well as to the edge and height annotations.

1 Open a tool palette that has an area tool.
2 Right-click an area tool, and click Area Styles.
3 Right-click the style that has the decomposition settings you want to change, and click Edit.
4 Click the Display Properties tab.
5 Select the Decomposed display representation, and select Style Override.
6 If necessary, click .
7 Click the Proof tab.

8 Define the prefix settings:

If you want to . . .	Then . . .
display a prefix for the numbers of the area subparts	enter a prefix.
change the style of the numbers of the area subparts	either select a text style from the list or click Edit Text Style (...) and create a new text style. For information about the Text Style dialog box, see the online *AutoCAD 2004 User's Guide*.
change the height of the numbers in the area subparts	enter a value for Height.

9 Define the edge dimension settings:

If you want to . . .	Then . . .
change the style of the edge dimensions	either select a text style from the list or click Edit Text Style (...) and create a new text style. For information about the Text Style dialog box, see the online *AutoCAD 2004 User's Guide*.
change the height of the edge dimensions	enter a value for Height.

10 Click OK three times.

Area Groups

Area groups are an important part of area evaluation. You can attach areas to groups and then detach them. You can also create area group templates and area name definitions.

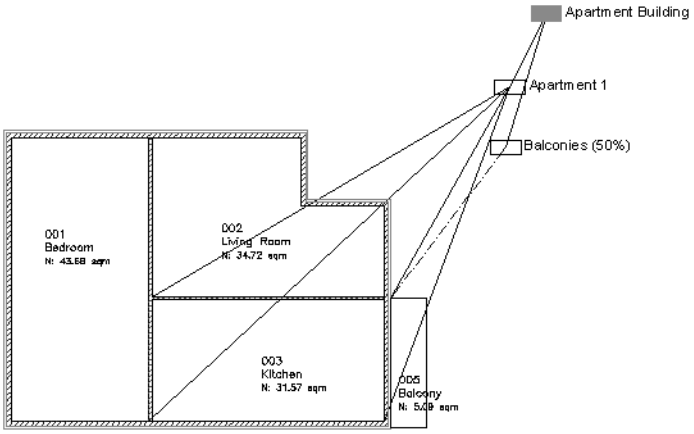
About Area Group Components

An area group is a container for areas and area groups. Area groups are necessary if you want to create an evaluation of your floor plan. With area groups, you structure areas into various groups, according to different schemes. For example, you can have functional groups, for example, con-

struction areas, or traffic areas. You can also have groups named "Apartment 1 Ground Floor," "apartment 2 Ground Floor," and so on. Another way to organize areas in area groups can be by special calculation rules, such as reducing the gross area by 50 percent. (According to some international standards, certain types of rooms are allowed to be calculated with only 50 percent of their actual area when you rent them to tenants. These include balconies, porches, or rooms under the roof with a room height of less than two meters).

Areas can be attached to more than one area group. You can, for example, attach a balcony area to both the groups "50 percent" and "Apartment 1 Ground Floor."

Areas attached to area groups



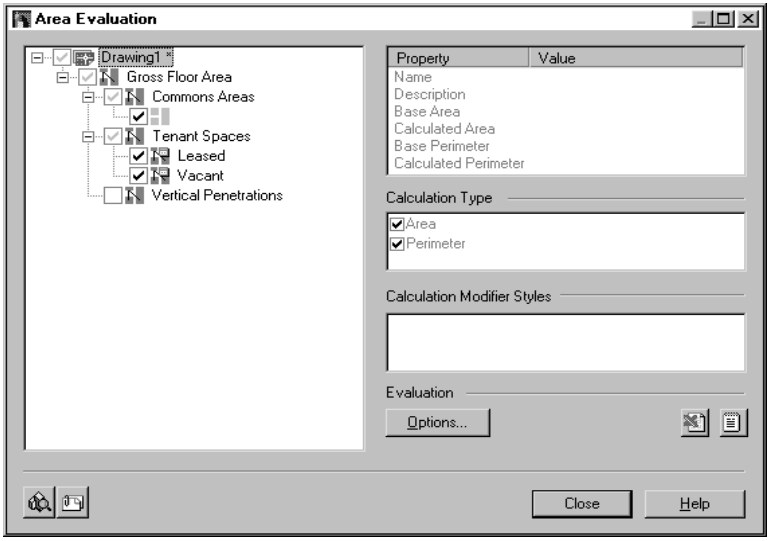
An area group can be connected to an area name definition, a list of names to choose from when creating an area that is attached to the group. This is a good way to ensure consistency in naming areas.

Area groups and area group templates can also have calculation modifier styles. A calculation modifier style is a formula applied to an area group that changes the calculated result of the area group value. You can create calculation modifier styles for purposes such as calculating plaster deductions, subtracting areas for construction, or calculating the height of the tiling in a bathroom.

Area Groups in the Area Evaluation

When you create an area evaluation of the floor plan, you can choose groups to include in it and groups to exclude.

Area Evaluation Manager



You might create an area evaluation for a single apartment in a building to determine square meters and set the rent accordingly. To do this, you only select the area group named "Apartment 1." Within the same drawing you might also create an evaluation that contains only bathrooms, to determine how many tiles to order from a sanitary products supplier. To do this, you select only the area group named "Bathrooms." Note that the bathroom from Apartment 1 appears in both groups and is calculated in both evaluations.

For information about area evaluations of the floor plan, see "Area Evaluation" on page 2074.

Area Group Templates

Area groups can be connected and nested into complex structures. An area group for a complete building, for example, would have one top-level group named "Building." Directly below that group would a be a number of groups for apartments—"Apartment 1," "Apartment 2," and so on. The individual apartment groups can contain other area groups like "Construction Areas," "50% Deduction," "Living Room," Bedroom," and so on.

Area group according to the German DIN277 area group template

When working with a complex group structure, you can create an area group template that contains the necessary groups and subgroups. When you draw a new building, you can insert an area group based on the group template "Building," and the area group "Building" with its subgroups is inserted in the drawing. Autodesk®Architectural Desktop templates contain a number of predefined area group templates.

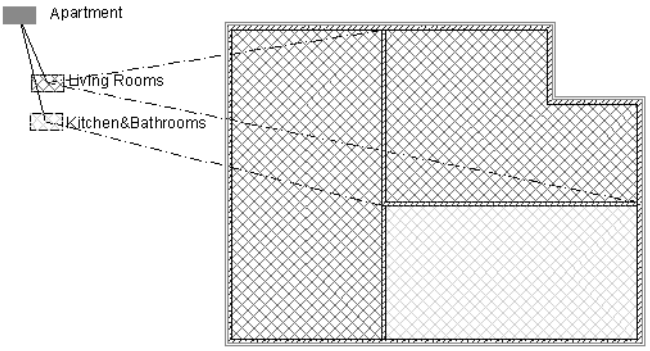
Related Topics and Procedures

- Process Overview: Creating Area Groups from Scratch
- Process Overview: Creating Area Groups from Templates
- Using Area Group Tools to Create Area Groups
- Creating an Area Group
- Creating Area Groups with User-Specified Settings
- Creating Area Groups from a Group Template
- Creating an Area Group Tool
- Editing Area Groups
- Area Group Styles
- Area Name Definitions
- Area Group Templates

Process Overview: Creating Area Groups from Scratch

Area groups are often placed into groups, and are later used for the area evaluation of a floor plan.

Area groups with attached areas



You can create area group structures "on the fly" while you insert groups in a drawing. This method is best suited for groups you won't need to reuse later.

Step 1: Create the areas you want to place in an area group.

Step 2: Create the individual area groups you need for your areas.

Step 3: Attach the areas to the area groups.

Step 4: Attach the individual area groups to each other, to create the desired structure.

Step 5: Add more areas and area groups to the drawing, according to your needs.

Related Topics and Procedures

- Creating an Area with User-Specified Settings
- Creating Area Groups with User-Specified Settings
- Attaching Areas to Area Groups
- Attaching Area Groups to Other Groups

Process Overview: Creating Area Groups from Templates

To create an area group structure, you can use a predefined template structure. This method is well suited if you will need the same group structure again, for a number of identical apartments or buildings. This method is also well suited if you have a basic structure, but need variations for different purposes. In this case, you would define the basic structure as an area group template and make the variations directly in the groups created from the template.

Area group according to the German DIN277 area group template

Step 1: Outline the groups and subgroups you need for your group structure.

Step 2: Outline the hierarchical and logical structure the groups are to have with each other.

Step 3: Create an area group template that contains these groups and their structure.

Step 4: Insert an area group based on that template in the drawing.

Step 5: Attach areas to that group.

Related Procedures

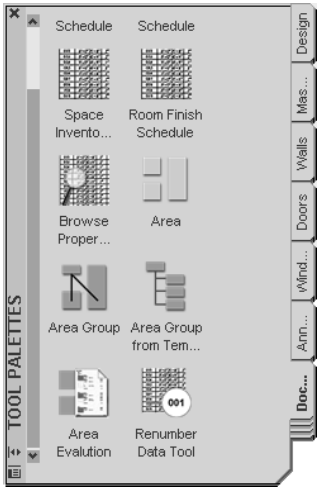
- Creating a Calculation Modifier Style
- Creating Area Groups from a Group Template

- Attaching Areas to Area Groups

Using Area Group Tools to Create Area Groups

Tools provided with Autodesk®Architectural Desktop let you quickly place area groups by selecting an area group tool with a specific area group style and other predefined properties. When you place area groups using area group tools, you can use the default settings of the tool, or you can change settings for the area group properties. You can also use area group tools to convert linework to area groups and to apply the settings of an area group tool to existing area groups.

Tool palettes containing area group tools



The default tool palettes in the workspace contain sample area group tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain area group tools that you can add to your tool palettes:

- Autodesk Architectural Desktop Stock Tool Catalog
- Autodesk Architectural Desktop Sample Palette Catalog
- My Tool Catalog

Custom palettes created by your CAD manager or other users may also contain area group tools with area group styles and properties that are customized for your projects or office standards.

Related Procedures

- Creating an Area Group
- Creating Area Groups with User-Specified Settings
- Creating Area Groups from a Group Template
- Creating an Area Tool

Creating an Area Group

Use this procedure to add a new area group that has the properties specified in the area group tool that you select. To specify settings when you add an area group, see "Creating Area Groups with User-Specified Settings" on page 2041 and "Creating Area Groups from a Group Template" on page 2044.

1. Open the tool palette that you want to use, and select an area group tool.
   If necessary, scroll to display the tool that you want to use.
2. Specify the insertion point of the area group.
   You can move or hide the Properties palette to expose more of the drawing area.
3. Continue adding area groups, and press ENTER.

Creating Area Groups with User-Specified Settings

Use this procedure to add an area group from scratch with settings that you specify.

1. Open the tool palette that you want to use, and select an area group tool.
   If necessary, scroll to display the tool that you want to use.
2. On the Properties palette, expand Basic, and expand General.
3. Enter a name for the area group.

4 Select a style.

5 Select a tag for the area group.

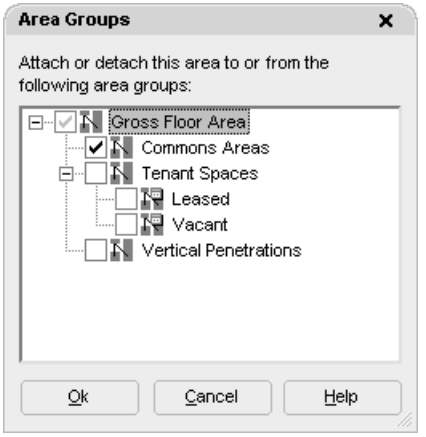
NOTE If no area tags are contained in the list, you can drag a tag into the drawing from AutoCAD®DesignCenter. You can also create your own area tags from multi-view blocks. For information about creating your own area tags, see "Process Overview: Creating User-Defined Area Tags" on page 2000.

6 To add a calculation modifier style to the area group, click the setting for Calculation Modifiers, and select one or more calculation modifiers for the area group.

For information about calculation modifier styles, see "Calculation Modifier Styles" on page 2023.

7 To attach other area groups subordinate to the area group, click the setting for Area Groups, and attach one or more area groups.

Attaching subordinated groups to an area group



If you are unsure whether the area group should have subordinate groups attached, or if area groups have not been created yet, you can omit this step and attach area groups later.

For information about area groups, see "Area Groups" on page 2034.

8 Expand Calculation.

9 Define the calculation type of the area group:

If you want to . . .	Then . . .
calculate the area values of attached areas	select Yes for Calculate Area.
calculate the perimeter values of attached areas	select Yes for Calculate Perimeter.
calculate both area and perimeter values of attached areas	select Yes for Calculate Area and Calculate Perimeter

For information about area evaluations, see "Area Evaluation" on page 2074.

For information on calculation types, see "About the Calculation Type of an Area Group" on page 2050.

10 Expand Content.

11 Define the content allowed in the area group:

If you want to . . .	Then . . .
allow only areas to be attached to the area group	select Yes for Can Contain Areas.
allow only area groups to be attached to the area group	select Yes for Can Contain Area Groups.
allow both areas and area groups to be attached to the area group	select Yes for Can Contain Areas and Can Contain Area Groups.

For information about area group content, see "Changing the Content Rules of the Area Group" on page 2049.

12 If you want to assign an area name definition to the area group, select one.

For information on area name definitions, see "Area Name Definitions" on page 2065.

13 In the drawing area, specify the insertion point of the area group.

You can move or hide the Properties palette to expose more of the drawing area.

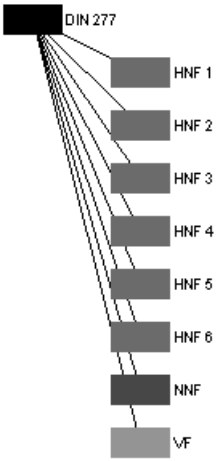
14 Continue adding area groups, and press ENTER.

Creating Area Groups from a Group Template

Use this procedure to create area groups based on a group template.

When you use the same group structure frequently, it is most efficient to create an area group template and use it to create groups in the drawing.

Area group structure according to the German DIN277 area group template



For information about creating area group templates, see "Area Group Templates" on page 2069.

1. Open the tool palette that you want to use, and select an Area Group from Template tool.
2. On the Properties palette, expand Basic, and expand General.
3. Select the area group template you want to create a group from.

4 Define the offsets between individual subgroups in the group:

If you want to . . .	Then . . .
define the offset between rows of the area group structure	enter a value for Row Offset.
define the offset between columns of the area group structure	enter a value for Column Offset.

5 In the drawing area, specify the insertion point of the area group.

You can move or hide the Properties palette to expose more of the drawing area.

6 Continue adding area groups from a template, and press ENTER.

Creating an Area Group Tool

Use this procedure to create an area group tool and add it to a tool palette. You may want to create your own area group tools if you are placing multiple area groups of specific templates with additional area group properties that you want to be the same each time you add an area group of that type.

For example, you are creating an office floor plan with different calculation types for area groups. To work efficiently, you can quickly create an area group tool for each calculation type. You can then select the appropriate tool to add the area group with the correct calculation type in the floor plan.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from an area group in the drawing	select the area group, and drag it to the tool palette.
create a tool from an area group style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.

If you want to . . .	Then . . .
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another palette	right-click the tool and click Copy; open the other palette, and click Paste.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new area group tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.
6. Expand Basic, and expand General.
7. Click the setting for Description, enter a description of the area group created from this tool, and click OK.
8. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.
9. Select an area group style.
10. Select the drawing file containing the style used for this area group tool.
11. Select a tag for the area group.
12. Select the drawing file containing the tag used for this area group tool.
13. Expand Calculation.
14. Define the calculation type of the area group tool:

If you want to . . .	Then . . .
calculate the area values of attached areas	select Yes for Calculate Area.
calculate the perimeter values of attached areas	select Yes for Calculate Perimeter.
calculate both area and perimeter values of attached areas	select Yes for Calculate Area and Calculate Perimeter.

For information about area evaluations, see "Area Evaluation" on page 2074.

For information on calculation types, see "About the Calculation Type of an Area Group" on page 2050

15 Expand Content.

16 Define the allowed content in the area group tool:

If you want to . . .	Then . . .
allow only areas to be attached to the area group	select Yes for Can contain areas.
allow only area groups to be attached to the area group	select Yes for Can contain area groups.
allow both areas and area groups to be attached to the area group	select Yes for Can contain areas and Can contain area groups.

For information about area group content, see "Changing the Content Rules of the Area Group" on page 2049.

17 If you want to assign an area name definition to the area group, select one.

For information on area name definitions, see "Area Name Definitions" on page 2065.

18 Select the drawing file containing the area name definition used for this area group tool.

19 Click OK.

Attaching Area Groups to Other Groups

Use this procedure to attach area groups to other area groups.

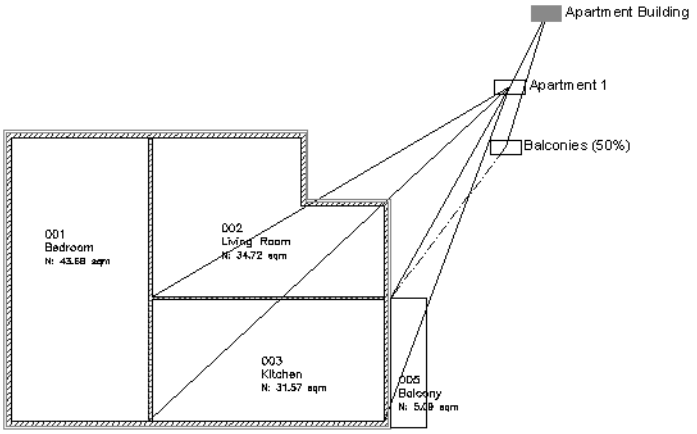
Area group connections are not unique. You can attach one area group to any number of other area groups.

- A higher-level group can have any number of subgroups attached.
- A subgroup can be attached to any number of higher-level groups.

You build a group structure from the top down. You select the top-level group and attach the first level of subgroups to it. Then you select the first-level sub-

groups and attach the second-level subgroups to them. Finally, you attach areas to the groups.

Group structure with areas attached



1. Select an area group to which you want to attach a subgroup, right-click, and click Attach Areas / Area Groups.
2. Select the area group which you want to attach as a subgroup, and press ENTER.

Detaching Area Groups from Other Groups

Use this procedure to detach area groups from other area groups.

You can detach only the direct subgroups of a selected area group.

1. Select the area group from which you want to detach a subgroup, right-click, and click Detach Areas / Area Groups.
2. Select the subgroup you want to detach from the area group, and press ENTER.

Editing Area Groups

You can change the properties of an area group. Area group properties include the hierarchical position of the area group, the style, and the location.

Autodesk® Architectural Desktop offers several methods for editing area groups:

- You can change area group settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected area group.

Related Topics and Procedures

- Changing the Area Group Style
- Changing the Content Rules of the Area Group
- About the Calculation Type of an Area Group
- Changing the Calculation Type of the Area Group
- Attaching One Area Group to Another
- Changing the Location of an Area Group
- Ordering Area Group Structures
- Creating Polylines from Area Groups
- Attaching Hyperlinks, Notes, or Files to an Area Group

Changing the Area Group Style

Use this procedure to change the style associated with an area group. Area group styles contain information about the display of the area group and the display of its attached subgroups and areas. You can also add classifications here. For information about how to define area group styles, see "Area Group Styles" on page 2056.

1. Select one or more area groups, and double-click one of them.
2. Expand Basic, and expand General.
3. Select an area group style.

Changing the Content Rules of the Area Group

Use this procedure to add a name definition to an area group and restrict the allowed content of the area group.

When you create an area group from a template, name definitions and content rules are predefined in the group template. You can, however, change them later.

1. Select one or more area groups, and double-click one of them.
2. Expand Content.
3. To associate an area group with an area name definition, select a name set for Use Name Definition. When you later attach an area to this group, the list of names from the definition is available for the area.

   For information about creating area name definitions, see "Area Name Definitions" on page 2065.

4. Define the allowed content in the area group:

If you want to . . .	Then . . .
allow only areas to be attached to the area group	select Yes for Can Contain Areas.
allow only area groups to be attached to the area group	select Yes for Can Contain Area Groups.
allow both areas and area groups to be attached to the area group	select Yes for Can Contain Areas and Can Contain Area Groups.

About the Calculation Type of an Area Group

An area group contains two values that you can calculate in the evaluation of the floor plan: the perimeter value of its associated areas and the area value of its associated areas. Depending on the value you choose for the group, this value is calculated later. This is also the value that calculation modifier styles are applied to.

For information about calculation modifier styles, see "Attaching and Detaching Calculation Modifier Styles" on page 2006.

You would use the calculation type *area* to measure the square meters of an apartment.

You would use the calculation type *perimeter* to determine how many meters of baseboard material you need.

In many cases, both calculation types area activated to allow for a variety of possible evaluations.

Changing the Calculation Type of the Area Group

Use this procedure to change the calculation type of an area group.

When you create an area group from a template, the calculation type is predefined in the group template. You can, however, change it later.

1. Select one or more area groups, and double-click one of them.
2. Expand Calculation.
3. Define the calculation type of the area group:

If you want to . . .	Then . . .
calculate the area values of attached areas	select Yes for Calculate Area.
calculate the perimeter values of attached areas	select Yes for Calculate Perimeter.
calculate both area and perimeter values of attached areas	select Yes for Calculate Area and Calculate Perimeter.

   For information about area evaluations, see "Area Evaluation" on page 2074.

   For information on calculation types, see "About the Calculation Type of an Area Group" on page 2050.

4. Click Close.

Attaching and Detaching Calculation Modifier Styles

Use this procedure to attach calculation modifier styles to area groups, sort them, and detach them.

For information about creating calculation modifier styles, see "Calculation Modifier Styles" on page 2023.

1. Select the area groups you want to change, and double-click one of them.
2. Expand Basic, and expand General.
3. Click the setting for Calculation modifiers.

NOTE This setting can be edited for multiple area groups only when these area groups have the same modifier styles attached in the same order.

4 Attach or detach calculation modifier styles:

If you want to . . .	Then . . .
attach a calculation modifier style	under Available, select the desired calculation modifier style, and click .
detach a calculation modifier style	under Attached, select the desired calculation modifier style, and click .
rearrange the order of attached calculation modifier styles	under Attached, select the calculation modifier style to move to a different position. Click to move the calculation modifier style up in the list, or click to move the calculation modifier style down in the list.

5 Click OK.

Attaching One Area Group to Another

Use this procedure to attach one area group to another, change the hierarchical position of the group, or detach one area group from another.

1 Double-click the area group that you want to assign to another area group.

2 Expand Basic, and expand General.

3 Click the setting for Area Groups.

NOTE If this setting appears as read-only, no area groups have been added to the drawing yet.

4 Attach or detach areas to a group:

If you want to . . .	Then . . .
attach one area group to another	select the area group's check box.

If you want to . . .	Then . . .
detach one area group from another,	clear the area group's check box.

NOTE There are different colors for the check marks.

A black check mark means that you have selected this group directly. You can clear this group directly.

A gray check mark means that you have selected a subgroup of the gray-marked group and have, by implication, added the area group to all supergroups of the selected group. You cannot clear a gray mark directly; you need to clear the black-marked subgroup to remove it.

5 Click OK.

Changing the Location of an Area Group

Use this procedure to relocate an existing area group by changing the coordinate values of its insertion point. The area group also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the area group are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the area group by aligning its normal with another axis. You can also rotate the area group on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD 2004 User's Guide*.

1 Select the area groups you want to relocate, and double-click one of them.

2 Expand Basic, and expand Location.

3 Enter a value for Rotation.

4 Enter a value for Elevation.

5 Click Additional Information for further location properties:

If you want to . . .	Then . . .
relocate the area group	enter new coordinate values under Insertion Point.

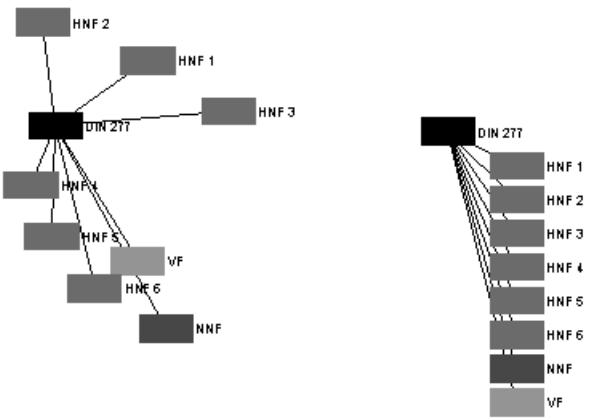
If you want to . . .	Then . . .
locate the area group on the *XY* plane	make the normal of the area group parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the area group on the *YZ* plane	make the normal of the area group parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the area group on the *XZ* plane	make the normal of the area group parallel to the *Y* axis: enter **1** for Y and enter **0** for X and Z.

6 Click OK.

Ordering Area Group Structures

Use this procedure to order area group structures. When you have a complex area group structure with many levels, it can be difficult to recognize the hierarchy of the groups. To sort the group nodes according to their hierarchical positions, Autodesk®Architectural Desktop offers you an easy-to-use command.

Ordering area group structures



1 Select the main node of the area group structure you want to sort, right-click, and click Area Group Layout.

2 Specify the row and column distance between the entries in the group structure, and press ENTER.

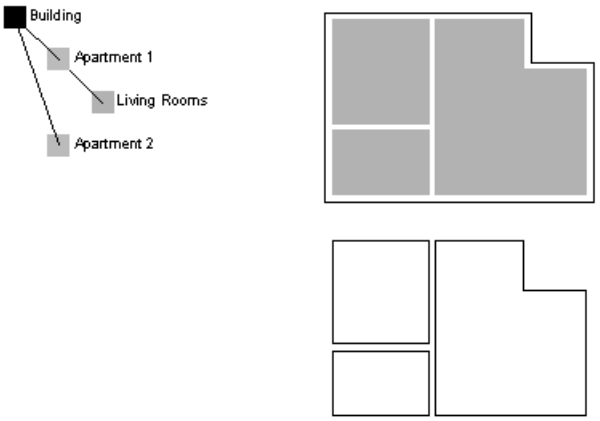
Creating Polylines from Area Groups

Use this procedure to create polylines from an area group.

This is useful, for example, in these cases:

- You want to export the floor plan to an application that can process only polylines.
- You want to create walls or spaces from areas.

Creating polylines from area groups



After converting areas to polylines, you can also reconvert them to areas.

1. Select the area group from which you want to create a polyline, right-click, and click Create Polyline.

   Standard AutoCAD®polylines are created on top of your area groups. You can edit them as any other polyline.

TIP When polylines lie above area groups, it can be difficult to select the area without the polyline. Try one of the following:

- Press CTRL, and click the boundary. Then click until the area group boundary is highlighted.
- If the area hatch is displayed, click the hatch.
- Click Quick Select on the Properties palette.

Attaching Hyperlinks, Notes, or Files to an Area Group

Use this procedure to attach hyperlinks, text notes, or files to an area group.

1. Double-click the area group you want to attach information to.
2. Click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.
   For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.
4. Click the setting for Notes, and add a note. Then, click OK.
5. Click the setting for Reference Documents.
6. Attach or detach reference files:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

7. Click OK.

Area Group Styles

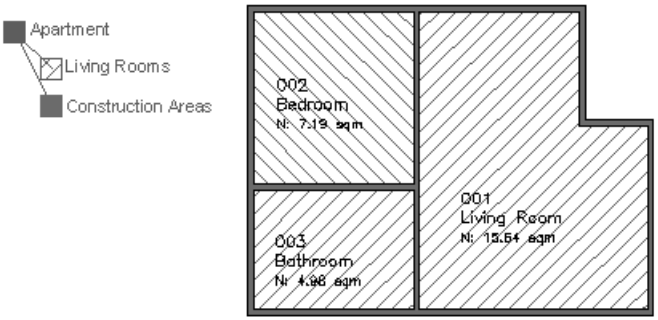
A style is a collection of display properties for an area group. Display properties are applied to the area group as well as to areas attached to the group.

You can use area group styles for these purposes:

- Different area group types: You can create groups for construction areas, calculated areas, base areas, traffic areas, or other areas with different display properties. For example, you might draw and hatch all areas in the

construction group, create the traffic area group in blue with a solid fill, and so on.

Living rooms and construction areas with different styles



- Different calculation standards: You can create area group styles for area groups according to national calculation standards (like the German DIN 277), groups for areas that are rented, or groups for demolition areas.

When you create an area evaluation, you can select area groups to include in it and area groups to exclude.

Related Topics and Procedures

- Creating an Area Style
- Changing the Area Group Display Components
- Specifying the Hatching for Components of an Area Group Style
- About Setting Display Properties of Attached Areas
- Setting Display Properties of Attached Areas
- Specifying Classifications for an Area Group Style
- Attaching Notes or Files to an Area Group Style

Creating an Area Group Style

Use this procedure to create an area group style. You can create a new style with default style properties, or you can create a new style by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand Area Group Styles.

3 Create a new area group style:

If you want to . . .	Then . . .
create a new style with default properties	right-click Area Group Styles, and click New.
create a new style from an existing style	right-click the area group style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new area group style, and press ENTER.

5 To edit the style properties of your new area group style, right-click the style, and click Edit:

If you want to . . .	Then . . .
enter a description of the style	click the General tab, and enter a description.
add classifications to an area group style	see "Specifying Classifications for an Area Style" on page 2022.
change the Layer, Color, and Linetype properties	see "Changing the Area Group Display Components" on page 2059.
change the area group style hatching	see "Specifying the Hatching for Components of an Area Group Style" on page 2060.
set the display of the associated areas and the area group marker	see "Setting Display Properties of Attached Areas" on page 2062.
add notes, files, or documents to the style	see "Attaching Notes or Files to an Area Group Style" on page 2064.

6 If you want to assign the style to an area group tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating an Area Group Tool" on page 2045.

7 Click OK.

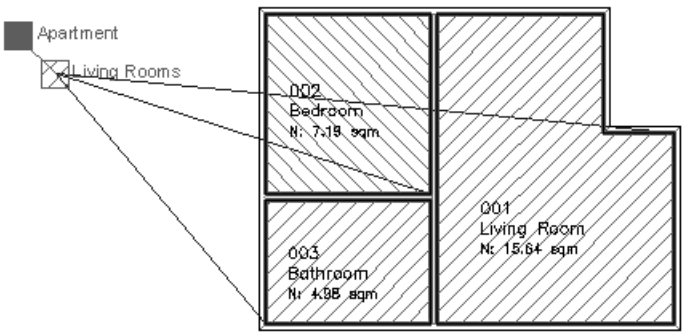
Changing the Area Group Display Components

Use this procedure to change the Layer/Color/Linetype properties of any display component of an area group.

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

In addition to components belonging directly to the area group, the area group style can include components of areas connected to the group. Area group display settings control the boundary and the hatch of connected areas as well.

Display components of an area group



Display components in plan views	
Component	**Description**
Entity	Entity boundaries of any area directly connected to that area group. Settings in the area group overwrite any settings defined for the area.
Hatch	Hatch component of the area group symbol as well as that of any area directly connected to the area group.Settings in the area group overwrite any settings defined for the area.
Name	Area group name
Marker	Area group symbol

Display components in plan views *(continued)*	
Component	**Description**
Group Connection Line	Connecting line between the group and any connected subgroups
Area Connection Line	Connecting line between the group and any connected areas

1. Open a tool palette that has an area group tool.
2. Right-click an area group tool, and click Area Group Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Layer/Color/Linetype tab.
8. Select the component to change, and select a different setting for the property.
9. Click OK three times.

Specifying the Hatching for Components of an Area Group Style

Use this procedure to specify the hatching settings of an area group style. This is the hatch of the area group symbol and the areas connected to the group. In this way, you can easily detect the structure in your drawing if you have many areas and groups. The hatch is also important if you want to create a coding legend from the area groups.

1. Open a tool palette that has an area group tool.
2. Right-click an area group tool, and click Area Group Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Hatching tab.

8 Select a component, and click the setting for Pattern.

9 Select the hatching for the component:

If you want to . . .	Then . . .
select a hatching pattern that is available in the software	select Predefined for Type, and then select a pattern.
select a custom pattern	select Custom for Type, and then enter the name of the custom pattern. If necessary, click Browse, and navigate to the folder where the custom pattern file is located.
select single hatching	select User-defined for Type, and clear Double Hatch.
select double hatching	select User-defined for Type, and select Double Hatch.
select solid fill	select Solid Fill for Type.

10 Click OK.

11 Click Scale/Spacing, and enter a value that determines how the selected pattern is repeated.

12 Click Angle, and enter the angle for the selected pattern.

13 Click Orientation, and specify how the hatching is oriented:

If you want to . . .	Then . . .
orient the hatching to the object, regardless of the object rotation	select Object.
orient the hatching to the World Coordinate System	select Global.

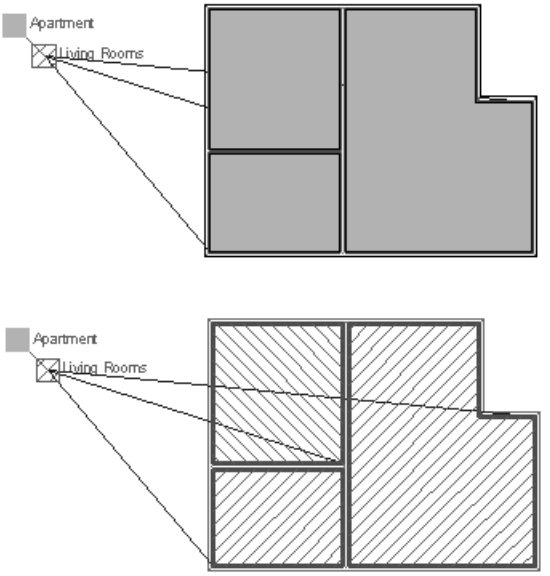
14 Click OK three times.

About Setting Display Properties of Attached Areas

Area groups contain a number of display properties that do not influence the group itself, but the areas attached to it. These are the entity boundary of the area and the hatch of the area.

You can decide whether these display properties are passed on only to the next lower level of attached areas or to all subsequent levels.

Draw all areas selected (top) and not selected (bottom)



For example, if you are interested in seeing all areas connected to a complete building, you can set the area group style to "Building" so that it passes its display properties to all attached areas, regardless of their relative position in the building hierarchy. If you want an area group to control the display of only its directly attached areas, you can set it accordingly.

For information on how to set the display behavior of an area group, see "Setting Display Properties of Attached Areas" on page 2062.

Setting Display Properties of Attached Areas

Use this procedure to specify the behavior of area groups as well as the area group marker size and text settings.

1. Open a tool palette that has an area group tool.
2. Right-click an area group tool, and click Area Group Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.

5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. Change the width and height of the area group symbol by selecting User Defined Scaling and then entering a width and height.

   To display the area group marker in 1/50 of the screen size, clear User Defined Scaling.
9. Define whether the area group display properties are used only for the next level of areas, or for all attached areas, regardless of their relative position in the group hierarchy:

If you want to . . .	Then . . .
use the display properties of the area group only for areas directly attached to it	clear Draw All.
use the display properties of the area group for all areas attached to it	select Draw All.

10. Change the appearance of the area group name.

If you want to . . .	Then . . .
change the height of the area group name	enter a new height.
change the text style of the area group name	either select a text style from the list, or click Edit Text Style (...) and create a new text style. For information about the Text Style dialog box, see the online *AutoCAD 2004 User's Guide*.

11. Click OK three times.

Specifying Classifications for an Area Group Style

Use this procedure to specify classifications for any classification definition applied to an area group style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Open a tool palette that has an area group tool.
2. Right-click an area group tool, and click Area Group Styles.
3. Right-click the style that you want to change, and click Edit.
4. Click the Classifications tab.

   By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to area group styles.
5. For each classification definition, select the classification you want to apply to the current area group style.
6. Click OK twice.

Attaching Notes or Files to an Area Group Style

Use this procedure to attach text notes and files to an area group style.

1. Open a tool palette that has an area group tool.
2. Right-click an area group tool, and click Area Group Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the General tab.
5. To add a description to the area group style, enter it for Description.
6. Click Notes.
7. To add a note, click the Notes tab, and enter the note.
8. Click the Reference Docs tab, and attach, edit, or detach a reference file:

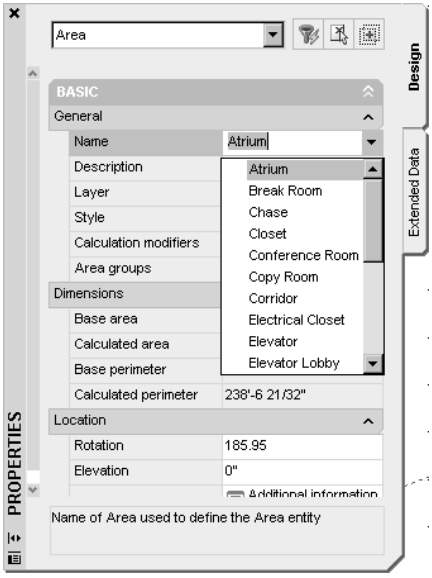
If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click Open.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Close the application when you are done editing.
detach a reference file	select the file name, and click Delete.

9. Click OK three times.

Area Name Definitions

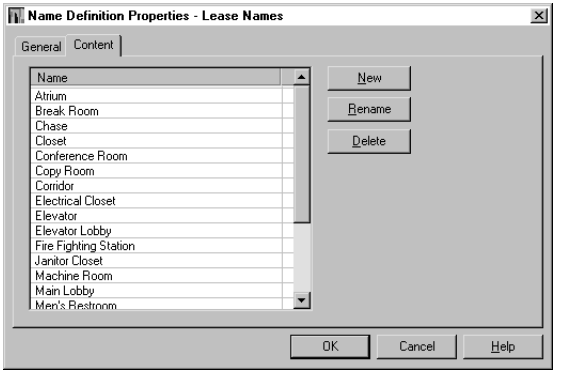
An area name definition is a list of names for a new area. It is displayed when you create an area associated with a group that has the name definition attached.

A list of names for an area



Area name definitions can be attached to area groups either directly in the properties of the group, or when creating an area group based on a template. When you attach a new area to the area group, you have access to the associated area name definition.

Area name definition list



For information about creating an area group based on a template, see "Creating Area Groups from a Group Template" on page 2044.

Area name definitions are useful when you are working with a standard group template. In such cases, area names often must follow certain standards.

Related Topics and Procedures

- Process Overview: Using an Area Name Definition
- Creating an Area Name Definition
- Edit the Name List of the Area Name Definition
- Attaching Notes and Files to a Calculation Modifier Style

Process Overview: Using an Area Name Definition

To use an area name definition you need to perform these steps:

Step 1: Create an area name definition.

Step 2: Connect that area name definition to an area group or an area group template.

Step 3: Create a new area that is connected to a group with an area name definition.

Step 4: Select a name from the name definition list for the area.

Related Procedures

- Creating an Area Name Definition

- Changing the Content Rules of the Area Group
- Creating a Calculation Modifier Style
- Creating an Area with User-Specified Settings

Creating an Area Name Definition

Use this procedure to create an area name definition. You can create a new definition with default properties, or you can create a new definition by copying an existing definition. After you create the definition, you edit the properties to customize the characteristics of the definition.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand Name Definitions.
3. Create a new area name definition:

If you want to . . .	Then . . .
create a new definition with default properties	right-click Name Definitions, and click New.
create a new definition from an existing definition	right-click the area name definition you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new area name definition, and press ENTER.
5. To edit the properties of your new name definition, right-click the definition, and click Edit:

If you want to . . .	Then . . .
edit the name list	see "Edit the Name List of the Area Name Definition" on page 2067.
add notes or files to the definition	see "Attaching Notes and Files to an Area Name Definition" on page 2068.

6. Click OK twice.

Edit the Name List of the Area Name Definition

Use this procedure to edit the name list of the area name definition.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand Name Definitions.

3 Select the definition you want to edit, right-click, and click Edit.

4 Click the Content tab.

5 Add, delete, or rename entries in the name list:

If you want to . . .	Then . . .
add a new entry to the list	click New, and enter the name of the entry.
delete an entry from the list	select the entry, and click Delete.
rename an entry in the list	select the entry, click Rename, and enter the new name.

6 Click OK three times.

Attaching Notes and Files to an Area Name Definition

Use this procedure to attach text notes and files to an area name definition.

1 On the Format menu, click Style Manager.

2 Expand Documentation Objects, and expand Name Definitions.

3 Select the definition for which you want to add a note or file, right-click and click Edit.

4 Click the General tab.

5 To add a description to the area name definition, enter the description under Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click Open.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Close the application when you are done editing.

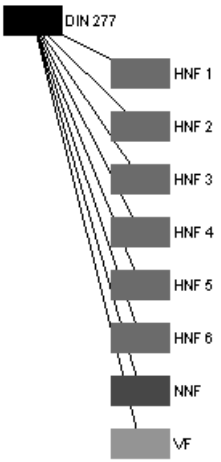
If you want to . . .	Then . . .
detach a reference file	select the file name, click Delete, and click OK.

9 Click OK twice.

Area Group Templates

An area group template is a structure definition for area groups with multiple hierarchical levels. You define the group template as a hierarchy with certain properties, and use it to create the group structure in the drawing.

Area group structure according to the German DIN277 template



You use an area group template only to insert a group structure. Later changes to the area group template are not copied to existing groups based on this group template. For example, if you have a group template named "Apartment Building," which contains the subgroups "First floor" and "Second floor," and you create a group from it, this group contains the subgroups "First floor" and "Second floor." If you change the group template to contain another subgroup named "Third floor" the existing group is not updated accordingly. Only groups created after the change have the new subgroup "Third floor."

Similarly, when you change a group that is based on a group template, those changes do not flow back into the template.

You should create area group templates for structures you need frequently, and provide them through Autodesk® Architectural Desktop style drawings.

Related Procedures

- Creating a Calculation Modifier Style
- Specifying the Content of an Area Group Template
- Attaching Notes and Files to an Area Group Template

Creating an Area Group Template

Use this procedure to create an area group template. You can create a new template with default properties, or you can create a new template by copying an existing template. After you create the template, you edit the properties to customize the characteristics of the template.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand Group Templates.
3. Create a new area group template:

If you want to . . .	Then . . .
create a new template with default properties	right-click Group Templates, and click New.
create a new template from an existing template	right-click the template you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new area group template, and press ENTER.
5. To edit the style properties of your new area group template, right-click the template, and click Edit:

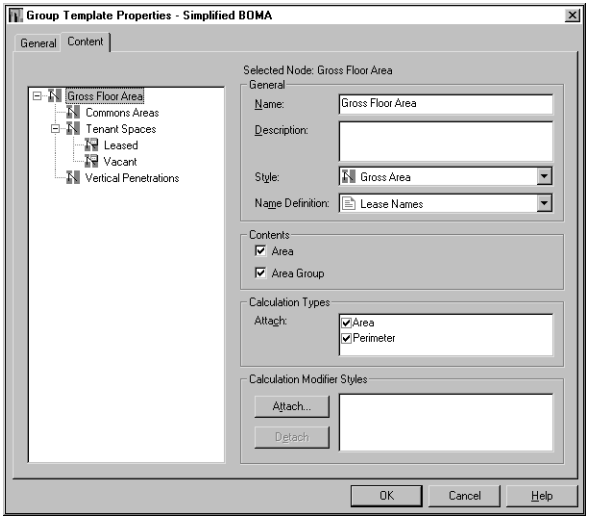
If you want to . . .	Then . . .
define the content of the area group template	see "Specifying the Content of an Area Group Template" on page 2071.
add notes or files to the group template	see "Attaching Notes and Files to an Area Group Template" on page 2073.

6. Click OK twice.

Specifying the Content of an Area Group Template

When you create an area group template, you set the structure as well as properties like calculation types, modifier styles, and name definitions. Every group you create from this set has the same structure and properties. For information about creating area groups from a group template, see "Creating Area Groups from a Group Template" on page 2044.

Defining an area group template



1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand Group Templates.
3. Select the template you want to edit, right-click, and click Edit.
4. Click the Content tab.

   In the left pane of the Content tab, a tree structure displays the structure of the area group template with all groups and subgroups. If you are creating a new area group template, only the top level group node is present. All other subgroups are yet to be inserted.

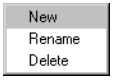
   You can navigate in this tree structure as you would in Microsoft® Windows®Explorer.

   - A (+) sign in front of a group signifies that this group has more sub-groups.

- A (-) sign in front of a group signifies that all subgroups are already displayed.
- When there is no sign in front of a group, the group has no more subgroups.

5 Add the desired subgroups to your group template.

The tree has a shortcut menu with the following commands:



Area group template shortcut menu

Shortcut menu command	Description
New	Creates a new subgroup under the group you have selected.
Rename	Lets you rename the group selected in the left pane. You can also rename a group in the General area in the right pane of the Definition tab, or click F2.
Delete	Deletes the group selected from the group structure. Its subgroups are deleted with it.

NOTE To rearrange groups within the structure, use standard Microsoft® Windows® navigation features.

6 Enter a description for the group node.

7 Select an area group style for the group node. For information about area group styles, see "Area Group Styles" on page 2056.

8 If desired, attach a name definition set to the group node. For information about area name definitions, see "Area Name Definitions" on page 2065.

9 Define what object types can be attached to the group node. You can choose areas, area groups, or both.

10 Select the calculation type used for that group node in the calculation of the floor plan.

Example: You have two area group nodes: one to calculate how many square meters of carpet you need (group "Carpet") and another to calculate how many meters of baseboard you need (group "Baseboard"). For the Carpet group node, you need to calculate the area; therefore you select the

area calculation type. For the Baseboard group node, you need to calculate the perimeter; therefore, you use the *perimeter* calculation type.

You can select both calculation types here if you want both values to appear in the evaluation.

11 Select one or more calculation modifier styles to apply to the group node.

For example, if you have a group node named "Balconies" you can attach a calculation modifier style that calculates all area values in this group with only 50 percent.

NOTE Calculation modifier styles accumulate. If you attach a 50-percent calculation modifier style to the area directly, and then attach the area to a group that also has a 50 percent calculation modifier style, the resulting area value is 25 percent, because both calculation modifier styles are applied.

NOTE Calculation modifier styles are processed top-down, with the first style in the list processed first, the second style after that, and so on. Depending on your calculation formulas, you can receive different result values. To change the order of calculation modifier styles, drag them to the correct positions within the list. For an example of how the order of calculation modifier styles can affect the calculation results, see "Calculation Modifier Styles" on page 2023.

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12 Click Attach.

13 In the Select an Area Calculation Modifier Style worksheet, select a calculation modifier style to attach to the group node, and click OK.

The templates contain a number of commonly used calculation modifier styles.

14 To detach a calculation modifier style, select it, and click Detach.

15 Click OK twice.

Attaching Notes and Files to an Area Group Template

Use this procedure to attach text notes and files to an area group template.

1 On the Format menu, click Style Manager.

2 Expand Documentation Objects, and expand Group Templates.

3. Select the template for which you want to add a note or file, right-click, and click Edit.
4. Click the General tab.
5. To add a description to the area group template, enter the description under Description.
6. Click Notes.
7. To add a note, click the Notes tab, and enter the note.
8. Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click Open.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Close the application when you are done editing.
detach a reference file	select the file name, click Delete, and click OK.

9. Click OK three times.

Area Evaluation

The area evaluation feature allows you to create detailed documents listing all aspects of your floor plan. You can include and exclude information and choose between different output formats.

About Area Evaluation

The area evaluation is a documentation feature that calculates and evaluates the area information of your finished floor plan. This information is displayed in a separate file that you export from Autodesk® Architectural Desktop to a spreadsheet or word processing application. Evaluation templates ensure that the information is displayed in a consistent, structured way.

Examples for Using the Area Evaluation

Architects need the area evaluation feature for submitting floor plans to the building authorities and customers. Area evaluation can also be used for per-

forming cost estimates, assigning jobs to contractors, or organizing the facility management of buildings.

You can create evaluations for

- Selected areas and area groups in the current drawing
- Selected areas and area groups from multiple open drawings
- All areas and area groups in a drawing
- All areas and area groups from all open drawings
- External references from all open drawings

Related Topics and Procedures

- Preparing the Area Evaluation
- Creating an XLS Evaluation Document
- Creating a TXT Evaluation Document
- Creating XLT Templates

Preparing the Area Evaluation

Before you create an evaluation file, you select the areas and area groups to include, and you set a number of options that control the exported output.

Related Procedures

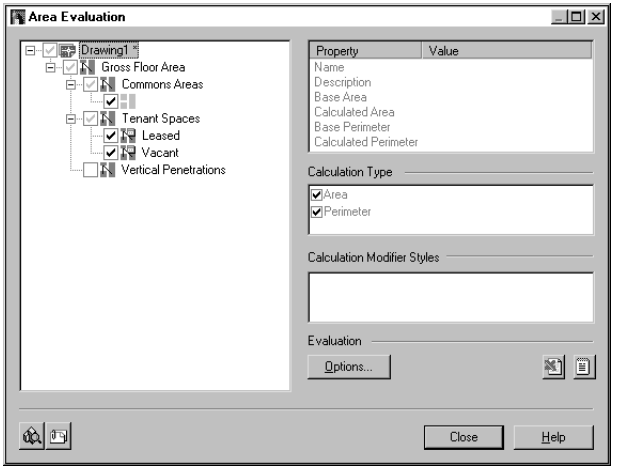
- Selecting Areas for Evaluation
- Evaluation Content
- Image Display Properties
- Data Format Style Properties
- Setting the Default Templates

Selecting Areas for Evaluation

Use this procedure to select areas and area groups to include in the evaluation.

1. Open the Documentation tool palette, and select the Area Evaluation tool. If necessary, scroll to display the tool.

Selecting areas and groups for an evaluation



In the left pane, all open drawings are displayed with areas and area groups in a tree structure.

When you highlight one of the areas or groups, the following information is displayed on the right side:

- Name and description
- Base and calculated area
- Base and calculated perimeter
- Calculation type
- Modifiers attached

2 To display areas and area groups from external references in your open drawings, click .

NOTE Areas and area groups from external references are displayed with the External References icon. You can select them in the same way as other areas and area groups.

---

3 Select the areas and area groups you want to include in the evaluation of the floor plan:

- To include an area or area group in the evaluation, select the area or area group.
- To exclude an area or area group from the evaluation, clear the area or area group.

NOTE There are different colors for the check marks.
A black check mark means that you have selected this area or group directly for evaluation. You can clear that mark directly.
A gray check mark means that you have selected a subgroup or attached area of the gray-marked area group. This does not mean that the gray-marked supergroup is included in the evaluation; if you want to include it, select it directly.
A blue check mark means that you have selected a supergroup of the blue-marked group or area. The blue-marked subgroup is added to the evaluation because it is a subgroup or attached area of a group already selected.

Evaluation Content

Use this procedure to define the values and categories to include in the evaluation file.

For areas, you can choose these components:

Evaluation content for areas

Component	Description
Name	Name of the area, for example: "Living Room"
Description	Description of the area, for example: "Main Living Room, Ground Floor"
Overview Image	Graphic image of the area evaluated in bitmap format
Base Area Label	Fixed prefix showing the type of the numbers, for example: "**Base Area** 50 m2"
Base Area Result	Value of the area without calculation modifier styles taken into account, for example: "Base Area **50 m2**"
Calculated Area Label	Fixed prefix showing the type of the numbers, for example: "**Calculated Area** 48.5 m2"
Calculated Area Result	Value of the area with calculation modifier styles taken into account, for example: "Calculated Area **48.5 m2**"

Evaluation content for areas *(continued)*	
Component	**Description**
Modifier Label	Prefix showing the name of the modifiers, for example: "**Plaster deduction** 50 * 0.97 = 48.5 m2"
Modifier Expression	Formula of calculation modifier styles applied to areas, for example: "Plaster deduction **50 * 0.97** = 48.5 m2"
Modifier Result	Resulting value of applied area calculation modifier styles, for example: "Plaster deduction 50 * 0.97 = **48.5 m2**"
Proof Label	Number of the area subdivisions plus any prefixes you may have set, for example: "**TF 1 (I)**: 0.5 * 7.591 * 4.156 = 15.772"
Proof Expression	Formula of the decomposition method applied to the area, for example: "TF 1 (I): **0.5 * 7.591 * 4.156** = 15.772"
Proof Result	Result of the area decomposition, for example: "TF 1 (I): 0.5 * 7.591 * 4.156 = **15.772**"
Decomposed Image	Graphic image of the area decomposition
Base Perimeter Label	Fixed prefix showing the type of the numbers, for example: "**Base Perimeter** 30 m"
Base Perimeter Result	Value of the perimeter without calculation modifier styles taken into account, for example: "Base perimeter **30 m**"
Calculated Perimeter Label	Fixed prefix showing the type of the numbers, for example: "**Calculated Perimeter** 29.1 m"
Calculated Perimeter Result	Value of the perimeter with calculation modifier styles taken into account, for example: "Calculated Perimeter **29.1 m**"
Modifier Label	Prefix showing the name of the modifier, for example: "**Plaster deduction**: 30 * 0.97 = 29.1 m"
Modifier Expression	Formula of calculation modifier styles applied to perimeters, for example: "Plaster deduction: **30 * 0.97** = 29.1 m"

Evaluation content for areas *(continued)*	
Component	**Description**
Modifier Result	Resulting value of any applied perimeter calculation modifier styles, for example: "Plaster deduction: 30 * 0.97 = **29.1 m**"

For area groups, you can choose these components:

Evaluation content for area groups	
Component	**Description**
Name	Name of the area group
Description	Description of the area group
Overview Image	Graphic image of the area group and its associated area boundaries
Base Area Label	Fixed prefix showing the type of the numbers, for example: "**Base Area** 75 m2"
Base Area Result	Value of the area group's total area without calculation modifier styles taken into account, for example: "Base Area **75 m2**"
Calculated Area Label	Fixed prefix showing the type of the numbers, for example: "**Calculated Area** 72.75 m2"
Calculated Area Result	Value of the area group's total area with calculation modifier styles taken into account, for example: "Calculated Area **72.75 m2**"
Modifier Label	Prefix showing the name of the modifier style attached to the area group, for example: "**Group deduction** 75 * 0.97 = 72.75 m2"
Modifier Expression	Formula of calculation modifier styles applied to the area group, for example: "Group deduction **75 * 0.97** = 72.75 m2"
Modifier Result	Resulting value of any applied area group calculation modifier styles, for example: "Group deduction 75 * 0.97 = **72.75 m2**"

Evaluation content for area groups *(continued)*	
Component	**Description**
Base Perimeter Label	Fixed prefix showing the type of the numbers, for example: "**Base Perimeter** 50 m"
Base Perimeter Result	Value of the area group's total perimeters without calculation modifier styles taken into account, for example: "Base Perimeter **50 m**"
Calculated Perimeter Label	Fixed prefix showing the type of the numbers, for example: "**Calculated Perimeter** 48.5 m"
Calculated Perimeter Result	Value of the area group's total perimeters with calculation modifier styles taken into account, for example: "Calculated Perimeter **48.5 m**"
Modifier Label	Prefix showing the name of the modifier attached to the area group perimeter, for example: "**Group deduction** 50 * 0.97 = 48 m2"
Modifier Expression	Formula of calculation modifier styles applied to the area group perimeter, for example: "Group deduction **50 * 0.97** = 48.5 m"
Modifier Result	Resulting value of any applied group calculation modifier styles, for example: "Group deduction 50 * 0.97 = **48.5 m2**"

1. Open the Documentation tool palette, and select the Area Evaluation tool.
2. Click Evaluation Options.
3. Click the Evaluation tab.
4. For Select, select Area or Area Group.
5. In the list displayed, select the values you want to appear in the evaluation file. For a description of the individual values, see the table above.
6. If desired, repeat Step 4–5 for area groups.
7. Click OK.

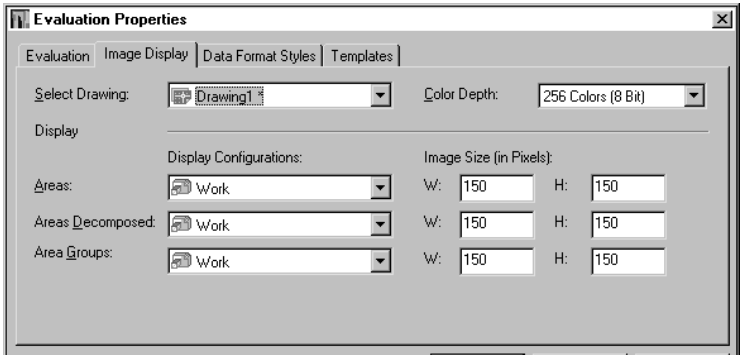
Image Display Properties

Use this procedure to define display settings for images included in your evaluation document. If you do not include images in your evaluation docu-

ment, you do not need to make any settings here.

1. Open the Documentation tool palette, and select the Area Evaluation tool.
2. Click Evaluation Options.
3. Click the Image Display tab.

Image display for area evaluation document



4. Select the drawing for which you want to set image properties.

NOTE If you want to create an evaluation document including several open drawings, you need to set the image properties for each open drawing separately.

---

5. Choose the desired color depth for the images in the evaluation file. Choosing a high resolution enhances the quality of the images and also enlarges the file size. If you are not sure about the correct resolution, experiment with different settings until you have found the optimal one.
6. Select the following settings for area boundaries, area groups, and decomposed areas:

   - Select the display configuration of the chosen element (area, area group, or decomposed area) in the exported evaluation file. For example, if you want to see your exported areas in Plan Low Detail, select Plan Low Detail.

NOTE In the list, you will see only those display configurations in which display representations for areas, area groups, and decomposed areas are turned on.

- Select the width and height of exported images of the areas, decomposed areas, and area groups.

7 Click OK.

Data Format Style Properties

You can set different data format styles for different elements of the evaluation file.

- **Area Result and Perimeter Result**: The format of the resulting area and perimeter values in the evaluation file.

  If you are using a data format style based on meters, and rounded off after three decimals, your area and perimeter results could look like this:

  Calculated Perimeter = 33.778 m

  Calculated Area = 88.532 m2

  When you select Area Results or Perimeter Results in the left pane, an additional check box, Additional Exact Value, is displayed in the right pane. When you select this box, the area or perimeter value displays with the precision set in the data format style and, in an extra column, with their exact precision without rounding.

  Example:

Calculated Perimeter = 33.778 m	Exact Calculated Perimeter = 33.777692 m
Calculated Area = 88.532 m2	Exact Calculated Area = 88.5321423 m2

- **Area and Perimeter Calculation Modifier Style Expressions**: This formats the formula used for calculation modifier styles, for example:

  Plaster Deduction = 88.832 - 0.3

- **Area Proof**: This formats the values of an area decomposition, for example:

  1 (I): 4.035 m2

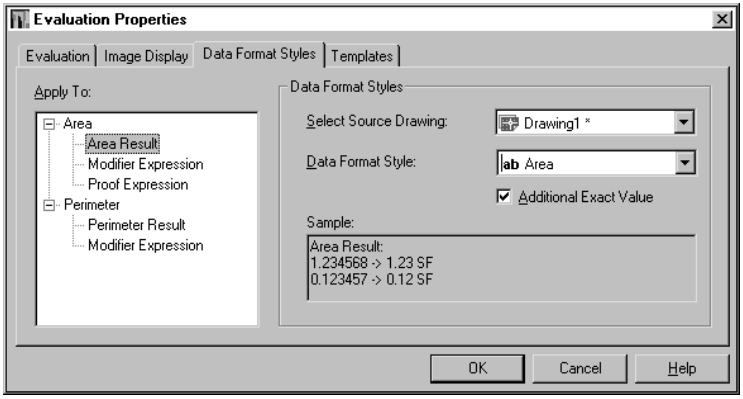
  2 (I): 27.141 m2

  3 (I): 36.41 m2

NOTE For information about creating data format styles, see "Property Data Formats" on page 2284.

1. Open the Documentation tool palette, and select the Area Evaluation tool.
2. Click Evaluation Options.
3. Click the Data Format Styles tab.

Setting data format styles



4. In the Apply To window, select the element to which you want to assign a data format style. You can choose from these elements:

   - Area results
   - Area calculation modifier expressions
   - Area proof
   - Perimeter results
   - Perimeter calculation modifier expressions

5. For Area Result and Perimeter Result, you can select the exact, unrounded values as additional information in the evaluation file. To display these values, select Additional Exact Value.
6. Select the drawing from which you want to take a data format style.
7. Select the desired data format style.
8. Click OK.

Setting the Default Templates

An evaluation document is saved as a spreadsheet (XLS) file or as an ASCII text format (TXT) file. To create an XLS file, you need an XLT template and to create a TXT document, you need a TXT template.

Autodesk®Architectural Desktop includes a number of preset templates. You can use those templates "as-is" or modify them according to your needs.

You can also create your own XLT and TXT templates in Microsoft®Excel or any word processor, like NotePad or Microsoft®Word.

After a default template is set, it is used for all evaluations until you change the default settings again. If you set no default template, you are prompted for a template with every evaluation you create.

1. Open the Documentation tool palette, and select the Area Evaluation tool.
2. Click Evaluation Options.
3. Click the Templates tab.
4. Set a default template for evaluations:

If you want to . . .	Then . . .
set a default template for XLS evaluation files	enter a file name and directory path for Excel Template File.
To set a default template for TXT evaluation files	enter a file name and directory path for Text Template File.

TIP You can use the Browse buttons to navigate to the desired template file.

5. Click OK.

Creating the Area Evaluation Document

When you create the area evaluation document, you receive a separate file that contains the area information from one or several drawing files. This file is saved as an XLS file or a TXT file, depending on your settings.

Related Procedures

- Creating an XLS Evaluation Document

- Creating a TXT Evaluation Document
- Creating XLT Templates

Creating an XLS Evaluation Document

Use this procedure to export an area evaluation to an Excel spreadsheet.

One of the most frequently used formats for area evaluation documents is XLS, the native file format of Microsoft®Excel. It is a powerful spreadsheet file format with numerous calculation and formatting abilities. You can easily export data from Excel to formats like HTML, XML, CSV (comma-delimited) or DBF (dBase).

You can export text (results, modifier expressions, and labels) and images (bitmap previews of areas and groups). For a detailed list of elements that can be exported, see "Evaluation Content" on page 2077.

You can create your own XLT templates into which the evaluation is integrated. For more information, see "Creating XLT Templates" on page 2086.

1. Open the Documentation tool palette, and select the Area Evaluation tool.
2. Prepare the area evaluation as described in "Preparing the Area Evaluation" on page 2075.
3. Click .
4. Select the export template:

   - If you did not select a default XLT template in the Evaluation Properties dialog box, you are prompted to select a template now.
   - If you selected a default template in the Evaluation Properties dialog box, proceed to step 5.

   For information about setting default templates, see "Setting the Default Templates" on page 2084.

5. Select a file directory and enter a name for the XLS evaluation file.
6. Click Save.
7. Click Close.

The area evaluation file is saved to the specified file directory and named as an XLS file. You can open it with Microsoft Excel or any other spreadsheet application that can read XLS.

Creating a TXT Evaluation Document

Use this procedure to export an area evaluation to a text file.

NOTE In TXT format, you can export text (results, modifier expressions, and labels), but not images. If you need to export images in the evaluation, use XLS format instead.

You can create your own TXT templates into which the evaluation is then integrated.

1. Open the Documentation tool palette, and select the Area Evaluation tool.
2. Prepare the evaluation as described in "Preparing the Area Evaluation" on page 2075.
3. Click .
4. Select the export template:

   - If you did not select a default TXT template in the Evaluation Properties dialog box, you are prompted to select a template now.
   - If you selected a default template in the Evaluation Properties dialog box, proceed to step 5.

   For information about setting default templates, see "Setting the Default Templates" on page 2084.

5. Select a file directory and enter a name for the area evaluation file.
6. Click Save.
7. Click Close.

The area evaluation file is saved to the specified file directory and named as a TXT file. You can open it with any word processor.

Creating XLT Templates

Use this procedure to create a template for exporting an area evaluation to an Excel spreadsheet.

To export an evaluation into an Excel file, you use an XLT template file.

You can use a number of predefined field settings to format your XLT templates:

Excel field definition	
Field name	**Description**
AREA_EVALUATION_BEGIN	The row in which your evaluation begins
AREA_COLUMN_IMAGE	The column in which your exported images are placed
AREA_COLUMN_LABEL	The column in which your labels and descriptions are placed
AREA_COLUMN_EXPRESSION	The column in which your decomposition expressions and modifier formulas are placed
AREA_COLUMN_RESULT	The column in which all results are placed
AREA_COLUMN_EXACT_VALUE	The column in which the unrounded results are placed

1. Open Microsoft Excel.
2. Select the table cell in which you want to place a special type of information, such as pictures or results.
3. Click the name box in the upper left corner of the Excel sheet and enter the desired field definition.
4. Repeat steps 2 and 3 for all information types you want to place.
5. Define additional settings for your template. Settings in an XLT file include

   - Header and footer information
   - Company logos
   - Company fonts
   - Special cell formatting (borders, colors)

6. Save the resulting file with the extension XLT (Excel Template) to the default directory you are using for templates.
7. The next time you create an area evaluation in Autodesk Architectural Desktop, select this template.

Sections

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A section represents a building model as if the model were cut vertically to show interior detail. You can create two-dimensional (2D) or three-dimensional (3D) section objects, or a live section view of the model. You can control the size and shape of the section you generate and assign materials to the section for an optimal visual representation of the sectioned objects. Section objects remain linked to the building model that you used to create them, unless you explode the section. Because of this link between the section and the building model, any changes to the building model can be reflected in the section as well.

In this chapter

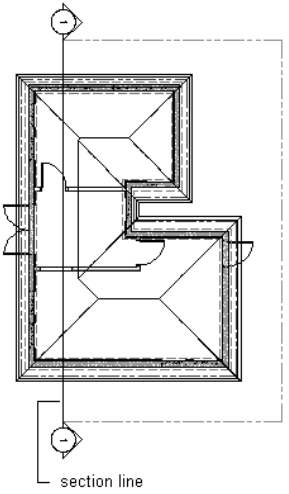
- Process Overview: Creating a 2D or 3D Section
- Process Overview: Creating a Live Section View
- Drawing and Editing Section Lines
- Creating a 2D or 3D Section
- Creating and Editing a Live Section View
- Editing a 2D or 3D Section
- Updating a 2D or 3D Section
- 2D Section Styles

Section Line and Marks

The section line defines the extents of the section that you extract from the building model. Sections lines can be straight or jogged. You can also specify the length and the height of the area defined by the section line. Section marks, which typically contain a letter or number and indicate the direction of the section, appear at each end of the section line.

After you draw the section line, you can create a section object or a live section view from the line.

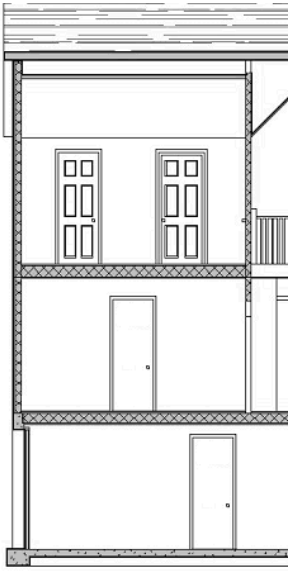
Section line through a building model in plan view



2D Sections

2D sections are created by cutting a number of objects with a section line and then creating a 2D section object from them. The section object is drawn without hidden and overlapping lines. You can edit a 2D section by changing its object display properties or its style display properties. The 2D section style lets you add display components to the display representation of the section and create rules that assign different parts of the section to different display components. You can control the visibility, layer, color, linetype, lineweight, and linetype scale of each component. You can also choose whether materials, such as brick or concrete hatches, are used to display individual components of the section object or the 2D section style. Furthermore, you can use linework editing commands to assign individual lines in a 2D section to different display components, and merge geometry into a 2D section. You can dimension 2D sections.

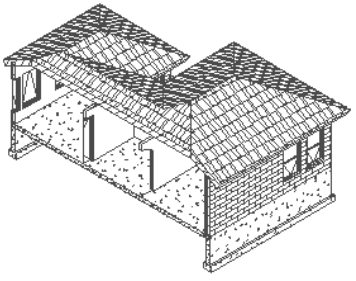
2D section with surface and shrinkwrap hatch detail



3D Sections

3D sections are created by cutting a number of objects with a section line and then creating a 3D isometric section object from them. 3D sections do not use styles. However, you can control the display of subdivisions within 3D sections. Using the Hidden Line Projection command, you can create 2D hidden line projections of any view of the 3D section that you can explode and edit or hatch. For more information about using this command, see "Creating a Hidden Line Projection" on page 2540.

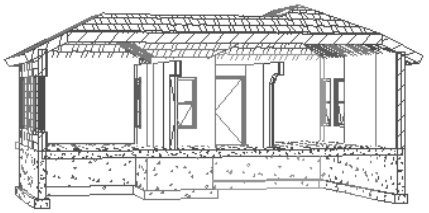
3D section in 3D view



Section Subdivisions

A 2D or 3D section object can have a number of subdivisions partitioning the section object. This feature is useful when you want to create a view of the object in which the parts that are closer to the viewer are drawn with darker and stronger lines, and parts that are farther off are drawn lighter.

3D section with subdivisions and assigned colors in perspective view



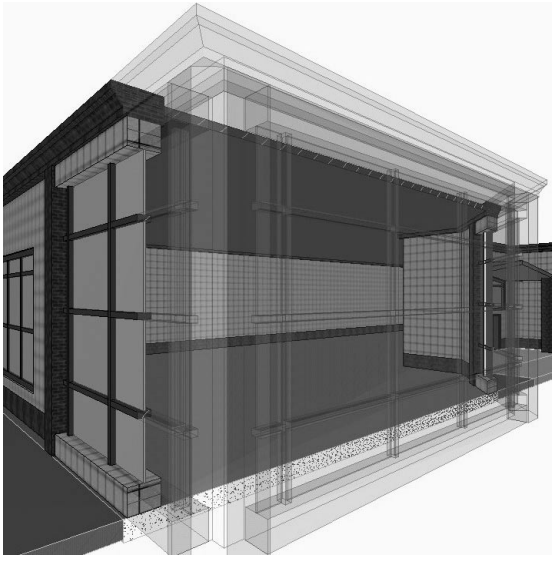
Live Section View

A live section view is a special view of a 3D section where the objects that are sectioned are not converted to a 3D section object. Instead, the existing model objects are displayed as a 3D section. The parts of the objects within the bounding box of the section line keep their individual display components while the parts of the objects outside of the section line can optionally be displayed or hidden. To control the appearance of the object parts outside of the section line, you need to assign a material to the sectioned objects.

When you render a live section, you can show the outside part as a half-transparent addition, for example.

For more information, see "Creating and Editing a Live Section View" on page 2110.

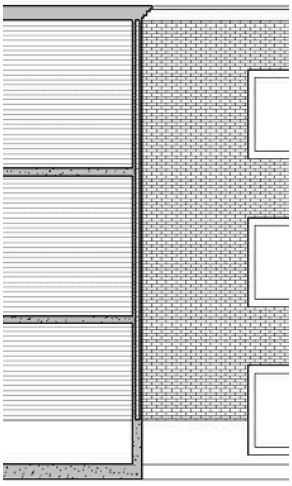
Rendered live section view with transparent body component



Materials in Sections

In Autodesk® Architectural Desktop, you can assign materials to different components of an object. These materials are displayed when you create a 2D or 3D section object or a live section view. Materials have specific settings for sections, such a as a 2D section hatch setting and a sectioned boundary for live section views. In a 2D or 3D section object, you can specify whether to use the display properties of the materials or the display properties of the section object.

2D section with different surface hatches

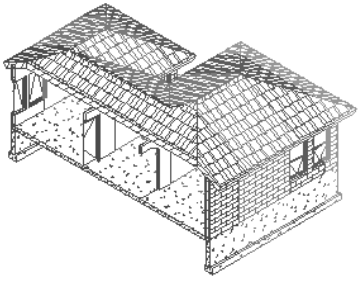


Autodesk® Architectural Desktop provides a large number of predefined materials for all common design purposes. You can use these predefined materials, or modify them to your special designs. You can also create your own materials from scratch. For more information, see "About 2D and 3D Section Display Components and Materials" on page 2132.

Subdivisions in 2D Section Styles and Materials

When you create subdivisions in your style, you usually want the objects in them to be visually distinct from other subdivisions. When you assign materials to the objects, you can set the 2D section style so that it uses the hatch pattern from the material, but uses the color and linetype from the subdivision display properties.

3D section with subdivisions and assigned colors in 3D view



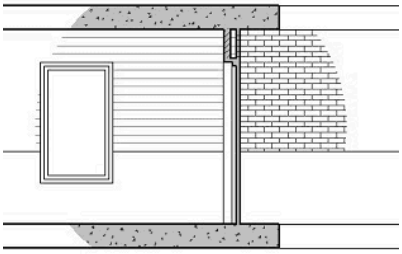
For more information see "Use Subdivision Properties and Materials in 2D Section Styles" on page 2139.

Material Boundaries in 2D Sections

Material boundaries allow you to erase or limit portions of a 2D section or elevation. For example, you might do the following:

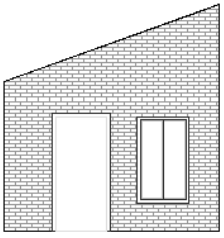
- Limit the amount of hatching to produce cleaner CDs.
- Highlight a region in an elevation or section.

2D section with highlighted hatching region detail



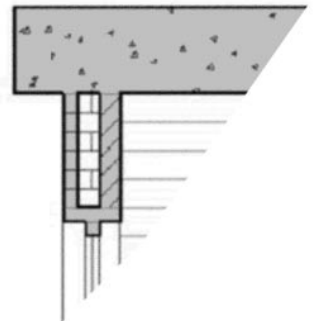
- Mask out a portion of a section so that more detail can be drawn.

2D section with hatch masked



- Crop an irregular-shaped portion of a section or elevation.

2D section with cropped material display detail



For more information, see "Creating a Material Boundary in a 2D Section" on page 2118.

Related Topics and Procedures

- Process Overview: Creating a 2D or 3D Section
- Process Overview: Creating a Live Section View
- Drawing and Editing Section Lines
- Creating a 2D or 3D Section
- Creating and Editing a Live Section View
- Editing a 2D or 3D Section
- Updating a 2D or 3D Section
- 2D Section Styles

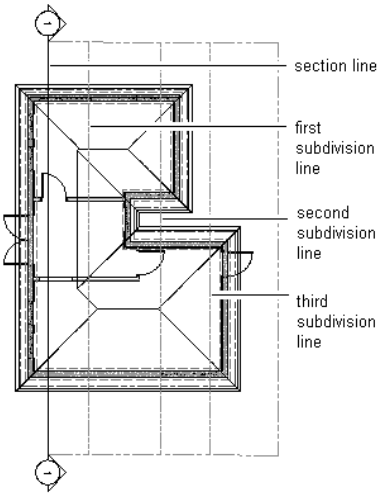
Process Overview: Creating a 2D or 3D Section

Creating a 2D or 3D section from a building model entails the following steps:

Step 1: Draw a section line and mark.

The section line defines the extents of the section (its width, height, and length) to extract from the building model. The section line also determines other characteristics of the section. You can also use the section line to define graphic subdivisions, in order to add levels of depth to the section object created from the section line.

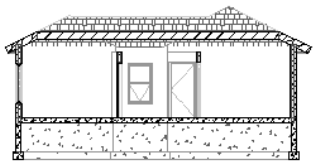
A section line with graphic subdivisions



Step 2: Create a 2D or 3D section.

You select the section line, right-click, and click Generate Section to create a 2D or 3D section object. At this time, you select the objects to include in the section. You also select the display representation for the selected objects, and the insertion point of the section in the drawing. If you create a 2D section, you also select a 2D section style, which determines the visual characteristics of the section.

2D section created from the section line shown above



Step 3: Edit the section or the building model.

You can edit the section line and the section object to refine the appearance of the section by doing the following:

- Edit the section line to change the area defined by the section and to add, remove, or modify graphic subdivisions.
- Edit the 2D section style, which determines how the linework in a 2D section is displayed.

- Edit existing material assignments, such as hatch patterns.
- Add a material boundary, so that only selected parts of the section are displayed with materials. This can improve performance and make the drawing clearer.
- Edit a 2D section object to change the display of selected linework or to add linework and detail that are not part of the building model.

You can continue to modify the building model as needed.

Step 4: Update the section.

You update a section to apply changes you made to the section line, the section object (including style changes to a 2D section), and the building model. When you update a section, you can also make any of the following changes:

- Select a different style for a 2D section.
- Select different objects to include and exclude from the section.
- Select a different display representation.
- Replace the existing section or add a new section showing the changes you made.

You can also refresh one or more sections to quickly apply changes you made to the section line, the section object, or the model.

Related Topics and Procedures

- Drawing and Editing Section Lines
- Creating a 2D or 3D Section
- Editing a 2D or 3D Section
- Updating a 2D or 3D Section

Process Overview: Creating a Live Section View

Creating a live section view of a building model entails the following:

Step 1: Draw a section line.

For more information, see "Drawing a Section Line and Marks" on page 2101.

Step 2: Switch into a 3D model view.

Step 3: Enable the live section view.

Related Topics and Procedures

- Drawing a Section Line and Marks
- Creating and Editing a Live Section View

Drawing and Editing Section Lines

The first step in creating a section is to draw a section line through the building model. The section line defines the extents of the section to extract from the building model.

Creating a Section Object from a Section Line

When you generate a section from a section line, you specify the type of section object that is created.

When you create . . .	The result is . . .
a 2D section object	an orthographic projection from the building model.
a 3D section object or a live section	the area of the building model defined in the section line.

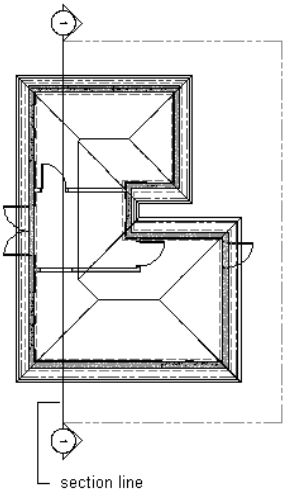
Creating a Live Section View from a Section Line

When you create a live section view from a section line, you do not create a new section object but instead switch to a special view of the 3D building model. You do not select objects to include in the section; the live section view includes all objects in the drawing. The section line controls how objects are displayed in a live section view. Objects or parts of objects that are within the bounding box of the section line retain their original display properties. Objects or parts of objects that are outside of the section line are either not displayed at all or displayed with a special display component for the sectioned body.

Viewing the Section Line

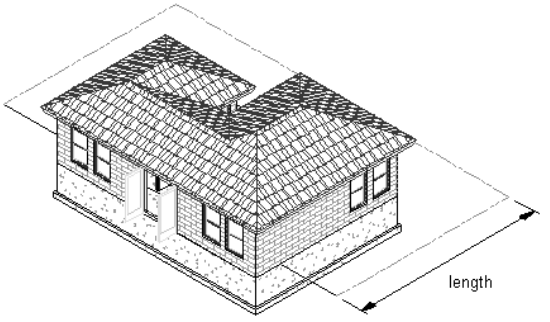
In plan view, the section line is displayed as you would expect on a construction document. The section marks point in the direction that the section is cut.

Viewing the section line and mark in plan view



In an isometric view, the same section line is displayed with a boundary that defines the extents of the section.

Viewing a section line in isometric view



Changing the Section Line

You can change the section line to control the section that you create. Within the section line, you can change the height and shape of the section. You can also add a lower extension to the section and create section subdivisions.

You can change section line properties before or after you create a section. After changing section line properties, you can apply the changes to a section that you previously created with the section line. For information about updating existing sections, see "Updating a 2D or 3D Section" on page 2126.

For information about updating existing live section views, see "Updating a Live Section View" on page 2112.

Using Subdivisions in Sections

You can set up graphic subdivisions in section line properties. These subdivisions are added to the 2D or 3D section you create. Subdivisions are specified at distances from the cutting plane of the section line. You can control the lineweight and other display properties of subdivisions to add levels of depth to sections. For example, you can display one subdivision with a heavy lineweight and another subdivision with a lighter lineweight to suggest that the first subdivision is in front of the second subdivision.

You can use the display properties of a subdivision together with the display properties of a material. For more information, see "Use Subdivision Properties and Materials in 2D Section Styles" on page 2139.

Related Procedures

- Drawing a Section Line and Marks
- Changing the Dimensions of a Section
- Creating Graphic Subdivisions for 2D and 3D Sections
- Changing Section Mark Attributes
- Changing the Location of a Section Line
- Attaching Hyperlinks, Notes, and Files to a Section Line

Drawing a Section Line and Marks

Use this procedure to draw a section line with a section mark at each end. You draw a section line by specifying a start point, an endpoint, a length, and a height for the section. You can specify additional points between the start point and the endpoint to create jogs in the section. The section line acts as a cutting plane, slicing a section from the building model.

NOTE If you are working with a drawing set where several xrefs are linked to a main drawing, draw the section line in the main drawing.

1. On the default tool palette set, click the Design tab, and then click the Section Line tool.

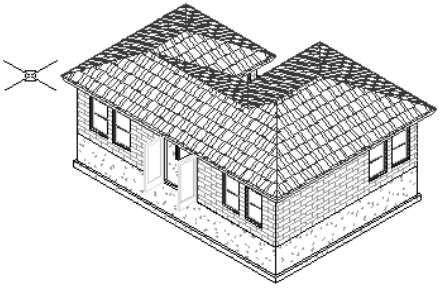
   If necessary, scroll the palette to display the tool that you need.

2. Specify the start point of the section line.
3. Continue to specify points to define the section line, if needed.

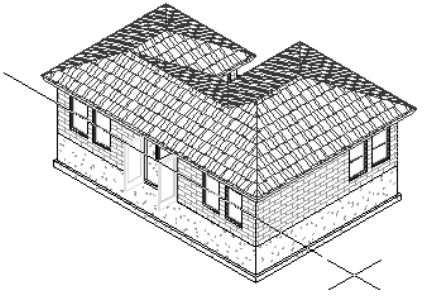
You can create jogs in the section line to cut through portions of the building model that you want to show in the section, but which are not along a single straight path.

4 Specify the endpoint of the section line, and press ENTER.

Specifying section line start and end points in 3D view



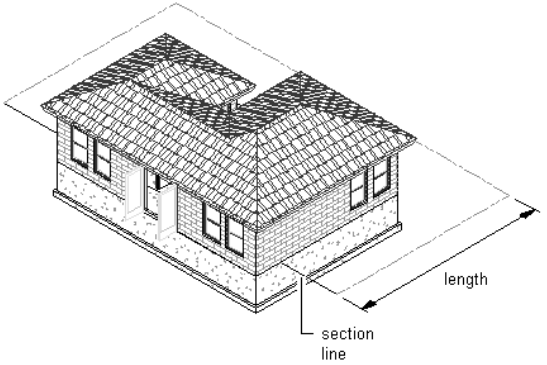
specify first section line point



specify next section line point

5 Specify the length of the section, or press ENTER to accept the length taken from the endpoints of the line.

The section line is displayed in the drawing. Depending on the direction in which you drew the section line, the section marks point in the direction of the section.



The section marks are multi-view blocks, anchored to the section line. You can edit the section marks to change the information displayed in the bubbles. For more information, see "Changing Section Mark Attributes" on page 2106.

The height of the section line is set to the extents of the selected objects. You can change the properties of the line to change the height and depth of the section, add a lower extension, or add subdivisions. For more information, see "Changing the Dimensions of a Section" on page 2103.

Changing the Dimensions of a Section

Use this procedure to change the height and the length of any section connected to the section line, or to add a lower extension to the section line. You can change the dimensions of the section line before or after you create a connected section. If you change the dimensions after creating the section, you need to update the section to show the changes.

The depth of a section (its length) can also be defined using grips to edit the section line boundary in the drawing.

1. Double-click the section line you want to change.
2. On the Properties palette, expand Basic, and expand Dimensions.
3. Specify new dimensions:

If you want to . . .	Then . . .
use the height of the objects in the section to define the section height	select Yes for Use Model Extents for Height.

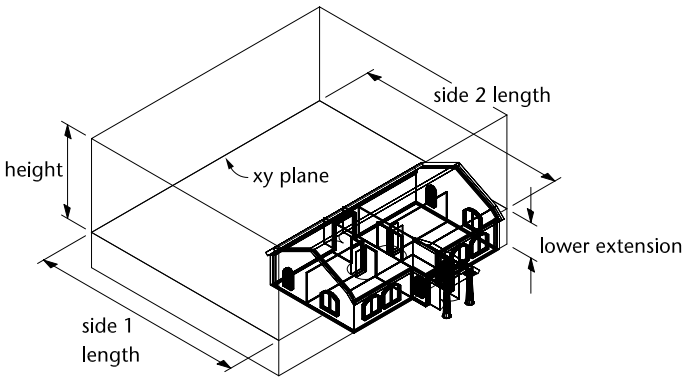
If you want to . . .	Then . . .
define the height of the box to create a section from a *Z* value measured from the *XY* plane of the world coordinate system (WCS) or the current user coordinate system (UCS)	select No for Use Model Extents for Height, and enter a value for Height. The objects are cut at this height when you create or update a section.
define the lower limit of the section box as a *Z* value measured from the *XY* plane of the WCS or the current UCS	select No for Use Model Extents for Height, and enter a value for Lower Extension. By default, the lower section is 1 foot below the *XY* plane unless Use Model Extents for Height is selected.

4 Expand Component Dimensions.

5 Specify the length of the lines that define the depth of the section by entering values for Side 1 and Side 2.

Side 1 starts from the first point specified for the section line. Side 2 starts from the endpoint of the section line.

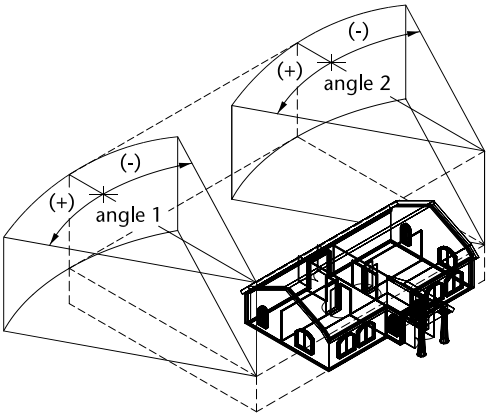
Specifying section height, lower extension, and side parameters



6 Specify values for Angle 1 and Angle 2.

These values define the angles of the two sides from the section line to create the section box. The apex of Angle 1 is the start point of the section line. The apex of Angle 2 is the endpoint of the section line. Values for these angles must be between 0 and 90 degrees.

Specifying section angle parameters



7 Click OK.

To update a 2D or 3D section created from this section line, see "Updating a 2D or 3D Section" on page 2126.

Creating Graphic Subdivisions for 2D and 3D Sections

Use this procedure to define subdivisions that are created when you generate a section. Each subdivision is specified as a distance from the cutting plane of the section line.

You can view the location of a subdivision by viewing the section line with its boundary in an isometric view. In this view, you can use grips to relocate a subdivision.

You can control the lineweight and other display properties of the subdivisions to add different levels of depth to sections.

You can use the display properties of a subdivision together with the display properties of a material. For more information, see "Process Overview: Creating a 2D or 3D Section" on page 2096 and "Use Subdivision Properties and Materials in 2D Section Styles" on page 2139.

1 Double-click the section line you want to change.

2 On the Properties palette, expand Basic, and expand Dimensions.

3 Click the setting for Subdivisions, and then add or modify subdivisions:

If you want to . . .	Then . . .
create a subdivision	click . To change the default distance from the section line, select the subdivision, then click the value and enter a new one.
change the length of a subdivision	select the subdivision, then click its value and enter a new one.
delete a subdivision	select the subdivision, and click .

4 Click OK.

Changing Section Mark Attributes

Use this procedure to change the information displayed in the section mark. The section mark is a multi-view block.

1 Double-click the section mark you want to change.
2 On the Properties palette, expand Advanced.
3 Click Attributes.
4 Select the existing attribute under Value, and enter the new information to include in the bubble.
5 Click OK.

Changing the Location of a Section Line

Use this procedure to relocate a section line by changing the coordinate values of its insertion point. The section line also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the section line are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the section line by aligning its normal with another axis. You can also rotate the section line on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD® User's Guide*.

1 Double-click the section line you want to relocate.
2 On the Properties palette, expand Basic, and expand Location.
3 Click Additional Information.
4 Specify the location of the section line:

If you want to . . .	Then . . .
relocate the section line	enter new coordinate values under Insertion Point.
locate the section line on the *XY* plane	make the normal of the section line parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the section line on the *YZ* plane	make the normal of the section line parallel to the *X* axis: under Normal, enter **1** for X, and enter **0** for Y and Z.
locate the section line on the *XZ* plane	make the normal of the section line parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the section line	enter a new value for Rotation Angle.

5 Click OK.

To update an existing section created from this section line, see "Updating a 2D or 3D Section" on page 2126.

Attaching Hyperlinks, Notes, and Files to a Section Line

Use this procedure to add hyperlinks, enter notes, and attach reference files to a section line. You can also edit notes and edit or detach reference files from a section line.

1 Double-click the section line you want to attach notes or files to.
2 On the Properties palette, click the Extended Data tab.
3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® Command Reference*.

4 To add a note, click next to Notes, enter text, and click OK.

5 To attach, detach, or edit a reference file, click next to Reference documents, and then do any of the following:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6 Click OK.

Creating a 2D or 3D Section

Use this procedure to create a 2D or 3D section. After you draw a section line, you extract a section from the section line and the objects you select in the building model.

TIP Before you create a section, thaw and turn on all layers containing objects that you want to include in the section. Objects on layers that are off or frozen cannot be part of the selection set for the section. To enhance performance, turn off the layers of the objects that you do not need to include in the section.

1 Draw a section line in the drawing.

For more information, see "Drawing a Section Line and Marks" on page 2101.

2 Select the section line, right-click, and click Generate Section.

3 Select the type of section object you want to create:

If you want to create . . .	Then . . .
a 2D section	select 2D Section/Elevation Object with Hidden Line Removal.

If you want to create . . .	Then . . .
a 3D section	select 3D Section/Elevation Object.

4 For Style to Generate, select a style for a 2D section.

If you want to use a particular style, select it from Style to Generate. Otherwise, use the Standard style. For more information, see "2D Section Styles" on page 2128.

3D sections do not use styles.

5 Under Selection Set, click (Select Objects), and select the objects that you want to include in the section. Press ENTER when you finish selecting objects.

NOTE If you select an object that you do not want to include in the section, hold down SHIFT and select the object again to remove it from the selection set.

6 Under Display Set, select a display set for the section object.

The display set controls the representation of the section.

7 Under Placement, select New Object, and specify where to place the section:

If you want to . . .	Then . . .
specify a location graphically	click (Pick Point), and specify the location for the new section object in the drawing.
specify the coordinates of the insertion point for the section	enter *X, Y,* and *Z* coordinates for the location of the new section object.

8 Click OK.

A 2D or 3D section is created from the section line properties and the selected objects in the building model. The section is linked to the building model. If you make changes to the building model after you create the section, you can update the section to reflect the changes. For more information, see "Updating a 2D or 3D Section" on page 2126.

You can edit certain characteristics of the section to control its placement and appearance. For more information, see "Editing a 2D or 3D Section" on page 2114.

You can also use a 2D section style to control the display of selected objects in a 2D section, and you can control the display of individual lines in a 2D section. For more information, see "2D Section Styles" on page 2128 and "Editing and Merging Linework in a 2D Section" on page 2123.

Creating and Editing a Live Section View

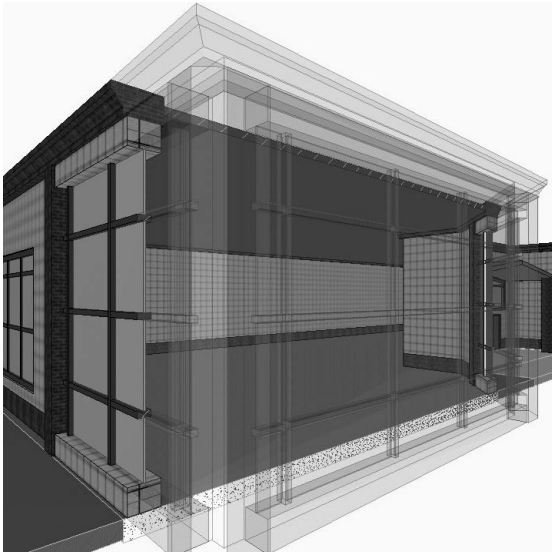
A live section view is a special view of a 3D model section.

A live section view is always applied to all objects in the drawing. Unlike a 2D or 3D section, you do not choose a selection set of objects to be contained in the section. All objects are contained in the live section view. Their display properties are determined by whether or not they are situated within the bounding box of the section line.

The objects contained in the live section view are not converted into a section object, but are retained as objects in the drawing. They keep all of their properties and display components, and can be edited. The area of objects that lie outside of the section line, or objects that lie completely outside of the section line, can be displayed or hidden. The appearance of these objects, and of parts of objects outside of the section line, is controlled by the Sectioned Body component. When you render a live section, you can show the outside part as a half-transparent addition, for example.

The live section view can be turned on and off in a drawing.

Rendered live section view with transparent sectioned body



Related Topics and Procedures

- Creating a Live Section View
- Updating a Live Section View
- Displaying the Sectioned Body in a Live Section View
- Removing a Live Section View

Creating a Live Section View

Use this procedure to create a live section view of your building model.

1 Draw a section line through the building model.

> **NOTE** You do not need to select objects for the live section view. The live section view is created from the whole drawing.

2 Switch to a 3D view, such as SW Isometric.

3 Select the section line, right-click, and click Enable Live Section.

Updating a Live Section View

When you create a live section view, the sectioned objects are not converted into a section object. Instead, the objects remain in the drawing. The objects and object areas which are inside the section line retain their previous display properties. A brick wall inside a section line retains its brick pattern and its dark red linework. The objects and object areas outside of the section line change their display properties, since they are now placed on the Sectioned Body display component and use its display properties.

The live section updates interactively when you change the objects associated with it. If you drag a wall outside of the section line, the wall uses the display properties of the Sectioned Body component. If you drag a wall inside of the section line, the wall uses its own display properties.

When you change the material assignment of an object in a live section view, the new material is automatically used in the live section.

NOTE If you change from a material in which the Sectioned Boundary and Sectioned Body components are turned on, to a material in which these components are turned off, it might look as if objects outside of the section line disappear. You can edit the current material definition to display objects outside of the section line, as described in "Displaying the Sectioned Body in a Live Section View" on page 2112.

Displaying the Sectioned Body in a Live Section View

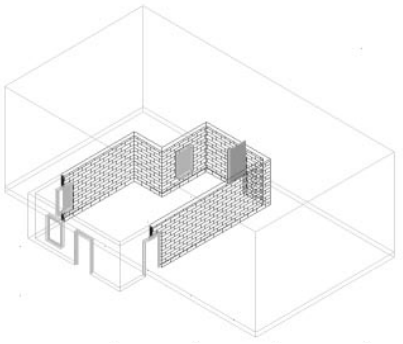
Use this procedure to display the parts of the drawing in a live section view that are outside the section.

Whether objects and areas of objects outside the section line are displayed in the live section view depends on the material settings for each object and object style. The sectioned objects inside the section are displayed with their regular display components and material assignments. For example, a brick wall inside a section displays its regular brick surface hatch.

Objects or object parts that are outside of the section are displayed differently. You can either hide them completely, or display them on the Sectioned Body display component. The Sectioned Body display component is specified in the material assigned to the object.

The sectioned body is often displayed in a lighter, half-transparent color, or as dotted linework.

Live section view with sectioned body displayed as light blue linework



In a material definition, the Sectioned Body and Sectioned Boundary display components influence the display of the live section view. The Sectioned Body includes the objects or object parts outside of the section line. The Sectioned Boundary is the cut line created by the section line.

1. Select the object for which you want to display the sectioned body, right-click and click Edit Object Display.
2. Click the Materials tab.
3. Select the material definition you want to change, and click .
4. Select the display representation of the material, and click .
5. Click the Layer/Color/Linetype tab.
6. Change the display of the sectioned body and sectioned boundary:

If you want to . . .	Then . . .
hide the sectioned body	set Visible off for the Sectioned Body and Sectioned Boundary components.
display the sectioned body	set Visible on for the Sectioned Body and Sectioned Boundary components, and assign them display properties as needed.

7. Click OK three times.

NOTE When the Sectioned Body component is set to visible and the material display component is on, you can turn the display of the sectioned body on and off by right-clicking the section line and clicking Toggle Sectioned Body Display.

Removing a Live Section View

Use this procedure to turn off a live section view. You can also remove the live section view by deleting the section line that was used to create it.

1. Select the section line that was used to create the live section view.
2. Right-click, and click Disable Live Section.

   After turning off the live section view, you see the regular 3D building model again. You can turn live section view on and off as long as the section line remains in the drawing.

Editing a 2D or 3D Section

After you create a 2D or 3D section, you can edit the section line and the section object to refine the appearance of the section:

- Add, remove, or modify graphic subdivisions.
- Reverse the section to display a different area of the building.
- Relocate the section.
- Add notes or reference files.
- Select a different style. A section style determines how the linework in a 2D section is displayed.
- Change the display properties of selected linework
- Add linework and details that are not part of the building model.

In addition, you can continue to modify the building model and then update the section to incorporate the changes.

You can also create and edit material boundaries for 2D sections. For more information, see "Creating a Material Boundary in a 2D Section" on page 2118.

Related Topics and Procedures

- Changing the Display of Graphic Subdivisions in a 2D Section
- Changing the Display of Graphic Subdivisions in a 3D Section
- Reversing a 2D or 3D Section
- Changing the Style of a 2D Section
- Creating a Material Boundary in a 2D Section
- Editing a Material Boundary
- Editing and Merging Linework in a 2D Section
- Changing the Location of a 2D or 3D Section

Changing the Display of Graphic Subdivisions in a 2D Section

Use this procedure to change the display of subdivisions in a 2D section by changing its display properties.

You create subdivisions by adding them to the section line. You can then change their length using grips or by editing the values in the section line properties. For more information, see "Creating Graphic Subdivisions for 2D and 3D Sections" on page 2105.

Each subdivision in a 2D section is assigned to a numbered subdivision display component in the display properties of the section or the 2D section style. You can control the visibility, layer, color, linetype, lineweight, and linetype scale of each subdivision by changing the display properties of each component. You can apply these changes to the selected section, to the current 2D section/elevation style, or to all 2D sections and elevations in the drawing that do not have a style override.

1. Select the 2D section in the drawing, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the property source to edit:

If you want to edit graphic subdivisions for . . .	Then . . .
all 2D sections and elevations in the current drawing (except those that have a 2D Section/Elevation Style override),	select Drawing Default.
all 2D sections and elevations that use the current style,	select 2D Section/Elevation Style, and click Object Override.
the selected 2D section	Select 2D Section/Elevation, and click Object Override.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab to list all the components that contribute to the display of the object.

The defining line represents the cutting plane of the section line. The numbered subdivision components correspond to subdivisions added to the section line. For example, the display component Subdivision 1 corresponds to the subdivision closest to, but not on, the cutting plane of the section line.

6 Turn the visibility on or off, and change the layer, color, linetype, lineweight, or linetype scale as needed for each subdivision component.

7 Click the Hatching tab to change the shrinkwrap hatch pattern of the s

8 Click the Other tab to add a custom display component to the display of the 2D section.

For more information about adding custom display components, see "Adding a Display Component to a 2D Section Style" on page 2131.

9 Click OK twice.

Changing the Display of Graphic Subdivisions in a 3D Section

Use this procedure to change the display of subdivisions in a 3D section by changing its display properties.

You create the subdivisions by adding them to the section line. You can then change their length using grips or by editing the values in the section line properties. For more information, see "Creating Graphic Subdivisions for 2D and 3D Sections" on page 2105.

Each subdivision in a 3D section is assigned to a numbered subdivision display component in the display properties of the 3D section. You can control the visibility, layer, color, linetype, lineweight, and linetype scale of each subdivision by changing the display properties of each component. You can apply these changes to the selected 3D section or to all 3D sections in the drawing.

1 Select the 3D section in the drawing, right-click, and click Edit Object Display.

2 Click the Display Properties tab.

3 Select the Sub-divisions display representation.

4 Select the property source to edit:

If you want to edit graphic subdivisions for . . .	Then . . .
all 3D sections in the current drawing	select Drawing Default.
the selected 3D section	select Bldg Section, and click object Override.

5 If necessary, click .

6 Click the Layer/Color/Linetype tab to list all the components that contribute to the display of the object.

The defining line represents the cutting plane of the section line. The numbered subdivision components correspond to subdivisions added to the section line. For example, the display component Subdivision 1 corresponds to the subdivision closest to, but not on, the cutting plane of the section line.

7 Turn the visibility on or off, and change the layer, color, linetype, lineweight, or lineweight scale as needed for each subdivision component.

8 Click OK twice.

Reversing a 2D or 3D Section

Use this procedure to reverse the direction of a section by reversing the section line and refreshing the section.

The direction of the section is determined by the direction in which you drew the section line. You can select the section line in plan view to see the bounding box that defines the area of the model included in the section. If the box does not include the area of the model that you intended, you can reverse the section line. If you have already created a section from the section line, update the section after reversing the section line.

1 Select the section line that you used to create the section, right-click, and click Reverse.

The section line is mirrored about its own axis, as is the bounding box with its original parameters.

2 Select the existing section, right-click, and click Regenerate.

NOTE If you do not need to respecify the objects to include in the section, you can click Refresh instead of Regenerate. This immediately updates the section.

3 If you want to include different objects in the updated section, click (Reselect Objects), and select the objects. Press ENTER when you finish selecting objects.

4 Click OK.

Changing the Style of a 2D Section

Use this procedure to select a different style for a 2D section. A 2D section/elevation style controls the appearance of any 2D section object to which the style is applied.

1 Double-click the section you want to change.

2 On the Properties palette, expand Basic, and expand General.

3 Select a new style for the section.

Creating a Material Boundary in a 2D Section

Use this procedure to create a material boundary in a 2D section. For more information, see "Material Components and Display Properties" on page 498.

1 Draw a polyline around the area in the section that you want to mask or to highlight.

2 Select the section, right-click, and click Material Boundary ➤ Add.

3 Select the polyline.

4 Enter **y** (Yes) to erase the polyline, or **n** (No) to keep the polyline in the drawing.

5 Specify the settings of the material boundary:

If you want to . . .	Then . . .
highlight the area inside the polyline	select Limit for Purpose.
mask (erase) the area inside the polyline	select Erase for Purpose.

If you want to . . .	Then . . .
apply the highlight or mask only to specific parts of the section	select the appropriate parts for Apply to. You can choose Surface and Section Hatching, Section Hatching Only, Surface Hatching Only, Edge Linework Only, and All Linework.
apply the material boundary to all materials used in the section	select All Materials for Material Selection.
apply the material boundary only to selected materials	select Specific Materials for Material Selection and then select the desired materials in the list below.
apply the highlighting or masking within the polyline to the shrinkwrap linework	select Apply to Section Shrinkwrap Linework. For information on section shrinkwrap, see "Shrinkwrap" on page 2135, and "Shrinkwrap Hatch" on page 2136.
apply the highlighting or masking within the polyline to the shrinkwrap hatching	select Apply to Section Shrinkwrap Hatching. For information on section shrinkwrap, see "Shrinkwrap" on page 2135, and "Shrinkwrap Hatch" on page 2136.

6 Click OK.

Editing a Material Boundary

You can edit existing material boundaries in a number of different ways:

- Change the content within the material boundary. For example, you can determine if you want to see only surface hatching, or both surface and section hatching.
- Change the shape of the material boundary. For example, you can make the boundary bigger or smaller, or add additional rings and vertex points to it.

For more information, see "Material Components and Display Properties" on page 498.

Related Procedures

- Editing the Content of a Material Boundary
- Adding a Vertex to a Material Boundary
- Removing a Vertex from a Material Boundary
- Adding a Ring to a Material Boundary

- Removing a Ring from a Material Boundary
- Replacing a Ring from a Material Boundary with Another

Editing the Content of a Material Boundary

Use this procedure to change the content of a material boundary. The content includes such settings as materials displayed, hatch types, and boundary type.

1. Select the 2D section with the material boundary, right-click, and click Material Boundary ➤ Edit In Place.

   You are now in in-place edit mode. The material boundary is highlighted, and the grips are displayed.

2. Right-click, and click Edit Material Boundary.
3. Specify the content of the material boundary:

If you want to . . .	Then . . .
highlight the area inside the boundary	select Limit for Purpose.
mask (erase) the area inside the boundary	select Erase for Purpose.
apply the highlight or mask only to specific parts of the section	select the appropriate parts for Apply to. You can choose Surface and Section Hatching, Section Hatching Only, Surface Hatching Only, Edge Linework Only, and All Linework.
apply the material boundary to all materials used in the section	select All Materials for Material Selection.
apply the material boundary only to selected materials	select Specific Materials for Material Selection, and then select the desired materials from the list below.

4. Click OK.
5. Select the material boundary, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Adding a Vertex to a Material Boundary

Use this procedure to add a vertex to a material boundary.

1. Select the 2D section with the material boundary to change, right-click, and click Material Boundary ➤ Edit In Place.

You are now in in-place edit mode. The material boundary is highlighted, and the grips are displayed.

2. Right-click, and click Add Vertex.
3. Specify the point at which to add a vertex.
4. Specify additional vertex points as needed.
5. Press ENTER.
6. Select the material boundary again, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Removing a Vertex from a Material Boundary

Use this procedure to remove a vertex from a material boundary.

1. Select the 2D section with the material boundary to change, right-click, and click Material Boundary ➤ Edit In Place.

   You are now in in-place edit mode. The material boundary is highlighted, and the grips are displayed.

2. Right-click, and click Remove Vertex.
3. Specify the vertex points to remove.
4. Press ENTER.
5. Select the material boundary, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Adding a Ring to a Material Boundary

Use this procedure to add a ring to a material boundary.

A material boundary can consist of more than one closed polyline. For example, you could use one polyline to highlight a wall detail and another polyline to highlight a window detail in another location.

1. Draw a polyline for the new material boundary ring.
2. Select the material boundary to add a new ring to, right-click, and click Material Boundary ➤ Edit In Place.

   You are now in in-place edit mode. The material boundary is highlighted, and the grips are displayed.

3. Right-click, and click Add Ring.
4. Select the polyline you drew in Step 1.

5 Enter **y** (Yes) to erase the polyline, or **n** (No) to keep the polyline in the drawing.

6 Select the material boundary, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Removing a Ring from a Material Boundary

Use this procedure to remove a ring from a material boundary.

A material boundary can consist of more than one closed ring. You can remove each ring individually.

NOTE You cannot remove the last ring from a material boundary.

---

1 Select the 2D section with the material boundary to change, right-click, and click Material Boundary ➤ Edit In Place.

   You are now in in-place edit mode. The material boundary is highlighted and the grips are displayed.

2 Right-click, and click Remove Ring.

3 Select the ring you want to remove.

4 Select the material boundary, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Replacing a Ring from a Material Boundary with Another

Use this procedure to replace a ring from a material boundary with a different ring.

1 Draw the polyline to replace one of the existing material boundary rings.

2 Select the 2D section with the material boundary to change, right-click, and click Material Boundary ➤ Edit In Place.

   You are now in in-place edit mode. The material boundary is highlighted and the grips are displayed.

3 Right-click, and click Replace Ring.

4 Select the ring to be replaced.

5 Select the closed polyline you drew in Step 1.

6 Enter **y** (Yes) to erase the polyline, or **n** (No) to keep the polyline in the drawing.

7 Select the material boundary, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Editing and Merging Linework in a 2D Section

After you create a 2D section, you can edit the display of individual lines that make up the section. For example, you may want to assign linework for small details to a display component with a lighter lineweight, so that the details are not obscured when plotted.

You can also merge existing geometry into the section.

Related Procedures

- Editing Linework in a 2D Section
- Merging Linework into a 2D Section

Editing Linework in a 2D Section

Use this procedure to edit individual lines in a 2D section by assigning them to display components in the section.

You can assign selected linework to fixed display components that determine the display of every section that you generate, or you can assign linework to display components that you have defined. For information about adding custom display components, see "Adding a Display Component to a 2D Section Style" on page 2131. After you assign linework to display components, you can change the display properties (visibility, color, layer, lineweight, linetype, and linetype scale) to change the display of lines.

1 Select the section to be changed, right-click, and click Linework ➤ Edit.

2 Select the lines that you want to assign to a display component, right-click, and click Modify Component.

A list of available display components is displayed.

3 Select the component on which to put the lines.

For example, to make the lines invisible, select Erased Vectors for Linework Component.

You can also click (Match existing linework) and select linework in the section whose display component you want to match.

4 Click OK.

5 To finish the linework editing process, select any line in the section, right-click, and click Edit in Place ➤ Save Changes to save the changes you

made, or click Edit in Place ➤ Discard Changes to undo your linework changes.

Merging Linework into a 2D Section

Use this procedure to merge geometry into a 2D section. When you merge linework into a section, you assign additional linework to a display component of a section. Use this feature to add detail, or to add linework that you did not model.

1. Draw the geometry that you want to merge into a 2D section.
2. Select the 2D section to be changed, right-click, and click Linework ➤ Merge.
3. Select the geometry to merge into the section, and press ENTER.
4. Select the display component to assign the linework to.

   You can also click (Match existing linework) and select linework in the section whose display component you want to match.

5. Click OK.

   The linework is merged into the 2D section. When you select the section, the linework is selected with it.

Changing the Location of a 2D or 3D Section

You can relocate a section by changing the coordinate values of its insertion point. The section also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the section are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the section by aligning its normal with another axis. You can also rotate the section on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD® User's Guide*.

1. Double-click the section you want to move.
2. On the Properties palette, expand Basic, and expand Location.
3. Click Additional information.
4. Specify a new location or rotation:

If you want to . . .	Then . . .
relocate the section	enter new coordinate values under Insertion Point.

If you want to . . .	Then . . .
locate the section on the *XY* plane	make the normal of the section parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the section on the *YZ* plane	make the normal of the section parallel to the *X* axis: under Normal, enter **1** for X, and enter **0** for Y and Z.
locate the section on the *XZ* plane	make the normal of the section parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the section	enter a new value for Rotation Angle.

5 Click OK.

Attaching Hyperlinks, Notes, and Files to a 2D or 3D Section

Use this procedure to add hyperlinks, enter notes, and attach reference files to a 2D or 3D section. You can also edit notes and edit or detach reference files from a 2D or 3D section.

1 Double-click the 2D or 3D section you want to attach notes or files to.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click next to Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® Command Reference*.

4 To add a note, click next to Notes, enter text, and click OK.

5 To attach, detach, or edit a reference file, click next to Reference documents, and then do any of the following:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.

If you want to . . .	Then . . .
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6 Click OK.

Updating a 2D or 3D Section

Use this procedure to update a 2D or 3D section to reflect changes you have made to the building model or to section line properties. For 2D sections, you also update the section to show changes made to the 2D section style. You can update a 2D or 3D section if you have not exploded the section, which destroys the link between the section and the building model.

When you update a section, you can add or remove objects from the section, change the location of the section in the drawing, and change the display set of the section.

If you do not need to change the section definition in any way, you can skip the following procedure. Instead, right-click the section you want to update, and click Refresh.

1 Select the section you want to update, right-click, and click Regenerate.

2 Select a result type:

If the section is . . .	Then . . .
a 2D section object	select 2D Section/Elevation Object with Hidden Line Removal.
a 3D section object	select 3D Section/Elevation Object.

3 To change the style of a 2D section, select a new style for Style to Generate.

4 If you edited linework in the 2D section, select a style in which to save the changes you made that cannot be reapplied. Choose a style that will distinguish the unapplied changes in the section.

5 Under Selection Set, specify the objects that you want to include in the section:

If you want to . . .	Then . . .
use the objects in the selection set you specified when you created the section or when you previously updated it	proceed to the next step.
add new objects to the selection set that you specified when you created the original section	click Select Additional Objects, select the new objects in the drawing, and press ENTER.
select a new selection set of objects for the section	click Reselect Objects, select a new selection set of objects for the section, and press ENTER.

NOTE If you select an object that you do not want to include in the section, hold down SHIFT, and select the object again to remove it from the selection set.

6 Under Display Set, select a display set for the section.

7 Under Placement, locate the section in the drawing:

If you want to . . .	Then . . .
create a new section object without overwriting the original object	select New Object, and either click to specify an insertion point in the drawing area, or enter X, Y, and Z coordinates for the new section.
replace the original section with the updated section	select Replace Existing.

8 Click OK.

2D Section Styles

A 2D section/elevation style is a group of properties assigned to a 2D section or to an elevation that determines the appearance and other characteristics of that object.

Using 2D Section Styles

A 2D section/elevation style controls the linework in a section, using design rules that determine how different parts of the section are displayed. You can apply the style to one or more sections to control their appearance. You can also change the display of individual lines in the section, and save the changes in a 2D section/elevation style.

Display Components and Design Rules

Display components determine the graphical characteristics, such as color and linetype, of linework assigned to each display component. Design rules determine how the linework in a section is assigned to display components.

When you create a design rule, you specify the part of the 2D section to control based on the color of those objects in the building model and their context in the section. You then select the display component to use for linework that meets the criteria you specified. You can assign the linework to a default display component or to a custom display component that you have added to the style. For example, you might define a rule that assigns all objects that are color 150 in the model and that are located along the section line (the defining line) to a custom display component named Darker that you created in the style. Or you might hide a staircase behind a wall using a rule that assigns all blue linework to the Hidden display component.

Managing 2D Section Styles

To create, edit, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk® Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager."

Materials and 2D Section Styles

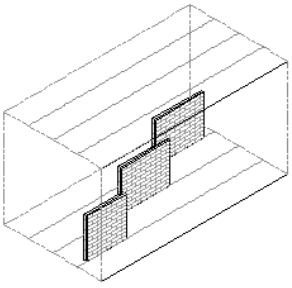
You can use 2D section styles to specify which section components will have their display controlled by materials and which will not. Custom components cannot use materials.

Subdivisions in 2D Section Styles and Materials

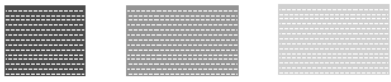
When you are creating subdivisions in your style, you usually want the objects in them to be visually distinct from other subdivisions. When you assign materials to the objects, you can set the 2D section style so that it uses

the hatch pattern from the material, but the color and linetype from the subdivision display properties.

Section subdivison surface hatching with color assignments



Three brick walls in different section subdivisions



2D section surface hatch from material, color and linetype from subdivisions

Related Procedures

- Creating a 2D Section Style
- Adding a Display Component to a 2D Section Style
- Removing a Display Component from a 2D Section Style
- About 2D and 3D Section Display Components and Materials
- Use Subdivision Properties and Materials in 2D Section Styles
- Use the 3D Body Component of a Material for the 2D Section Linework
- Adding a Design Rule to a 2D Section Style
- Changing a Design Rule in a 2D Section Style
- Removing a Design Rule from a 2D Section Style
- Adding Classifications to a 2D Section Style
- Changing the Layer, Color, and Linetype of a 2D Section Style
- Attaching Notes and Files to a 2D Section Style

Creating a 2D Section Style

Use this procedure to create a 2D section style. You can create a style using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand 2D Section/Elevation Styles.
3. Create a 2D section style:

If you want to . . .	Then . . .
create a style using default properties	right-click 2D Section/Elevation Styles, and click New.
create a style from an existing style	right-click the 2D section style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new 2D section style, and press ENTER.
5. To edit the 2D section style, right-click the style, and click Edit:

If you want to . . .	Then . . .
add display components to the style	see "Adding a Display Component to a 2D Section Style" on page 2131.
remove display components from the style,	see "Removing a Display Component from a 2D Section Style" on page 2132.
use the subdivision properties of the section for the display,	see "Use Subdivision Properties and Materials in 2D Section Styles" on page 2139.
use the 3D Body component of the material for the section linework,	see "Use the 3D Body Component of a Material for the 2D Section Linework" on page 2140.
add design rules to the style	see "Adding a Design Rule to a 2D Section Style" on page 2141.
change design rules in the style	see "Changing a Design Rule in a 2D Section Style" on page 2142.

If you want to . . .	Then . . .
add classifications to a style	see "Adding Classifications to a 2D Section Style" on page 2143.
change the display properties of the display components in the style	see "Changing the Layer, Color, and Linetype of a 2D Section Style" on page 2143.
add notes, files, or documents to the style	see "Attaching Notes and Files to a 2D Section Style" on page 2144.

6 Click OK.

Adding a Display Component to a 2D Section Style

Use this procedure to add a custom display component to a 2D section style. After you add a component, you assign linework in the section to the new component. To apply these style changes to existing 2D sections, you must update the section.

2D sections include the following default display components: Defining Line, Hidden, Erased, Unknown, and Subdivision.

1 Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.

2 Click the Components tab.

3 Click Add.

4 Enter a name and a description for the new component.

To enter a name, click Unnamed and enter a new name. To enter a description, click in the Description column next to the name, and enter a description.

5 Click the Display Properties tab.

6 Select the display representation in which to display the changes, and select Style Override.

7 If necessary, click .

8 Click the Layer/Color/Linetype tab.

9 Specify the display properties of the new component.

10 Click OK twice.

To create a design rule that uses the new display component, see "Adding a Design Rule to a 2D Section Style" on page 2141. To manually assign linework to the display component, see "Editing Linework in a 2D Section" on page 2123.

Removing a Display Component from a 2D Section Style

Use this procedure to remove a custom display component from a 2D section style. Removing a display component also removes any design rules that use the component. You cannot remove the default display components.

1. Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Components tab.
3. Select the component that you want to remove, and click Remove.

   If the component is used in a design rule, a dialog box is displayed, warning you that the associated design rule is removed as well.
4. Click OK.
5. Update the section to apply the style changes to the section.

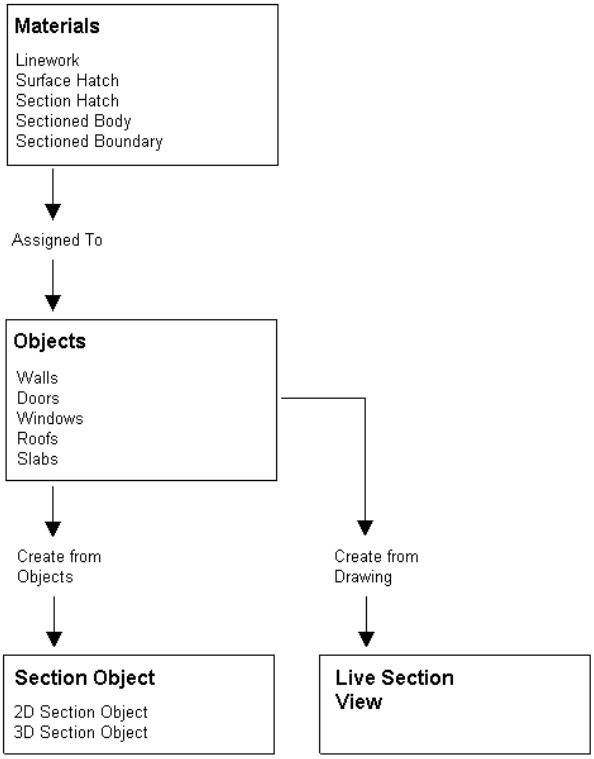
   For more information, see "Updating a 2D or 3D Section" on page 2126.

About 2D and 3D Section Display Components and Materials

2D and 3D section object consist of a number of display components which can be determined by materials.

When you assign materials to an object, you assign one material to each display component of a object. For example, you assign a wood material to the frame of window and a glass component to the glass of a window.

When you create a 2D or 3D section object from building objects, the material assignments of the source objects are applied to the section. You do not assign a material directly to a 2D/3D section. The section takes its material assignments from the objects sectioned. For example if you create a section through a wall with a window, the section hatch you have defined in the glass, wood, and brick materials of the wall and the window are displayed in the section.



If you do not want to use the material display properties, but instead use those of the 2D or 3D section object, or the 2D section style, you can deactivate the material assignments in the display properties of the section or the section style.

Material Component Assignments

Material definitions consist of display components which correspond to component types of objects. For example, the Linework component of a material is used for all linework of objects in Plan view. The Surface Hatch component of a material is used to hatch all object surfaces in 3D model views and elevations.

For a complete list of material components and their description, see "Material Components and Display Properties" on page 498.

The following table lists all section components plus information about the material components that determine them.

NOTE Keep in mind that materials are not assigned directly to 2D section objects, but that the assignment of materials happens indirectly via the sectioned objects. For example, if a brick material has a surface hatch component with a red brick pattern, this surface hatch determines the display of the surface hatch in a brick wall. When you create a 2D section from that wall, the resulting section object will inherit the red brick pattern from the wall. When you change the material of the wall from brick to concrete, and then update the 2D section, it will now display with a grey concrete pattern.

2D Section Component	Material Component
Defining Line	2D Section/Elevation Linework or 3D Body. For information on switching between these material components, see "Use the 3D Body Component of a Material for the 2D Section Linework" on page 2140.
Outer Shrinkwrap	No Material
Inner Shrinkwrap	No Material
Shrinkwrap Hatch	No Material
Surface Hatch Linework	Surface Hatch
Section Hatch Linework	Section Hatch
Hidden	No Material
Erased	No Material
Subdivision 1-10	2D Section/Elevation Linework or 3D Body. For information on switching between these material components, see "Use the 3D Body Component of a Material for the 2D Section Linework" on page 2140.

Related Topics

- Defining Line
- Shrinkwrap
- Shrinkwrap Hatch
- Surface Hatch Linework
- Section Hatch Linework
- Hidden Component

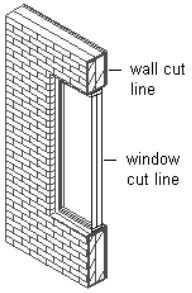
- Erased Component
- Subdivision Components

Defining Line

The defining line determines where the section cuts the objects it contains. The material component which controls the display of the Defining Line is the Linework component. The defining line is a display component of both 2D and 3D section objects.

For example, if you cut a brick wall that contains a window, you can specify one uniform color for the defining line, or use different colors where the section line cuts the wall and where it cuts the window. If you want to use a uniform color for the Defining Line component, assign a color to it and do not use the properties of the material. If you want the color of the defining line to be influenced by the objects in the section, use the material properties. In the case of a section through a brick wall with a window, you might use a red defining line where the wall is cut and a blue defining line where the window is cut.

Specifying cut line colors for different materials

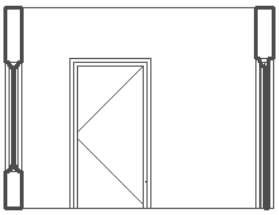


Shrinkwrap

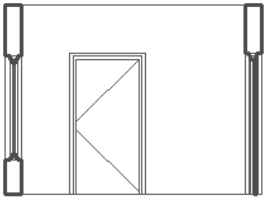
The shrinkwrap displays the union of all object faces cut by the section line. The Outer Shrinkwrap component represents the outline of solid, filled components, such as a wall shrinkwrap. The Inner Shrinkwrap component represents the outline of holes which have been cut, such as a space. These components are specific to 2D sections.

You can exclude individual objects from contributing to the shrinkwrap. For example, you might do this for glass components in windows. For information on excluding objects from the 2D shrinkwrap, see "Excluding a Material from 2D Section Shrinkwrap" on page 528.

2D section with red outer shrinkwrap



Window glass excluded from shrinkwrap

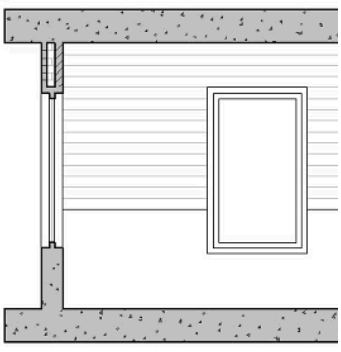


The Outer and Inner Shrinkwrap components cannot be defined by a material component.

Shrinkwrap Hatch

The Shrinkwrap Hatch component hatches the union of all object faces cut by a section line. The Shrinkwrap Hatch is defined by either an outer or an inner shrinkwrap line component. This component is specific to 2D sections.

Shrinkwrap Hatch with glass excluded from shrinkwrap detail



The Shrinkwrap Hatch component cannot be defined by a material component.

NOTE The Shrinkwrap Hatch and Section Hatch components overlap each other. This could result in two different hatches in the same location. To avoid a conflict, either assign a solid hatch for Shrinkwrap Hatch, or do not use the Shrinkwrap and Section Hatch components simultaneously.

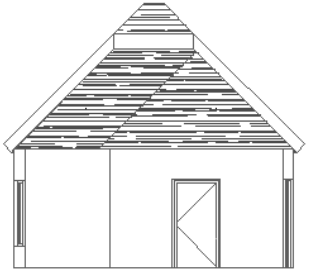
Surface Hatch Linework

The Surface Hatch Linework component draws all linework coming from surface hatches of the objects cut. Surface hatches appear in faces of the section object that are not cut by the section line. This component is specific to 2D sections.

NOTE Surface hatches that you have assigned to objects will display in a 3D section object. However, you cannot set them separately in a 3D section; you can do that only in a 2D section object.

The surface hatch linework component is controlled by the surface hatch component of the material. For information about the surface hatch component of the material, see "Surface Hatch Material Component" on page 500.

2D section with roof surface hatch

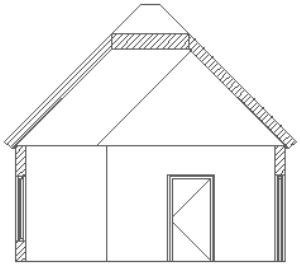


Section Hatch Linework

The Section Hatch Linework component draws all linework coming from section hatches. Section hatches appear on all faces that are cut by the section line. A section hatch is similar to a shrinkwrap hatch. The difference is that in a section hatch the sectioned faces are not merged into one shrinkwrap component. Use either a section hatch or a shrinkwrap hatch on a 2D section. For information on shrinkwrap hatches see "Shrinkwrap Hatch" on page 2136.

The Section Hatch Linework display component is specific to 2D section.

Section hatches on walls, roof and door



The Section Hatch Linework component is controlled by the Section Hatch component of the material. For information about the Section Hatch component of the material, see "Section Hatch Material Component" on page 502.

Hidden Component

The Hidden component contains all linework that is hidden in the 2D projection because other components are in front of it. By default, this component is turned off. You can use design rules to achieve special effects, such as a see-through effect, using the Hidden component. The Hidden component is specific to 2D sections.

The Hidden component cannot be defined by a material component. You can only set it in the display properties of the 2D section. For information on setting the display properties of a 2D section, see "Changing the Layer, Color, and Linetype of a 2D Section Style" on page 2143.

Erased Component

The Erased component contains linework in the section object that you do not want to see. For example, if you have a section of a multi-story building in which you want to hide the lines between each floor, you can edit the linework of the section and assign the floor lines to the Erased component. Since the Erased component is turned off by default, the floor lines do not display. For information on linework editing of a section, see "Editing Linework in a 2D Section" on page 2123.

The Erased component is specific to 2D sections.

The Erased component cannot be defined by a material component.

Subdivision Components

The subdivision components partition a section object. They are useful to create perspective effects, where parts closer to the viewer are drawn with

darker, stronger lines and parts which are farther from the user are drawn with lighter, thinner lines. Subdivisions can have no individual material assignments. However the display properties of the subdivisions can be used for the surface hatching of the subdivisions by selecting "Use Subdivision Properties for Surface Hatching" in the Other tab of the 2D section display properties. For information on using the subdivision display properties to display the section divisions, see "Use Subdivision Properties and Materials in 2D Section Styles" on page 2139.

Subdivisions are a display component of both 2D and 3D section objects.

The subdivision components are either controlled by the 2D Section/Elevation Linework component of the material or by the 3D Body component of a material. For information how to switch between these component assignments, see "Use the 3D Body Component of a Material for the 2D Section Linework" on page 2140.

Use Subdivision Properties and Materials in 2D Section Styles

Use this procedure to use the display properties of materials together with the display properties of section subdivisions.

1. Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Display Properties tab.
3. Select the display representation in which to display the changes, and select Style Override.
4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. To set a subdivision to use the surface hatch of the material, while using the layer, color, and linetype display properties of the subdivision, perform the following steps:
   - Clear By Material.
   - Specify the layer, color and linetype settings of the subdivision as desired. For example, the first subdivision could have a darker color and stronger linetype the second subdivision.
7. Click the Other tab.
8. Select Use Subdivison properties for surface hatching.
9. Click OK twice.

For more information, see "Updating a 2D or 3D Section" on page 2126.

Use the 3D Body Component of a Material for the 2D Section Linework

Use this procedure to use the 3D Body component of a material for the linework in a 2D section.

1. Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Display Properties tab.
3. Select the display representation in which to display the changes, and select Style Override.
4. If necessary, click .
5. Click the Other tab.
6. Determine if the 3D body component of the selected material should control the display of the linework in the 2D section:

If you want to . . .	Then . . .
control the display of the 2D section linework by the 3D Body component of the material,	select Use 3D Body display component for By Material linework.
control the display of the 2D section linework by the 2D Section/ Elevation Linework component of the material,	clear Use 3D Body display component for By Material linework. This is the default behavior.

7. Click OK twice.

For more information, see "Updating a 2D or 3D Section" on page 2126.

Adding a Design Rule to a 2D Section Style

Use this procedure to add a design rule to a 2D section style. A design rule has four fields of information that identify lines in the section and determine how to display them:

Field	Description
Color	Identifies the color of the objects in the building model represented by lines in the section.
Context	Identifies the context of the lines in the 2D section, such as on the defining line (the cutting plane) or in a graphic subdivision.
Component	Identifies the display component to which the lines are assigned.
Description	Contains a description of the design rule.

For example, a design rule has the color 50, a context of Within Subdivision 2, and a component of New. This rule assigns any lines in the section representing objects that have the color 50 in the building model and that are within subdivision 2 in the section to the user-defined display component, New.

1. Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Design Rules tab, and click Add.

   A new design rule is created with default color, context, and component values.

3. Specify settings for the new design rule:

If you want to . . .	Then . . .
specify the color of objects in the building model that are affected by this rule	click the default color, select a new color, and click OK.
specify the context in which the linework for the objects appears in the section	click the default context, and select a new context.

If you want to . . .	Then . . .
select the display component for the linework	click the default component, and select a new component.
enter a description of the rule	click the Description field, enter a description, and press ENTER.

4 Click OK.

5 Update the section to apply the style changes to the section.

For more information, see "Updating a 2D or 3D Section" on page 2126.

Changing a Design Rule in a 2D Section Style

Use this procedure to change the settings in the fields that define a design rule.

1 Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.

2 Click the Design Rules tab.

3 Specify settings for the design rule you want to change:

If you want to . . .	Then . . .
specify the color of objects in the building model that are affected by this rule	click the current color, select a new color, and click OK.
specify the context in which the linework for the objects appears in the section	click the current context, and select a new context.
select the display component for the linework	click the current component, and select a new component.
edit the description of the rule	click the description, edit the description, and press ENTER.

4 Click OK.

5 Update the section to apply the style changes to the section.

For more information, see "Updating a 2D or 3D Section" on page 2126.

Removing a Design Rule from a 2D Section Style

Use this procedure to remove a design rule from a 2D section style.

1. Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Design Rules tab.
3. Select the rule that you want to remove, and click Remove.
4. Click OK.
5. Update the section to apply the style changes to the section.

   For more information, see "Updating a 2D or 3D Section" on page 2126.

Adding Classifications to a 2D Section Style

Use this procedure to specify classifications for any classification definition applied to a 2D section style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Classifications tab.

   By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to 2D section styles.

3. For each classification definition, select the classification you want to apply to the current 2D section style.
4. Click OK twice.

Changing the Layer, Color, and Linetype of a 2D Section Style

Use this procedure to change the following display properties of a 2D section style:

- Visibility (component is on or off)
- Display properties by materials
- Layer

- Color
- Linetype
- Lineweight
- Linetype scale

NOTE The custom display components in the display properties are identical to those listed on the Components tab of the 2D Section/Elevation Styles dialog box. For more information about custom display components, see "Adding a Display Component to a 2D Section Style" on page 2131.

1. Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Display Properties tab.
3. Select the display representation in which to display the changes, and select Style Override.
4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Select By Material for any component that you want to use the display properties of the materials assigned to the sectioned objects.

   NOTE Not all display components of a 2D section have an associated material definition. For example, Hidden and Erased cannot be set by material. For a list of all display components and their associated material components, see "About 2D and 3D Section Display Components and Materials" on page 2132.

8. Click OK twice.

Attaching Notes and Files to a 2D Section Style

Use this procedure to enter notes and attach reference files to a 2D section style. You can also edit reference files attached to the style.

1. Select a section that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the General tab.

3 To add a description to the 2D section, enter the description under Description.

4 Click Notes.

5 To add or edit a note, click the Notes tab, and enter the note.

6 To attach, edit, or detach a reference file, click the Reference Docs tab:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK when you are done editing.
detach a reference file	select the file name, click Delete, and click OK.

7 Click OK twice.

Elevations

29

You can create elevations of the building models in your drawings by first drawing an elevation line and mark, and then creating a 2D or 3D elevation based on that line. You can control the size and shape of any elevation that you create, and you can update an existing elevation when the objects included in the elevation are modified. 2D elevations are created with hidden and overlapping lines removed. You can control the appearance of 2D elevations by applying rules that are controlled by the style and display properties of the 2D elevation.

In this chapter

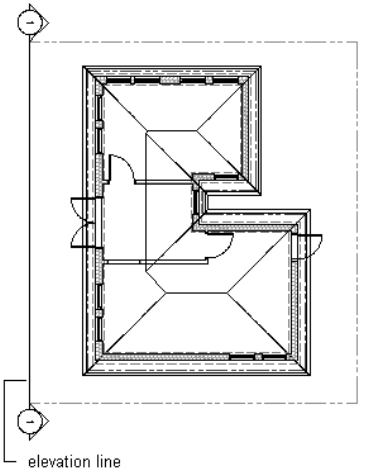
- Process Overview: Creating a 2D or 3D Elevation
- Drawing and Editing Elevation Lines
- Creating a 2D or 3D Elevation
- Editing a 2D or 3D Elevation
- Updating a 2D or 3D Elevation
- 2D Elevation Styles

Elevation Line and Marks

The elevation line defines the extents of the elevation view of your building model. Elevation lines can be straight or jogged. You can also specify the length and the height of the area defined by the elevation line. Elevation marks, which typically contain a letter or number and indicate the direction of the elevation, appear at each end of the elevation line.

After you draw the elevation line, you create an elevation object from the line.

Viewing the elevation line and mark



2D Elevations

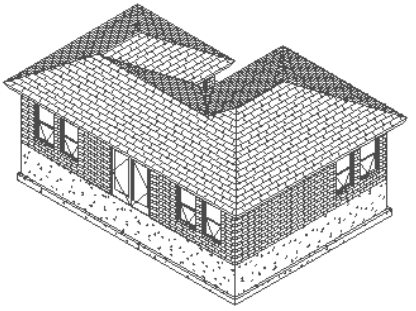
2D elevations are created by drawing an elevation line in front of a number of objects and then creating a 2D elevation object from them. The elevation object is drawn without hidden and overlapping lines. You can edit a 2D elevation by changing its object display properties or its style display properties. The 2D elevation style lets you add display components to the display representation of the elevation and create rules that assign different parts of the elevation to different display components. You can control the visibility, layer, color, linetype, lineweight, and linetype scale of each component. You can also assign a material, such as a brick or concrete hatch, to individual components of the object or the style. Furthermore, you can use linework editing commands to assign individual lines in a 2D elevation to different display components, and merge geometry into a 2D elevation. You can dimension 2D elevations.

2D building elevation

3D Elevations

3D elevations are created by drawing an elevation line in front of a number of objects and then creating a 3D isometric elevation object from them. 3D elevations do not use styles. However, you can control the display of subdivisions within 3D elevations. Using the Hidden Line Projection command, you can create 2D hidden line projections of any view of the 3D elevation that you can explode and edit or hatch. For more information about using this command, see "Creating a Hidden Line Projection" on page 2540.

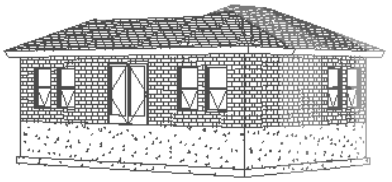
3D elevation in 3D view



Elevation Subdivisions

A 2D or 3D elevation object can have a number of subdivisions partitioning the elevation object. This feature is useful when you want to create a perspective view of the object, in which the parts that are closer to the viewer are drawn with darker and stronger lines, and parts that are farther off are drawn lighter.

3D elevation with subdivisions in perspective view



Live Section View

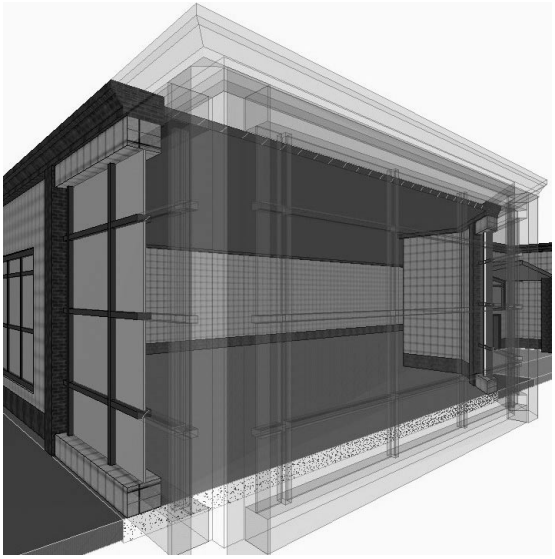
A live section view is a special view of a 3D section where the objects that are sectioned are not converted to a 3D section object, but remain in the drawing as objects. The parts of the objects within the bounding box of the section line keep their individual display components while the parts of the objects outside of the section line can be displayed or hidden. To control the appearance of the object parts outside of the section line, you need to assign a material to the sectioned objects.

When you render a live section, you can show the outside part as a half-transparent addition, for example.

You can use the live section view in an elevation in order to clip out just the region you need momentarily and to focus on that specific area. This can accelerate performance and make working with the building model easier.

For information on creating live section views, see "Creating a Live Section View" on page 2111.

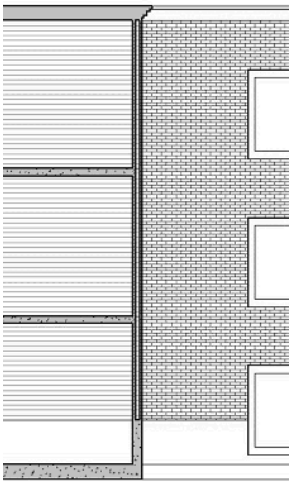
Rendered live section view with transparent body component



Materials in Elevations

In Autodesk Architectural Desktop, you can assign materials to different components of an object. These materials are displayed when you create a 2D or 3D elevation object. You can specify whether to use the display properties of the materials or the display properties of the elevation object.

2D elevation with different surface hatches

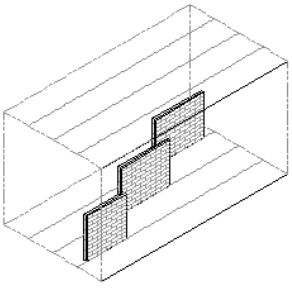


Autodesk Architectural Desktop provides a large number of predefined materials for all common design purposes. You can use these predefined materials or modify them to your special designs. You can also create your own materials. For more information, see "About 2D and 3D Elevation Display Components and Materials" on page 2186.

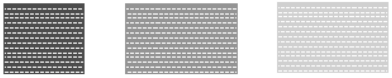
Subdivisions in 2D Elevation Styles and Materials

When you are creating subdivisions in your style, you usually want the objects in them to be visually distinct from other subdivisions. When you have assigned materials to the objects, you can set the 2D elevation style so that it uses the hatch pattern from the material, but uses the color and linetype from the subdivision display properties.

Elevation subdivisions with assigned surface hatching



Three brick walls
in different elevation
subdivisions



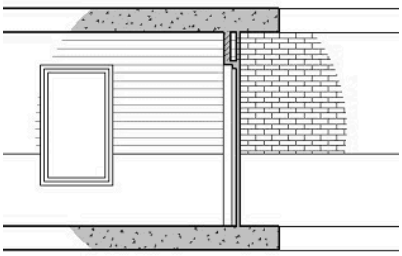
2D elevation surface hatch
from material, color and
linetype from subdivisions

For more information see "Use Subdivision Properties and Materials in 2D Elevation Styles" on page 2190.

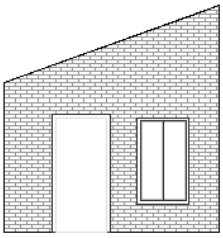
Material Boundaries in 2D Elevations

Material boundaries allow you to erase or limit portions of a 2D elevation:

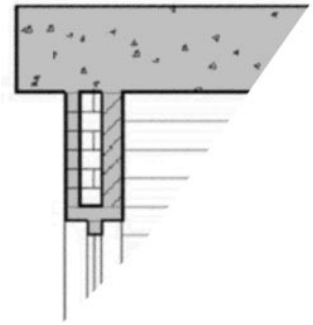
- Limit the amount of hatching to produce cleaner CDs.
- Highlight a region in an elevation.



- Mask out a portion of an elevation so that more detail can be drawn.



- Crop an irregular-shaped portion of an elevation.



For more information, see "Creating a Material Boundary in a 2D Elevation" on page 2173.

Related Topics and Procedures

- Process Overview: Creating a 2D or 3D Elevation
- Drawing and Editing Elevation Lines
- Creating a 2D or 3D Elevation
- Editing a 2D or 3D Elevation
- Updating a 2D or 3D Elevation
- 2D Elevation Styles

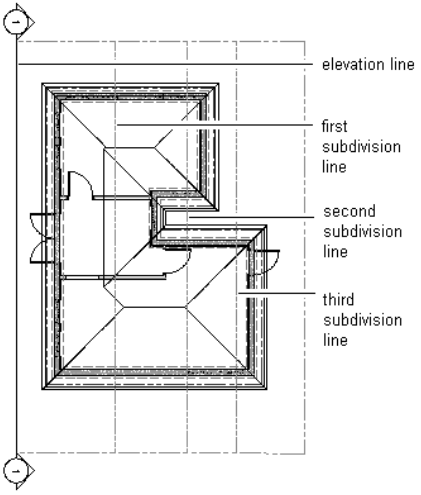
Process Overview: Creating a 2D or 3D Elevation

Creating a 2D or 3D elevation from a building model involves the following steps:

Step 1: Draw an elevation line and mark.

The elevation line defines the extents of the elevation (its width, height, and length) that you extract from the building model. The elevation line also determines other characteristics of the elevation. For example, you can define graphic subdivisions to add levels of depth to the elevation object created from the elevation line.

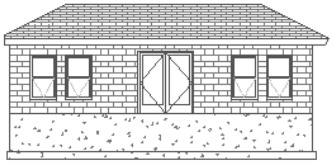
An elevation line with graphic subdivisions



Step 2: Create a 2D or 3D elevation.

You select the elevation line, right-click, and click Generate Elevation to create a 2D or 3D elevation object. At this time, you select the objects to include in the elevation. You also select the display representation for the elevation and the insertion point of the elevation in the drawing. If you create a 2D elevation, you also select a 2D elevation style, which determines the visual characteristics of the elevation.

2D elevation created from the elevation line shown above



Step 3: Edit the elevation or the building model.

You can edit the elevation line and the elevation object to refine the appearance of the elevation:

- Edit the elevation line to change the area defined by the elevation and to add, remove, or modify graphic subdivisions.
- Edit the 2D elevation style, which determines how the linework in a 2D elevation is displayed.
- Edit existing material assignments, like hatch patterns.
- Edit a 2D elevation object to change the display of selected linework or to add linework and detail that are not part of the building model.

You can continue to modify the building model as needed.

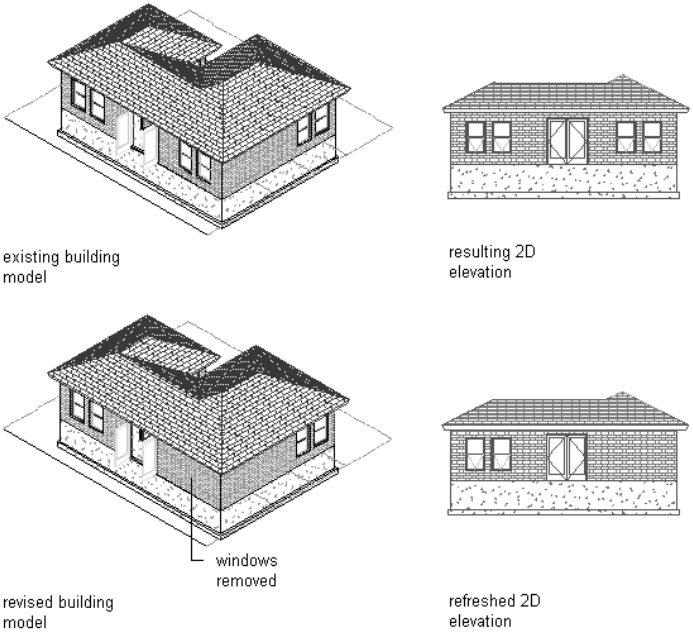
Step 4: Update the elevation.

You update an elevation to apply changes you made to the elevation line, the elevation object (including style changes to a 2D elevation), and the building model. When you update an elevation, you can also make any of the following changes:

- Select a different style for a 2D elevation.
- Select different objects to include and exclude from the elevation.
- Select a different display representation.
- Replace the existing elevation or add a new elevation showing the changes you made.

You can also refresh one or more elevations to quickly apply changes you made to the elevation line, the elevation object, or the model.

Refreshing a 2D elevation after changes to the building model



Related Topics and Procedures

- Drawing and Editing Elevation Lines
- Creating a 2D or 3D Elevation
- Editing a 2D or 3D Elevation
- Updating a 2D or 3D Elevation

Drawing and Editing Elevation Lines

The first step in creating elevations is to draw an elevation line relative to your building model. The elevation line defines the extents of the elevation view of the building model.

Creating an Elevation Object from an Elevation Line

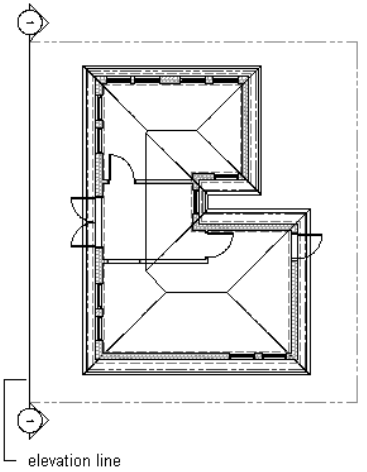
When you generate an elevation from an elevation line, you specify the type of elevation object that is created.

When you create . . .	The result is . . .
a 2D elevation object	an orthographic projection from the building model.
a 3D elevation object	the area of the building model defined in the elevation line.

Viewing the Elevation Line

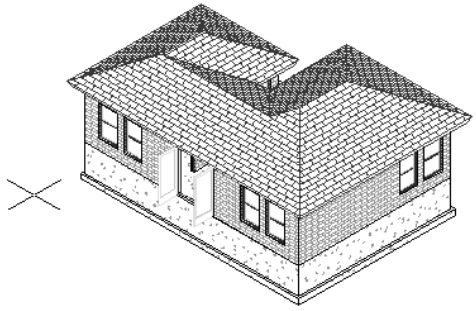
In plan view, the elevation line is displayed as you would expect on a construction document.

Viewing the elevation line and mark in plan view

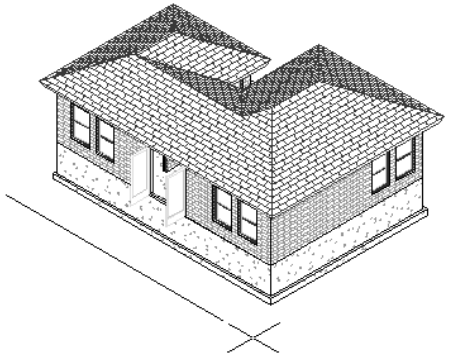


In an isometric view, the same elevation line is displayed with a boundary that defines the depth of elevation view.

Drawing an elevation line in 3D view

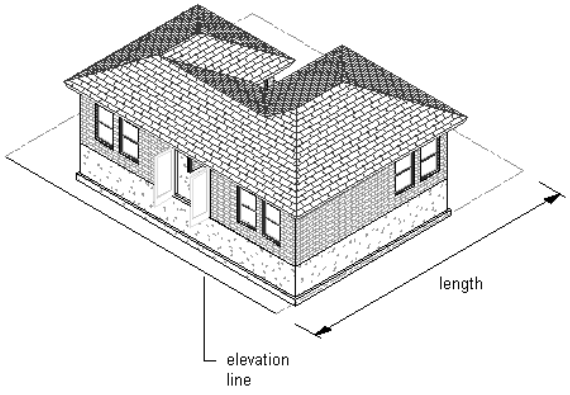


specify first elevation line point



specify next elevation line point

Resulting elevation line in 3D view



Changing the Elevation Line

You can change the elevation line to control the elevation that you create. Within the elevation line, you can change the height and shape of the elevation. You can also add a lower extension to the elevation and create elevation subdivisions.

You can change elevation line properties before you create an elevation. You can also change elevation line properties and update an elevation that you have already created. For more information about updating existing elevations, see "Updating a 2D or 3D Elevation" on page 2180.

Using Subdivisions in Elevations

You can set up graphic subdivisions in elevation line properties. These subdivisions are then added to the 2D or 3D elevation you create. Subdivisions are specified at distances from the elevation line. You can control the lineweight and other display properties of subdivisions to add levels of depth to elevations. For example, you can display one subdivision with a heavy lineweight and another subdivision with a lighter lineweight to suggest that the first subdivision is in front of the second subdivision.

Related Procedures

- Drawing an Elevation Line and Mark
- Changing the Dimensions of an Elevation
- Creating Graphic Subdivisions for 2D and 3D Elevations
- Changing Elevation Mark Attributes
- Changing the Location of an Elevation Line
- Attaching Hyperlinks, Notes and Files to an Elevation Line

Drawing an Elevation Line and Mark

Use this procedure to draw an elevation line with an elevation mark at each end. You draw an elevation line by specifying a start point and an endpoint for the line in relation to your building model.

NOTE If you are working with a drawing set in which several xrefs are linked to a main drawing, draw your elevation line in the main drawing.

1. On the default tool palette set, click the Design tab, and then click the Elevation Line Object tool.

   If necessary, scroll the palette to display the tool that you need.

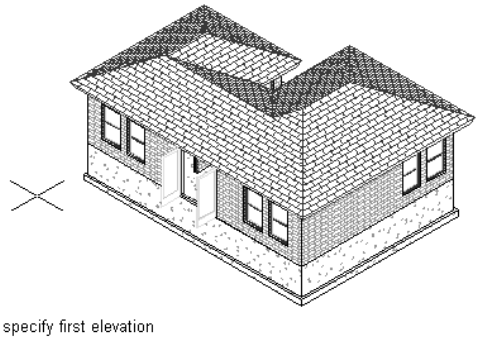
2. Specify the elevation line start point.

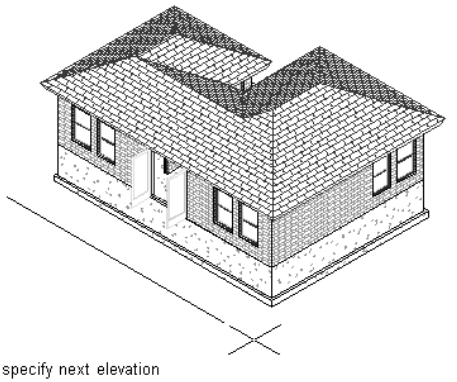
NOTE Specify a start and endpoint for the elevation line that extends past the face or segment of your building model view to ensure that all objects are included in the elevation view.

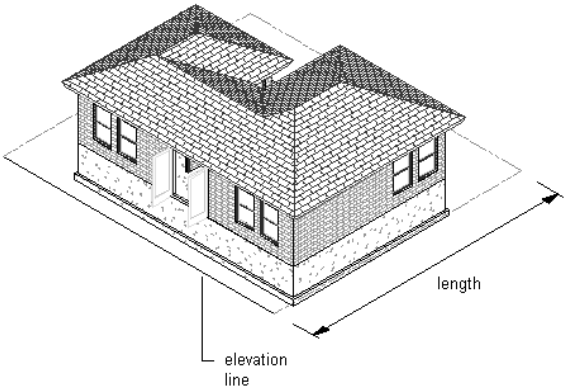
3 Specify the elevation line endpoint.

The elevation line is displayed in your drawing with an elevation mark. The elevation line boundary is automatically drawn, using the elevation line as its left side and forming a box with the elevation line. This is the area that defines the elevation.

Drawing an elevation line in 3D view







Depending on the direction in which you drew the elevation line, the elevation mark points in the direction of the elevation view.

The elevation mark is a multi-view block, anchored to the elevation line. You can edit the elevation mark to change the information that is displayed in the bubble. For more information, see "Changing Elevation Mark Attributes" on page 2165.

Once you have an elevation line in your drawing, you can change the properties of the line to change the elevation. For more information, see "Changing the Dimensions of an Elevation" on page 2162.

Changing the Dimensions of an Elevation

Use this procedure to change the height and length of any elevation connected to the elevation line, or to add a lower extension to the elevation line. You can change the dimensions of the elevation line before or after you create a connected elevation. If you change the dimensions after creating the elevation, you need to update the elevation to show the changes.

The depth of an elevation (its length) can also be defined using grips to edit the elevation line boundary in the drawing.

1. Double-click the elevation line you want to change.
2. On the Properties palette, expand Basic, and expand Dimensions.

3 Specify new dimensions:

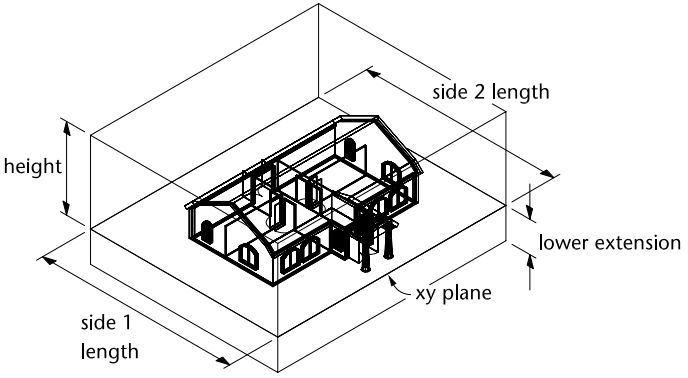
If you want to . . .	Then . . .
use the height of the objects in the elevation to define the elevation height	select Yes for Use Model Extents for Height.
define the height of the box to create an elevation from a *Z* value measured from the *XY* plane of the world coordinate system (WCS) or the current user coordinate system (UCS)	select No for Use Model Extents for Height, and enter a value for Height. The objects are cut at this height when you create or update a elevation.
define the lower limit of the elevation box as a *Z* value measured from the *XY* plane of the WCS or the current UCS	select No for Use Model Extents for Height, and enter a value for Lower Extension. By default, the lower elevation is 1 foot below the *XY* plane unless Use Model Extents for Height is selected.

4 Expand Component dimensions.

5 Specify the length of the lines that define the depth of the elevation by entering values for Side 1 and Side 2.

Side 1 starts from the first point specified for the elevation line. Side 2 starts from the endpoint of the elevation line.

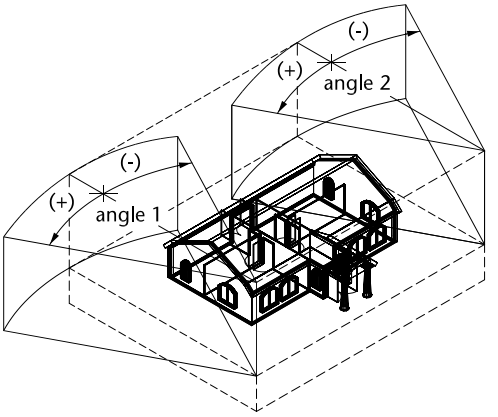
Specifying elevation height, lower extension, and side parameters



6 Specify values for Angle 1 and Angle 2.

These values define the angles of the two sides from the elevation line to create the elevation box. The apex of Angle 1 is the start point of the elevation line. The apex of Angle 2 is the endpoint of the elevation line. Values for these angles must be between 0 and 90 degrees.

Specifying elevation angle parameters



To update an elevation created from this elevation line, see "Updating a 2D or 3D Elevation" on page 2180.

Creating Graphic Subdivisions for 2D and 3D Elevations

Use this procedure to define subdivisions that are created within the elevation when you generate it. Each subdivision is specified as a distance from elevation line.

You can view the location of a subdivision by viewing the elevation line with its boundary in an isometric view. In this view, you can use grips to relocate a subdivision.

You can control the lineweight and other display properties of the subdivisions to add different levels of depth to elevation.

1. Double-click the elevation line you want to change.
2. On the Properties palette, expand Basic, and expand Dimensions.

3 Click the setting for Subdivisions, and then add or modify subdivisions:

If you want to . . .	Then . . .
create a subdivision	click . To change the default distance from the elevation line, select the subdivision, click the value, and enter a new value.
change the length of a subdivision	select the subdivision, click its value, and enter a new value.
delete a subdivision	select the subdivision, and click .

4 Click OK.

Changing Elevation Mark Attributes

Use this procedure to change the information displayed in the elevation mark. The elevation mark is a multi-view block.

1 Double-click the elevation mark you want to change.

2 On the Properties palette, expand Advanced.

3 Click Attributes.

4 Select the existing attribute under Value, and enter the new information to include in the bubble.

5 Click OK.

Changing the Location of an Elevation Line

Use this procedure to relocate an elevation line by changing the coordinate values of its insertion point. The elevation line also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the elevation line are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the elevation line by aligning its normal with another axis. You can also rotate the elevation line on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD User's Guide*.

1 Double-click the elevation line you want to relocate.
2 On the Properties palette, expand Basic, and expand Location.
3 Click Additional Information.
4 Specify the location of the elevation line:

If you want to . . .	Then . . .
relocate the elevation line	enter new coordinate values under Insertion Point.
locate the elevation line on the *XY* plane	make the normal of the elevation line parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the elevation line on the *YZ* plane	make the normal of the elevation line parallel to the *X* axis: under Normal, enter **1** for X, and enter **0** for Y and Z.
locate the elevation line on the *XZ* plane	make the normal of the elevation line parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the elevation line	enter a new value for Rotation Angle.

5 Click OK.

To update an existing elevation created from this elevation line, see "Updating a 2D or 3D Elevation" on page 2180.

Attaching Hyperlinks, Notes and Files to an Elevation Line

Use this procedure to add hyperlinks, enter notes and attach reference files to an elevation line. You can also edit notes and edit or detach reference files from an elevation line.

1 Double-click the elevation line you want to attach notes or files to.
2 On the Properties palette, click the Extended Data tab.
3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD Command Reference*.

4 To add a note, click next to Notes, enter text, and click OK.

5 Click next to Reference documents, and then attach, detach, or edit a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6 Click OK.

Creating a 2D or 3D Elevation

Use this procedure to create a 2D or 3D elevation. After you draw an elevation line, you extract an elevation from the elevation line and the objects you select in the building model.

When you create a 2D elevation, the object that is created is a 2D Section/Elevation object. Both 2D sections and elevations share the same object type and style.

TIP Before you create an elevation, thaw and turn on all layers of objects in the building model that you want to include in the elevation. Objects on layers that are off or frozen cannot be part of the selection set for the elevation. To speed performance, turn off the layers of the objects that you do not need to include in the elevation.

1 Draw an elevation line in the drawing.

For more information, see "Drawing an Elevation Line and Mark" on page 2160.

2 Select the elevation line, right-click, and click Generate Elevation.

3 Select the type of elevation object you want to create:

If you want to create . . .	Then . . .
a 2D elevation	select 2D Section/Elevation Object with Hidden Line Removal.
a 3D elevation	select 3D Section/Elevation Object.

4 For Style to Generate, select a style for a 2D elevation.

If you want to use a particular style, select it from Style to Generate. Otherwise, use the Standard style. For more information, see "2D Elevation Styles" on page 2182.

3D elevations do not use styles.

5 Under Selection Set, click (Select Objects), select the objects that you want to include in the elevation, and press ENTER.

NOTE If you select an object that you do not want to include in the elevation, press and hold SHIFT and select the object again to remove it from the selection set.

6 Under Display Set, select a display set for the elevation object.

The display set controls the representation of the elevation.

7 Under Placement, select New Object, and specify where to place the elevation:

If you want to . . .	Then . . .
specify a location graphically	click (Pick Point), and specify the location for the new elevation object in the drawing.
specify the coordinates of the insertion point for the elevation	enter *X, Y,* and *Z* coordinates for the location of the new elevation object.

8 Click OK.

A 2D or 3D elevation is created from the elevation line properties and the selected objects in the building model. The elevation is linked to the

building model. If you make changes to the building model after you create the elevation, you can update the elevation to reflect the changes. For more information, see "Updating a 2D or 3D Elevation" on page 2180.

You can edit certain characteristics of the elevation to control its placement and appearance. For more information, see "Editing a 2D or 3D Elevation" on page 2169.

You can also use a 2D section/elevation style to control the display of selected objects in a 2D elevation, and you can control the display of individual lines in a 2D elevation. For more information, see "2D Elevation Styles" on page 2182 and "Editing and Merging Linework in a 2D Elevation" on page 2177.

Editing a 2D or 3D Elevation

After you create an elevation, you can edit the elevation line and the elevation object to refine the appearance of the elevation:

- Edit the elevation line to add, remove, or modify graphic subdivisions.
- Display a different area of the building model by reversing the elevation.
- Place the elevation in a different location in the drawing.
- Add notes or reference files to the elevation.
- Select a different style for 2D elevations. An elevation style determines how the linework in a 2D elevation is displayed.
- Edit a 2D elevation object to change the display properties of selected linework or to add linework and details that are not part of the building model.

In addition, you can continue to modify the building model and then update the elevation to incorporate the changes.

Related Topics and Procedures

- Changing the Display of Graphic Subdivisions in a 2D Elevation
- Changing the Display of Graphic Subdivisions in a 3D Elevation
- Reversing a 2D or 3D Elevation
- Changing the Style of a 2D Elevation
- Creating a Material Boundary in a 2D Elevation
- Editing a Material Boundary
- Editing and Merging Linework in a 2D Elevation
- Changing the Location of a 2D or 3D Elevation

Changing the Display of Graphic Subdivisions in a 2D Elevation

Use this procedure to change the display of subdivisions in a 2D elevation by changing its display properties.

You create subdivisions by adding them to the elevation line. You can then change their length using grips or by editing the values in the elevation line properties. For more information, see "Creating Graphic Subdivisions for 2D and 3D Elevations" on page 2164.

Each subdivision in a 2D elevation is assigned to a numbered subdivision display component in the display properties of the elevation or the 2D elevation style. You can control the visibility, layer, color, linetype, lineweight, and linetype scale of each subdivision by changing the display properties of each component. You can apply these changes to the selected elevation, to the current 2D section/elevation style, or to all 2D sections and elevations in the drawing that do not have a style override.

You can use the display properties of a subdivision together with the display properties of a material. For more information, see "Use Subdivision Properties and Materials in 2D Elevation Styles" on page 2190.

1. Select the 2D elevation in the drawing, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the property source to edit:

If you want to edit graphic subdivisions . . .	Then . . .
for all 2D sections and elevations in the current drawing (except those that have a 2D Section/Elevation Style override)	select Drawing Default.
for all 2D sections and elevations that use the current style	select 2D Section/Elevation Style, and click Object Override.
for the selected 2D elevation	Select 2D Section/Elevation, and click Object Override.

4 If necessary, click .

5 Click the Layer/Color/Linetype tab to list all the components that contribute to the display of the object.

6 Turn the visibility on or off, and change the layer, color, linetype, lineweight, or linetype scale as needed for each subdivision component.

7 Click the Other tab to add a custom display component to the display of the 2D elevation.

For more information about adding custom display components, see "Adding a Display Component to a 2D Elevation Style" on page 2185.

8 Click OK twice.

Changing the Display of Graphic Subdivisions in a 3D Elevation

Use this procedure to change the display of subdivisions in a 3D elevation by changing its display properties.

You create the subdivisions by adding them to the elevation line. You can then change their length using grips or by editing the values in the elevation line properties. For more information, see "Creating Graphic Subdivisions for 2D and 3D Elevations" on page 2164.

Each subdivision in a 3D elevation is assigned to a numbered subdivision display component in the display properties of the elevation. You can control the visibility, layer, color, linetype, lineweight, and linetype scale of each subdivision by changing the display properties of each component. You can apply these changes to the selected 3D elevation or to all 3D elevations in the drawing.

1 Select the 3D elevation in the drawing, right-click, and click Edit Object Display.

2 Click the Display Properties tab.

3 Select the Subdivisions display representation.

4 Select the property source to edit:

If you want to edit graphic subdivisions . . .	Then . . .
for all 3D elevations in the current drawing	select Drawing Default.

If you want to edit graphic subdivisions . . .	Then . . .
for the selected 3D elevation	select Bldg Section, and click Object Override.

5 If necessary, click .

6 Click the Layer/Color/Linetype tab to list all the components that contribute to the display of the object.

The defining line represents the cutting plane of the elevation line. The numbered subdivision components correspond to subdivisions added to the elevation line. For example, the display component Subdivision 1 corresponds to the subdivision closest to, but not on, the cutting plane of the elevation line.

7 Turn the visibility on or off, and change the layer, color, linetype, lineweight, or lineweight scale as needed for each subdivision component.

8 Click OK twice.

Reversing a 2D or 3D Elevation

Use this procedure to reverse the direction of an elevation by reversing the elevation line and updating the elevation.

The direction of the elevation is determined by the direction in which you drew the elevation line. You can select the elevation line in plan view to see the bounding box that defines the area of the model included in the elevation. If the box does not include the area of the model that you intended, you can reverse the elevation line. If you have already created an elevation from the elevation line, update the elevation after reversing the elevation line.

1 Select the elevation line that you used to create the elevation, right-click, and click Reverse.

The elevation line is mirrored about its own axis, as is the bounding box with its original parameters.

2 Select the existing elevation, right-click, and click Regenerate.

NOTE If you do not need to respecify the objects to include in the elevation, you can click Refresh instead of Regenerate. This immediately updates the elevation.

3 If you need to include different objects in the updated elevation, click (Reselect Objects), select the objects, and press ENTER.

4 Click OK.

Changing the Style of a 2D Elevation

Use this procedure to select a different style for a 2D elevation. A 2D section/elevation style controls the appearance of any 2D elevation object to which the style is applied.

1 Double-click the elevation you want to change.

2 On the Properties palette, expand Basic, and expand General.

3 Select a new style for the elevation.

Creating a Material Boundary in a 2D Elevation

Use this procedure to create a material boundary in a 2D elevation.

1 Draw a polyline around the area in the elevation that you want to mask or to highlight.

2 Select the elevation, right-click, and click Material Boundary ➤ Add.

3 Select the polyline.

4 Enter **y** (Yes) to erase the polyline, or **n** (No) to keep the polyline in the drawing.

5 Specify the settings of the material boundary:

If you want to . . .	Then . . .
highlight the area inside the polyline	select Limit for Purpose.
mask (erase) the area inside the polyline	select Erase for Purpose.
apply the highlight or mask only to specific parts of the elevation	select the appropriate parts for Apply to. You can choose Surface Hatch, Edge Linework, and All Linework.
apply the material boundary to all materials used in the elevation	select All Materials for Material Selection.
apply the material boundary only to selected materials	select Specific Materials for Material Selection and then select the appropriate materials in the list below.

6 Click OK.

Editing a Material Boundary

You can edit existing material boundaries in two ways:

- Change the content within the material boundary. For example, you can determine of you want to see only brick hatching, or both brick and glass hatching.
- Change the shape of the material boundary. For example, you can make the boundary bigger or smaller, or add additional rings and vertex points to it.

Related Procedures

- Editing the Content of a Material Boundary
- Adding a Vertex to a Material Boundary
- Removing a Vertex from a Material Boundary
- Adding a Ring to a Material Boundary
- Removing a Ring from a Material Boundary
- Replacing a Ring from a Material Boundary with Another

Editing the Content of a Material Boundary

Use this procedure to change the content of a material boundary. The content includes such settings as materials displayed, hatch types, and boundary type.

1 Select the material boundary to change, right-click, and click Material Boundary ➤ Edit In Place.

   You are now in the in-place edit mode. The selected boundary is highlighted and the grips are displayed.

2 Right-click, and click Edit Material Boundary.

3 Specify the content of the material boundary:

If you want to . . .	Then . . .
highlight the area inside the boundary	select Limit for Purpose.
mask (erase) the area inside the boundary	select Erase for Purpose.

If you want to . . .	Then . . .
apply the highlight or mask only to specific parts of the elevation	select the appropriate parts for Apply to. You can choose Surface Hatch, Edge Linework, and All Linework.
apply the material boundary to all materials used in the elevation	select All Materials for Material Selection.
apply the material boundary only to selected materials	select Specific Materials for Material Selection, and then select the appropriate materials from the list below.

4 Click OK.

5 Select the material boundary again, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Adding a Vertex to a Material Boundary

Use this procedure to add a vertex to a material boundary.

1 Select the material boundary to which you want to add a vertex, right-click, and click Material Boundary ➤ Edit In Place.

You are now in the in-place edit mode. The selected boundary is highlighted and the grips are displayed.

2 Right-click, and click Add Vertex.

3 Specify the point at which to add a vertex.

4 Specify additional vertex points.

5 Press ENTER.

6 Select the material boundary again, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Removing a Vertex from a Material Boundary

Use this procedure to remove a vertex from a material boundary.

1 Select the material boundary from which you want to remove a vertex point, right-click, and click Material Boundary ➤ Edit In Place.

You are now in the in-place edit mode. The selected boundary is highlighted and the grips are displayed.

2 Right-click, and click Remove Vertex.

3 Specify the vertex points to remove.

4 Remove additional vertex points as needed.

5 Press ENTER.

6 Select the material boundary again, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Adding a Ring to a Material Boundary

Use this procedure to add a ring to a material boundary.

A material boundary can consist of more than one closed polyline. For example, you could use one polyline to highlight a wall detail, and another polyline to highlight a window detail in another location.

1 Draw a polyline for the new material boundary ring.

2 Select the material boundary to add a new ring to, right-click, and click Material Boundary ➤ Edit In Place.

You are now in the in-place edit mode. The selected boundary is highlighted and the grips are displayed.

3 Right-click, and click Add Ring.

4 Select the polyline you drew in step 1.

5 Enter **y** (Yes) to erase the polyline, or **n** (No) to keep the polyline in the drawing.

6 Select the material boundary again, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Removing a Ring from a Material Boundary

Use this procedure to remove a ring from a material boundary.

A material boundary can consist of more than one closed ring. You can individually remove each ring.

NOTE You cannot remove the last ring from a material boundary.

1 Select the material boundary to change, right-click, and click Material Boundary ➤ Edit In Place.

You are now in the in-place edit mode. The selected boundary is highlighted and the grips are displayed.

2 Right-click, and click Remove Ring.

3 Select the ring you want to remove.

4 Select the material boundary again, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Replacing a Ring from a Material Boundary with Another

Use this procedure to replace a ring from a material boundary with a different ring.

1 Draw the polyline to replace one of the existing material boundary rings.

2 Select the material boundary where you want to replace a ring, right-click, and click Material Boundary ➤ Edit In Place.

You are in the in-place edit mode now. The selected boundary is highlighted and the grips are displayed.

3 Right-click, and click Replace Ring.

4 Select the ring to be replaced with another ring.

5 Select the closed polyline you drew in step 1.

6 Enter **y** (Yes) to erase the polyline, or **n** (No) to keep the polyline in the drawing.

7 Select the material boundary again, right-click, and click Save Changes to save the changes you made, or click Discard All Changes to undo the changes to the material boundary.

Editing and Merging Linework in a 2D Elevation

After you create a 2D elevation, you can edit the display of individual lines that make up the elevation. For example, you may want to assign linework for small details to a display component with a lighter lineweight, so that the details are not obscured when plotted.

You can also merge existing geometry into the elevation.

Related Procedures

- Editing Linework in a 2D Elevation
- Merging Linework into a 2D Elevation

Editing Linework in a 2D Elevation

Use this procedure to edit individual lines in a 2D elevation by assigning them to display components in the elevation.

You can assign selected linework to fixed display components that determine the display of every elevation that you generate, or you can assign linework to display components that you have defined. For information about adding custom display components, see "Adding a Display Component to a 2D Elevation Style" on page 2185. After you assign linework to display components, you can change the display properties (visibility, color, layer, lineweight, linetype, and linetype scale) to change the display of lines.

1. Select the elevation to be changed, right-click, and click Linework ➤ Edit.
2. Select the lines that you want to assign to a display component, right-click, and click Modify Component.

   A list of available display components is displayed.
3. Select the component you want to put the lines on.

   For example, if you want to make the lines invisible, select Erased Vectors for Linework Component.

   You can also click (Match existing linework), and select linework in the elevation whose display component you want to match.
4. Click OK.
5. To finish the linework editing process, select any line in the elevation, right-click, and select Edit in Place ➤ Save Changes to save the changes you made, or click Edit in Place ➤ Discard Changes to undo your linework changes.

Merging Linework into a 2D Elevation

Use this procedure to merge geometry into a 2D elevation. When you merge linework into an elevation, you assign additional linework to a display component of an elevation. Use this feature when you want to add detail, or add linework that you did not model.

1. Draw the geometry that you want to merge into a 2D elevation.
2. Select the 2D elevation to be changed, right-click, and click Linework ➤ Merge.
3. Select the geometry to merge into the elevation, and press ENTER.
4. Select the display component to assign the linework to.

   You can also click (Match existing linework) and select linework in the elevation whose display component you want to match.
5. Click OK.

The linework is merged into the 2D elevation. When you select the elevation, the linework is selected with it.

Changing the Location of a 2D or 3D Elevation

You can relocate an elevation by changing the coordinate values of its insertion point. The elevation also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the elevation are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the elevation by aligning its normal with another axis. You can also rotate the elevation on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Using Coordinates and Coordinate Systems" in the online *AutoCAD User's Guide*.

1. Double-click the elevation you want to move.
2. On the Properties palette, expand Basic, and expand Location.
3. Click Additional Information.
4. Specify a new location or rotation:

If you want to . . .	Then . . .
relocate the elevation	enter new coordinate values under Insertion Point.
locate the elevation on the *XY* plane	make the normal of the elevation parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the elevation on the *YZ* plane	make the normal of the elevation parallel to the *X* axis: under Normal, enter **1** for X, and enter **0** for Y and Z.
locate the elevation on the *XZ* plane	make the normal of the elevation parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the elevation	enter a new value for Rotation Angle.

5. Click OK.

Attaching Hyperlinks, Notes, and Files to a 2D or 3D Elevation

Use this procedure to add hyperlinks, enter notes, and attach reference files to a 2D or 3D elevation. You can also edit notes and edit or detach reference files from a 2D or 3D elevation.

1. Double-click the 2D or 3D elevation you want to attach notes or files to.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD Command Reference*.

4. To add a note, click next to Notes, enter text, and click OK.
5. Click next to Reference documents, and then attach, detach, or edit a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6. Click OK.

Updating a 2D or 3D Elevation

Use this procedure to regenerate a 2D or 3D elevation to reflect changes you have made to the building model or to elevation line properties. For 2D elevations, you also update the elevation to show changes made to the 2D elevation style. You can update a 2D or 3D elevation if you have not exploded the elevation, which destroys the link between the elevation and the building model.

When you update an elevation, you can add or remove objects from the elevation, change the location of the elevation in the drawing, and change the display set of the elevation.

If you do not need to change the elevation definition in any way, you can skip the following procedure. Instead, right-click the elevation you want to update, and click Refresh.

1. Select the elevation you want to update, right-click, and click Regenerate.
2. Select a result type:

If the elevation is . . .	Then . . .
a 2D elevation object	select 2D Section/Elevation Object with Hidden Line Removal.
a 3D elevation object	select 3D Section/Elevation Object.

3. To change the style of a 2D elevation, select a new style for Style to Generate.
4. If you edited linework in the 2D elevation, select a style in which to save the changes you made that cannot be reapplied.

   Select a style that distinguishes the unapplied changes in the elevation.

5. Under Selection Set, specify the objects that you want to include in the elevation:

If you want to . . .	Then . . .
use the objects in the selection set you specified when you created the elevation or when you previously updated it	proceed to the next step.
add new objects to the selection set that you specified when you created the original elevation	click Select Additional Objects, select the new objects in the drawing, and press ENTER.
select a new selection set of objects for the elevation	click Reselect Objects, select a new selection set of objects for the elevation, and press ENTER.

NOTE If you select an object that you do not want to include in the elevation, press and hold SHIFT and select the object again to remove it from the selection set.

6 Under Display Set, select a display set for the elevation.

7 Under Placement, locate the elevation in the drawing:

If you want to . . .	Then . . .
create a new elevation object without overwriting the original object	select New Object, and either click to specify an insertion point in the drawing area, or enter X, Y, and Z coordinates for the new elevation.
replace the original elevation with the updated elevation	select Replace Existing.

8 Click OK.

2D Elevation Styles

A 2D section/elevation style is a group of properties assigned to a 2D elevation that determines the appearance and other characteristics of that object.

Using 2D Elevation Styles

A 2D section/elevation style controls the linework in an elevation, using design rules that determine how different parts of the elevation are displayed. You can apply the style to one or more elevations to control their appearance. You can also change the display of individual lines in the elevation, and save the changes in a 2D section/elevation style.

Display Components and Design Rules

Display components determine the graphical characteristics, such as color and linetype, of linework assigned to each display component. Design rules determine how the linework in an elevation is assigned to display components.

When you create a design rule, you specify the part of the 2D elevation to control based on the color of those objects in the building model and their context in the elevation. You then select the display component to use for linework that meets the criteria you specified. You can assign the linework to a default display component or to a custom display component that you

have added to the style. For example, you might define a rule that assigns all objects that are color 150 in the model and located along the elevation line to a custom display component named Darker that you created in the style. Or you might hide a staircase behind a wall using a rule that assigns all blue linework to the Hidden display component.

Managing 2D Elevation Styles

To create, edit, copy, or purge styles, you access the Style Manager. The Style Manager provides a central location in Autodesk Architectural Desktop to work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager."

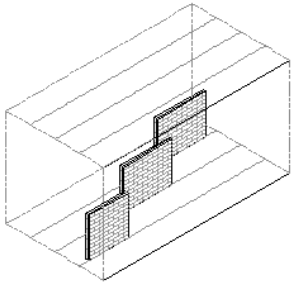
Materials and 2D Elevation Styles

Two-dimensional elevation styles offer an easy way to assign materials to 2D elevation objects. You can specify which section components should have its display controlled by materials and which do not. Custom components cannot have any material assignments.

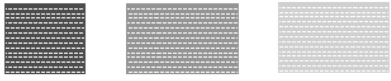
Subdivisions in 2D Elevation Styles and Materials

When you are creating subdivisions in your style, you usually want the objects in them to be visually distinct from other subdivisions. When you have assigned materials to the objects, you can set the 2D elevation style so that it uses the hatch pattern from the material, but the color and linetype from the subdivision display properties.

Elevation subdivisions with assigned surface hatching



Three brick walls
in different elevation
subdivisions



2D elevation surface hatch
from material, color and
linetype from subdivisions

Related Topics and Procedures

- Creating a 2D Elevation Style
- Adding a Display Component to a 2D Elevation Style
- Removing a Display Component from a 2D Elevation Style
- About 2D and 3D Elevation Display Components and Materials
- Use Subdivision Properties and Materials in 2D Elevation Styles
- Use the 3D Body Component of a Material for the 2D Elevation Linework
- Adding a Design Rule to a 2D Elevation Style
- Changing a Design Rule in a 2D Elevation Style
- Removing a Design Rule from a 2D Elevation Style
- Adding Classifications to a 2D Elevation Style
- Changing the Layer, Color, and Linetype of a 2D Elevation Style
- Attaching Notes and Files to a 2D Elevation Style

Creating a 2D Elevation Style

Use this procedure to create a 2D elevation style. You can create a style using default style properties or by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand 2D Section/Elevation Styles.
3. Create a new 2D elevation style:

If you want to create a style . . .	Then . . .
using default properties	right-click 2D Section/Elevation Styles, and click New.
style from an existing style	right-click the 2D elevation style you want to copy, and click Copy. Right-click, and click Paste.

4. Enter a name for the new 2D elevation style, and press ENTER.
5. To edit the 2D elevation style, right-click the style, and click Edit:

If you want to . . .	Then . . .
add display components to the style	see "Adding a Display Component to a 2D Elevation Style" on page 2185.

If you want to . . .	Then . . .
remove display components from the style	see "Removing a Display Component from a 2D Elevation Style" on page 2186.
use the subdivision properties of the elevation for the display	see "Use Subdivision Properties and Materials in 2D Elevation Styles" on page 2190.
use the 3D Body component of the material for the elevation linework	see "Use the 3D Body Component of a Material for the 2D Elevation Linework" on page 2191.
add design rules to the style	see "Adding a Design Rule to a 2D Elevation Style" on page 2192.
change design rules in the style	see "Changing a Design Rule in a 2D Elevation Style" on page 2193.
add classifications to a style	see "Adding Classifications to a 2D Elevation Style" on page 2194.
change the display properties of the display components in the style	see "Changing the Layer, Color, and Linetype of a 2D Elevation Style" on page 2194.
add notes, files, or documents to the style	see "Attaching Notes and Files to a 2D Elevation Style" on page 2195.

6 Click OK twice.

You can click Apply instead of OK to save the changes and continue working in the Style Manager.

Adding a Display Component to a 2D Elevation Style

Use this procedure to add a custom display component to a 2D elevation style. After you add a component, you assign linework in the elevation to the new component. To apply these style changes to existing 2D elevations, you must update the elevation.

2D elevations include the following default display components: Defining Line, Hidden, Erased, Unknown, and Subdivision.

1 Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.

2 Click the Components tab

3 Click Add.

4 Enter a name and a description for the new component.

To enter a name, click Unnamed and enter a new name. To enter a description, click in the Description column next to the name, and enter a description.

5 Click the Display Properties tab.

6 Select 2D Section/Elevation Style for the property source, and click .

7 Click the Layer/Color/Linetype tab.

8 Specify the display properties of the new component.

9 Click OK twice.

To create a design rule that uses the new display component, see "Adding a Design Rule to a 2D Elevation Style" on page 2192. To manually assign linework to the display component, see "Editing Linework in a 2D Elevation" on page 2177.

Removing a Display Component from a 2D Elevation Style

Use this procedure to remove a custom display component from a 2D elevation style. Removing a display component also removes any design rules that use the component. You cannot remove the default display components.

1 Select a elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.

2 Click the Components tab.

3 Select the component that you want to remove, and click Remove.

If the component is used in a design rule, the associated design rule is removed as well.

4 Click OK.

5 Update the elevation to apply the style changes to the elevation.

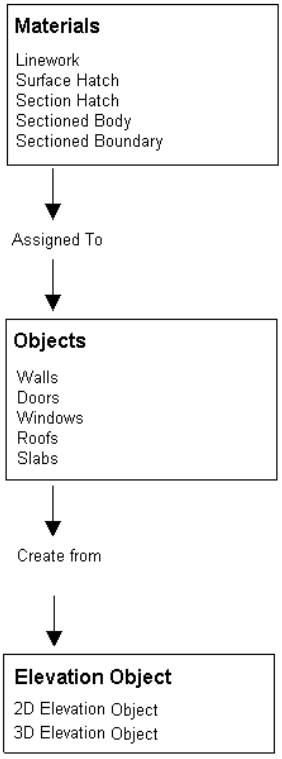
For more information, see "Updating a 2D or 3D Elevation" on page 2180.

About 2D and 3D Elevation Display Components and Materials

A 2D and 3D elevation object consists of a number of display components that can be determined by materials. When you assign materials to an object,

you assign one material to each display component of the object. For example, you assign a wood material to the frame of a window and a glass component to the glass of a window.

When you create a 2D or 3D elevation object from building objects, the material assignments of the source objects are applied to the elevation. You do not assign a material directly to a 2D/3D elevation. The elevation takes its material assignments from the objects. For example, if you create an elevation of a wall with a window, the surface hatches you have defined in the glass, wood, and brick materials of the wall and the window are displayed in the elevation object.



If you do not want to use the material display properties, but instead use those of the 2D or 3D elevation object or the 2D elevation style, you can deactivate the material assignments in the display properties of the elevation or the elevation style.

Material definitions consist of display components that correspond to component types of objects. For example, the Linework component of a material

is used for all linework of objects in Plan view. The Surface Hatch component of a material is used to hatch all object surfaces in 3D model views and elevations.

For a complete list of material components and their description, see "Material Components and Display Properties" on page 498.

The following table lists elevation components plus information about the material components that determine them.

NOTE An elevation is technically the same object as a section, and has the same display components as a section. The following topics describe the display components most relevant to elevations. For a complete list of all section and elevation components, see "About 2D and 3D Section Display Components and Materials" on page 2132.

2D Elevation Component	Material Component
Surface Hatch Linework	Surface Hatch
HIdden	No Material
Erased	No Material
Subdivision 1-10	2D Section/Elevation Linework or 3D Body. For information on switching between these material components, see "Use the 3D Body Component of a Material for the 2D Elevation Linework" on page 2191.

Related Topics

- Surface Hatch Linework
- Hidden Component
- Erased Component
- Subdivision Components

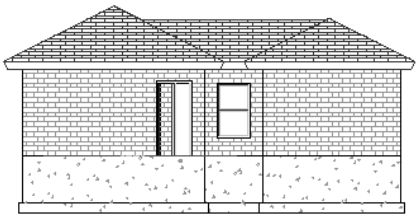
Surface Hatch Linework

The Surface Hatch Linework component draws all linework coming from surface hatches of the objects in the elevation. This component is specific to 2D elevations.

NOTE Surface hatches you have assigned to objects display in a 3D elevation object. However, you cannot set them separately in a 3D elevation; you can do that only in a 2D elevation object.

The surface hatch linework component is controlled by the surface hatch component of the material. For information about the surface hatch component of the material, see "Surface Hatch Material Component" on page 500.

2D elevation with building roof, wall, and foundation surface hatching



Hidden Component

The Hidden component contains all linework that is hidden in the 2D projection because other components are in front of it. By default, this component is turned off. You can use design rules to achieve special effects, such as a see-through effect, using the Hidden component. The Hidden component is specific to 2D elevations.

The Hidden component cannot be defined by a material component. You can only set it in the display properties of the 2D elevation. For information on setting the display properties of a 2D elevation, see "Changing the Layer, Color, and Linetype of a 2D Elevation Style" on page 2194.

Erased Component

The Erased component contains linework in the elevation object that you do not want to see. For example, if you have an elevation of a window front with three windows, but you want to display only one (for a higher level of abstraction), edit the linework of the elevation and assign the linework of the remaining two windows to the Erased component. Because the Erased component is turned off by default, the two windows do not display. For information on linework editing of an elevation, see "Editing Linework in a 2D Elevation" on page 2177.

The hidden component is specific to 2D elevations, and cannot be defined by a material component.

Subdivision Components

The subdivision components partition an elevation object. They are useful to create perspective effects, where parts closer to the viewer are drawn with darker, stronger lines and parts farther from the user are drawn with lighter, thinner lines. Subdivisions can have no individual material assignments. However the display properties of the subdivisions can be used for the surface hatching of the subdivisions by selecting Use Subdivision Properties for Surface Hatching in the Other tab of the 2D elevation display properties. For information on using the subdivision display properties to display the elevation divisions, see "Use Subdivision Properties and Materials in 2D Elevation Styles" on page 2190.

Subdivisions are a display component of both 2D and 3D elevation objects.

The subdivision components are either controlled by the 2D Section/Elevation Linework component of the material or by the 3D Body component of a material. For information on how to switch between these component assignments, see "Use the 3D Body Component of a Material for the 2D Elevation Linework" on page 2191.

Use Subdivision Properties and Materials in 2D Elevation Styles

Use this procedure to use the display properties of materials together with the display properties of elevation subdivisions.

1. Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Display Properties tab.
3. Select 2D Section/Elevation Style for the property source, and click Style Override.
4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. To set a subdivision to use the surface hatch of the material, while using the layer, color, and linetype display properties of the subdivision, clear By Material, and specify the layer, color and linetype settings of the subdivision.

   For example, the first subdivision could have a darker color and stronger linetype the second subdivision.
7. Click the Other tab.

8 Select Use Subdivison Properties for Surface Hatching.

9 Click OK twice.

Use the 3D Body Component of a Material for the 2D Elevation Linework

Use this procedure to use the 3D Body component of a material for the linework in a 2D elevation.

1 Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.

2 Click the Display Properties tab.

3 Select 2D Section/Elevation Style for the property source, and click Style Override.

4 If necessary, click .

5 Click the Other tab.

6 Determine if the 3D body component of the selected material should control the display of the linework in the 2D elevation:

If you want to control the display . . .	Then . . .
of the 2D elevation linework by the 3D Body component of the material	select Use 3D Body Display Component for By Material Linework.
of the 2D elevation linework by the 2D Section/Elevation Linework component of the material	deselect Use 3D Body Display Component for By Material Linework. This is the default behavior.

7 Click OK twice.

Adding a Design Rule to a 2D Elevation Style

Use this procedure to add a design rule to a 2D elevation style. A design rule has four fields of information that identify lines in the elevation and determine how to display them:

Field	Description
Color	Identifies the color of the objects in the building model presented by the lines in the elevation
Context	Identifies the context of the lines in the elevation, such as in a graphic subdivision
Component	Identifies the display component to which the lines are assigned
Description	Contains a description of the design rule

For example, a design rule has the color 50, a context of Within Subdivision 2, and a component of New. This rule assigns any lines in the elevation representing objects that have the color 50 in the building model and that are within subdivision 2 in the elevation to the user-defined display component, New.

1. Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Design Rules tab, and click Add.

   A new design rule is created with default color, context, and component values.

3. Specify settings for the new design rule:

If you want to . . .	Then . . .
specify the color of objects in the building model that are affected by this rule	click the default color, select a new color, and click OK.
specify the context in which the linework for the objects appears in the elevation	click the default context, and select a new context.

If you want to . . .	Then . . .
select the display component for the linework	click the default component, and select a new component.
enter a description of the rule	click the Description field, enter a description, and press ENTER.

4 Click OK.

5 Update the elevation to apply the style changes to the elevation.

For more information, see "Updating a 2D or 3D Elevation" on page 2180.

Changing a Design Rule in a 2D Elevation Style

Use this procedure to change the settings in the fields that define a design rule.

1 Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.

2 Click the Design Rules tab.

3 Specify settings for the design rule you want to change:

If you want to . . .	Then . . .
specify the color of objects in the building model that are affected by this rule	click the current color, select a new color, and click OK.
specify the context in which the linework for the objects appears in the elevation	click the current context, and select a new context.
select the display component for the linework	click the current component, and select a new component.
edit the description of the rule	click the description, edit the description, and press ENTER.

4 Click OK.

5 Update the elevation to apply the style changes to the elevation.

For more information, see "Updating a 2D or 3D Elevation" on page 2180.

Removing a Design Rule from a 2D Elevation Style

Use this procedure to remove a design rule from a 2D elevation style.

1. Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Design Rules tab.
3. Select the rule that you want to remove, and click Remove.
4. Click OK.
5. Update the elevation to apply the style changes to the elevation.

For more information, see "Updating a 2D or 3D Elevation" on page 2180.

Adding Classifications to a 2D Elevation Style

Use this procedure to specify classifications for any classification definition applied to a 2D elevation style.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1. Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Classifications tab.

   By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to 2D elevation styles.
3. For each classification definition, select the classification you want to apply to the current 2D elevation style.
4. Click OK twice.

Changing the Layer, Color, and Linetype of a 2D Elevation Style

Use this procedure to change the following display properties of a 2D elevation style:

- Visibility (component is on or off)

- Display properties by materials
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

NOTE The custom display components in the display properties are identical to those listed on the Components tab of the 2D Section/Elevation Styles dialog box. For more information about custom display components, see "Adding a Display Component to a 2D Elevation Style" on page 2185.

1. Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.
2. Click the Display Properties tab.
3. Select 2D Section/Elevation Style for the property source, and click Style Override.
4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Select By Material for any component that you want to use the display properties of the materials assigned to the elevation objects.

   NOTE Not all display components of a 2D elevation have an associated material definition. For example, Hidden and Erased cannot be set by material. For a list of all display components and their associated material components, see "About 2D and 3D Elevation Display Components and Materials" on page 2186.

8. Click OK twice.

Attaching Notes and Files to a 2D Elevation Style

Use this procedure to enter notes and attach reference files to a 2D elevation style. You can also edit notes and edit or detach reference files attached to the style.

1. Select an elevation that has the style you want to change, right-click, and click Edit 2D Section/Elevation Style.

2 Click the General tab.

3 To add a description to the 2D elevation, enter the description under Description.

4 Click Notes.

5 To add or edit a note, click the Notes tab, and enter the note.

6 To attach, edit, or detach a reference file, click the Reference Docs tab:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK when you are done editing.
detach a reference file	select the file name, click Delete, and click OK.

7 Click OK twice.

Schedules

30

Schedules are tables in your drawings that list information about selected components in your building model. You can create different types of schedules in Autodesk®Architectural Desktop by attaching property set data to objects and object styles, and then extracting and displaying the data in a schedule table.

Creating Schedules in Autodesk Architectural Desktop

The following elements allow you to create schedules in Autodesk®Architectural Desktop:

- schedule tables and schedule table styles
- property set definitions
- property data formats
- schedule tags

Updating Schedules

Because the property set data is attached to objects and styles, you can create and update schedules at any stage of a project. Rather than waiting until the end of a project to create schedules, you can create preliminary schedules and update them to reflect changes in your drawings.

Schedule Tables and Schedule Table Styles

A *schedule table* is an object that provides the tabular representation of the property data in your drawing. A *schedule table style* specifies the objects that can be included in a schedule table. The style also determines the object properties reported in the table and controls formatting such as text height and spacing, columns, and headers. The display properties of the schedule

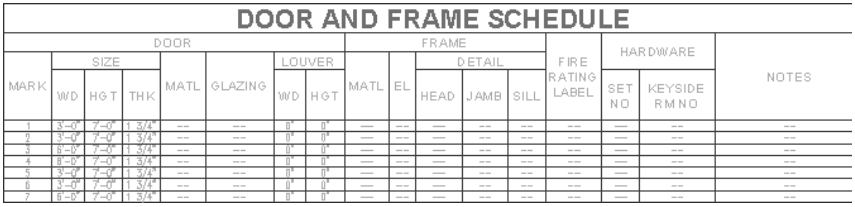
In this chapter

- Property Sets and Property Set Definitions
- Process Overview: Creating Schedules
- Process Overview: Including Classification Data in Schedules
- Adding and Editing Property Set Data
- Creating and Editing Schedule Tables
- Adding Schedule Tags
- Custom Tags
- Property Set Definitions
- Schedule Table Styles
- Property Data Formats
- Classification Definitions
- Troubleshooting Schedule Tables
- Troubleshooting Schedule Table Styles
- Troubleshooting Classification

table control visibility, layer, color, linetype, lineweight, and linetype scale of its components.

Options in schedule table styles let you create both regular and matrix schedules. (Matrix schedules are sometimes called dot schedules.) You can also specify a matrix format for individual columns in a regular schedule.

Sample door schedule



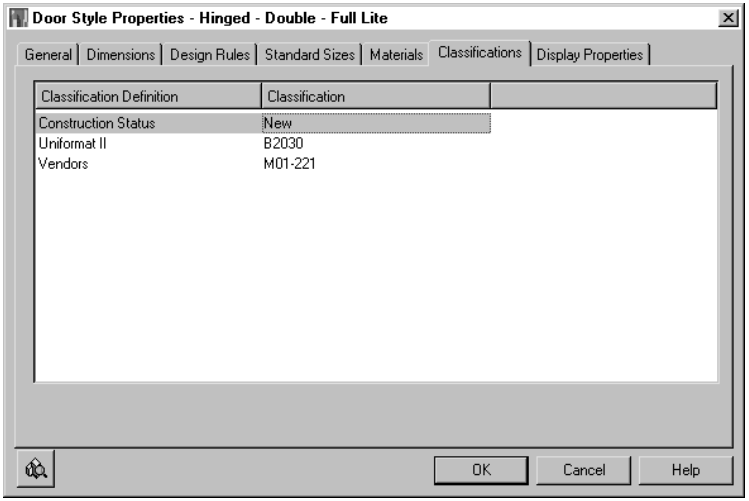
DOOR AND FRAME SCHEDULE

	DOOR							FRAME						HARDWARE		
	SIZE					LOUVER				DETAIL			FIRE RATING LABEL			
MARK	WD	HGT	THK	MATL	GLAZING	WD	HGT	MATL	EL	HEAD	JAMB	SILL		SET NO	KEYSIDE RMNO	NOTES
1	3'-0"	7'-0"	1 3/4"	--	--	0"	0"	--	--	--	--	--	--	--	--	--
2	3'-0"	7'-0"	1 3/4"	--	--	0"	0"	--	--	--	--	--	--	--	--	--
3	6'-0"	7'-0"	1 3/4"	--	--	0"	0"	--	--	--	--	--	--	--	--	--
4	6'-0"	7'-0"	1 3/4"	--	--	0"	0"	--	--	--	--	--	--	--	--	--
5	3'-0"	7'-0"	1 3/4"	--	--	0"	0"	--	--	--	--	--	--	--	--	--
6	3'-0"	7'-0"	1 3/4"	--	--	0"	0"	--	--	--	--	--	--	--	--	--
7	6'-0"	7'-0"	1 3/4"	--	--	0"	0"	--	--	--	--	--	--	--	--	--

Using Classifications in Scheduling

Classification definitions are groups of named properties or characteristics that you can assign to the objects of a particular style. Classifications enable you to track objects by construction status, project phase, building element, vendor, or other criteria.

Classification definitions applied to a door style



Related Topics and Procedures

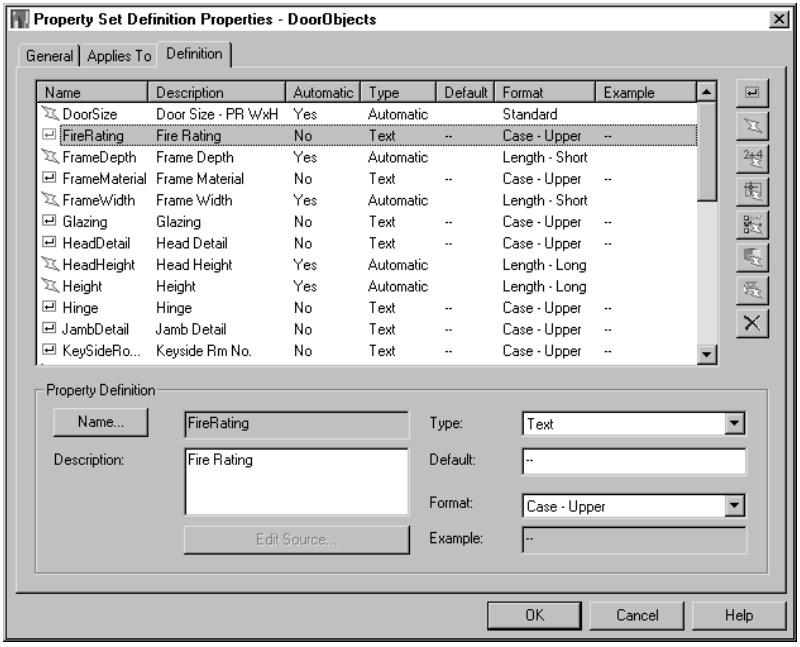
- Process Overview: Creating Schedules
- Adding and Editing Property Set Data

- Creating and Editing Schedule Tables
- Adding Schedule Tags
- Property Set Definitions
- Schedule Table Styles
- Property Data Formats
- Classification Definitions
- Troubleshooting Schedule Tables
- Troubleshooting Schedule Table Styles
- Troubleshooting Classification Definitions

Property Sets and Property Set Definitions

The data reported in a schedule table is collected from property sets that you attach to the objects or object styles you are scheduling. Properties contained in a property set are determined by the *property set definition*. A property set definition is a group of related properties of the objects and object styles to be reported in the schedule. Once attached to an object or its style, a property set becomes the container for the data associated with the object. Values for properties are obtained directly from the object or are entered manually for the object or the style.

A property set definition for a door object



Automatic and Manual Properties

AEC objects and styles have two types of properties:

- Automatic properties built into objects and styles when you create them. Examples are width, length, height, and data retrieved from other sources such as the project or the object's material.
- Manual properties are those that you enter explicitly, such as fire rating, manufacturer, or finish.

Automatic properties are available to include in your property set definitions. You must create manual properties and enter values for them when you attach the property set to the object or the style.

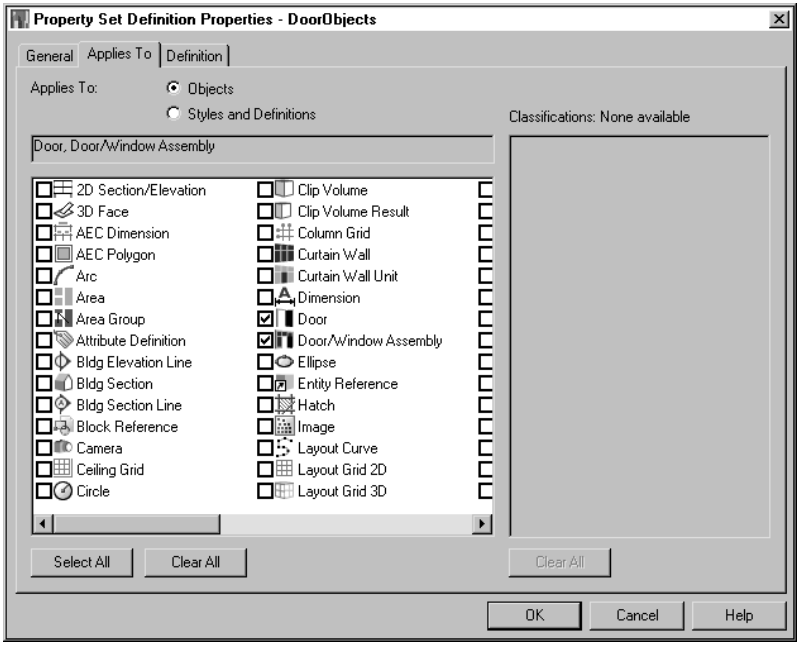
Applying Property Set Definitions to Objects and Styles

You create a property set definition for either objects or object styles. Manual properties that are likely to be different for each instance of an object belong in an object-based property set definition, while manual properties that will be the same for all instances of a style belong in a style-based property set definition.

Automatic properties are dynamically retrieved from the object. Most automatic properties should be put in a style-based property set definition, even

if values may vary for each instance of the object. For example, the properties "Door Width" and "Door Height" are extracted automatically from door objects. Placing these properties in a style-based property set definition provides a value for each door object of that style, and is more efficient than putting them in an object-based property set definition that you then attach to each door.

Defining a property set definition that applies to door objects



Property Data Formats

A *property data format* is applied to each definition within a property set definition. Property data formats specify how the data for each property displays in a schedule table, schedule tag, or the property palette. For example, you can use property data formats to display a door that is three feet wide, with a raw value of 36 units in a drawing, with inch units as 3'-0", or 3', or 3 ft. Property set definitions and schedule table styles use property data formats to control the format of values for each property.

Schedule Tags and Property Set Data

You can use tags in your drawings to graphically display an object's property data. You can report property data in the tag by linking it to a property in a property set. When you anchor the tag to an object to which the property set

is applied, the value of the property displays in the tag. The information in the tag is updated if the object or property changes.

NOTE Property data values are not contained in the schedule tag, but on the object itself. The schedule tag simply displays values retrieved directly from the object to which it is anchored.

Predefined Content for Creating Schedules

You can access default tags and property set definitions in drawings located in *C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\AEC Content\Imperial or Metric\Documentation\Schedule Tags*.

You can access schedule table styles in drawings located in *C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\Styles*.

You can use this content to create typical schedules, such as door and window schedules, and room finish schedules. You can also use this content as the basis for custom schedules.

Related Topics and Procedures

- Process Overview: Creating Schedules
- Process Overview: Including Classification Data in Schedules
- Adding and Editing Property Set Data
- Creating and Editing Schedule Tables
- Adding Schedule Tags
- Property Set Definitions
- Schedule Table Styles
- Property Data Formats
- Troubleshooting Schedule Tables
- Troubleshooting Schedule Table Styles

Process Overview: Creating Schedules

If you create schedule tables from schedule table styles provided with Autodesk® Architectural Desktop, the property set definitions and property data formats used in the schedule table style are already created for you. You can begin the process of creating a schedule from Step 4.

To create schedules, use the following steps:

Step 1: Create or modify property data formats.

These styles determine how data is displayed in a schedule table.

Step 2: Create or modify property set definitions for objects or object styles.

Property set definitions determine the data listed for each object.

Step 3: Create or modify schedule table styles.

Schedule table styles determine the kinds of objects listed in a schedule table, what data is displayed, and how the data is sorted.

Step 4: Attach property set data to the objects and object styles to be included in your schedule table.

You can also attach schedule tags to these objects.

Step 5: Add a schedule table to the drawing.

Step 6: Edit the schedule table as needed.

Changes you make to objects and styles are reflected in the schedule. You can also edit schedule tables directly in the following ways:

- Edit individual table cells to change values of manual properties
- Add, remove, reselect, and show relationships with items from the table
- Renumber property data

Step 7: Export the finished schedule table to an external file, if necessary.

Related Topics and Procedures

- Property Data Formats
- Property Set Definitions
- Schedule Table Styles
- Adding and Editing Property Set Data
- Creating and Editing Schedule Tables
- Adding Schedule Tags

Process Overview: Including Classification Data in Schedules

The process of including classification data for objects in a schedule table has the following major steps:

Step 1: Create a classification definition, and specify the object styles in which it is used.

Step 2: Create and attach property sets to the classifications in the classification definition.

Step 3: Specify the classification for each object style that you want to schedule.

Step 4: Add the classification or its properties to a property set definition for the object style.

Step 5: Add the classification or its properties as columns in a schedule table style that uses the property set definition you edited in step 4.

Step 6: If necessary, specify filtering options for classifications in the schedule table style.

Step 7: Create the schedule table.

The classification information for each object is included in the columns you added to the schedule table style.

Related Topics and Procedures

- Classification Definitions
- Property Set Definitions
- Adding a Classification Property Definition to a Property Set Definition
- Adding Columns to a Schedule Table Style
- Filtering Scheduled Objects by Classification in a Schedule Table Style
- Adding a Schedule Table

Adding and Editing Property Set Data

Objects to be included in schedule tables or linked to tags must have property set data attached to them. Schedule tables and tags do not store any data, but extract and display property set data from the included objects.

Property set data is created from one or more property sets attached to an object or a style. Some property data comes from automatic properties that are obtained from the object or the object style and cannot be manually entered, such as dimensions. Other property data consists of manual properties for which you must enter values for each object or object style, such as manufacturer's name.

If an entity or style containing a property set is copied from a source drawing into a target drawing that already contains a property set with the same name, the property set in the target drawing does not change. There is a potential for a loss of data in this case. An example of this is as follows:

- A drawing contains a property set that has a number of manual properties defined. This property set is attached to a door style with manual property values set. This door style is then copied into another drawing that contains a duplicate property set that does not have the same manual properties defined. In the target drawing the door style will contain the target drawing's property set, not the source drawing's property set. Any data values associated with the source drawing's manual properties will be lost.

Related Procedures

- Attaching Property Set Data to Objects
- Entering Manual Properties for Objects
- Removing Property Set Data from an Object
- Attaching Property Set Data to Styles and Definitions
- Entering Manual Properties for Styles and Definitions
- Removing Property Set Data from a Style or Definition
- Browsing Property Data

Attaching Property Set Data to Objects

Use this procedure to attach property set data to objects that you want to include in a schedule table or link to schedule tags.

You attach property set data to objects by attaching one or more property sets defined by a property set definition. After property sets are attached, the values for automatic properties are determined, and you can enter values for the manual properties.

To attach property set data to an object style, see "Attaching Property Set Data to Styles and Definitions" on page 2207.

1 Double-click the objects to which to attach property set data.

NOTE If you select more than one type of object, you can attach only the property set definitions that apply to all the selected objects. For example, if you select doors and windows, you can attach only those property sets that apply to both doors and windows. You cannot attach those that apply to doors only or to windows only.

2 On the Properties Palette, click the Extended Data tab.

3 Click .

4 Select the property sets to attach to the object, and click OK.

Entering Manual Properties for Objects

Use this procedure to enter values for manual properties for one or more objects. For example, to enter a remark that applies to several doors in a drawing, you can select the doors and enter the remark as data for Notes.

If the property you want to enter is not listed in a property set for the object, the property may be attached to the object style. To enter values for manual properties attached to styles and definitions, see "Entering Manual Properties for Styles and Definitions" on page 2207.

1 Double-click the objects for which to enter manual properties.

NOTE If no property set data appears, no property sets are attached to the objects. To attach property sets, see "Attaching Property Set Data to Objects" on page 2205.

2 On the Properties palette, click the Extended Data tab, and enter a value for a manual property.

If you selected multiple objects, the value applies to all the objects.

Removing Property Set Data from an Object

Use this procedure to remove one or more property sets from an object. If an object is included in a schedule table, any data in the table obtained from the removed property set is removed from the table.

1 Double-click the objects from which to remove property set data.

2 On the Properties Palette, click the Extended Data tab.

3 Click .

4 Select property sets to remove, and clear any property sets to remain attached to the object.

5 Click OK.

Attaching Property Set Data to Styles and Definitions

Use this procedure to attach data directly to these object styles and definitions, such as area styles, curtain wall styles, door styles, and multi-view block definitions.

You attach data to a style or a definition by attaching one or more property sets to it. Objects that use the style or definition inherit its property set data. The values for automatic properties, which may be different for each instance of the style, are determined, and you can enter values for manual properties. To attach property set data to individual objects, see "Attaching Property Set Data to Objects" on page 2205.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Architectural Objects, and locate the style or definition to which to attach property set data.

3 Right-click the style or definition, and click Edit.

4 Click the General tab, and click Property Sets.

5 Click .

6 Select the property sets that you want to attach.

7 Click OK four times.

Entering Manual Properties for Styles and Definitions

Use this procedure to enter values for manual properties in the property set data for a style or definition. The values you enter apply to all instances of objects associated with the style or definition.

If the property you want to edit is not listed in the property set data for the style or definition, it may be in a property set attached to the objects. To enter

values for manual properties attached to objects, see "Entering Manual Properties for Objects" on page 2206.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Architectural Objects, and locate the style or definition for which to add manual properties.
3. Right-click the style or definition, and click Edit.
4. Click the General tab, and click Property Sets.

NOTE If no data appears, no property sets are attached to the style or definition. To attach property sets, see "Attaching Property Set Data to Styles and Definitions" on page 2207.

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5. Enter a value for a manual property.
6. Click OK three times.

Removing Property Set Data from a Style or Definition

Use this procedure to remove one or more property sets from a style or definition. If objects using the style or definition are included in a schedule table, any data in the table obtained from the removed property set is also removed from the table.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Architectural Objects, and locate the style or definition from which to remove property set data.
3. Right-click the style or definition, and click Edit.
4. Click the General tab, and click Property Sets.
5. Click .
6. Select property sets to remove, and clear any property sets that should remain attached.
7. Click OK four times.

Browsing Property Data

Use this procedure to access and view the data for all property sets in a drawing.

For more information about browsing property sets of objects scheduled from external references, or to override property sets for those objects, see "Attaching Property Sets to Objects from External References" on page 349.

1 Open the tool palette that you want to use, and select the Browse Property Data tool.

   This tool is located with the Scheduling and Reporting Tools in the Stock Tool Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Specify view options:

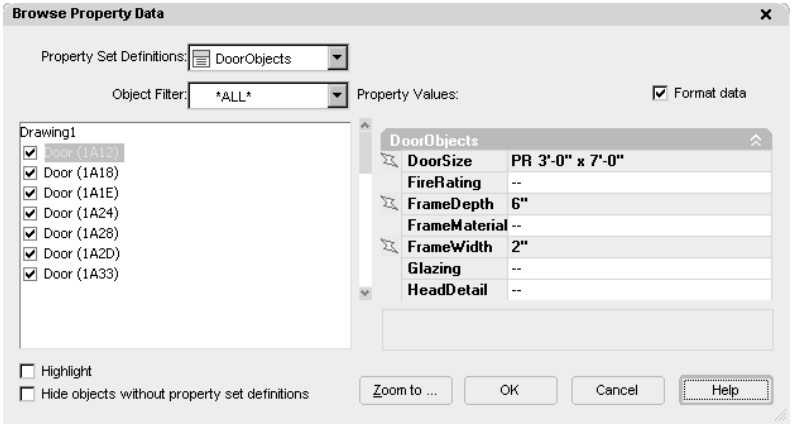
If you want to . . .	Then . . .
allow an object to be highlighted in the drawing when you select a property set that is attached to the object or its style	select Highlight.
prevent an object from being highlighted in the drawing when you select a property set that is attached to the object or its style	clear Highlight.
display objects in the drawing with the property set definition selected in the left pane	clear Hide objects without property set definitions.
prevent objects in the drawing with the property set definition selected from displaying in the left pane	select Hide objects without property set definitions.
view the raw, unformatted data in the property set	clear Format data.

3 View property sets and the objects or styles to which they are assigned:

If you want to . . .	Then . . .
view the object or style type to which a property set applies	select the property set. The right pane lists the property values, if available, and the objects or the styles to which the property set can be attached.

If you want to . . .	Then . . .
view the list of objects or styles to which a property set is attached	apply the object filter to the property set. The left pane shows objects by their unique identifiers, or styles by style name, to which the property set is attached. If Highlight is selected, any objects to which the property set is attached (directly or through a style) are highlighted in the drawing.
view the property values for a specific property set and a specific object or style	under the property set, select the object or style. The right pane shows the values for the selected object or style.

Viewing property values for objects with property sets attached



4 Edit property sets and values:

If you want to . . .	Then . . .
edit property values for a property set and a object or style	select the object or style from the left pane. You can then edit manual values and add or remove property sets from the object or style. Click OK.

WARNING! If you detach a property set from an object or style, any manually entered values are lost. If you mistakenly detach a property set, click OK, and then immediately click Edit ➤Undo to undo the remove action.

5 Remove property sets from objects or styles:

If you want to . . .	Then . . .
detach a property set from a object or style	clear the selection of the object or style.
add a property set to objects or styles	select the object or style.

6 Click Zoom to to view the selected object in the drawing.

7 Click OK.

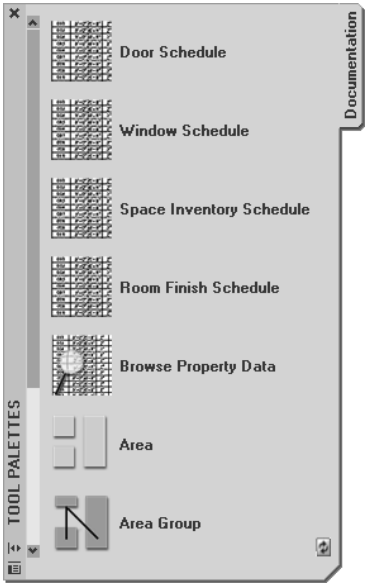
Creating and Editing Schedule Tables

You can create schedule tables to graphically represent specific information about objects in your drawing. There are several elements of schedule tables.

Creating Schedule Tables Using Schedule Table Tools

Tool palettes provided with Autodesk® Architectural Desktop let you quickly place schedule tables by selecting a tool with a specific schedule table style and other predefined properties. You can also apply the settings of a schedule table tool to existing schedule tables.

Tool palette containing schedule table tools



The following palettes contain one or more schedule table tools:

Tool Palette	Schedule Table Tools
Documentation palette in the Tool palette set	a schedule table tool for the Standard schedule table style and default settings for other schedule table properties
custom tool palettes created by your CAD manager	schedule table tools with schedule table styles and properties that your CAD manager customized for your projects or office standards

You can use the default settings of schedule table tools, or you can change settings for any schedule table properties that are not controlled by the style.

Using Schedule Table Styles

Schedule table styles control the content and appearance of schedule tables. A drawing must contain a schedule table style for the type of schedule table you want to create. When you copy a schedule table style into a drawing, property set definitions and data formats specified in the style are also copied. For more information, see "Schedule Table Styles" on page 2269.

Attaching Property Set Data

Before creating schedule tables, you attach the property sets referenced in the schedule table style to the objects and object styles. The attached property sets become the containers for data. For more information, see "Adding and Editing Property Set Data" on page 2204.

A schedule table extracts data from objects and displays the data in the table. No data is saved in the table itself.

Updating Property Set Data

When you add a schedule table to a drawing, you specify whether new objects are added to the table when they are added to the drawing. You can also specify whether the data in the schedule table is updated when objects or styles are modified. If you do not select these options for automatic updating, you can update a schedule at any time.

You can also directly edit the data in individual cells and columns for any manual properties included in the table. In addition, after you add, remove, or change objects in a schedule, you can renumber the objects and their schedule tags.

Exporting Property Set Data

You can export data directly to external files in the following formats:

- Microsoft®Excel spreadsheet (XLS) files
- Comma-separated values (CSV) files
- Tab-delimited text (TXT) files

Related Procedures

- Creating a Schedule Table Tool
- Adding a Schedule Table
- Turning Off the Out-of-Date Schedule Table Marker
- Updating a Schedule Table
- Adding Objects to a Schedule Table
- Removing Objects from a Schedule Table
- Reselecting Objects for a Schedule Table
- Showing Objects in a Schedule Table
- Renumbering Property Set Data
- Exporting a Schedule Table
- Specifying the Display Properties of a Schedule Table
- Changing General Schedule Table Properties
- Changing the Selection Criteria of a Schedule Table
- Changing the Placement of a Schedule Table

- Changing External Source Properties of a Schedule Table
- Adding Table Breaks to a Schedule Table
- Adding Documentation Information to a ScheduleTable
- Identifying and Editing Table Cell Data
- Adding Property Set Data to All Objects

Creating a Schedule Table Tool

Use this procedure to create a schedule table tool and add it to a tool palette. You may want to create your own schedule table tools if you are placing multiple schedule tables of specific styles that have the same properties.

You can use any of the following methods to create a schedule table tool:

- Drag a schedule table that has the properties you want to a tool palette.
- Drag a schedule table style from the Style Manager to a tool palette, and then customize the properties of the new tool.
- Copy a tool from another palette to the current palette, and then customize the properties of the new tool.
- Copy an existing tool in the current palette and then customize the properties of the new tool.

1. Open the tool palette on which you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a schedule table in the drawing	select the object, and drag it to the tool palette.
create a tool from a schedule table style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Right-click the tool, and click Copy. Open the other palette, and click Paste.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.

5 Click the setting for Description, enter a description of the tool, and click OK.

6 Expand General.

7 Specify general properties for the schedule table:

If you want to . . .	Then . . .
add a description	enter text for Description.
specify the layer key	select Layer Key.
specify layer overrides	select Layer Overrides.
specify the schedule table style	select Style.
specify an external drawing file source for the style	select Style Location or Browse to specify a location.
change the schedule table scale	enter a value for Scale.
automatically update the schedule table when data in the drawing changes	select Yes for Update automatically.
manually update the schedule table when the drawing changes	select No for Update automatically.

NOTE Turning on the automatic update feature may slow drawing performance, especially in large drawings. For information about updating schedules manually, see "Updating a Schedule Table" on page 2218.

8 Expand Selection.

9 Specify how to add objects to the schedule table:

If you want to . . .	Then . . .
automatically add new objects to the schedule table as they are added to the drawing	select Yes for Add new objects automatically.
manually add new objects to the schedule table	select No for Add new objects automatically.

If you want to . . .	Then . . .
include objects from xref drawings in the schedule table	select Yes for Scan xrefs.
exclude objects from xref drawings in the schedule table	select No for Scan xrefs.
include objects from block references in the schedule table	select Yes for Scan block references.
exclude objects from block references in the schedule table	select No for Scan block references.
apply a layer filter to the table	specify a layer wild card.

NOTE When adding a schedule table that must scan xrefs or blocks, use a layer filter that includes both the name of the layer that contains the xref or block, and the name of the layer of the object inside the xref or block. You can separate multiple layer wild cards with a comma.

10 Click OK.

Adding a Schedule Table

Use this procedure to add a schedule table to a drawing sheet. You can specify schedule table properties on the Properties palette when you add a schedule table, or you can modify the schedule table later.

Before adding a schedule table, ensure that objects can be scheduled.

- The drawing contains a schedule table style for the objects you want to schedule. For more information, see "Schedule Table Styles" on page 2269.
- Property set data is attached to the objects and object styles. For more information, see "Adding and Editing Property Set Data" on page 2204.

1 Open the tool palette that you want to use, and select the Schedule Table tool.

A Schedule Table tool is located with the Scheduling and Reporting Tools in the Stock Tool Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2 Select the objects to include in the schedule table, or press ENTER to schedule an external drawing.

For more information, see “Changing External Source Properties of a Schedule Table” on page 2226.

You can use a window or a crossing window to select the objects. Objects that are not of the type specified for the schedule table are filtered out.

3 In the drawing area, specify the insertion point for the upper-left corner of the schedule table.

4 Specify the lower-right corner of the table, or press ENTER to scale the schedule table to the current drawing scale.

- If the schedule table contains question marks in any cells, the property set containing that property is not attached to an object or style.
- Empty cells or dashes in cells indicate that the property set is attached, but data is not available or is not entered for that object or style.

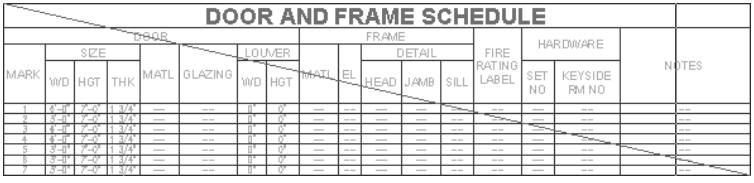
For more information about attaching property sets for property set data, see “Adding and Editing Property Set Data” on page 2204.

Turning Off the Out-of-Date Schedule Table Marker

Use this procedure to turn off an out-of-date marker that appears when an object, object style, or attached property set data has changed but the schedule table is not updated.

With the out-of-date display component on in the General schedule display representation of your drawing, a line is drawn through the schedule table to indicate that the information tracked by the schedule has changed. For example, a line is drawn through the schedule table if an object tracked in the schedule is moved or deleted, or if its dimensions are edited. The line is removed when you update the schedule table.

Displaying an out-of-date schedule



NOTE Turning on this display component can slow drawing performance, especially in large drawings.

1. Select the schedule table, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the General display representation.
4. If necessary, click .
5. Scroll to display the Out-of-Date marker component, and click Visible.
6. Click OK twice.

Updating a Schedule Table

Use this procedure to update the values in a schedule table when the automatic update option is turned off. Always update schedule tables before plotting the drawings that contain them.

When you update a table manually, changes to objects in the table or to property set data attached to objects or object styles are shown. Objects added to the drawing after creating the schedule table are not included in the table unless Add Objects Automatically is specified in the table properties. To add objects manually, see "Adding Objects to a Schedule Table" on page 2218. To update the numbering in a schedule table, see "Renumbering Property Set Data" on page 2220.

NOTE To ensure that the table contains accurate information, close and reopen your drawing before plotting schedule tables. Certain changes to drawings, such as reference editing, are reflected in schedule tables only when a drawing is reopened.

- Select the schedule table, right-click, and click Update Schedule Table.

Adding Objects to a Schedule Table

Use this procedure to add objects to a schedule table.

1. Select the schedule table, right-click, and click Selection.
2. Click Add.
3. In the drawing, select the objects to add to the table, and press ENTER

Use a window or a crossing window to select multiple objects. Objects that are already in the table are not added.

NOTE You cannot add objects to a schedule table through RefEdit. Although the command appears to work during the RefEdit session, as soon as changes are saved back, the rows disappear from the schedule table. This is because you are actually selecting temporary copies of the objects in the file. In order to have objects that are in an xref or block display in a schedule table, select the xref. To include only selected objects from the xref or block, use a layer filter with the schedule table.

Removing Objects from a Schedule Table

Use this procedure to remove objects from a schedule table.

1. Select the schedule table, right-click, and click Selection.
2. Click Remove.
3. In the drawing, select the objects to remove from the table, and press ENTER.

Reselecting Objects for a Schedule Table

Use this procedure to reselect objects to include in a schedule table. After reselection, the table contains only the objects that you selected.

1. Select the schedule table, right-click, and click Selection.
2. Click Reselect.
3. In the drawing, select the objects to include in the table, and press ENTER.

Showing Objects in a Schedule Table

Use this procedure to highlight objects that are included in a schedule table.

1. Select the schedule table, right-click, click Selection, and click Show.
2. Select the border of the schedule table to show all the objects in the table, or select a specific cell to show only the object contained on that row.

The selected objects are highlighted in the drawing.

Renumbering Property Set Data

Use this procedure to renumber objects that are included in a schedule or linked to schedule tags. You may want to renumber objects if you moved them in the building model or if you have deleted objects. Only those property definitions with a Type of Auto Increment—Integer or Auto Increment—Character can be renumbered with this procedure. For more information, see "Adding Schedule Tags" on page 2231.

1. Open the tool palette that you want to use, and select the Renumber Data tool.

   A Renumber Data tool is located with the Scheduling and Reporting Tools in the Stock Tool Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Select the property set to renumber.

   You select the property set that contains the number property. For example, if you renumber doors, you select the DoorObjects property set.

3. Select the start number.
4. Select an increment value.

   Each number is increased by this amount in the drawing when the property set data is renumbered. For example, if the start number is 1 and the increment is 3, the sequence would number 1, 4, 7, 10, and so on.

5. Select Attach New Property Set to add a new property set to the numbering sequence.
6. Click OK.
7. When prompted with a sequence number, select the object or schedule tag to assign that number.
8. Continue renumbering.
9. Press ENTER.

NOTE Under certain circumstances, such as after Renumber Data during RefEdit, you may see duplicate property set definition names. For example, the property set defintion name may be preceded by "1." Modify these property set definitions by opening the attached drawing and making the changes.

Exporting a Schedule Table

Use this procedure to export the contents of a schedule table to a separate file. You can export the data in the following file formats:

- Microsoft®Excel spreadsheet (XLS) files
- Comma-separated values (CSV) files
- Tab-delimited text (TXT) files

NOTE You must have Microsoft Excel installed to export a file to Excel format.

1. Select the schedule table, right-click, and click Export.
2. Select a file type to Save As.
3. Specify the name of the file to export to, or click Browse to select a file.
4. Select Use Existing Table, and click OK.

NOTE Architectural format (6'-0") is not supported by Microsoft Excel. If you export to Microsoft Excel, you are prompted to convert the schedule values to decimal values or text format in the exported file. The format of values does not change in the drawing file.

5. Select the schedule table to export, and press ENTER.

If a file already exists with the name you specified, a warning is displayed with the option to overwrite the existing file, specify a unique name, or cancel the export command.

Exporting Schedule Table Data for Selected Objects

Use this procedure to export selected property set data from a schedule table to a separate file. You can export the data in the following file formats:

- Microsoft®Excel spreadsheet (XLS) files
- Comma-separated values (CSV) files
- Tab-delimited text (TXT) files

NOTE You must have Microsoft Excel installed to export a file to Excel format.

Using this procedure, you can create a file with property set data for selected objects even if the schedule table does not exist in the drawing. To export all the data in a schedule table, see "Exporting a Schedule Table" on page 2221.

1. Select the schedule table, right-click, and click Export.
2. Select a file type to Save As.
3. Specify the name of the file to export to, or click Browse to select a file.
4. Clear Use Existing Table.
5. Select the table style to use in the exported file.

   Columns included in the schedule table style determine the property set data that is exported for the objects. For more information, see "Creating a Schedule Table Style" on page 2271.
6. Select the layer wild card to use as a filter in the exported file.
7. Specify whether to scan for xrefs or block references.
8. Click OK.

NOTE Architectural format (6'-0") is not supported by Microsoft Excel. If you export to Microsoft Excel, you are prompted to convert the schedule values to decimal values or text format in the exported file. The format of values does not change in the drawing file.

9. Select the objects to include in the exported table, and press ENTER.

If a file already exists with the name you specified, a warning is displayed with the option to overwrite the existing file, specify a unique name, or cancel the export command.

Specifying the Display Properties of a Schedule Table

Use this procedure to change the properties of display components for a schedule table:

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

To change these display properties for all schedule tables of the same schedule table style, and to see additional information about schedule table display components, see "Specifying the Display Properties of a Schedule Table Style" on page 2282.

1. Select the schedule table you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation on which to display the changes, and select Object Override.

   The display representation in bold is the current one.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Changing General Schedule Table Properties

Use this procedure to change general properties of basic schedule table settings on the Design tab of the Properties palette.

1. Double-click the schedule table you want to change.
2. On the Properties palette, expand Basic, and expand General.
3. Specify general properties for the schedule table:

If you want to . . .	Then . . .
change the description	enter text for Description.
change the layer	select Layer.
change the schedule table style	select Style.
change the schedule table scale	enter a value for Scale.
automatically update the schedule table when data in the drawing changes	select Yes for Update automatically.
manually update the schedule table when the drawing changes	select No for Update automatically.

NOTE Turning on the automatic update feature may slow drawing performance, especially in large drawings. For information about updating schedules manually, see "Updating a Schedule Table" on page 2218.

Changing the Selection Criteria of a Schedule Table

Use this procedure to change how objects are added to the schedule table.

1. Double-click the schedule table you want to change.
2. On the Properties palette, expand Basic, and expand Selection.
3. Change how objects are added to the schedule table:

If you want to . . .	Then . . .
automatically add new objects to the schedule table as they are added to the drawing	select Yes for Add new objects automatically.
manually add new objects to the schedule table	select No for Add new objects automatically.
include objects from xref drawings in the schedule table	select Yes for Scan xrefs.
exclude objects from xref drawings in the schedule table	select No for Scan xrefs.
include objects from block references in the schedule table	select Yes for Scan block references.
exclude objects from block references in the schedule table	select No for Scan block references.
apply a layer filter to the table	specify a layer wild card.

NOTE When adding a schedule table that must scan xrefs or blocks, use a layer filter that includes both the name of the layer that contains the xref or block, and the name of the layer of the object inside the xref or block. You can separate multiple layer wild cards with a comma.

Changing the Placement of a Schedule Table

Use this procedure to change the rotation, elevation, and location of the schedule table.

You can relocate a schedule table by changing the coordinate values of its insertion point. The schedule table also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the schedule table are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the schedule table by aligning its normal with another axis. You can also rotate the schedule table on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the *AutoCAD® 2004 User's Guide*.

1. Double-click the schedule table you want to change.
2. On the Properties palette, expand Basic, and expand Location.
3. Specify the placement of the schedule table:

If you want to . . .	Then . . .
change the rotation	enter a new value for Rotation Angle.
change the elevation	enter a new value for Elevation.

4. Click Additional information to specify location of the schedule table:

If you want to . . .	Then . . .
relocate the schedule table	enter new coordinate values under Insertion Point.
locate the schedule table on the *XY* plane	make the normal of the schedule table parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the schedule table on the *YZ* plane	make the normal of the schedule table parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the schedule table on the *XZ* plane	make the normal of the schedule table parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.

If you want to . . .	Then . . .
change the rotation of the schedule table	enter a new value for Rotation Angle.

Changing External Source Properties of a Schedule Table

Use this procedure to create a schedule table that contains property data from an external drawing such as a project drawing.

Schedule tables can contain information from external references and block references, which typically must exist in the same drawing as the schedule table. Optionally, schedule tables can specify an external drawing. The information is scheduled as if it were an external reference in the same drawing as the table. The advantage is that the graphics of the external drawing do not need to be generated in order to fill out the data in the table.

1. Double-click the schedule table you want to change.
2. On the Properties palette, expand Advanced, and expand External Source.
3. Specify the external drawing you want to schedule:

If you want to . . .	Then . . .
schedule an external drawing	select Yes for Schedule external drawing. The external drawing property is displayed.
not schedule an external drawing	select No for Schedule external drawing. The external drawing property is hidden.
specify the external drawing to schedule	select the name of the drawing for External drawing.

The External drawing property is displayed with a drop-down list containing all drawings in the View directory of the current project. Each drawing corresponds to a View defined in the project. If no project is active, the list contains all drawings in the last directory browsed.

Adding Table Breaks to a Schedule Table

Use this procedure to split long tables into a series of shorter pages.

1 Double-click the schedule table you want to change.
2 On the Properties palette, expand Advanced, and expand Table Breaks.
3 Specify how you want to display the pages of tables:

If you want to . . .	Then . . .
display pages horizontally to the right of one another	select Right for Direction.
display pages vertically below one another	select Down for Direction.
display the title on each page	select Yes for Repeat title.
display the column headers on each page	select Yes for Repeat Headers.
hide the column headers on each page	select No for Repeat Headers.
control the height of each page individually	select Yes for Manual heights.
have all pages approximately the same height	select No for Manual heights.
specify the maximum height of each page when Manual heights is No	enter a value for Maximum height, or select and drag the Maximum Page Height grip at the bottom of the table.
specify the distance between each page	enter a value for Spacing.

You can control the height of all pages by setting one value if Manual heights is set to No. If the table contains more than one object, select and drag the Maximum Page Height grip at the bottom of the table.

You can control the height of each page individually if Manual heights is set to Yes. If the table contains more than one object, it will have one Insert Page grip at the bottom of the last page and one Page Height grip at the bottom of all other pages. Select the Insert Page grip, and drag it up to insert a new page. Select a Page Height grip, and drag it up or down to set the height of that page. Continuing to drag a Page Height grip down reduces the height of the last page, and could possibly remove it.

Adding Documentation Information to a ScheduleTable

Use this procedure to add hyperlinks, notes, and reference documents to the schedule table.

1. Double-click the schedule table to which to add documentation.
2. On the Properties palette, expand Documentation.
3. Specify documentation information:

If you want to . . .	Then . . .
add a hyperlink	click . Select the file, and click Open.
edit notes	click , and enter text.
attach a reference document	click . Click Add, and select a file. Click Open, and click OK.
edit the reference document attached	click . Select the document, right-click, and click Edit. Select a new document, click Open, and click OK.
edit the description of a reference file	click . Select the description, enter the new description, and click OK.
detach a reference file	click . Select the file name, and click Remove.

Identifying and Editing Table Cell Data

Use this procedure to identify table cell data and edit manual property set data. Automatic property set data cannot be edited in a schedule table. You must edit the object, style, or other data to change the values of automatic property data. For more information about property set data, see "Adding and Editing Property Set Data" on page 2204.

You can use this procedure to troubleshoot problems between a table cell and a source object. If the object is not currently visible in your drawing area, press CTRL + SELECT (Zoom to) to display the source object. The changes you

make to the manual property set data in the table cell are saved with the object.

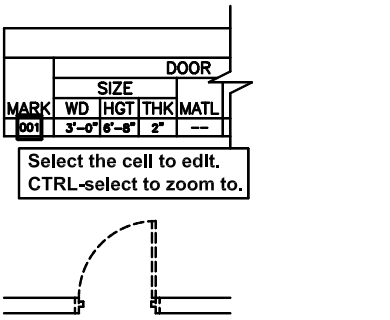
If you are working in a table that schedules a drawing from an external source, you cannot edit table cells.

If the schedule table cell references several objects in a quantity cell, Zoom to displays an area that includes all the source objects. Hovering over a quantity cell highlights the objects counted by that cell.

1. Select the schedule table, right-click, and click Edit Table Cell.
2. Position the cursor over the cell.

   The source object is highlighted if it is visible. A tooltip is displayed regardless of whether or not the cell can be edited, what type of data is presented in the table cell, or any potential problems with the data in that cell.

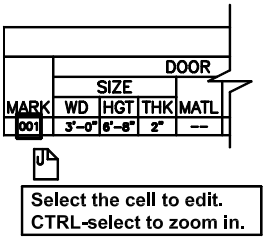
Displaying a table cell source object



resulting tool tip displayed with source object highlighted

An external reference icon is displayed if the cell data is from an object in an externally referenced drawing. If you edit this cell, the externally referenced drawing is modified. If the drawing is locked by another user, you cannot edit it.

Displaying a table cell tooltip for externally referenced data



resulting tool tip displayed with xref icon

3 Identify the different views:

If you want to . . .	Then . . .
view all source objects associated with the schedule table cell	press CTRL, and select the data in the schedule table cell. The drawing changes to show the source objects associated with the cell.
restore the previous view	click Zoom Previous.

4 Edit the data in the schedule table:

If you want to . . .	Then . . .
edit the value in an individual table cell	select the individual cell, and enter a new value.
edit the value for all instances of a property	select the border of the schedule table, and enter a value for the selected property.

NOTE Cells that display property set data attached to styles may affect multiple objects. Editing one cell changes the value for all objects of that style in the schedule table.

Adding Property Set Data to All Objects

Use this procedure to add property set data to all objects in a schedule table that have a question mark (**?**) in a cell. If a table column requires property data from an object before it can add information to the cells, and the property set containing that property data has not been attached to the object, a question mark (**?**) is typically shown in the cell. You can attach these property sets individually, as described in "Identifying and Editing Table Cell Data" on page 2228, or you can attach the property sets to all of the objects at once.

- Select the schedule table, right-click, and click Add All Property Sets.

NOTE If you are working in a table that schedules an external drawing, you cannot add property sets to those objects. For more information, see "Changing External Source Properties of a Schedule Table" on page 2226.

Adding Schedule Tags

Schedule tags are symbols that connect building model components with lines of data in a schedule. Schedule tags usually display data about the objects to which they are attached.

To add a tag, you anchor it to an object in your drawing. Each tag is a multi-view block with attributes. Values from the property set data of the object can be transferred to the tag attributes if, when the tag is anchored, the tag attributes are named.

PropertySetDefName:PropertyDefName
For example:

DoorStyles:DoorHeight

NOTE Attribute definition tags cannot have extended names (names that contain spaces). If you use extended names for your property set definitions or your property definitions, you are not able to display those objects automatically through the use of a tag anchor.

Because tag attributes are linked to property set data, the tag attributes change when the property set data changes. For example, the number displayed in a door tag associated with a door is updated when the number property of the door is renumbered. To edit the information that displays in

the tag, edit the property set data. For more information, see "Entering Manual Properties for Objects" on page 2206.

The software includes predefined tags, and you can also create your own tags. For more information, see "Custom Tags" on page 2237.

If you want to tag multiple objects, you can do that after you tag a single object. The placement of the first tag relative to the object you are tagging is used to determine the placement of subsequent tags.

- For walls, the tag (or the end of its leader) is positioned relative to the midpoint of the wall.
- For spaces, the tag (or the end of its leader) is positioned relative to the center of the geometric extents of the space.
- For all other objects, a tag with a leader is placed with the end of the leader at the geometric center of the object. Tags without leaders are placed at the same distance and direction as the first tag, relative to the center of the object.

Select one object at a time when using the multiple tag option in order to control the numbering sequence of the tags. The sequence of auto-incrementing is undefined if you use a window or another multiple selection tool.

NOTE When you insert schedule tags into drawings, use the appropriate base units for the tag to match the drawing scale properly.

Related Procedures

- Displaying Property Set Data When You Add a Tag
- Adding Door and Window Tags
- Adding Object Tags
- Adding Room Finish, Room, Space, and Wall Tags
- Anchoring a Tag to an Object
- Releasing an Anchored Tag
- Viewing the Relationship Between Schedule Tags and Objects
- Custom Tags
- Creating a Tag and Multi-View Block
- Adding a Custom Tag to the DesignCenter

Displaying Property Set Data When You Add a Tag

Use this procedure to enter or edit property set data when you attach a schedule tag to an object.

When you anchor a tag to an object, you can display the property set data that is attached to the object. Depending on the property set definitions that are attached to the object, you can immediately edit or enter property set data.

NOTE If you are adding tags that contain only automatic properties, it is more efficient to turn off this option.

---

1. At the command line, right-click, and click Options.
2. Click the AEC Content tab.
3. Select Display Edit Property Data Dialog During Tag Insertion.
4. Click OK.

Adding Door and Window Tags

Use this procedure to attach schedule tags to doors and windows. Autodesk® Architectural Desktop contains a number of predefined door and window tags.

1. Open the tool palette that you want to use, and select a door or window tag tool.

   Door and window tag tools are located on the Custom tab in DesignCenter. You can add these tools to any tool palette. For more information, see "DesignCenter" in the *AutoCAD® 2004 User's Guide*.

2. Change the tag symbol and add a leader, if necessary:

If you want to . . .	Then . . .
change the tag symbol	enter **s** (Symbol).
add a leader to the symbol	enter **l** (Leader).
change the dimension style used to create the leader	enter **d** (Dimension Style).

3 Select the door or window to which to attach the tag.

4 Specify the location of the tag.

5 If prompted, enter or edit property set data for the door or window.

If property set data is not yet attached to the object, and an appropriate property set is defined in the current drawing or in the *PropertySetDefs.dwg* file in *C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\AEC Content\Imperial or Metric\Documentation\Schedule Tags*, you can attach that information to the door or window. For more information about property sets, see "Property Set Definitions" on page 2241.

6 Press **m** to add tags to multiple doors or windows.

7 Continue adding tags.

8 Press ENTER.

Adding Object Tags

Use this procedure to attach an object tag to a block reference or a multi-view block reference. The software contains a number of predefined object tags.

1 Open the tool palette that you want to use, and select an object tag tool.

Object tag tools are located on the Custom tab in DesignCenter. You can add these tools to any tool palette. For more information, see "DesignCenter" in the *AutoCAD® 2004 User's Guide*.

2 Change the tag symbol and add a leader, if necessary:

If you want to . . .	Then . . .
change the tag symbol	enter **s** (Symbol).
add a leader to the symbol	enter **l** (Leader).
change the dimension style used to create the leader	enter **d** (Dimension Style).

3 Select the object to which to attach the tag.

4 Specify the location of the tag.

NOTE Different object tags may have different prompts. The steps below may not correspond directly to those for the object tag you are placing.

5 If prompted, enter or edit property set data for the object.

If property set data is not yet attached to the object, and an appropriate property set is defined in the current drawing or in the *PropertySetDefs.dwg* file in *C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\AEC Content\Imperial or Metric\Documentation\Schedule Tags*, you can attach that information to the object. For more information about property sets, see "Property Set Definitions" on page 2241.

6 Press **m** to add tags to multiple blocks or references.

7 Continue adding tags.

8 Press ENTER.

Adding Room Finish, Room, Space, and Wall Tags

Use this procedure to attach room finish, room, and space tags to spaces. The software contains a number of predefined tags.

1 Open the tool palette that you want to use, and select an object tag tool.

Spacetag tools are located on the Custom tab in DesignCenter. You can add these tools to any tool palette. For more information, see "DesignCenter" in the *AutoCAD® 2004 User's Guide*.

2 Change the tag symbol and add a leader, if necessary:

If you want to . . .	Then . . .
change the tag symbol	enter **s** (Symbol).
add a leader to the symbol	enter **l** (Leader).
change the dimension style used to create the leader	enter **d** (Dimension Style).

3 Select the space to which to attach the tag.

4 Specify the location of the tag.

NOTE Different tags may have different prompts. The steps below may not correspond directly to those for the tag you are placing.

5 If prompted, enter or edit property set data.

If property set data is not yet attached, and an appropriate property set is defined in the current drawing or in the *PropertySetDefs.dwg* file in *C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\AEC Content\Imperial or Metric\Documentation\Schedule Tags*, you can attach that information to the space. For more information about property sets, see "Property Set Definitions" on page 2241.

6 Press **m** to add tags to multiple rooms or room finishes.

7 Continue adding tags.

8 Press ENTER.

Anchoring a Tag to an Object

Use this procedure to anchor an existing schedule tag to an object or re-anchor a tag to a new object.

If you copy a tag from one object to another, the tag remains anchored to the original object. Use this procedure to re-anchor the tag to the new object.

NOTE You can view the current relationship between schedule tags and objects. For more information, see "Viewing the Relationship Between Schedule Tags and Objects" on page 2236.

---

1 Select a tag, right-click, and click Tag Anchor.

2 Click Set Object.

3 Select an object to which to anchor the tag.

Releasing an Anchored Tag

Use this procedure to release a tag that is anchored to an object. After you release the tag, you can re-anchor it to another object.

1 Select the anchored tag, right-click, and click Tag Anchor.

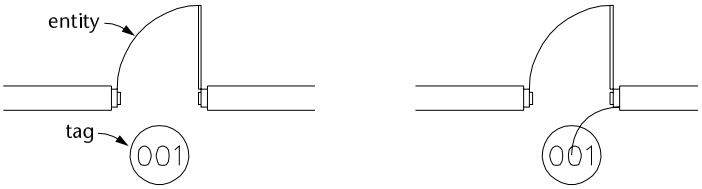
2 Click Release.

Viewing the Relationship Between Schedule Tags and Objects

Use this procedure to turn on the General display representation for Anchor Tag To Entity in the current view. If you have many tags and are not sure of

their attachments, use this feature to view the current relationship between schedule tags and objects.

Viewing the relationship between a door tag and a door



Anchor Tag To Entity General display representation off

Anchor Tag To Entity General display representation on

1. On the Format menu, click the Display Manager.
2. Expand Sets.
3. Select the current display set.

   The current display set appears in bold in the list under Sets.
4. Click the Display Representation Control tab.
5. In the Objects list, locate Anchor Tag To Entity, and select the General display representation for this object.
6. Click OK.
7. Regenerate the drawing, if necessary.

   The schedule tag is connected to the object to which it is anchored by an arc. The tag and object are attached from insertion point to insertion point.

Custom Tags

You can create custom tags that display property set data about objects.

First, you determine the object that you intend to tag, and the information to display inside the tag. Next, you create or identify a property set definition for the object. The property set definition must contain the property or properties for the information that displays in the tag.

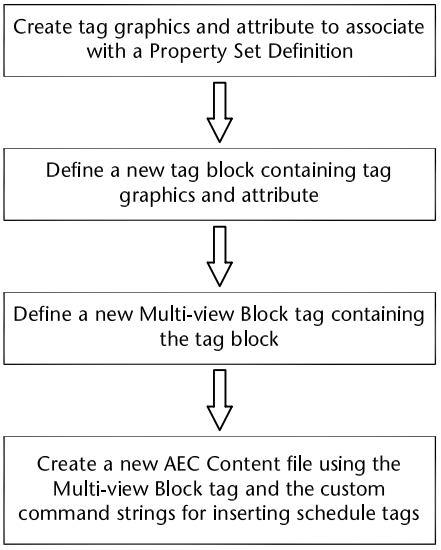
Then, you create the tag geometry and save it as a block with one or more attributes. You must assign each attribute a unique name, formed from a

combination of the name of the property set definition and the property definition to which you will link the tag. The name looks like this:

PropertySetDefName:PropertyDefName

Use the tag block to create a multi-view block and add it to the DesignCenter using the AEC Content Wizard. When the tag is anchored to objects to which the property set definition applies, the tag displays the property value as the value of its tag attribute.

Creating a custom tag



For example, you have a property set definition named DoorProps, which contains a property definition named FireRating. The FireRating property contains fire rating information for door objects. To create a door tag that displays the fire rating of a door to which the tag is anchored, you must create a block definition that contains an attribute definition whose attribute tag is DoorProps:FireRating. You then create a multi-view block definition.

Related Procedures

- Creating a Tag and Multi-View Block
- Adding a Custom Tag to the DesignCenter

Creating a Tag and Multi-View Block

Use this procedure to create a block for the custom tag and to create a multi-view block from the tag block.

NOTE Attribute definitions tags cannot have extended names (names that contain spaces). If you use extended names for property set definitions or property definitions, you are not able to display those objects automatically through the use of a tag anchor.

1. Identify or create a property set definition with the property definitions that you want to display in the tag.

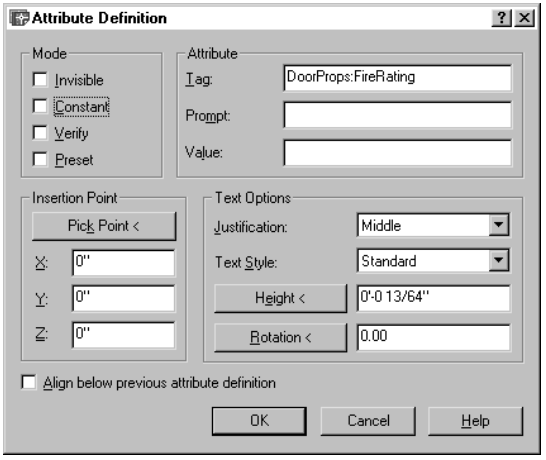
   For more information, see "Property Set Definitions" on page 2241.

2. Save the property set definition in *PropertySetDefs.dwg*, located in *C:\Documents and Settings\All Users\Application Data\Autodesk\Autodesk Architectural Desktop 2004\R16.0\enu\AEC Content\Imperial or Metric\Documentation\Schedule Tags*.
3. Start a new drawing, and create the tag geometry.
4. On the Format menu, click Blocks ➤ Define Attributes to define an attribute name for the tag.
5. Under Attribute, enter the property set definition and property definition that you want to display in the tag for Tag.

   The tag must be defined in the format:

PropertySetDefName:PropertyDefName

Defining an attribute for a custom tag



6. Specify values for the prompt, value, height, and justification, and click OK.
7. On the Format menu, click Blocks ➤ Block Definition.

8. Enter a name for the block, and use the Select Objects button to define the objects in it. Click OK.
9. Create a multi-view block from the tag block.

   For more information, see "Creating Multi-View Block Definitions" on page 2483.
10. Add the multi-view block to the DesignCenter.

    For more information, see "Adding a Custom Tag to the DesignCenter" on page 2240.

Adding a Custom Tag to the DesignCenter

Use this procedure to add to the DesignCenter a multi-view block defined for a custom tag. You can then use the tag in any of your drawings.

1. Create the custom tag as described in "Creating a Tag and Multi-View Block" on page 2238.
2. On the Format menu, click AEC Content Wizard.
3. Select Custom Command for Content Type.
4. Select the block and multi-view block under Current Drawing, and click Add.
5. Link the tag to a property set definition by entering the following for Command String:

```
_AecAnnoScheduleTagAdd PropertySetDefsDwg_Symbol TagName
_LEADER None _DIMSTYLE Current
```

   where TagName is replaced with the name of the multi-view block and *PropertySetDefDwgName* is the name of a drawing file containing the property set definitions used in the tag. The search order for this drawing is as follows:

   1. The directory in which the tag drawing is located
   2. The parent directory of that directory
   3. The current directory
   4. The directory that contains the current drawing file
   5. The directories specified in Options: Files: Support File Search Path
   6. The directory that contains the AutoCAD program files

   You can specify a leader then you insert the symbol and specify a different dimension style for the leader by changing the value listed after LEADER and DIMSTYLE in the command string.
6. Click Next, and specify the Insertion Options.

For more information, see "Creating an AEC Custom Command" on page 2353.

7 Click Next, and click OK to exit the AEC Content Wizard.

You can now use the DesignCenter to add the custom tag to objects in your drawing.

Property Set Definitions

A property set definition specifies the characteristics of a group of properties that can be tracked with an object. For example, you could create a property set definition named *DoorProps* that contains property definitions for DoorNumber, DoorWidth, and FireRating. Each property has a name, description, data type, data format, and default value.

Property Sets and Property Data

A property set is an object created from a property set definition. It contains a user-definable group of related object properties. When you attach a property set to an object or a style, the property set becomes the container for the property data associated with the object.

Creating Property Set Definitions for Objects or Styles

When you create a property set definition, you specify whether the property set created from the definition can be attached to objects or to styles. The kinds of properties you want to track should determine whether the property set applies to objects or styles.

- Automatic properties generally belong in style-based definitions. Automatic properties, even when attached to a style, can vary for each instance of the object. It is more efficient to include automatic properties in a style-based definition because the properties are immediately associated with any object that uses the style.
- Manual properties can belong to either style-based or object-based definitions. The value of a manual property associated with a style is the same for every object. For example, a Manufacturer property will probably be the same for every instance of a particular door style, so it should be in a style-based property. However, a Door Number property is different for each instance of a door, so it should be in an object-based property.

Automatic and Manual Properties Definitions

Property sets, whether attached to objects or to styles, can include both manual and automatic properties.

- Automatic properties cannot be edited directly, but are obtained directly from the object or other source. For example, the physical characteristics of an object, such as its dimensions, or the classification or material of an object, are automatic properties. To change the value of an automatic property, you must modify its source. The change then appears in the property set data for the object.
- Manual properties must be edited directly in the property set data for the object or style. For example, the object number (for tagging) and notes or remarks are manual properties. The value entered for a manual property in an object-based property set is saved with the object. The value entered for a manual property in a style-based property set is saved with the style and is available to all objects using that style.

Using Property Data Formats in Property Set Definitions

Property data formats determine the format of numbers and text for property values. Both property set definitions and schedule table styles use property data formats. The drawing must contain the property data formats you want to use before you create a property set definition. For more information about creating property data formats, see "Property Data Formats" on page 2284.

Managing Property Set Definitions

To create, edit, copy, or purge property set definitions, you access the Style Manager. The Style Manager provides a central location where you can work with definitions and styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

WARNING! If you overwrite one property set definition with another, you may lose data. For example, a drawing might contain a property set definition with a number of manual properties. The property set is attached to doors with the manual properties entered, and is included in a schedule table. If you overwrite this property set definition with one that does not have the same properties, the values entered for the manual properties are lost. In addition, any columns in the schedule table that reference these manual properties are flagged as invalid. Changes to the schedule table that result from changes to the property set definition are displayed the next time the tables are updated manually or automatically.

Related Topics and Procedures

- Creating a Property Set Definition
- Attaching Notes or Reference Files to a Property Set Definition

- Specifying How the Property Set Definition is Applied
- Adding a Manual Property Definition to a Property Set Definition
- Adding an Automatic Property Definition to a Property Set Definition
- Adding a Formula Property Definition to a Property Set Definition
- Adding a Location Property Definition to a Property Set Definition
- Adding a Classification Property Definition to a Property Set Definition
- Adding a Material Property Definition to a Property Set Definition
- Adding a Project Property Definition to a Property Set Definition
- Editing a Property Set Definition
- Removing All Property Sets from Objects and Styles
- Merging Property Set Definitions

Understanding Automatic Properties

The data in an automatic property is obtained from individual objects or their styles and is not entered manually. For example, a number of doors might have the same style but different widths. A Width automatic property may be different for each door. However, those doors have the same thickness, because thickness is a property of the style. A Thickness automatic property has the same value for all doors of the same style. For more information, see "Adding an Automatic Property Definition to a Property Set Definition" on page 2252.

More than a thousand automatic properties are available in Autodesk®Architectural Desktop. Most are self-explanatory, but a few need additional explanation.

Related Topics

- Wall Area Properties
- Wall Volume Properties
- Wall Length Property
- Slab and Roof Slab Elevation Properties
- Door Size Properties
- Door Swing Direction Properties
- Structural Member Length Property

Wall Area Properties

Four automatic properties provide data for wall area calculations:

- Area—Right Gross
- Area—Right Net

- Area—Left Gross
- Area—Left Net

The right and left sides of a wall are determined as if you were standing on the start point of the wall and facing the endpoint. Gross area is the area of one side without allowing for holes for openings such as doors and windows. Net Area is the area of one side of a wall after cutting holes for openings. Gross Area might be used to determine the quantity of gypsum board needed for a wall, while Net Area might be used to determine the quantity of brick.

WARNING! The area of a wall is determined by adding the union of the wall components (not including body modifiers or interferences) to the area of all faces that point to the right (for right areas) or the left (for left areas). If a particular wall style has multiple components with air space between them, the wall area is probably not reported as expected. For example, a wall typically used in construction has a brick exterior, an air space, and a CMU interior. A style defined for this wall might have a component for the brick and a component for the CMU, but no component for the air space. If the wall was drawn with the brick on the left side, the wall area computed for the right side would include the right face of the CMU as well as the right face of the brick. The area reported would be twice the actual area. To avoid this situation, create components for interior air spaces in wall styles, so that no interior faces exist when the wall components are unioned.

A wall can take a variety of shapes by adding or subtracting body modifiers, or by replacing the wall with body modifiers. Automatically calculating appropriate areas for every possible wall shape is next to impossible. Because of this, body modifiers and interferences are not currently included in wall area calculations. Wall areas for unusually shaped walls must be computed manually.

Wall Volume Properties

Four automatic properties provide data for wall volume calculations:

- Volume—Gross
- Volume—Net
- Volume—Gross With Mods
- Volume—Net With Mods

Gross volume is the volume of wall components without allowing for holes for openings such as doors or windows. Net volume is the volume after cutting holes for openings.

You can obtain the wall volume with or without wall body modifiers.

- Gross and net show the volume of the wall components as if no body modifiers exist.
- Gross With Mods and Net With Mods include body modifiers.

Wall Length Property

A wall can take a variety of shapes by adding or subtracting body modifiers, or by replacing the wall with body modifiers. Automatically calculating the appropriate length for every possible wall shape is next to impossible. Because of this, the Wall Length property returns only the distance between the start point and endpoint of the wall. To get a more accurate report for the length of a wall, you may have to reposition the endpoint of the wall.

The visible length of a wall may be different than the distance between the endpoints due to wall cleanups.

Slab and Roof Slab Volume Properties

Volumes for slabs and roof slabs do not include the volumes of fascias or soffits.

Slab and Roof Slab Elevation Properties

Two elevation properties exist for slabs and roof slabs:

- Elevation—High
- Elevation—Low

These properties provide the highest and lowest value of all slab and roof slab vertices, including fascias and soffits.

Door Size Properties

In addition to the separate dimension properties of Width, Height, and Thickness, these values can be combined in three additional properties. The table below shows how Door Size properties appear for a number of different doors, each with a width of 3'-0", a height of 6'-8", and a thickness of 2", but differing the in number and size of individual door panels.

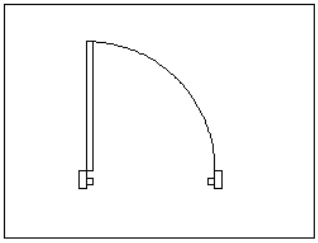
Property	Single Door	Double Door	Uneven Door
Door Size - W x H	3'-0"x6'-8"	3'-0"x6'-8"	3'-0"x6'-8"
Door Size - 2 @ W x H	3'-0"x6'-8"	2@1'-6"x 6'-8"	2'-0"(1'-0")x6'-8"
Door Size - PR W x H	3'-0"x6'-8"	PR 1'-6"x 6'-8"	2'-0"(1'-0")x6'-8"

NOTE Try using a formula property definition if you need more control in formatting multiple door size properties. For more information, see "Adding a Formula Property Definition to a Property Set Definition" on page 2254.

Door Swing Direction Properties

Different countries have different conventions for specifying the swing direction of a door. For example, the door shown in the next illustration is considered a left-swinging door in the United States and Great Britain. It is considered a right-swinging door in Australia, Russia, and most of Europe. To accommodate these differences, a property called Swing Direction - Reverse has been added. You can select the door swing property you want to use when you create or modify a property set definition.

Determining the swing direction of a door



Structural Member Length Property

The length of a structural member is its logical length—which is the length between its grip points. It is not the actual length, which can be difficult to compute. Structural members with offsets and cut planes give a visible length that is different from the logical length.

Evaluating Formulas

A property set using the property set definition that contains the formula is added to an object or style in the usual manner. When the value of the formula property is needed by a schedule table or schedule tag, the process used to determine that value is as follows:

- The value of the property using each property definition in the formula is retrieved from the object or style. It is inserted into the formula in place of the property definition name and the brackets surrounding it.

NOTE Make sure that all property sets used in the formula have been applied to the object or style. Otherwise, a question mark (**?**) is displayed instead.

- If the formula string contains the word "RESULT," it is evaluated as a VBScript function, and the value displayed for the property is the result of that evaluation.
- If the formula string does not contain the word "RESULT," it is evaluated as a mathematical expression.

For more information, see "Adding a Formula Property Definition to a Property Set Definition" on page 2254.

Creating a Property Set Definition

Use this procedure to create a property set definition. You can create a new empty property set definition by copying an existing definition. You then edit the definition properties to customize the characteristics of the definition. For more information, see "Editing a Property Set Definition" on page 2265.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Property Set Definitions.
3. Create a property set definition:

If you want to . . .	Then . . .
create an empty property set definition with default properties	right-click the style or definition, and click New. Enter a name for the new property set definition, and press ENTER.
create a property set definition from an existing property set definition	right-click the property set definition to copy, and click Copy. Right-click, and click Paste. Right-click the new property set definition, and click Rename. Enter a name, and press ENTER.

NOTE If this property set definition will be used with schedule tags, do not enter spaces in the name.

4 Click OK.

Attaching Notes or Reference Files to a Property Set Definition

Use this procedure to enter notes and attach reference files to a property set definition. You can also edit notes and edit or detach reference files from a property set definition.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Property Set Definitions.

3 Select the property set definition to which to attach notes or reference files, right-click, and click Edit.

4 Click the General tab.

5 To add a description to the property set definition, enter it for Description.

6 To add a note, click Notes, click the Notes tab, and enter the note.

7 Click Notes, click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8 Click OK three times.

Specifying How the Property Set Definition is Applied

Use this procedure to specify whether a property set definition applies to objects or to styles and definitions. You also select the objects or the styles and definitions that can use the property sets created from this definition.

If the property set that you define contains properties that are the same for all objects created using a specific style, select a style-based property set. This eliminates the need to attach data for each instance of the object that you create. Objects created using the style with the property set assigned have access to the associated style-based property set.

In general, use automatic properties only within property set definitions that are applied to styles or definitions.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Property Set Definitions.
3. Select the property set definition that you want to change, right-click, and click Edit.
4. Click the Applies To tab.
5. Specify how the property set definition is applied:

If you want to . . .	Then . . .
apply the property set definition to objects	select Objects. The list of objects becomes available.
apply the property set definition to styles and definitions	select Styles and Definitions. The list of styles and definitions becomes available.

6. Select the objects or the styles and definitions to which the property set applies.

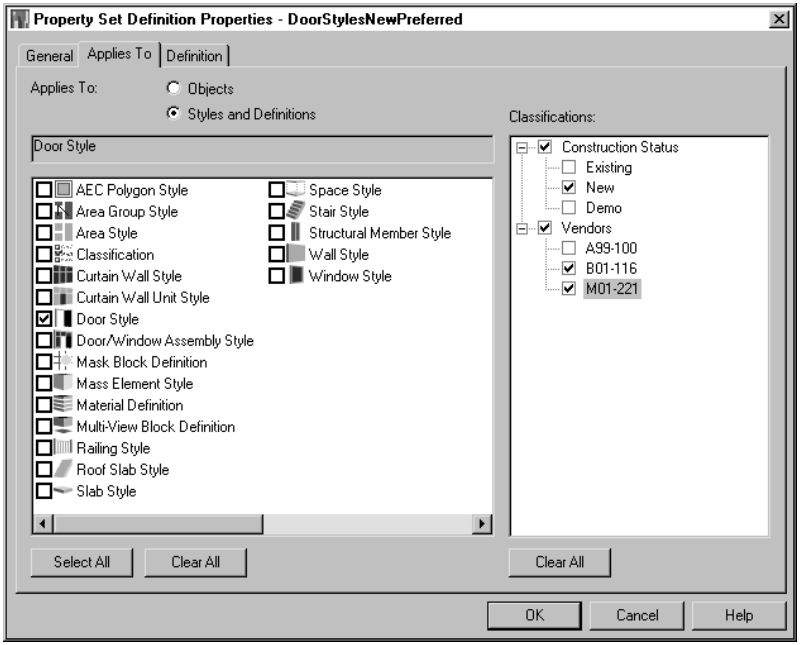
If you want to . . .	Then . . .
define an object-based property set definition	select the objects from the list in the left pane.
define a style- or definition-based property set definition	select the styles or definitions from the list in the right pane.
select all objects or style and definitions	click Select All.
clear the current selections	click Clear All.

By default, all object types are selected. If all the objects or none of the objects are selected, your property set definition can be added to any object type. The area above the list displays the objects that are currently selected.

7 To specify classification criteria, expand a classification definition, and select one or more classifications.

For example, you can select a construction status of New and two preferred vendors. To meet the criteria, the classification in the object style must be New for construction status *and* the Vendor classification must be one of the two vendors selected.

Specifying multiple classification criteria in a property set definition



All classification definitions that apply to the same objects to which the property set definition applies are displayed on the right with a list of their classifications. If classifications are selected, the property set definition can be applied only to those objects or styles and definitions selected on the left that have all the classifications selected on the right.

8 Click OK twice.

Adding a Manual Property Definition to a Property Set Definition

Use this procedure to add a manual property definition to a property set definition. Manual properties are those that must be entered rather than obtained directly from the object.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Property Set Definitions.
3. Select the property set definition for which to add a manual property, right-click, and click Edit.
4. Click the Definition tab.
5. Click .
6. Enter the Name for the property.

   NOTE If this property will be used with schedule tags, do not enter spaces in the property name.

7. To define a property by using existing properties, select a property from the Start With list.
8. Click OK.
9. Enter a short description of the property.

   The default description is the same as the property definition name. This text is for a column header in a schedule table that uses this property.

   NOTE The description does not change if you edit the property name. You can edit the description.

10. Specify the type of data the property contains.

    Changing the data type of a definition for property data already stored in the drawing will set the data to the default value, possibly removing data previously edited.

    For property definitions to be displayed in a matrix column in a schedule table, you can assign multiple values to the same property by using a text data type and separating the values with semicolons. Each value will be displayed in a separate matrix column.

11 Enter a default value.

When a property set is attached to an object, manual properties are set to their default values. These values are used in the example fields and as example data for schedule table columns.

NOTE If you create a manual property, it is helpful to enter neutral characters, such as "--," as the default value. When you create a schedule table, the characters fill the cells for which you have not entered values. You can edit the characters in each cell later. If you leave the default value blank in the property set definition, the corresponding cells are blank. You cannot select and edit blank cells.

12 Select a property data format to specify the method used to display the data included in the definition.

The format you select becomes the default format of a column when this property is added to a schedule table style. It can be changed at any time. The example area shows how the default value is displayed using the selected format.

13 Continue adding manual properties as necessary.

14 Click OK twice.

NOTE When you attach property set data to an xref drawing or block using RefEdit and the property set includes Auto Increment—Integer or Auto Increment—Character, then you must set the default value to the first number to be used in the xref or block to avoid creating duplicate numbers.

Adding an Automatic Property Definition to a Property Set Definition

Use this procedure to add an automatic property definition to a property set definition. The values for automatic properties are obtained directly from an object or its style. For general information about automatic properties and additional explanation about some properties for walls, slabs, roof slabs, doors, and structural members, see "Understanding Automatic Properties" on page 2243.

NOTE Ensure that the property data formats you want to use are stored in the current drawing. For more information, see "Creating a Property Data Format" on page 2285.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Property Set Definitions.
3. Select the property set definition for which to change, right-click, and click Edit.
4. Click the Definition tab.
5. Click .
6. Select one property for each object to which the property set definition applies.

   For example, if the definition applies to windows and window assemblies, you can select the Width property for windows and the Width property for window assemblies. A warning is displayed if you select different properties from different object types. If a property is not selected for an object, a question mark (**?**) is displayed as the value for that object.

   NOTE If the property set definition applies to only one object, you can create multiple automatic property definitions at the same time by selecting multiple items in the list. If the property set definition applies to more than one object, you can only create one property definition at a time. Typically, you would like to select items with the same name for every object the property set definition applies to. Selecting or clearing an item for one object selects or clears items with the same name for all other objects. You can control the selection of individual items by pressing CTRL.

7. Click OK.

   If you want to change the name of the property definition, select Name to make changes.

8. Enter a short description of the property definition.

   The default description is the same as the property definition name. It is the default text for a column header in a schedule table that uses this property.

NOTE The description does not change if you edit the property name. You can edit the description.

9 Select a property data format to specify the method used to display the data included in the definition.

The format you select becomes the default format of a column when this property is added to a schedule table style. It can be changed at any time. The example area shows how the default value is displayed using the selected format.

10 Click OK twice.

NOTE If you double-click on a drawing to open it, and Autodesk Architectural Desktop is not running, you may not be successful. Drawings that include a schedule table which lists the hyperlink for an object will cause this effect. If Autodesk Architectural Desktop is running when you double-click, this will not occur.

Adding a Formula Property Definition to a Property Set Definition

Use this procedure to add a formula property definition to a property set definition. Formula property values are computed based on the values of other property data. For more information about how a formula is evaluated, see "Evaluating Formulas" on page 2246.

For example, width and height are automatic door properties, which you can use to compute the perimeter of the door. Defining *(2 * [Width]) + (2 * [Height])* as a formula for a 36" x 84" door results in a value of 240. A formula property definition is a type of automatic property, because the value it displays is determined automatically, based on its definition, and cannot be edited directly.

Formulas can be simple mathematical expressions, such as *2+2*. They can also contain variables, operators, and functions allowed in VBScript, as shown in these examples.

Statements

Call Statement	For Each...Next Statement	Property Get Statement	Set Statement

Statements

Class Statement	For...Next Statement	Property Let Statement	Sub Statement
Const Statement	Funtion Statement	Property Set Statement	While...Wend Statement
Dim Statement	If...Then...Else Statement	Public Statement	Set Statement
Do...Loop Statement	On Error Statement	Randomize Statement	With Statement
Erase Statement	Option Explicit Statement	ReDim Statement	
Execute Statement	Private Statement	Select Case Statement	

Functions

Abs	Escape	LBound	ScriptEngineMinor Version
Array	Eval	LCase	Second
Asc	Exp	Left	SetLocale
Atn	Filter	Len	Sgn
CBool	FormatCurrency	LoadPicture	Sin
CByte	FormatDateTime	Log	Space
CCur	FormatNumber	LTrim	Split
CDate	FormatPercent	Maths	Sqr
CDbl	GetLocale	Mid	StrComp
Chr	GetObject	Minute	String
CInt	GetRef	Month	Tan
CLng	Hex	MonthName	Time

Functions

Conversions	Hour	MsgBox	Timer
Cos	InputBox	Now	TimeSerial
CreateObject	InStr	Oct	TimeValue
CSng	InStrRev	Replace	Trim
Date	Int, Fix	RGB	TypeName
DateAdd	IsArray	RTrim	UBound
DateDiff	IsDate	Right	UCase
DatePart	IsEmpty	Rnd	Unescape
DateSerial	IsNull	Round	VarType
DateValue	IsNumeric	ScriptEngine	Weekday
Day	IsObject	ScriptEngineBuild Version	WeekdayName
Derived Math	Join	ScriptEngineMajor Version	Year

More detailed information about VBScript is available at *http://msdn.microsoft.com*.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Property Set Definitions.
3. Select the property set definition for which to change, right-click, and click Edit.
4. Click the Definition tab.
5. Click .
6. Enter a name for the formula property.
7. Clear Use formula for description if you do not want to use the formula as the description of the property.

8 Enter the formula:

If you want to . . .	Then . . .
enter text	click to select an insertion point and type.
enter one of the operators	click one of the buttons under the edit box.
surround text with parentheses or quotes	select the text to be surrounded and click the **()** or **“”** under the edit box.
use the value of another property definition in the formula	select the definition in the Property Definitions list.
evaluate the formula as a VBScript function	enter **RESULT** anywhere in the formula.

Select components of the formula from the property definitions listed.

The property definitions available for use in the formula can be applied to the same objects as the property set definition containing the formula.

The names of property definitions used in the formula are displayed in bold and within brackets, such as **[Width]**. If a property definition belongs to a property set definition other than the one containing the formula, that name is displayed as well, such as [**DoorObjects:Height]**.

The formula property definition cannot be used in the formula it defines, as indicated by the and the addition of **[Self]** after its name. Property definitions that end up using the value of the formula cannot be used in the formula, as indicated by the and the addition of **[Circular Reference]** after their names.

NOTE Typing the name of a property definition directly in the formula string, or copying and pasting between formulas, does not work as expected. In these cases the property definition is displayed with normal text, not bold text. For property values to be inserted correctly, they must be selected from the list.

9 Click OK.

To change the name of the property definition, click Name and double-click the property definition in the table, or select Edit Formula. If Use formula for description is not set, edit the description.

10 Select a property data format to specify the method used to display the data included in the definition.

The format you select becomes the default format of a column when this property is added to a schedule table style. It can be changed at any time. The example area shows how the default value is displayed using the selected format.

11 Click OK twice.

Adding a Location Property Definition to a Property Set Definition

Use this procedure to add a location property definition to a property set definition. Location property values are obtained from property data on AEC polygons, areas, or spaces in or near an object. When a selected object has a property set that contains a location property, a Data Location grip is displayed along with its other grips. If the location property is defined to retrieve property data from an area object; for example, if the property data comes from the area underneath the grip, when the object is moved, the grip moves. If an MvBlock representing a piece of furniture is moved from one area to another, it has access to the area's property data, which might include the occupant of a room.

A location property definition is a type of automatic property, because the value it displays is determined automatically, based on its definition, and cannot be edited directly. To create a location property definition, you select a property definition contained in a property set definition that can be applied to AEC polygon, area, or space objects.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Property Set Definitions.

3 Select the property set definition that you want to change, right-click, and click Edit.

4 Click the Definition tab.

5 Click .

6 Enter a name for the location property.

7 Clear Use property name for description if you do not want to use the location property as the description of the property.

8 Expand AEC Polygon, Area, or Space.

9 Expand a property set definition.

10 Select the property data you wish to retrieve.

11 Click OK.

   To change the name of the property definition, click Name and double-click the property definition in the table, or select Edit Location. If Use property name for description is not set, edit the description.

12 Select a property data format to specify the method used to display the data included in the definition.

   The format you select becomes the default format of a column when this property is added to a schedule table style. It can be changed at any time. The example area shows how the default value is displayed using the selected format.

13 Click OK twice.

Adding a Classification Property Definition to a Property Set Definition

Use this procedure to add a classification or its properties to a property set definition. Including classifications or classification properties in a property set definition used for schedules enables you to report classification data for the objects in a schedule.

For example, if you have a classification definition for vendors, you can specify the vendor for different object styles. You can then include the vendor classification or its properties in a property set definition for those object styles. You can use the classification properties in a schedule table for the objects.

1 On the Format menu, click Style Manager.

2 Expand Multi-Purpose Objects, and expand Property Set Definitions.

3 Right-click the property set definition that you want to change, and click Edit.

   For example, if you want to include classifications in a door schedule, select a property set definition that applies to door styles.

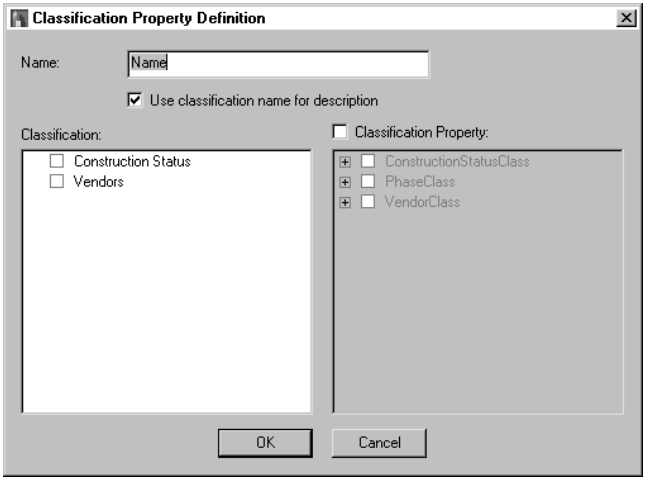
4 Click the Definition tab.

5 Click .

The Classification Property Definition dialog box is displayed. The pane on the left lists classification definitions that apply to the object style for the current property set definition. For example, if the current property set definition applies to door styles, the Classification Definition lists all the classification definitions that apply to door styles.

The pane on the right lists all the property sets that apply to classification definitions.

Example of the Classification Property Definition dialog box with default settings



6 Enter a name for the property.

The name identifies the property in the property set definition.

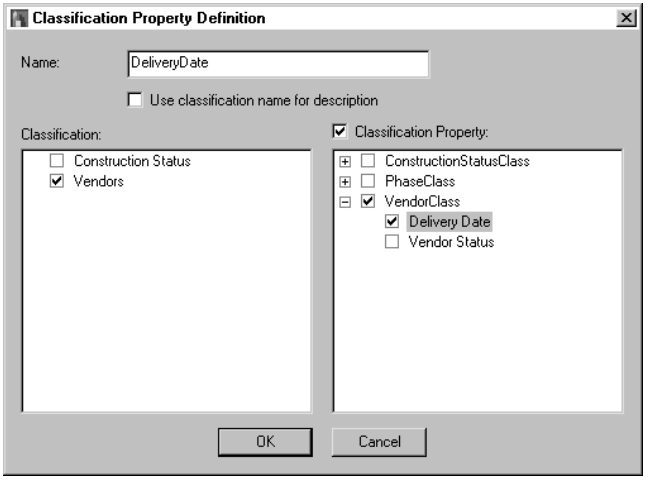
7 Clear Use classification name for description if you do not want to use the classification name for the description of the property.

By default, schedule table styles use the description for the column heading. The default description for classification properties comprises the names of the classification definition, the property set definition, and the property (such as Vendor - Vendor Class - Delivery Date).

8 Select the classification or the classification property to add to the property set:

If you want to . . .	Then . . .
include the value specified for each object for a classification definition	in the left pane, select the classification definition.
include the value of a property that is attached to a classification	in the left pane, select the classification. In the right pane, select Classification Property, expand the property set, and select the property.

Selecting a classification property



9 Click OK.

To change the name of the property definition, click Name, and double-click the property definition in the table, or select Edit Classification. If Use classification name for description is not set, edit the description.

10 Select a property data format to specify the method used to display the data included in the definition.

The format you select becomes the default format of a column when this property is added to a schedule table style. It can be changed at any time. The example area shows how the default value is displayed using the selected format.

11 Click OK twice.

Adding a Material Property Definition to a Property Set Definition

Use this procedure to add a material property definition to a property set definition. Material property values are obtained from an object's component materials or from property data specified for an object's component materials.

A material property definition is a type of automatic property, because the value it displays is determined automatically, based on its definition, and cannot be edited directly.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Property Set Definitions.
3. Select the property set definition that you want to change, right-click, and click Edit.
4. Click the Definition tab.
5. Click .
6. Enter a name for the material property.
7. Clear Use material name for description if you do not want to use the material property as the description of the property.
8. Select a material:

If you want to . . .	Then . . .
retrieve the name of a material specified for a component on an object or style	clear Material Property.
retrieve property data for the material specified for a component on an object or style	select Material Property.

9. Click OK.

   To change the name of the property definition, click Name, and double-click the property definition in the table, or select Edit Material. If Use material name for description is not set, edit the description.

10 Select a property data format to specify the method used to display the data included in the definition.

   The format you select becomes the default format of a column when this property is added to a schedule table style. It can be changed at any time. The example area shows how the default value is displayed using the selected format.

11 Click OK twice.

Adding a Project Property Definition to a Property Set Definition

Use this procedure to add a project property definition to a property set definition. Project property values are obtained from the Drawing Management project in which an object is located.

A project property definition is a type of automatic property. The value it displays is determined automatically, based on its definition, and cannot be edited directly. In order for a project property definition to return correct project data, a drawing management project must be currently open, and the drawing containing the object must be part of that project. If either of these conditions are not met:

- the data in the Property palette extended data tab, and similar dialogs, is displayed as "No Project."
- attributes of schedule tags that display project data are not updated. Attributes display data from the last time the tag was updated when the conditions were met and the drawing was saved. In this case, the data displayed may not be accurate.
- schedule tables that display project data in one or more cells are not updated. Schedule tables display data from the last time the table was updated when the conditions were met and the drawing was saved. In this case, the data displayed may not be accurate.

These conditions allow drawings that contain project data to be viewed and plotted when drawing management is not available.

1 On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Property Set Definitions.

3 Select the property set definition that you want to change, right-click, and click Edit.

4 Click the Definition tab.

5 Click .

6 Enter a name for the project property.

7 Clear Use project information for description if you do not want to use the project property as the description of the property.

8 Select the project information to include in the property definition:

Property	Description
Name	Name of the project
Description	Description of the project
Number	Number of the project
Location	File location of the project on the hard disk or network drive
Number of Levels	Total number of levels in your project
Level ID	ID of the object's level. For example, if you create a wall property set definition with this property and attach it to a wall on the first floor, the extended data will display "Level 1." If you attach the property set definition to a wall on the second floor, this property will be changed accordingly.
Level Elevation	Elevation of the object's level
Level Height	Height of the object's level
Number of Division	Total number of divisions in your project
Division ID	ID of the object's division
Sheet Name	Name of the sheet drawing that contains the object
Sheet Description	Description of the sheet drawing that contains the object
Details	Properties for all project details you created

9 Click OK.

To change the name of the property definition, click Name and double-click the property definition in the table, or select Edit Project. If Use project information for description is not set, edit the description.

10 Select a property data format to specify the method used to display the data included in the definition.

   The format you select becomes the default format of a column when this property is added to a schedule table style. It can be changed at any time. The example area shows how the default value is displayed using the selected format.

11 Click OK twice.

Editing a Property Set Definition

Use this procedure to edit a property set definition.

- You can change the objects or styles to which the property set can be attached.
- You can add and remove properties.
- You can change the name, description, and format of properties.
- You can change additional items for each type of property definition.

Changes are immediately applied to any objects or styles to which the property set created from the definition is attached. If automatic update is specified for a schedule table, the changes also appear in the schedule table. If automatic update is not specified, you need to update the table.

NOTE If you remove a property that is used in a schedule table, INVALID is displayed for value in the table.

1 On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Property Set Definitions.

3 To change how the property set is applied, click the Applies To tab, and specify objects or styles:

If you want to . . .	Then . . .
apply the property set created from this definition to objects	select Objects, and select the objects to which the property set can be attached. For more information, see "Specifying How the Property Set Definition is Applied" on page 2248.

If you want to . . .	Then . . .
apply the property set created from this definition to styles or definitions	select Styles and Definitions, and select the styles and definitions to which the property set can be attached.

4 Click the Definition tab.

5 Edit the properties that define each property definition:

If you want to . . .	Then . . .
edit a manual property definition	select the manual property definition, and change the name, description, type, default, or format. For more information, see "Adding a Manual Property Definition to a Property Set Definition" on page 2251.
edit an automatic property definition	select the automatic property definition, and change the name, description, and format. Double-click the automatic property definition, or select it and click Edit Source. Select the automatic property source, and click OK. For more information, see "Adding an Automatic Property Definition to a Property Set Definition" on page 2252.
edit a formula property definition	select the formula property definition, and change the name, description, and format. Double-click the formula property definition, or select it and click Edit Formula. Change the name, clear or select Use formula for description, and modify the formula by typing in it or selecting property definitions. Click OK. For more information, see "Adding a Formula Property Definition to a Property Set Definition" on page 2254.
edit a location property definition	select the location property definition, and change the name, description, and format. Double-click the location property definition, and click Edit Location. Change the name, clear or select Use property name for description, and select property definitions. Click OK. For more information, see "Adding a Location Property Definition to a Property Set Definition" on page 2258.

If you want to . . .	Then . . .
edit a classification property definition	select the classification property definition, and change the name, description, and format. Double-click the classification property definition, or select it and click Edit Classification. Change the name, and clear or select Use classification name for description. Select from the classifications available in the left pane. Select a property of the classification from the right pane with Classification Property selected, and click OK. For more information, see "Adding a Classification Property Definition to a Property Set Definition" on page 2259.
edit a material property definition	select the material property definition, and change the name, description, and format. Double-click the material property definition, or select it and click Edit Material. Change the name, and clear or select Use material name for description. Select from the materials available in the left pane for the property definition. Select a property of the material from the right pane with Material Property selected, and click OK. For more information, see "Adding a Material Property Definition to a Property Set Definition" on page 2262.
edit a project property definition	select the project property definition, and change the name, description, and format. Double-click the project property definition, or select it and click Edit Project. Change the name, clear or select Use project information name for description, and select the project information. Click OK. For more information, see "Adding a Project Property Definition to a Property Set Definition" on page 2263.
remove a property from the property set definition	select a property, and click . For more information, see "Removing All Property Sets from Objects and Styles" on page 2268.

6 Edit the property definition for manual property definitions:

If you want to . . .	Then . . .
change the name	click Name. Enter a new name, and click OK.
change the description	select the description, and enter new text.

If you want to . . .	Then . . .
change the type of data	select a data type for Type. You cannot change the data type of automatic properties.
change the default value	specify a new default value. You cannot change the default value of automatic properties.
change the format of the data	select a new setting for Format. The information in Example shows the default value in the format you select.

7 Click OK twice.

NOTE Property data format styles, property set definitions, and schedule table styles cannot be changed through RefEdit. Changes seem to work, but will revert to the previous settings when saved back to the xref file. Open the xref drawing directly, and make the changes there.

Removing All Property Sets from Objects and Styles

Use this procedure to remove a property set that no longer applies to the objects and object styles to which it is attached.

If you remove an object or style from the Applies To list in a property set definition after the property set based on the definition is attached to the object, the property set is not automatically removed. This allows you to retrieve data that might have been entered for manual properties.

1 On the command line, enter **PropertySetClean**, and press ENTER.

2 Enter the name of the property set that you want to remove, or press ENTER to remove all the property sets from all objects or styles.

Merging Property Set Definitions

Use this procedure to replace one property set definition with another for all objects or object styles.

1 On the command line, enter **PropertySetDefMerge**, and press ENTER.

2 Enter the name of the property set definition that you want to keep, and press ENTER.

3 Enter the name of the property set definition that you want to merge, and press ENTER.

4 Specify whether to purge the merged property set definition:

If you want to . . .	Then . . .
purge the property set definition that you merged	enter **y** (yes), and press ENTER.
keep the merged property set definition in the drawing	press ENTER.

If you keep the merged property set definition in the drawing, it is not attached to any objects.

5 Specify whether to remove property sets:

If you want to . . .	Then . . .
remove the property sets that do not apply after the merge	enter **y** (yes), and press ENTER.
keep the property sets attached to objects and styles even though they may not apply	press ENTER.

Schedule Table Styles

Schedule table styles determine the content and appearance of schedule tables that you add to drawings.

Content and Format of Schedule Tables

Use schedule table styles to specify the following characteristics of schedule tables:

- Objects that can be included in the schedule table
- Property data to be tracked in the schedule table
- Sequence and format of columns
- Property data format of schedule values
- Format of table titles, column headers, and table cells
- Sorting sequence of rows
- Display properties of tables

Flagging Out-of-Date Schedules

In a schedule table style, you can specify whether a schedule table is updated when objects included in the schedule change. If you turn off the automatic update option, you can still determine whether data in the schedule reflects changes in the drawing. The display properties of the schedule style include an out-of-date marker. When this marker is turned on, a diagonal slash is drawn through the table when the schedule table has not been updated. Updating the table removes the out-of-date marker.

NOTE The out-of-date marker is not entirely reliable. You should always update your schedule tables before plotting.

What You Need to Create a Schedule Table Style

Your drawings must contain the following information to create a new schedule table style:

- Property set definitions for any property data to be included in the tables created from the style. Each column in a schedule table corresponds to one property in a property set for an object or an object style. For more information, see "Property Set Definitions" on page 2241.
- Property data formats to control the format of values in each column of a schedule table. Typically, you use the data format for values that the property set definition uses. However, you can override those data formats in the schedule table style. For more information, see "Property Data Formats" on page 2284.

The content and tools included with Autodesk® Architectural Desktop include schedule table styles for typical schedules, such as door and window schedules or room finish schedules. You can customize these styles for your projects.

Creating Styles for Matrix Schedules

A matrix schedule is a table that contains columns for schedule properties. A symbol, such as a dot or a cross, appears in the cells in each row for objects that have the property. Matrix schedules are also called dot schedules.

You can define schedule table styles to include matrix columns for specific properties. In addition, you can control the following characteristics of matrix schedules or matrix columns in regular schedules:

- The symbol used in each cell containing the property listed in the column header

- The maximum number of columns for each matrix property. If the unique property values in the column exceed this maximum number, the column is displayed as a normal column

If the property data displayed in a matrix column is a string containing a semicolon-delimited list of values, each value in the list will be displayed separately. You can use this format to assign multiple values to the same property, such as multiple floor materials in the same space.

Creating Tools from Schedule Table Styles

You can create a schedule table style tool from schedule table style. You can drag the style from the Style Manager onto a tool palette. You can then specify settings for schedule table style properties for the tool. For more information, see "Creating a Schedule Table Tool" on page 2214.

Managing Schedule Table Styles

To create, edit, copy, or purge schedule table styles, you access the Style Manager. The Style Manager provides a central location for working with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

Related Procedures

- Creating a Schedule Table Style
- Specifying the Default Format of a Schedule Table Style
- Specifying Objects for a Schedule Table Style
- Filtering Scheduled Objects by Classification in a Schedule Table Style
- Adding Columns to a Schedule Table Style
- Adding a Heading Across Columns in a Schedule Table Style
- Editing Columns in a Schedule Table Style
- Specifying the Sort Order in a Schedule Table Style
- Specifying Title Formats in a Schedule Table Style
- Specifying the Display Properties of a Schedule Table Style
- Attaching Notes and Files to a Schedule Table Style

Creating a Schedule Table Style

Use this procedure to create a schedule table style. You can create a style using default style properties or by copying an existing style. You can then edit the style properties to customize the characteristics of the style.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Schedule Table Styles.

3 Create a new schedule table style:

If you want to . . .	Then . . .
create an empty schedule table style	right-click Schedule Table Styles, and click New.
create a style from an existing style	right-click the schedule table style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new schedule table style, and press ENTER.

5 To edit the new schedule table style, right-click the style, and click Edit.

6 Edit the options for the schedule table style:

If you want to . . .	Then . . .
specify default format for the style	see "Specifying the Default Format of a Schedule Table Style" on page 2273.
specify the objects for the schedule table style to track	see "Specifying Objects for a Schedule Table Style" on page 2274.
use classifications to specify objects included in a schedule table	see "Filtering Scheduled Objects by Classification in a Schedule Table Style" on page 2275.
add columns to represent properties reported in the schedule table style	see "Adding Columns to a Schedule Table Style" on page 2276.
add column headings to a schedule table style	see "Adding a Heading Across Columns in a Schedule Table Style" on page 2278.
edit column data and column placement in a schedule table style	see "Editing Columns in a Schedule Table Style" on page 2279.
specify the sort order of rows in a schedule table style	see "Specifying the Sort Order in a Schedule Table Style" on page 2280.
specify the formats of the table title, column headings, and matrix column headings	see "Specifying Title Formats in a Schedule Table Style" on page 2281.

If you want to . . .	Then . . .
specify visibility, layer, linetype, and other display properties of the schedule table style	see "Specifying the Display Properties of a Schedule Table Style" on page 2282.
add notes and files to the style	see "Attaching Notes and Files to a Schedule Table Style" on page 2283.

7 Click OK twice.

Specifying the Default Format of a Schedule Table Style

Use this procedure to specify the default text format and placement for table columns and their contents. You can also specify the default symbol used in matrix schedules and for true/false values in regular schedules.

If necessary, you can override these settings for individual columns and for table titles.

NOTE Most schedule table styles provided by Autodesk® Architectural Desktop have overrrides applied to their titles and column headers. You can access these settings on the Layout tab in the Schedule Table Style Properties dialog box.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Schedule Table Styles.

3 Select the schedule table style that you want to change, right-click, and click Edit.

4 Click the Default Format tab.

5 Select a text style.

The text style must be defined as an AutoCAD® text style before you can apply it to a schedule table style. To use a different font in your schedule, you must first define an AutoCAD text style that uses the font.

6 Select a text alignment.

For more information about aligning text using the Multiline Text Editor, see "Formatting Multiline Text" in the *AutoCAD® 2004 User's Guide*.

NOTE Height, Fixed Width, and Gap are normally specified as the size you want to use when plotting the drawing containing the schedule table.

7 Enter the prescaled text height for Height.

8 Enter the prescaled gap between the text and the schedule table lines for Gap.

9 Select the text orientation within the cell.

For the table title and group titles, this option also controls the location of the cell relative to the rest of the table.

10 Select a matrix symbol.

The symbol is used in matrix columns and, optionally, for true/false values. Symbols include the following:

- Check
- Dot
- Cross
- Slash

11 Select or clear Use for True/False to control whether matrix symbols or the data format text is used for true/false values.

12 Enter a fixed width for all columns, or enter **0.0** for columns that adjust to fit the data within them.

Cell Size Height is a read-only field. Its value is calculated from the Height and Gap values.

13 Click OK twice.

Specifying Objects for a Schedule Table Style

Use this procedure to specify the types of objects to track in tables created from a schedule table style.

You can include more than one object type in a schedule table style. For example, you can create a schedule table style for windows that tracks both individual windows and window assemblies.

The property sets from which you select data must apply to all object types specified in the style. For example, in a schedule table style for windows and window assemblies, the window assembly styles property set is not available

because it does not apply to windows. In addition, limiting the number of object types in a schedule table style improves drawing performance.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Schedule Table Styles.
3. Select the schedule table style that you want to change, right-click, and click Edit.
4. Click the Applies To tab.
5. Select the objects that the schedule table style applies to.

   By default, all object types are selected. If all objects or none of the objects are selected, your schedule table style can include any object type. You can select all objects on the list, or clear all the selections. The area above the lists displays the objects that are currently selected.

   All classification definitions that apply to the objects that the schedule table style applies to are displayed on the right, with a list of their classifications. Select any number of classifications in any number of classification definitions. If classifications are selected, the schedule table style can include objects or styles and definitions selected on the left only if they have been classified with the classifications selected on the right.

6. Click OK twice.

Filtering Scheduled Objects by Classification in a Schedule Table Style

Use this procedure to specify the classification criteria that an object style must satisfy to be included in schedule tables created from this schedule table style. You can specify more than one classification criteria.

For example, if you want to schedule only door styles with a New construction status and a vendor with preferred status, you can specify those criteria in the schedule table style. Only doors with styles that meet *both* criteria can be included in the schedule table.

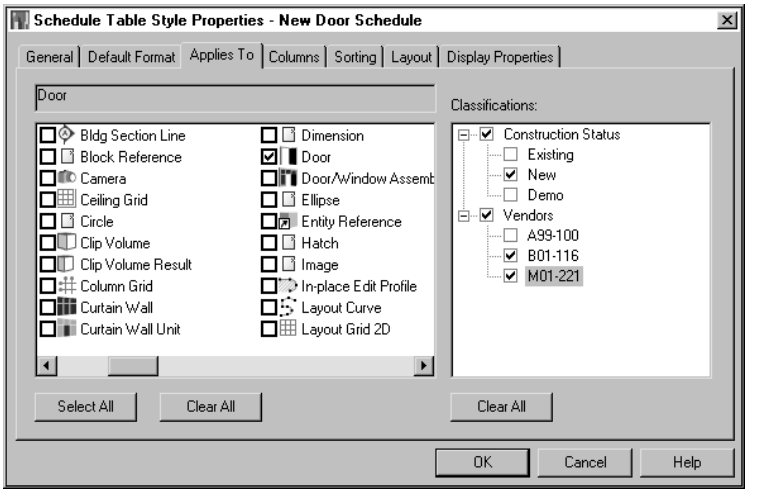
1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand Schedule Table Styles.
3. Right-click the schedule table style that you want to change, and click Edit.
4. Click the Applies to tab.

5 Click Clear All, and then select the objects you want the schedule table style to apply to.

6 To specify classification criteria, expand a classification definition, and select one or more classifications.

For example, you can select a construction status of New and two preferred vendors. For objects to be included in schedules of this style, the classification in the object style must be New for construction status, and the classification for Vendor must be one of the two vendors selected.

Specifying multiple classification criteria in a schedule table style



7 Click OK twice.

Adding Columns to a Schedule Table Style

Use this procedure to add columns for each property to be reported in schedule tables created from a schedule table style.

Each column contains the values for one property in a property set. The property set definitions for the properties you specify must exist in the drawing before you can create columns for them.

You must also specify the objects that the schedule table style applies to before you add columns. For more information, see "Specifying Objects for a Schedule Table Style" on page 2274.

For more information about property set definitions, see "Property Set Definitions" on page 2241.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Schedule Table Styles.
3. Select the schedule table style that you want to change, right-click, and click Edit.
4. Click the Columns tab.
5. Select the existing column.
6. Click Add Column.

   The new column is inserted after the selected column.

7. Select the property to track in this column.

   Properties that are already used in a column are unavailable in the properties list in the Add Column dialog box.

8. Enter the heading for the column.

   The property description is the default text for a column header in a schedule table that uses this property.

9. Select the property data format, or use the default format from the property set definition.
10. Specify additional settings for the column:

If you want to . . .	Then . . .
specify a different format and orientation for the cells in this column	click Override Cell Format, and specify format settings that apply only to data cells in this column.
use a matrix format for the values in the column	select Matrix, and enter the maximum number of columns used to report the values for the selected property.
report a total value from all the values in this column	select Total.
hide the column from view in the drawing	select Hide.

NOTE Hiding a column does not affect the data displayed in it or any other column in the table. It only affects the display of the table.

When you edit property data to be displayed in a matrix column, you can assign multiple values by using a text data type and separating the values with semicolons. Exch value is displayed in a separate column in the matrix column.

11 Specify the placement of this column, relative to the location of existing columns.

The new column is inserted after the existing column selected above.

12 Click OK.

13 To repeat the first column at the end of the table, select Repeat First Column.

14 To include a quantity column, select Include Quantity Column.

If you include a quantity column in a schedule table, the objects in the table with the same values in every column are displayed in one row, with the number of objects displayed in the Quantity column.

15 If you include a quantity column and want to add a product column, select Include Product Column.

The Product column multiplies the value in the Quantity column by the value in the Data column. For example, you can use a Product column to multiply a unit cost for an object by the number of objects to get a total cost. To specify the Data column, select the Product column, click Modify, and then select one of the schedule table columns in the Data column list.

16 Click OK twice.

Adding a Heading Across Columns in a Schedule Table Style

Use this procedure to add a heading that spans multiple adjacent columns in a schedule table style. For example, you can create the heading "Hardware" to span the columns for hinges, handles, and locks in a door schedule.

You can also remove a heading that spans multiple columns.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Schedule Table Styles.

3 Select the schedule table style that you want to change, right-click, and click Edit.

4 Click the Columns tab.

5 Select the first column you want to include under a heading, and press CTRL while you select the other columns.

   Columns must be adjacent.

6 Click Add Header.

7 Enter a title for the heading, and press ENTER.

8 To remove a heading, select it, and click Delete. In the Remove Columns/Headings dialog box, click OK.

9 Click OK twice.

Editing Columns in a Schedule Table Style

Use this procedure to change the text of column headings, the format of column data, and the placement of a column in a schedule table style. You can also delete a column.

To change the format of column headings, see "Specifying Title Formats in a Schedule Table Style" on page 2281.

1 On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Schedule Table Styles.

3 Select the schedule table style that you want to change, right-click, and click Edit.

4 Click the Columns tab.

5 Select a column, and click Modify.

6 Specify settings for the column:

If you want to . . .	Then . . .
specify a different column heading	enter the new column heading for Heading.
specify a different format and orientation for the cells in this column	click Override Cell Format, and specify format settings that apply only to data cells in this column.
use a matrix format for the values in this column	select Matrix, and enter the maximum number of columns used to report the values for the selected property.

If you want to . . .	Then . . .
report a total value from all the values in this column	select Total.
hide the column from view in the drawing	select Hide.

7 Click OK.

8 Change the order of columns:

If you want to . . .	Then . . .
move an individual column	select the column heading, and drag the column to a new location.
move a group of columns that have a common heading that spans the columns	select the common heading, and drag the column group to a new location.
add or remove a column in a column group	select the heading for the column group, click Delete, and click OK. Select the columns to include in the column group, click Add Header, and enter the heading name.

9 To delete a column, select the column, and click Delete.

10 To use a different property in a column, delete the column, and add a new column with the property you want to use.

11 Click OK twice.

NOTE Property data format styles, property set definitions, and schedule table styles cannot be changed through RefEdit. Changes seem to work, but will revert to the previous settings when saved back to the xref file. Open the xref drawing directly, and make the changes there.

Specifying the Sort Order in a Schedule Table Style

Use this procedure to specify the sort order of rows in a schedule table style. You can sort rows in ascending or descending order of the values in one or more columns.

1 On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Schedule Table Styles.

3 Select the schedule table style that you want to change, right-click, and click Edit.

4 Click the Sorting tab.

5 Specify the sort order of the rows:

If you want to . . .	Then . . .
add a property to sort by	click Add, select a property to sort by, and click OK. The selections presented are the columns defined on the Columns tab that are not already selected for sorting.
select the sorting method for a property	select the property, and select Ascending or Descending for Sort Order.
remove a property from the sorting list	select the property, and click Remove.
change the location of a property in the sort order	select the property, and click Move Up or Move Down.

6 Click OK twice.

Specifying Title Formats in a Schedule Table Style

Use this procedure to enter the title of a schedule table, and to specify the formats of the table title, column headings, and matrix column headings. The formats that you specify in this procedure for regular and matrix column headings override the default format settings.

1 On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2 Expand Documentation Objects, and expand Schedule Table Styles.

3. Select the schedule table style that you want to change, right-click, and click Edit.
4. Click the Layout tab.
5. Enter the title of the schedule table for Table Title.
6. Select Override Cell Format next to the type of title format you want to change.
7. Select a text style.

   The text style must be defined as an AutoCAD®text style before you can apply it to a schedule table style. To use a different font in your schedule, you must first define an AutoCAD text style that uses the desired font.

8. Select a text alignment.

   For more information about aligning the text using the Multiline Text Editor, see "Formatting Multiline Text" in the *AutoCAD® 2004 User's Guide*.

9. Enter the prescaled text height for Height.

   This height is scaled according to the drawing scale specified in the Drawing Setup dialog box.

10. Enter the prescaled gap between the text and the schedule table lines for Gap.

    Cell Size Height is a read-only field that is calculated by Height + 2 x Gap.

11. Select the text orientation within the cell.

    For the table title and group titles, this option also controls the location of the cell relative to the rest of the table.

12. Click OK.
13. To remove an override, clear the check box next to the title format you want to restore to the default format.
14. Click OK twice.

Specifying the Display Properties of a Schedule Table Style

Use this procedure to change the following properties of the display components of a schedule table style:

- Visibility (display component is on or off)
- Layer
- Color
- Linetype

- Lineweight
- Linetype scale

You can specify display properties for the table outer frame, lines between rows and columns, the table title, column headers, and the data in table cells.

Use Data Major Row Lines for every fifth row and Data Minor Row Lines for all other rows to control the display properties for lines separating each row of data. This is useful for long schedule tables.

You can also turn on an out-of-date marker that indicates when the data in a schedule table created from the schedule table style does not show the latest changes. This component is turned off by default. Turning it on can slow drawing performance, especially in large drawings.

1. Select the schedule table style you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation on which to display the changes, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Attaching Notes and Files to a Schedule Table Style

Use this procedure to enter notes and attach reference files to a schedule table style. You can also edit notes and edit or detach reference files from a schedule table style.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Schedule Table Styles.
3. Right-click the schedule table style that you want to change, and click Edit.
4. Click the General tab.

5 To add a description to the schedule table style, enter it for Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9 When you finish making changes to the schedule table style, click OK.

Property Data Formats

Property data formats control how data is displayed in schedule tables, schedule tags, and the Edit Property Data dialog box.

Data Formats

Each property data format contains settings to format the following data types:

- Text
- True/False values
- Integers
- Real numbers

When you apply a data format to schedule data, the value for the property is displayed using the appropriate settings for the property. For example, a dimension value uses the real number settings while a remark can use the settings for text from the same schedule data format.

Applying Property Data Formats

Property data is retrieved from an object as raw, unformatted values. Property set definitions, schedule table styles, and schedule tags use data formats to display property data as formatted values. The Edit Property Data dialog box uses the data formats from property set definitions to format values.

You typically apply the same data format to similar properties, such as width, height, and thickness of a door. You can select a data format that is appropriate for each property. For example, you may want to use architectural format to display real numbers for dimensions. However, real numbers for costing properties require a monetary format. You can create different property data formats for these situations.

The data formats available for property set definitions, schedule table styles, and tags are those stored in the current drawing. When you copy property set definitions or schedule table styles into a drawing, data formats used in the definitions and styles are also copied into the drawing.

If you modify a data format, the property data is affected in any property set, schedule table, or schedule tag that uses the format.

Using Different Data Formats

You can specify different data formats for the same property in property set definitions, schedule table styles, and schedule tags. This enables you to display the same value differently in different contexts. For example, you may want to use a data format with greater precision for real numbers in a property set, and display fewer digits in a schedule table.

Managing Data Formats

To create, edit, copy, or purge data formats, you access the Style Manager. The Style Manager provides a central location for working with data formats from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

Related Procedures

- Creating a Property Data Format
- Attaching Notes and Reference Files to a Property Data Format

Creating a Property Data Format

Use this procedure to create a property data format. You can create a format using default properties or by copying an existing data format. You can then edit the properties to customize the characteristics of the property data format.

NOTE Certain automatic properties cannot be formatted with property data formats because their values are formatted from within the automatic query.

1 On the Format menu, click Style Manager.

The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Property Data Formats.
3. Right-click Property Data Formats, and click New.
4. Enter a name for the new property data format, and press ENTER.
5. Right-click the new property data format, and click Edit.
6. Click the Formatting tab.
7. Specify general formatting values:

If you want to . . .	Then . . .
specify a prefix	enter a string to be placed in front of data for Prefix. For example, tolerances might require a preceding plus/minus symbol; a tolerance of 10 could be displayed as +10. A currency string could be prefixed with a dollar sign.
specify a suffix	enter a string to be placed after data for Suffix. For example, a door leaf thickness of 35 could have a millimeter suffix (35mm).
specify text for a property that is undefined	enter a text string to be displayed when the requested property has not been attached to an object for Undefined. A typical undefined string is "?".
specify text for a property that is not applicable	enter a text string to be displayed when the requested property does not apply to an object for Undefined. For example, the rise property does not apply to a door with a rectangular opening, but it does apply to one with an arched opening. A typical "not applicable string" is "NA."

8. Specify the case for the schedule text:

If you want to . . .	Then . . .
use no case formatting	select As Is for Case.
convert all text to uppercase	select Upper for Case.
convert all text to lowercase	select Lower for Case.
capitalize the first letter of the first word	select Sentence for Case.

If you want to . . .	Then . . .
capitalize the first letter of each word	select Title for Case.

9 Enter the maximum number of digits, including leading zeroes, for integers.

Zero padding is the expansion of integer values to include leading zeros. The value entered specifies the maximum length of a numeric value after it has been padded with leading zeros. For example, with Zero Padding at 3, the number 6 would become 006. This option primarily is intended for identity numbers, such as those used by door and window tags. For example, to number doors as D01 through to D99, the raw value of the data would be saved as a simple integer, but the prefix would be D and Zero Padding would be 2. Entering zero for Zero Padding applies no zero padding.

10 Enter the values for True and False.

For example, you can specify Yes for True and No for False.

11 Enter data to display a sample of your current settings for Result.

12 To use a dimension style to specify some formatting, click Set from Dimension Style, select a dimension style, and click OK.

Undefined, Not Applicable, Case, Zero Padding, and True/False are not defined by dimension styles.

13 Select the unit format, numerical precision, fraction format, and scale for real numbers. Definitions of these items are as follows:

- **Unit Format:** The AutoCAD® conversion units (Architectural, Scientific, Decimal, Engineering, and Fractional) used when converting numeric values into strings. For example, a value of 14.25 is displayed as 1'–2-1/4" in Architectural units.
- **Precision:** The number of decimal places used to display floating point numbers (for example, 0, 0.0, 0.00, and so on).
- **Fraction Format:** If the unit format is Architectural or Fractional, set the format used to display fractions (Horizontal, Diagonal, or Not Stacked). Note that all fonts do not support all fraction formats.
- **Scale:** The value by which the real number is scaled before it is displayed. For example, if the current drawing units are inches, a scale of 2.54 converts a dimension to centimeters.

14 Select the Round Off value for real numbers:

If you want to . . .	Then . . .
round to the nearest value	select Nearest.
round to the nearest greater value	select Up.
round to the nearest lesser value	select Down.

If you enter a value of 0.25, all numeric values are rounded to the nearest 0.25 unit. Similarly, if you enter a value of 1.0, all numeric values are rounded to the nearest integer. The number of digits displayed after the decimal point depends on the precision specified. No round-off occurs for a value of 0.0.

15 Specify the rules for suppression of leading and trailing zeros, and feet and inches of floating point numbers:

If you want to . . .	Then . . .
suppress leading zeros in all decimal numeric values	select Leading for Zero Suppression. For example, 0.5000 becomes .5000.
suppress trailing zeros in all decimal numeric values	select Trailing for Zero Suppression. For example, 12.5000 becomes 12.5.
suppress the feet portion of a feet-and-inches numeric value when the value is less than one foot	select 0 Feet for Zero Suppression. For example, 0'–6 1/2" becomes 6 1/2".
suppress the inches portion of a feet-and-inches numeric value when the value is an integral number of feet	select 0Inches for Zero Suppression. For example, 2'–0" becomes 2'.

For more information, see "Suppressing Zeros in Dimension Units" in the *AutoCAD® 2004 User's Guide*.

16 Select the decimal separator.

For more information about fraction format and decimal separators, see "Formatting Primary Dimension Units" in the *AutoCAD® 2004 User's Guide*.

17 Select the whole number separator.

18 Click OK twice.

Attaching Notes and Reference Files to a Property Data Format

Use this procedure to enter notes and attach reference files to a property data format. You can also edit notes and edit or detach reference files from a property data format.

1. On the Format menu, click Style Manager.

   The Style Manager is displayed with the current drawing expanded in the tree view.

2. Expand Documentation Objects, and expand Property Data Formats.
3. Select the property data format that you want to change, right-click, and click Edit.
4. Click the General tab.
5. To add a description to the property data format, enter it for Description.
6. To add a note, click the Notes tab, and enter the note.
7. Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, click Open, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

8. Click OK twice.

Classification Definitions

A classification definition is a group of named properties or characteristics that you can assign to the objects of a particular style. Classifications enable you to track objects by construction status, project phase, building element, vendor, or other criteria. A classification definition is applied to one or more object styles. The definition contains classification names and descriptions. Each classification can have property sets attached to it.

Classifications and Schedules

Classifications provide additional control over the content of schedule tables.

- You can include only those objects that meet the classification criteria in the schedule table.
- You can include classification definitions as columns in a schedule table.
- You can create and attach property sets to individual classifications to track additional data with each classification; and you can include this information in schedule tables.

Uses for Classifications

Here are some examples of classification definitions:

- Classifications for multi-view blocks enable you to distinguish among blocks to use for furniture, appliances, fixtures, and equipment
- Classifications for project phases
- Classifications for door types let you filter partition doors in bathrooms from door schedules

Classifications and the Display System

You can modify display sets in a display configuration to show or hide objects based on their classification. For more information, see "Displaying Objects by their Classification" on page 471.

Managing Classification Definitions

To create, edit, copy, or purge classification definitions, you access the Style Manager. The Style Manager provides a central location for working with definitions and styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

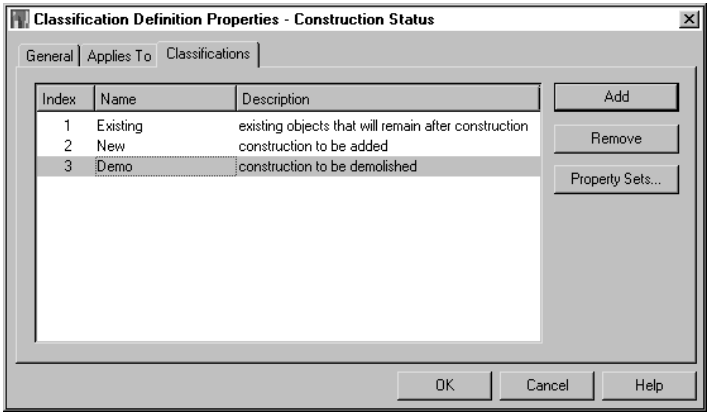
Related Topics and Procedures

- An Example of Classifications and their Use
- Specifying the Object Styles for a Classification Definition
- Entering Classifications in a Classification Definition
- Attaching Property Set Definitions to a Classification Definition
- Editing a Classification Definition
- Viewing the Classifications in a Classification Definition
- Attaching Notes and Files to a Classification

An Example of Classifications and their Use

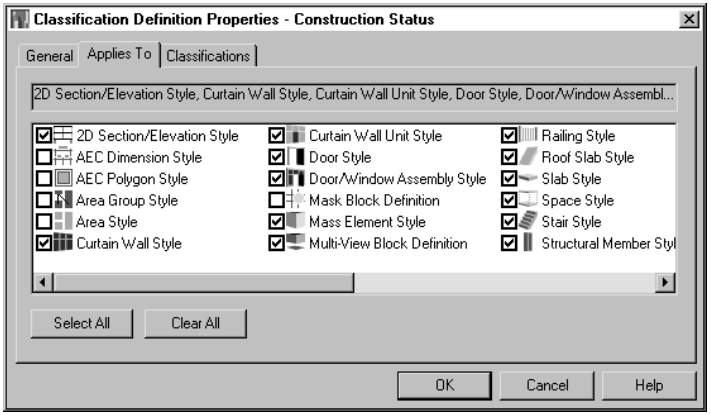
You can create a classification definition that contains a classification for each construction status, such as Existing, Demo, and New.

Creating a classification definition for construction status



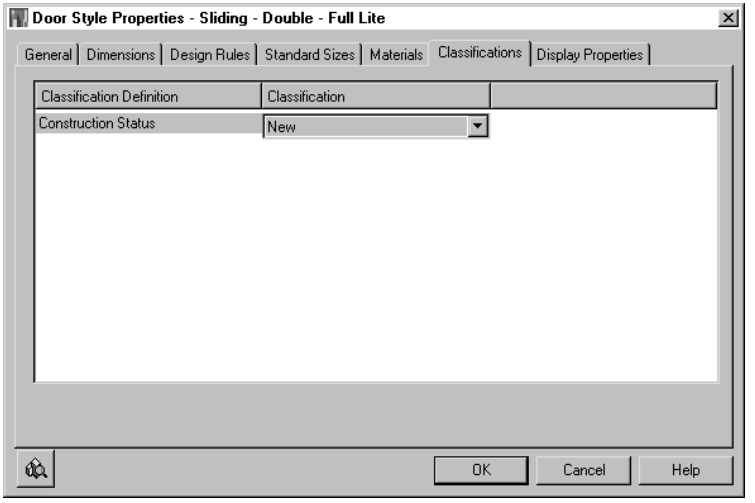
You also specify the object styles to which the classification definition applies.

Specifying object styles in a classification definition



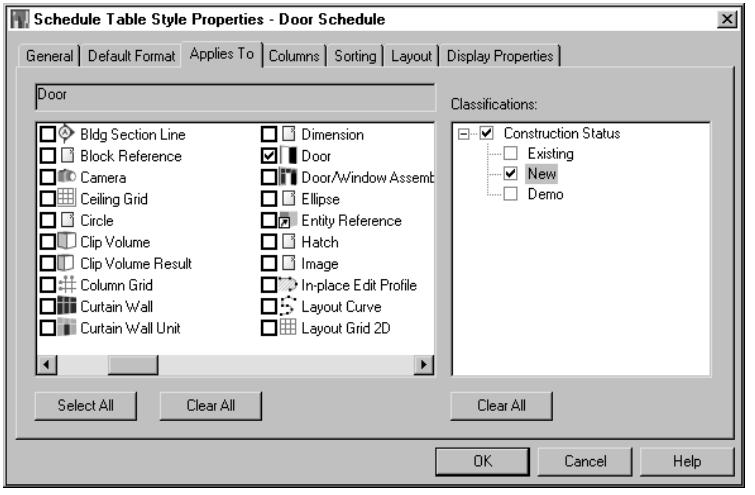
The classification definition is listed on the Classifications tab in the object style properties. You select a classification, such as New, in the object style. For example, your drawing might contain certain door styles for existing doors, and different door styles for new construction. All doors created from these styles have the classification specified in their style.

Door style with a classification specified



When you are ready to schedule doors, you can specify in the schedule table style to include only those doors with the New classification. Any other doors included in the selection set are filtered from the table.

Specifying classification criteria in a schedule table style



You can also include classifications as a column in your schedule tables. You can create and attach property sets to individual classifications to track additional data, and you can include this data in schedule tables. In addition, you

can modify settings in the display system to filter the display of objects based on their classification.

Creating a Classification Definition

Use this procedure to create a classification definition. You can create a definition using default properties or by copying an existing definition.

1 On the Format menu, click Style Manager.

2 Expand Multi-Purpose Objects, and expand Classification Definitions.

3 Create a classification definition:

If you want to . . .	Then . . .
create a definition with default properties	right-click Classification Defnitions, and click New.
create a definition from an existing definition	right-click the classification definition you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new classification definition, and press ENTER.

5 To edit the new classification definition, right-click the definition, and click Edit.

6 Edit the classification definition:

If you want to . . .	Then . . .
enter a description of the classification definition	click the General tab, and enter the description.
specify the objects to which the definition applies to	see "Specifying the Object Styles for a Classification Definition" on page 2294.
enter classifications	see "Entering Classifications in a Classification Definition" on page 2295.
attach property sets to the individual classifications in the definition	see "Attaching Property Set Definitions to a Classification Definition" on page 2296.
add notes and files to the definition	see "Attaching Notes and Files to a Classification" on page 2300.

7 Click OK twice.

Specifying the Object Styles for a Classification Definition

Use this procedure to specify the object styles to which a classification definition applies. You can specify that a classification definition apply to one or more styles. The classification will be listed on the Classification tab for all the object styles that you specify.

For example, if you specify that a classification definition applies to door styles and window styles, the classification is listed on the Classifications tab of all door and window styles in the drawing. You can then select an individual classification appropriate for each door style and window style. For more information about specifying a classification in an object style, see the style topics in the object chapters of the online Help.

1 On the Format menu, click Style Manager.

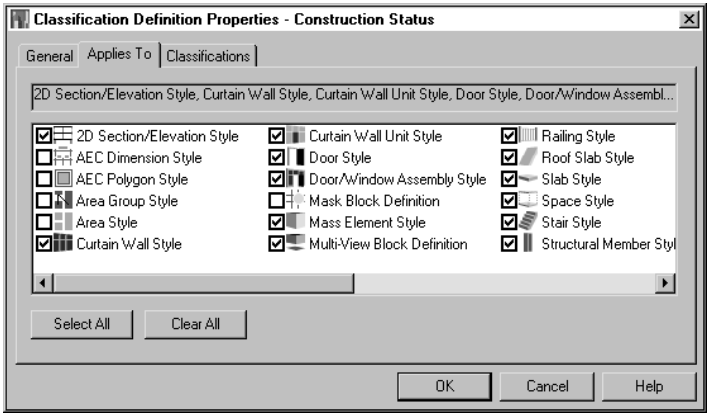
2 Expand Multi-Purpose Objects, and expand Classification Definitions.

3 Right-click the classification definition, and click Edit.

4 Click the Applies to tab.

5 Select the object styles to which the classification definition will apply.

Selecting object styles to which a classification definition applies



6 Click OK twice.

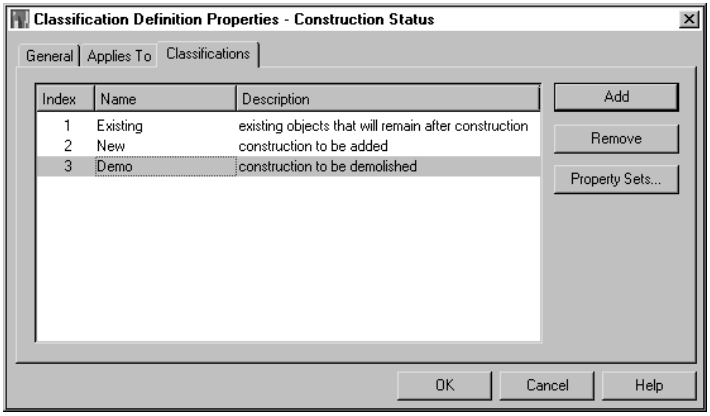
Entering Classifications in a Classification Definition

Use this procedure to enter classifications for a classification definition. Classifications are individual entries within a classification definition. For example, a classification definition for construction status may contain the classifications existing, demo, and new. In the object styles to which the definitions applies, you can select one classification for each style.

NOTE Be sure to specify the object styles to which the classification definition applies. The classifications are not available in object styles until you specify the object styles in the classification definition. For more information, see "Specifying the Object Styles for a Classification Definition" on page 2294.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects, and expand Classification Definitions.
3. Right-click the classification definition, and click Edit.
4. Click the Classifications tab.
5. Click Add.
6. Select the new classification, and enter a name for it.
7. Select the description, and enter a description of the classification.

Adding classificatons to a classification definition



8. Continue adding classificaitons.
9. Click OK twice.

Attaching Property Set Definitions to a Classification Definition

Use this procedure to add property set definitions to individual classifications in a classification definition. You can add property sets to each classification to track additional information with that classification.

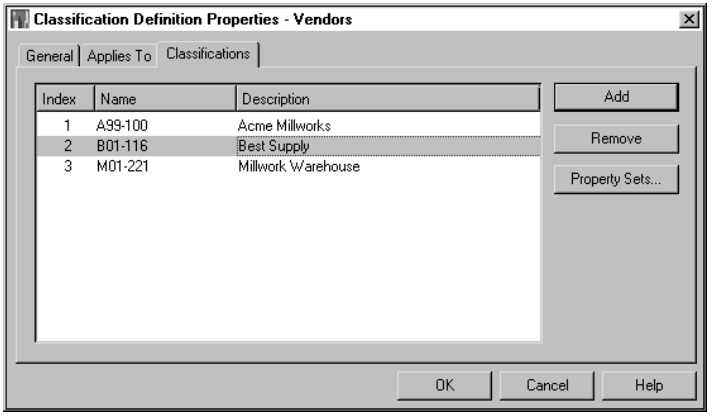
For example, if you create a classification definition for vendors, you can attach a property set to each vendor classification. The property sets can contain any properties that you specify. The properties are then associated with each object created from a style that is assigned the classification. These properties can be included in the schedule table when the objects are scheduled.

For more information about creating property sets, see "Property Set Definitions" on page 2241. For more information about adding classification property data to property set definitions, see "Adding a Classification Property Definition to a Property Set Definition" on page 2259.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects, and expand Classification Definitions.
3. Right-click the classification definition, and click Edit.
4. Click the Classifications tab.
5. Select one or more classifications, and click Property Sets.

   Hold down SHIFT or CTRL to select multiple classifications to which you want to attach the same property sets.

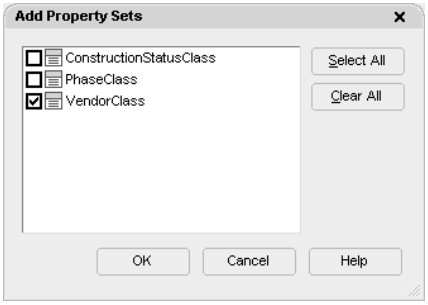
Selecting a classification to which you attach property sets



6 Click .

7 Clear property sets that you do *not* want to attach to the classificaton, and click OK.

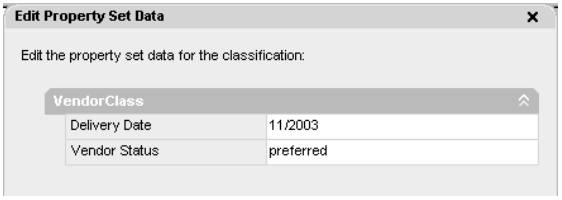
Clearing property sets you do not want to attach to classifications



8 Enter values for the property data, and click OK.

You can enter or edit values later, if necessary.

Entering data for a property set attached to a classification



9 Continue attaching property sets to other classifications.

10 Click OK twice.

Editing a Classification Definition

Use this procedure to edit or remove classifications in a classification definition, to add or edit data in property sets attached to classifications, and to detach property sets from classifications.

NOTE You can remove only those classifications not currently assigned to an object style. You cannot delete classifications that are in use.

---

1 On the Format menu, click Style Manager.

2 Expand Multi-Purpose Objects, and expand Classification Definitions.

3 Right-click the classification definition, and click Edit.

4 Click the Classifications tab.

5 Edit classifications:

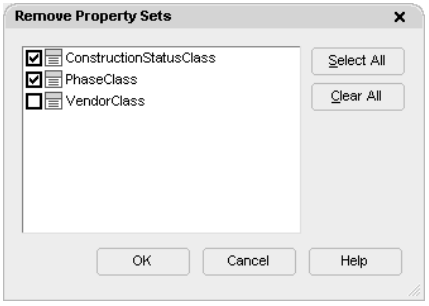
If you want to . . .	Then . . .
edit the classification name	select the name, edit the text, and press ENTER.
edit the classification description	select the description, edit the text, and press ENTER.
add or edit property set data in property sets already attached to a classification	select the classification, and click Property Sets. Enter or edit property data, and click OK.

6 To detach property sets from a classification, select the classification, and click Property Sets.

7 Click .

8 Clear the property sets you do *not* want to remove, and click OK.

Removing property sets from a classification



9 Click OK.

10 To remove a classification, select the classification, and click Remove.

If the Remove button is unavailable, you cannot delete the classification because it is currently assigned to an object style.

11 Click OK twice.

Viewing the Classifications in a Classification Definition

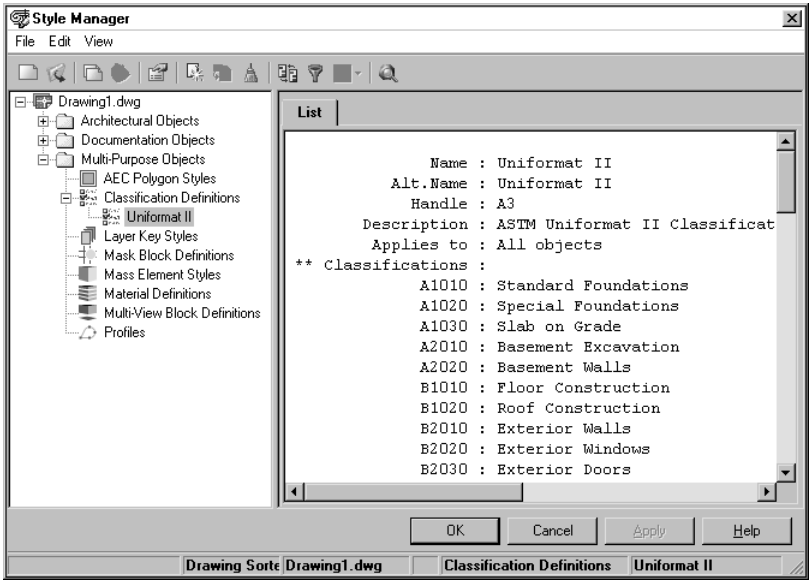
Use this procedure to view a list of classifications and their descriptions for a classification definition in the current drawing.

Only the classifications, and not their descriptions, are listed on the Classifications tab in the style properties. If descriptions have been entered, you can view them in the Style Manager.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects, and expand Classification Definitions.
3. Select the classification definition whose classifications you want to view.
4. In the right pane, click the List tab.

   Use the scroll bar to view the entire list of classifications.

   Viewing classifications for a selected classification definition



5. Click Cancel.

Attaching Notes and Files to a Classification

Use this procedure to enter notes and attach reference files to a classification definition. You can also edit notes and edit or detach reference files from a definition.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects, and expand Classification Definitions.
3. Right-click the classification definition that you want to change, and click Edit.
4. Click the General tab.
5. To add a description to the definition, enter it for Description.
6. Click Notes.
7. To add a note, click the Notes tab, and enter the note.
8. Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

9. When you finish making changes to the classification definition, click OK.

Troubleshooting Schedule Tables

This topic provides answers to the following questions about schedule tables and their data:

- I added a schedule table, but all the cells contain question marks. Why did this happen?
- Why is an object I added to the drawing not listed in the schedule table?
- How do I know which property sets to attach to objects or styles to remove question marks from columns in a schedule table?

- Why doesn't the data in the schedule table show the changes I made to objects in the drawing?
- After adding and removing objects, I updated the schedule table. Why are the object numbers still out of order?
- Is there an easy way to locate an object that is listed in a schedule table?
- Why can't I select an empty cell in the schedule table to enter a value for a manual property?
- Why do all the cells of one column in a schedule table show a value of INVALID?

I added a schedule table, but all the cells contain question marks. Why did this happen?

Question marks appear in table cells when property sets are not attached to the objects included in the table, or to the object styles for objects in the table. When attached to an object or a style, a property set becomes the container for the property data. The schedule table stores no data. For more information about attaching property sets to objects and styles, see "Adding and Editing Property Set Data" on page 2204.

To attach property sets to objects and styles individually, select the table, right-click, selecting Edit Table Cell, and selecting the cell. For more information, see "Identifying and Editing Table Cell Data" on page 2228.

To attach property sets to all objects and styles that need them, select the table, right-click, and select Add All Property Sets. For more information, see "Adding Property Set Data to All Objects" on page 2231.

For more information about attaching property sets to objects and styles, see "Attaching Property Set Data to Objects" on page 2205 and "Attaching Property Set Data to Styles and Definitions" on page 2207.

Why is an object I added to the drawing not listed in the schedule table?

Objects added to a drawing after you add a schedule table are not added to the drawing unless the Add New Objects Automatically option is selected in the table properties. However, you can manually add objects to a table schedule. For more information, see "Adding Objects to a Schedule Table" on page 2218.

If the schedule table style uses classifications to filter objects, review the troubleshooting information in "Troubleshooting Classification Definitions" on page 2305.

How do I know which property sets to attach to objects or styles to remove question marks from columns in a schedule table?

You can find this information by viewing the column definitions in the schedule table style used to create the schedule table. Select the schedule table, right-click, and click Edit Table Style. Click the Columns tab. You can view the property assigned to each column and the property set from which the property is obtained. Click Cancel to return to the drawing.

Property sets provided with Autodesk® Architectural Desktop use the words Object and Style in their names to identify how the property set can be attached. For example, you can attach the DoorObjects property set to doors. You can attach the DoorStyles property set to any door style.

To attach property sets to objects and styles individually, select the table, right-click, select Edit Table Cell, and select the cell. For more information, see "Identifying and Editing Table Cell Data" on page 2228.

To attach property sets to all objects and styles that need them, select the table, right-click, and select Add All Property Sets. For more information, see "Adding Property Set Data to All Objects" on page 2231.

For more information about attaching property sets to objects and styles, see "Adding and Editing Property Set Data" on page 2204.

Why doesn't the data in the schedule table show the changes I made to objects in the drawing?

Changes that you make to objects—whether through graphically modifying the object, editing the object properties or style, or editing property data—automatically appear in a schedule table only when the Automatic Update option is specified in the schedule table properties. However, you can manually update a table to reflect the changes. For more information, see "Updating a Schedule Table" on page 2218.

After adding and removing objects, I updated the schedule table. Why are the object numbers still out of order?

Updating a schedule table does not change the numbers assigned to the objects. To renumber objects in a schedule table, see "Renumbering Property Set Data" on page 2220.

Is there an easy way to locate an object that is listed in a schedule table?

Yes. You can select a row in the schedule table to highlight the object that corresponds to the row. For more information, see "Showing Objects in a Schedule Table" on page 2219.

Why can't I select an empty cell in the schedule table to enter a value for a manual property?

A table cell must contain at least one character for you to be able to select an individual cell. If the property was defined without a default entry and no data for that property was entered before the table was created, the cell is blank.

You can enter the value by accessing the property data directly in the object or the object style, depending on where the property is attached. For more information, see "Adding and Editing Property Set Data" on page 2204.

Why do all the cells of one column in a schedule table show a value of INVALID?

A property value appears as invalid in a schedule table if the property was deleted from a property set that is used in the schedule table. To edit the schedule table style to remove the property from the table, see "Editing Columns in a Schedule Table Style" on page 2279. To edit the property set definition to restore the property, see "Adding a Manual Property Definition to a Property Set Definition" on page 2251 or "Adding an Automatic Property Definition to a Property Set Definition" on page 2252.

Troubleshooting Schedule Table Styles

This topic provides answers to the following questions:

- Why is the Add Column button unavailable when I try to add columns to a schedule table style?
- Why are the property sets I want to use unavailable when I try to add a column?
- Why is the Quantity column in my schedule table style not totalling objects that are the same.
- Why does the Product column in my schedule table style show question marks in all the cells?
- Why does the matrix column I formatted for a property show data values instead of the matrix symbol?

Why is the Add Column button unavailable when I try to add columns to a schedule table style?

This button is unavailable if the drawing does not contain any property sets that apply to the same objects or styles that the schedule table style is applied to. For more information, see "Specifying Objects for a Schedule Table Style" on page 2274 and "Adding Columns to a Schedule Table Style" on page 2276.

Why are the property sets I want to use unavailable when I try to add a column?

Property sets are listed only if property set definitions are stored in the current drawing. Also, only property sets that apply to all the objects you selected on the Applies To tab are available to use in schedule table columns. A property set that applies only to some of the selected objects cannot be included in the schedule table. For example, a window schedule that applies to windows and window assemblies cannot contain columns for properties that apply only to window assemblies.

Why is the Quantity column in my schedule table style not totalling objects that are the same.

Objects that are the same, such as all doors of a certain style with identical dimensions, are not grouped and totaled if values for any cell are different. For example, the objects are not totalled if the table contains object numbers or if some objects have remarks and some do not.

Why does the Product column in my schedule table style show question marks in all the cells?

The Product column shows the result of the value in the Quantity column multiplied by a data column that you specify. Question marks appear in the cells of the column if the data column that you selected is not a valid numeric property.

Why does the matrix column I formatted for a property show data values instead of the matrix symbol?

If the property specified in the column can have multiple values, you need to add columns to the matrix format to accommodate all possible values. For example, in a finish schedule in which walls may be assigned one of four finishes, you need to enter a number greater than three for Max Columns to create a column for each finish. When you then create a table from the style, the matrix symbol appears in the finish column for the finish value entered in the property data for the walls of each space.

Troubleshooting Classification Definitions

This topic answers the following questions about troubleshooting classification definitions:

- Why does the Classifications tab in the style properties have nothing in it?
- My schedule table contains an extremely long title for a classification property. How can I fix this?
- Why are no classification property sets listed when I try to add a classification property to a property set definition?
- I want to include classifications in a schedule table. Why do I not see an option for them in the schedule table style?
- Why were numerous objects in my drawing not included in a schedule table?
- I selected all the classifications for a classification definition in the schedule table style, but many objects were not included in the schedule. Why did this happen?

Why does the Classifications tab in the style properties have nothing in it?

The Classifications tab in the object style properties contains no data if no classification definitions are defined for styles of that object type. For example, if the drawing contains no classification definitons that apply to wall styles, the Classifications tab in the Wall Style Properties dialog box does not contain any classification information. You specify the object styles to which a classification definition applies when you create the definition. For more information, see "Specifying the Object Styles for a Classification Definition" on page 2294.

My schedule table contains an extremely long title for a classification property. How can I fix this?

The default column header in schedule table styles is the description of the property selected in the property set definition. The default description for classification properties comprises the names of the classification definition, the classification property set, and the classification. In the schedule table style, you can edit the column header to create a shorter header. For more information, see "Adding Columns to a Schedule Table Style" on page 2276.

If you clear Use classification name for description when you add or edit a classification property in the property set definition, you can enter a shorter description. For more information, see "Adding a Classification Property Definition to a Property Set Definition" on page 2259.

Why are no classification property sets listed when I try to add a classification property to a property set definition?

No classification property sets are listed if there are no classification property sets for the classification definitions that apply to the object or object style specified in the current property set definition.

I want to include classifications in a schedule table. Why do I not see an option for them in the schedule table style?

The schedule table style must use property sets that contain classification properties. The classification properties are then available to include in a schedule table style.

Why were numerous objects in my drawing not included in a schedule table?

If you use classification filters in the schedule table style, only objects of the specified type that meet all the classification criteria are included in the schedule table. For example, if you create a door schedule for doors that are classified new and exterior, only doors that meet *both* criteria are included in the schedule table. If an object meets only some of the classification criteria, it is not included in the schedule table.

I selected all the classifications for a classification definition in the schedule table style, but many objects were not included in the schedule. Why did this happen?

If a classification was not selected in the object style for the classification definition used in the schedule table style, objects of that style are not included in the schedule. The classification for such objects is Unspecified, and they are filtered from the schedule table. To include all objects in a schedule table, regardless of classification, do not select any classifications on the Applies to tab in the schedule table style.

Annotation

31

You can add annotation symbols such as break marks, revision clouds, and title marks to your drawing.

If you are using a template for the drawing, setup options such as units and scale are preset, based on whether you installed a metric or an imperial version of the software. For more information about setting up your drawing, see "About Templates" on page 550.

You can change the plot size of annotation, override the dimension scale of objects in your drawing, and save the settings as the default. For more information about the drawing scale, see "Setting up a Drawing" on page 553.

Locating Annotation Symbols
Basic annotation symbols are located on the default Annotation tool palette. You can also find annotation tools in the following catalogs:

- Autodesk®Architectural Desktop Sample Palette Catalog
- Autodesk®Architectural Desktop Design Tool Catalog
- Autodesk®Architectural Desktop Document Tool Catalog

Annotation AEC content is located in DesignCenter™. For more information, see "DesignCenter" in the online *AutoCAD®2004 User's Guide*.

In this chapter

- Changing the Annotation Plot Size
- Turning Off the Dimension Scale Override
- Adding Annotation to a Drawing
- Creating Revision Clouds
- Creating Break Marks
- Creating Detail Marks
- Creating Elevation Marks
- Creating Angular Dimensions
- Creating Radial Dimensions
- Creating Section Marks
- Creating Title Marks
- Creating an Annotation Tool
- Annotation Symbols Default Information

Related Procedures

- Changing the Annotation Plot Size
- Turning Off the Dimension Scale Override

Changing the Annotation Plot Size

Use this procedure to change the plotted size of annotation that can be scaled. Annotation plot size affects any annotation that includes an attribute. The attribute stores alphanumeric information for the annotation. The value that you enter for the annotation plot size, multiplied by the drawing scale factor, determines the height of plotted annotation text. For more information about attributes, see "Overview of Block Attributes" in the *AutoCAD® 2004 User's Guide*.

1. On the Format menu, click Drawing Setup, or on the Open drawing menu in the drawing window status bar, click Drawing Setup.
2. Click the Scale tab.
3. Enter a value for Annotation Plot Size.
4. Select Save As Default if you want subsequent drawings to use these settings, or clear Save As Default to save your settings in the current drawing only.
5. Click OK.

Turning Off the Dimension Scale Override

Use this procedure to prevent the software from applying an override to the dimension scale in the drawing. This control is on by default and creates a dimension scale override to the active dimension scale. With a dimension scale override, dimensions added to the drawing are scaled based on the current drawing scale. For more information on the dimension scale, see "Draw to Scale" in the *AutoCAD® 2004 User's Guide*.

If you want the software to automatically make your dimension scale match your drawing scale, leave Automatically Create Dimscale Override selected. The override applies a scale factor to the dimension style properties. To be able to adjust the dimension scale independently of the drawing scale, clear Automatically Create Dimscale Override.

WARNING! Any time you close the Drawing Setup dialog box by selecting OK or Apply, an override is applied if Automatically Create Dimscale Override is selected, regardless of the tab that was originally opened.

AEC dimensions are not affected by the dimension scale override because an AEC dimension style depends on what display representation is active. For more information about AEC Dimensions, see "Dimension Types and Uses" on page 2359.

1. On the Format menu, click Drawing Setup.
2. Click the Scale tab.
3. Clear Automatically Create Dimscale Override.

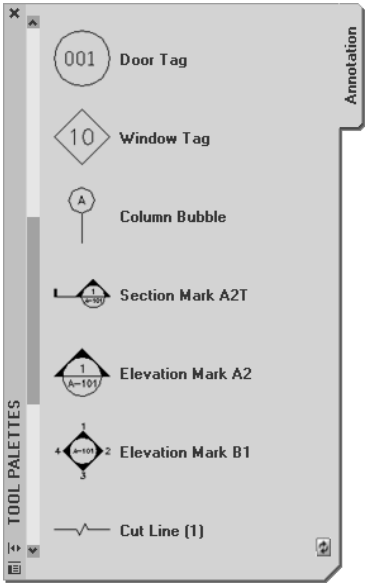
   When you clear this setting, you can adjust the dimension scale independently of the drawing scale.
4. Select Save As Default if you want subsequent drawings to use these settings, or clear Save As Default to save your settings in the current drawing only.
5. Click OK.

Adding Annotation to a Drawing

Tools provided with Autodesk®Architectural Desktop let you place annotation by selecting an annotation tool with predefined properties. You can use the default settings of the tool, or change settings for annotation properties. The default metric and imperial versions are similar, differing only in their base units.

The default Annotation tool palette in the workspace contains basic annotation tools, such as object tags, cut lines, and dimensioning tools. This palette is stored in the Autodesk Architectural Desktop Sample Palette catalog. In addition, the Autodesk Architectural Desktop Design Tool Catalog and the Autodesk Architectural Desktop Documentation Tool Catalog contain annotation AEC content tools found in DesignCenter. For more information, see "Exploring the Content Browser" on page 174.

Tool palette containing annotation tools



Custom palettes created by your CAD manager or other users may also contain annotation tools that are customized for your projects or office standards.

You can find additional annotation AEC content tools in DesignCenter, where you can manage and edit the AEC content, and then specify it in a tool. For more information, see "Using Design Content" on page 2321.

To create your own AEC content, you can use a wizard. You can create blocks, drawings, and commands from data in the current drawing. For more information, see "Custom Content" on page 2343.

The annotation plot size controls the scaling of most symbols when plotted. Symbols are defined with attribute text sized at one unit (1.0) height for text to be plotted at the annotation plot size. Other text can be sized proportionately larger or smaller. For more information, see "Changing the Annotation Plot Size" on page 2308.

Most annotation content is formatted to use the current text style for attribute text. For information about text styles, see "Work with Text Styles" in the online *AutoCAD® 2004 User's Guide*.

Related Procedures

- Creating Revision Clouds

- Creating Break Marks
- Creating Detail Marks
- Creating Elevation Marks
- Creating Angular Dimensions
- Creating Section Marks
- Creating Title Marks
- Creating an Annotation Tool

Creating Revision Clouds

Use this procedure to place revision clouds in your drawing. You can define the color, length, and width for the arcs of the revision cloud. The software contains the following predefined revision clouds as well as tags to annotate them:

- Small arcs
- Medium arcs
- Large arcs
- Small arcs and tag
- Medium arcs and tag
- Large arcs and tag

1 Select a revision cloud tool:

If you want to . . .	**Then . . .**
use a tool from a tool palette	open the tool palette that contains a revision cloud tool, and select the tool.
use a revision cloud from DesignCenter	open DesignCenter. On the Custom tab, locate the revision cloud you want to use, and double-click it.

2 Specify the starting point for the cloud.

3 Do any of the following:

- To select a different symbol to use for the revision cloud annotation, enter **s** (Select).
- To change the color of the polyline used to draw the revision cloud, enter **c** (pline Color), and then specify a color.
- To specify the arc length for the cloud, enter **a** (Arc length).

- To change the line width for the polyline used to draw the revision cloud, enter **w** (pline Width).

4 Move the cursor to draw the cloud.

The cloud finishes when the cursor moves to the starting location of the cloud.

5 If the cloud has a tag associated with it, select the location for the center point of the tag.

6 Enter the revision number, and click OK.

Creating Break Marks

Use this procedure to place break marks in your drawing. The break mark is a polyline that you either scale to fit between specified points, or stretch, based on the drawing scale, to fit specified points. The software contains the following predefined break marks:

- Bar
- Bar (Filled)
- Cut Line (1)
- Cut Line (2)
- Cut Line (Curved)
- Pipe
- Pipe (Filled)

1 Select a break mark tool:

If you want to . . .	Then . . .
use a tool from a tool palette	open the tool palette that contains a break mark tool, and select the break mark tool.
use a break mark from DesignCenter	open DesignCenter. On the Custom tab of DesignCenter, locate the break mark you want to use, and double-click it.

2 Do either of the following:

- To change the symbol for the break mark, enter **s** (Symbol).
- To change the break mark symbol to either Stretched or Scaled, enter **t** (Type).

3 Specify the first point for the break line.

4 Specify the second point for the break line.

5 Select an object to trim, or press ENTER.

Creating Detail Marks

Use this procedure to place detail marks in your drawing. You can place boundaries for details and place marks for detail references. The software contains the following predefined detail marks:

- Circular Detail Boundary
- Rectangular Detail Boundary
- Custom Detail Boundary
- Detail Mark A1
- Detail Mark A1T
- Detail Mark A2
- Detail Mark A2T

1 Select a detail mark tool:

If you want to . . .	Then . . .
use a tool from a tool palette	open the tool palette that contains a detail mark tool, and select the tool.
use a detail mark from DesignCenter	open DesignCenter. On the Custom tab, locate the detail mark you want to use, and double-click it.

2 Specify the first point for the detail line.

3 Specify the second point for the detail line.

4 Do any of the following:

- To place a break in the detail line, enter **b** (Break). Specify a new point to continue the detail line.
- To change the detail symbol, enter **s** (Symbol).
- To change the length and width of the detail line's tail, enter **t** (Tail).

5 Continue specifying points for the detail line.

6 Press ENTER when the line is finished.

7 If you are adding a boundary detail, specify points for the leader line.

8 Press ENTER when the leader is finished.

9 Enter the section mark number and the sheet number.

10 Click OK.

11 If you are adding a detail mark with a tail, specify the side on which to place the tail.

The symbol is placed in the drawing at the same angle as the last section of the leader line.

Creating Elevation Marks

Use this procedure to place elevation marks in your drawing. You can place up to four separate elevations using the 4-way elevation mark. You can add elevation marks to existing elevation objects. For more information about elevation marks, see "Drawing an Elevation Line and Mark" on page 2160. The software contains a number of predefined elevation marks.

1 Select an elevation mark tool:

If you want to . . .	Then . . .
use a tool from a tool palette	open the tool palette that contains an elevation mark tool, and select the tool.
use an elevation mark from DesignCenter	open DesignCenter. On the Custom tab, locate the elevation mark you want to use, and double-click it.

2 Specify the location for the elevation tag.

NOTE Different elevation marks have different prompts. The steps below may not correspond exactly to those for the elevation mark you are placing.

3 Specify the direction for the elevation.

4 Do any of the following:

- To change the symbol block for the elevation mark, enter **s** (Symbol).
- To change the arrow block for the elevation mark, enter **a** (Arrow).
- To change between the single and 4-way arrow block, enter **t** (Type).

5 Enter the elevation number and the sheet number, and click OK.

6 Enter **y** (Yes) to add an AEC elevation object to the elevation mark, and enter the width of the elevation object; or, enter **n** (No) to end the command.

The width is also the default depth of the elevation object.

Creating Angular Dimensions

Use this procedure to place angular dimensions in your drawing. This AutoCAD® dimension has a layer key assigned to it.

1 Select an angular dimension tool:

If you want to . . .	Then . . .
use a tool from a tool palette	open the tool palette that contains a dimension symbol tool, and select the tool.
use a dimension from DesignCenter	open DesignCenter. On the Custom tab, locate the dimension symbol you want to use, and double-click it.

2 Select an arc, circle, or line, or press ENTER to specify a vertex.

3 Select a second line or specify a second angle endpoint.

4 Do any of the following:

- To add multiline text to the dimension line, enter **m** (Mtext). For more information about multiline text, see "Overview of Multiline Text" in the online *AutoCAD® 2004 User's Guide*.
- To add text to the dimension line, enter **t** (Text).
- To specify an angle for the dimension line text, enter **a** (Angle).

5 Specify the location for the dimension line.

Creating Radial Dimensions

Use this procedure to place radial dimensions in your drawing. This AutoCAD® dimension has a layer key assigned to it.

1 Select a radius dimension tool:

If you want to . . .	Then . . .
use a tool from a tool palette	open the tool palette that contains a dimension symbol tool, and select the tool.
use a dimension from DesignCenter	open DesignCenter. On the Custom tab, locate the dimension symbol you want to use, and double-click it.

2 Select an arc or a circle.

3 Do any of the following:

- To add multiline text to the dimension line, enter **m** (Mtext). For more information about multiline text, see "Overview of Multiline Text" in the online *AutoCAD® 2004 User's Guide*.
- To add text to the dimension line, enter **t** (Text).
- To specify an angle for the dimension line text, enter **a** (Angle).

4 Specify the location for the dimension line.

Creating Section Marks

Use this procedure to place a section line and section mark in your drawing. You can add section marks to existing section objects. The software contains a number of predefined section marks.

1 Select a section mark tool:

If you want to . . .	Then . . .
use a tool from a tool palette	open the tool palette that contains a section mark tool, and select the section mark tool.
use a section mark from DesignCenter	open DesignCenter. On the Custom tab, locate the section mark you want to use, and double-click it.

2 Specify the first point for the section line.

3 Continue specifying points for the section line.

4 Do any of the following:

- To place a break in the section mark line, enter **b** (Break). Specify a new point to continue the section mark line.
- To change the symbol block for the section mark, enter **s** (Symbol).
- To change the arrow block for the section mark, enter **a** (Arrow).
- To change the tail length and width, enter **t** (Tail).

5. Continue specifying points for the section line.
6. Press ENTER when the line is finished.
7. Enter the section mark number and the sheet number.
8. Click OK.
9. Specify the side for the section mark arrow.
10. Enter **y** (Yes) to add an AEC section object to the section mark line, or enter **n** (No).

If you add an AEC section object to the section mark, it is created as a square (if there is one line) in the direction of the section mark arrow.

Creating Title Marks

Use this procedure to place title marks a your drawing.

1. Select a title mark tool:

If you want to . . .	Then . . .
use a tool from a tool palette	open the tool palette that contains a title mark tool, and select the tool.
use a title mark from DesignCenter	open DesignCenter. On the Custom tab, locate the title mark you want to use, and double-click it.

2. Do any of the following:

- To change the symbol block, enter **s** (Symbol block).
- To change the text block, enter **te** (Text block).
- To change the width of the polyline, enter **w** (polyline Width).

3. Specify the insertion point for the title mark.
4. Enter the title mark number, and click OK.
5. Enter the scale and title, and click OK.

6 Specify the endpoint for the title mark line.

Creating an Annotation Tool

Use this procedure to create an AEC content tool that references the AEC content drawing file in DesignCenter.

1 Open the tool palette on which to create the tool.
2 Open DesignCenter, and locate the piece of AEC content to place on a tool palette.
3 Drag the AEC content from the right pane of DesignCenter to the tool palette.
4 Right-click the new tool, and click Properties.
5 Specify properties for the tool:

If you want to . . .	Then . . .
name the image on the tool palette	enter text for Name.
add a tooltip description to the image	enter text for Description.

6 Click OK.

Annotation Symbols Default Information

Annotation symbols are placed by custom commands launched from the Autodesk®Architectural Desktop view of the DesignCenter. Each symbol content file contains the data necessary to construct a specific type of drawing annotation, specifically

- All graphics used in the symbol, for example: blocks, multi-view blocks, and mask blocks
- All styles used by the command, for example: dimension styles, linetypes, and text styles
- A set of dictionary entries, which controls how the DesignCenter places the symbol, including the custom command string
- Icon, preview image, and description text displayed in the DesignCenter

For more information, see "Creating an AEC Drawing" on page 2346.

Dictionary entries consist of two parts. Those marked Common are generally the same for all content of that type, and are set on the Insert Options page of the AEC Content Wizard. The other entries are set in the command string of the content. A typical command string begins with the command name, followed by a series of label and data pairs, as shown in the following example:

```
_AecAnnoSectionMarkAdd _SYMBOL Anno_Section_A2 _ARROW
Anno_Arrow_A2 _TAIL .1875,.0625
```

The label is shown in all capital letters, but entries are not case-specific. The underscore has been added for use with translated versions of the software. It is important to separate each word by a single space, because each space is interpreted as pressing ENTER on the command line. All numeric parameters are based on the current units of the content file and are scaled based on the other scale settings in the content.

NOTE These settings are provided as examples only. They are not necessarily those in the shipping version of the product. To see all the command string options, enter **-CreateContent**(with a leading dash), and step through the prompts.

To modify custom content after creating it, open the file as read-only, so that you can save it with the same name in the Create AEC Content wizard. Remember that any changes in the wizard are not made in the currently open drawing, but only in the saved drawing. To make additional changes, you must open the drawing file again. Changes to the drawing other than in the wizard (for example, symbol definitions and dimstyles) can be made using the normal AutoCAD®OPEN and SAVE commands. The DesignCenter preview window always displays the current view direction and display configuration of the content file when it was last saved. It does, however, perform a Zoom Extents, regardless of the last saved view.

Design Content

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In the AutoCAD® DesignCenter™, you can locate AEC drawing data and drawings and drag them into your drawings. Using the AEC Content Wizard, you can also create AEC content using multi-view blocks, masking blocks, and profiles and drag them into your drawings.

Related Procedures

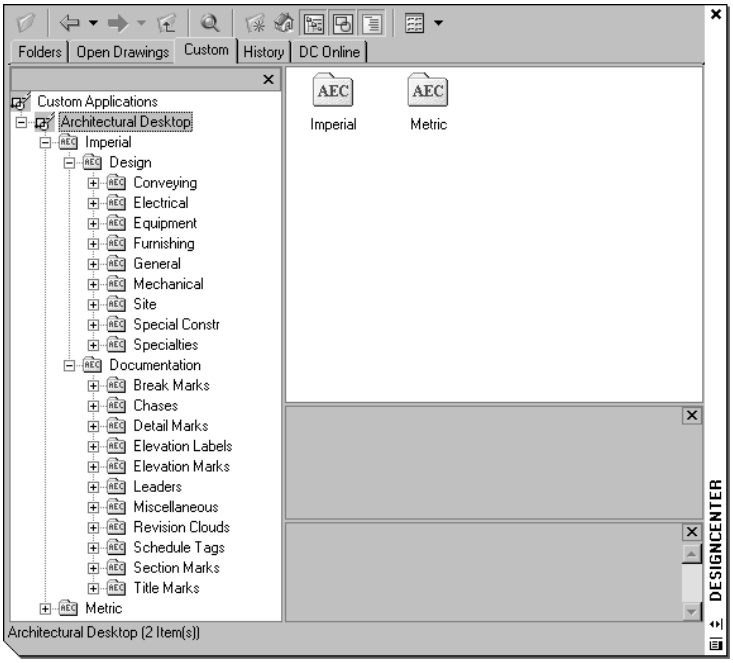
- Using Design Content
- Adding Autodesk Architectural Desktop Content
- Adding Imperial Content
- Fixture Layout Overview

In this chapter

- Using Design Content
- Adding Autodesk Architectural Desktop Content
- Fixture Layout Overview

Using Design Content

Content in Autodesk® Architectural Desktop, is accessed through Custom view in AutoCAD DesignCenter. In Custom view, the top-level for AEC content is named Architectural Desktop. You can drag and drop AEC content onto a tool palette to create custom tools.



For more information about the specific differences between AutoCAD DesignCenter and the enhanced AutoCAD DesignCenter used with AEC content, see "AutoCAD DesignCenter Custom View" on page 2322. For information about AutoCAD DesignCenter other than the Custom view, see "AutoCAD DesignCenter" in the online *AutoCAD 2004 User's Guide*.

Related Procedures

- AutoCAD DesignCenter Custom View

AutoCAD DesignCenter Custom View

When you are in Custom view in AutoCAD DesignCenter, Architectural Desktop is at the top, and the tree view displays the file system folders and file system shortcuts only. All other files stored in the directory structure are not displayed. In Custom view, drawing files do not function as containers as they do in the Folders view of AutoCAD DesignCenter. Instead, each drawing file represents one piece of AEC content; therefore, drawing files are not displayed in Custom view.

You can navigate the file system using shortcuts within Custom view to customize content hierarchies for specific needs. In all other aspects, naviga-

tion in the Custom view tree is identical to navigation in the Folders view of AutoCAD DesignCenter.

Like other AutoCAD DesignCenter views, the Custom view palette provides four different display options: Large Icons, Small Icons, List, and Details. Only Large Icons display an image of the content. All other options display the generic DWG icon. When the view displays the contents of a directory, it displays all directories, drawings, and shortcuts. You can drag drawings and shortcuts to drawings from the view into the drawing. You can also drag AEC content to a tool palette for direct access or to create a custom tool.

Each file displayed in Custom view in the AutoCAD DesignCenter is a *.dwg* file containing one piece of AEC content.

Note the following specific differences between AutoCAD DesignCenter and Custom view in AutoCAD DesignCenter used with AEC Content:

- Drawings that represent AEC content are not displayed in the tree view as containers. Drawings are shown only in the palette.
- The Preview window displays a user-controllable higher-resolution image of the content. This can be a different image from the Large Icons image. The Large Icons image is a bitmap stored with the drawing file. The preview is the last saved view of the content drawing zoomed to the extents of the drawing.
- Special icons indicate shortcuts.
- The root of Custom view is named Architectural Desktop.

The Preview window provides a higher-resolution preview of the content than is available in the Large Icons view. In the Custom view, the Preview window behaves exactly like the Object Viewer. For more information, see "Using the Object Viewer" on page 2542. The Object Viewer shortcut menu is available. Left-clicking rotates the contents dynamically.

Text in the Description pane provides more details about the currently selected content.

Adding Autodesk Architectural Desktop Content

You can place imperial and metric symbols through AutoCAD DesignCenter.

Related Procedures

- Adding Documentation Content
- Adding Imperial Content
- Adding Metric Design Content

Adding Documentation Content

You can place imperial or metric documentation symbols, such as break marks or elevation labels, through AutoCAD DesignCenter.

Adding Break Mark Content

Using AutoCAD DesignCenter, you can drag break marks, such as bars, cut lines, and pipes, into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1. Click on the Navigation toolbar to open AutoCAD DesignCenter.
2. Click the Custom tab.
3. Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.
4. Expand Documentation, and select Break Marks.
5. Select a break mark symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.

6. Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

   You can also drag the block onto a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, then an Insert option is displayed.

Adding Chase Content

Using AutoCAD DesignCenter, you can drag chases, such as return and supply chases, into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1. Click on the Navigation toolbar to open AutoCAD DesignCenter.
2. Click the Custom tab.
3. Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.
4. Expand Documentation, and select Chases.
5. Select a chase symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.

6 Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. The Add Multi-View Block dialog box is displayed to place the block.

Adding Detail Mark Content

Using AutoCAD DesignCenter, you can drag detail marks into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.

4 Expand Documentation, and select Detail Marks.

5 Select a detail mark symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

6 Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. Enter information about the block in the Edit Attributes dialog box.

Adding Elevation Label Content

Using AutoCAD DesignCenter, you can drag elevation labels, such as 2D section, model, and plan labels, into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.

4 Expand Documentation, and expand Elevation Labels.

5 Select a type of elevation label, such as 2D Section, Model, or Plan.

6 Select an elevation label symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. The Add Elevation Label dialog box is displayed to place the block.

Adding Elevation Mark Content

Using AutoCAD DesignCenter, you can drag elevation marks into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.

4 Expand Documentation, and select Elevation Marks.

5 Select an elevation mark symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

6 Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. Enter information about the block in the Edit Attributes dialog box.

Adding Leader Content

Using AutoCAD DesignCenter, you can drag leaders, such as spline and straight leaders, into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1. Click on the Navigation toolbar to open AutoCAD DesignCenter.
2. Click the Custom tab.
3. Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.
4. Expand Documentation, and select Leaders.
5. Select a leader symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.
6. Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

   You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. Enter information about the block in the Edit Attributes dialog box.

Adding Miscellaneous Documentation Content

Using AutoCAD DesignCenter, you can drag miscellaneous documentation symbols, such as datum points, match lines, and north arrows, into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1. Click on the Navigation toolbar to open AutoCAD DesignCenter.
2. Click the Custom tab.
3. Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.
4. Expand Documentation, and expand Miscellaneous.
5. Select a type of miscellaneous documentation symbol, such as Dimensions, Fire Rating Lines, Match Lines, or North Arrows.
6. Select a miscellaneous documentation symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, then an Insert option is displayed.

Adding Revision Cloud Content

Using AutoCAD DesignCenter, you can drag revision clouds into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.

4 Expand Documentation, and select Revision Clouds.

5 Select a revision cloud symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

6 Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. Enter information about the block in the Edit Attributes dialog box.

Adding Schedule Tag Content

Using AutoCAD DesignCenter, you can drag schedule tags, such as door and window tags, into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.

4 Expand Documentation, and expand Schedule Tags.

5 Select a type of schedule tag, such as Area Tags, Door & Window Tags, Object Tags, Room & Finish Tags, or Wall Tags.

6 Select a schedule tag symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

   You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. Enter information about the block in the Edit Attributes dialog box. For more information, see "Displaying Property Set Data When You Add a Tag" on page 2233.

Adding Section Mark Content

Using AutoCAD DesignCenter, you can drag section marks into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.

4 Expand Documentation, and select Section Marks.

5 Select a section mark symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.

6 Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

   You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. Enter information about the block in the Edit Attributes dialog box.

Adding Title Mark Content

Using AutoCAD DesignCenter, you can drag title marks into your drawing or onto a tool palette. These symbols are automatically scaled and are placed in your drawing using the current display configuration.

1. Click on the Navigation toolbar to open AutoCAD DesignCenter.
2. Click the Custom tab.
3. Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.
4. Expand Documentation, and select Title Marks.
5. Select a title mark symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.
6. Drag the block into your drawing, select a location for the insertion point, and follow the prompts to place the symbol in the drawing.

   You can also drag the block on to a tool palette to create a tool.

The block is placed in your drawing using the current display configuration.

NOTE If you right-click to place the block, an Insert option is displayed. Enter information about the block in the Edit Attributes dialog box.

Adding Imperial Content

You can place imperial symbols through AutoCAD DesignCenter. Imperial content is categorized by the standard CSI Master divisions.

Adding General Requirements Content

Using AutoCAD DesignCenter, you can drag CSI Division 1 General Requirements symbols into your drawing.

1. Click on the Navigation toolbar to open AutoCAD DesignCenter.
2. Click the Custom tab.
3. Under Custom Applications, expand Architectural Desktop, and expand Imperial.
4. Expand Design, and expand General.
5. Select a type of symbol, such as People, People Elevation, or Scale Figure.
6. Select a general symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.
7. Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Division 2 Site Construction Content

Using AutoCAD DesignCenter, you can drag CSI Division 2 Site Construction symbols into your drawing.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.
2 Click the Custom tab.
3 Under Custom Applications, expand Architectural Desktop, and expand Imperial.
4 Expand Design, and expand Site.
5 Select a type of symbol, such as Basic Site, Utility Services, Drainage, Parking, or Planting.
6 Select a site symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Specialties Content

Using AutoCAD DesignCenter, you can drag CSI Division 10 Specialties symbols into your drawing.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.
2 Click the Custom tab.
3 Under Custom Applications, expand Architectural Desktop, and expand Imperial.
4 Expand Design, and expand Specialties.

5 Select a type of symbol, such as Fire Protection or Toilet & Bath Accessories.

6 Select a specialties symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Equipment Content

Using AutoCAD DesignCenter, you can drag CSI Division 11 Equipment symbols into your drawing.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial.

4 Expand Design, and expand Equipment.

5 Select a type of symbol, such as Vending, Food Service, Residential, Unit Kitchens, or Office.

6 Select an equipment symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Division 12 Furnishing Content

Using AutoCAD DesignCenter, you can drag CSI Division 12 Furnishing symbols into your drawing.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial.

4 Expand Design, and expand Furnishings.

5 Select a type of symbol, such as Art, Casework, Accessories, Furniture, or Plants.

6 Select a furnishing symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Division 13 Special Construction Content

Using AutoCAD DesignCenter, you can drag CSI Division 13 Special Construction symbols into your drawing.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial.

4 Expand Design, and expand Special Constr.

5 Select a type of symbol, such as Detection and Alarm.

6 Select a special construction symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Division 14 Conveying Systems Content

Using AutoCAD DesignCenter, you can drag CSI Division 14 Conveying Systems symbols into your drawing.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial.

4 Expand Design, and expand Conveying.

5 Select a type of symbol, such as Elevators or Ladders.

6 Select a conveying symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

---

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Division 15 Mechanical Content

Using AutoCAD DesignCenter, you can drag CSI Division 15 Mechanical symbols into your drawing.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Imperial.

4 Expand Design, and expand Mechanical.

5 Select a type of symbol, such as Plumbing Fixtures, Air Distribution, or HVAC Controls.

6 Select a mechanical symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Division 16 Electrical Content

Using AutoCAD DesignCenter, you can drag CSI Division 16 Electrical symbols into your drawing.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.
2 Click the Custom tab.
3 Under Custom Applications, expand Architectural Desktop, and expand Imperial.
4 Expand Design, and expand Electrical.
5 Select a type of symbol, such as Power, Lighting, or Communications.
6 Select an electrical symbol from the right pane.

   You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

   You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Metric Design Content

Using AutoCAD DesignCenter, you can add metric design symbols to your drawing.

Adding Bathroom Fixtures Content

Using AutoCAD DesignCenter, you can drag bathroom fixture symbols, such as basins, baths, and showers, into your drawing or onto a tool palette.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.
2 Click the Custom tab.
3 Under Custom Applications, expand Architectural Desktop, and expand Metric.

4 Expand Design, and expand Bathroom.

5 Select a type of symbol, such as Basin, Shower, or Toilet.

6 Select a bath symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Domestic Furniture Content

Using AutoCAD DesignCenter, you can drag domestic furniture symbols, such as garden furniture and potted plants, into your drawing or onto a tool palette.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Metric.

4 Expand Design, and expand Domestic Furniture.

5 Select a type of symbol, such as Bedroom, Garden, or Plants.

6 Select a furniture symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Electrical Services Content

Using AutoCAD DesignCenter, you can drag electrical service symbols, such as power outlets and switches, into your drawing or onto a tool palette.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Metric.

4 Expand Design, and expand Electrical Services.

5 Select a type of symbol, such as Communications, Power Outlets, or Switches.

6 Select an electrical service symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Kitchen Fittings Content

Using AutoCAD DesignCenter, you can drag kitchen fitting symbols, such as sinks and appliances, into your drawing or onto a tool palette.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Metric.

4 Expand Design, and expand Kitchen Fittings.

5 Select a type of symbol, such as Appliances, Sinks, or Units.

6 Select a kitchen fitting symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Office Furniture Content

Using AutoCAD DesignCenter, you can drag furniture symbols, such as conference tables and filing cabinets, into your drawing or onto a tool palette.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.
2 Click the Custom tab.
3 Under Custom Applications, expand Architectural Desktop, and expand Metric.
4 Expand Design, and expand Office Furniture.
5 Select a type of symbol, such as Chairs, Desks, or Tables.
6 Select an office furniture symbol from the right pane.
You can view the symbol in 2D and 3D in the Preview window.
7 Drag the block into your drawing and place it at the location for the block.
You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Pipe and Duct Content

Using AutoCAD DesignCenter, you can drag pipe and duct symbols, such as pipe details and sanitary fittings, into your drawing or onto a tool palette.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.
2 Click the Custom tab.
3 Under Custom Applications, expand Architectural Desktop, and expand Metric.
4 Expand Design, and expand Piped and Ducted Services.
5 Select a type of symbol, such as Ceiling, Drainage, or Valves.
6 Select a pipe and duct symbol from the right pane.
You can view the symbol in 2D and 3D in the Preview window.
7 Drag the block into your drawing and place it at the location for the block.
You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Adding Site Content

Using AutoCAD DesignCenter, you can drag site symbols, such as boats and trees, into your drawing or onto a tool palette.

1 Click on the Navigation toolbar to open AutoCAD DesignCenter.

2 Click the Custom tab.

3 Under Custom Applications, expand Architectural Desktop, and expand Metric.

4 Expand Design, and expand Site.

5 Select a type of symbol, such as Boats, Trees, or Vehicles.

6 Select a site symbol from the right pane.

You can view the symbol in 2D and 3D in the Preview window.

7 Drag the block into your drawing and place it at the location for the block.

You can also drag the block onto a tool palette to create a tool.

NOTE If you right-click to place the block, an Insert option is displayed, and you can place multiple copies of the content. Use the Properties palette to specify the insertion point or edit attributes as you add the block.

8 Specify a rotation angle for the symbol, and press ENTER.

Fixture Layout Overview

Using DesignCenter, you can drag various pre-constructed fixture layouts into your drawings. Then, you can explode them into component parts. For example, after you drop a toilet stall into your drawing and explode it, the stall walls are wall objects, the door to the stall is a door object, and the toilet is a multi-view block. You can also drag the fixture layouts onto a tool palette to create custom tools.

See "Fixture Layout Notes and Hints" on page 2340 for more information about fixture layout content.

DISCLAIMER: The intent of the fixture layouts is to provide samples from which to create your own office standards for restroom design. All of the components can be modified, as required, to meet project and code requirements, then added to the DesignCenter for access. The samples provided do not necessarily meet jurisdictional regulations or ADA (Americans with Disabilities Act) requirements.

Related Procedures

- Placing Fixture Layout Content

Fixture Layout Notes and Hints

The following is a list of notes and hints for working with fixture layouts available through DesignCenter:

- The layout files are custom content set to Content Type: Drawing.
- The layout files have no layer key, because all objects have hard-coded layers within the file. You can change the layers, as required.
- The layout files are not set to Explode on Insert, because you can place them at only one rotation and orientation (not mirrored), and it is easier to reposition them as unexploded blocks.
- To set rotation and mirroring before insertion, double-click the icon instead of dragging the content to display the standard AutoCAD Insert dialog box.
- The rotation angle and scale (for mirroring) can be set in the Insert dialog box or on the command line. If you use the command line, you can see the result of each option before actually inserting the content. You can apply multiple settings on the command line, even though the prompt says "Specify insertion point:" after the first one. You can still type another **X**, **Y**, or **R**.
- Use X = -1 or Y = -1 to mirror the content.
- Use the NODe object snap to position individual stall and urinal layouts next to each other. The toilet partitions and screens are inserted with centered baselines, so the node snap places them correctly.
- After insertion, the stall layouts can be exploded in order to have the partition objects clean up with each other. The layout can also be adjusted to extend partitions, or move doors, fixtures, or grab bars.
- Stall partitions are wall objects placed in the wall group "Toilet_Ptn." They do not clean up with other walls. Urinal screens are in the "Standard" group, but set to "Do Not Cleanup."
- Each lavatory layout consists of a counter, made of a wall object with the cleanup group "Toilet_Counter" with lavatory MV Blocks anchored as follows:

  Lavs (1) Wall anchor; centered along curve

Lavs (2) - (4) Layout Curve (on counter); even spacing (1'-6" start & end offset)

Lavs (5) Layout Curve (on counter); repeat @ 3'-0" (1'-6" start & end offset)

- Use the ENDpoint object snap to position a counter against a stall or urinal screen.
- After exploding, the lav counters can be trimmed or extended to the rest room walls. The lavs adjust appropriately, depending on the anchoring mode.
- The rest room files are preconfigured assemblies of individual layouts, arranged as typical Men's and Women's rooms.

Placing Fixture Layout Content

Using AutoCAD DesignCenter, you can place fixture layouts into your drawing. Then, you can explode the layout into its component parts that can be modified to your specifications.

NOTE After you create your custom fixture layout, save the layout as Custom Design Content for easy placement in future drawings.

See "Fixture Layout Notes and Hints" on page 2340for more information about fixture layout content.

1. Click on the Navigation toolbar to open AutoCAD DesignCenter.
2. Click the Custom tab.
3. Under Custom Applications, expand Architectural Desktop, and expand Imperial or Metric.
4. Expand Design, and expand one of the following layouts:
   - For imperial content, Mechanical\Plumbing Fixtures\Layouts
   - For metric content, Bathroom\Layouts
5. Double-click a layout.

   You can view the symbol in 2D and 3D in the Preview window.
6. Use the Insert dialog box to control the placement of the layout, and click OK.
7. Specify a location for the fixture layout.
8. To modify the components of the layout, type **explode**.
9. Select the fixture layout, and press ENTER.

The components can be edited separately.

Custom Content

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Autodesk®Architectural Desktop provides a wizard to help you create your own custom content. You can create blocks, drawings, and commands from data existing in the current drawing.

To create custom content, you first select the content type to be created. Next, you set options to be used when content is inserted into a drawing. The final step is to specify the output file and other parameters that control how the DesignCenter™ displays the content.

When creating content in an existing AEC file (that is, a drawing generated from the Create AEC Content Wizard), the default values for each page of the wizard are set to the value used to create the drawing. This provides intelligent defaults so that it is easy for you to make small modifications to existing content files.

Related Procedures

- Creating an AEC Block
- Creating an AEC Drawing
- Creating an AEC Multi-View Block
- Creating an AEC Masking Block
- Creating an AEC Custom Command

In this chapter

- Creating an AEC Block
- Creating an AEC Drawing
- Creating an AEC Multi-View Block
- Creating an AEC Masking Block
- Creating an AEC Custom Command

Creating an AEC Block

Use this procedure to create a new AEC block that you can add to your drawing using DesignCenter. You create a new block from an existing block in the current drawing. The block is saved in a new drawing that can be accessed from DesignCenter.

1. On the Format menu, click AEC Content Wizard.
2. Select Block for Content Type.

   All of the defined blocks in the current drawing are displayed in Current Drawing.

3. Select a block for Current Drawing, and click Add.

   Only one block can be selected at a time for Current Drawing and added to Content File.

4. Click Next.
5. Specify an insertion method for Insert Options:

If you want to . . .	Then . . .
explode the AEC block when you add it to your drawing	select Explode on Insert.
have the AEC block remain a block when you add it to your drawing	clear Explode on Insert.
specify an elevation for the AEC block when adding it to your drawing	enter a value for Preset Elevation.
specify an anchor type to use when adding the AEC block to your drawing	select a type of anchor for Anchor Type.

6. Specify an insertion scale factor for Scale:

If you want to . . .	Then . . .
scale the AEC block instance using a coordinate (*X*, *Y*, *Z*) direction	enter values for X, Y, and Z for Scale.
apply no additional scaling method to the AEC block instance	select None for Additional Scaling.

If you want to . . .	Then . . .
scale the AEC block instance by the annotation scale of the drawing you are adding the block to	select Annotation for Additional Scaling.
scale the AEC block instance by the drawing units of the drawing you are adding the block to	select Drawing for Additional Scaling.
scale the AEC block definition by the drawing units of the drawing you are adding the block to	select Enable AEC Unit Scaling.

7 If there are attributes in the block, specify a text style for Attribute Text Style:

If you want to . . .	Then . . .
assign the attribute the default text style of AEC content in the current drawing	select As Defined by Content.
assign the attribute the text style of the target drawing	select Target Drawing Text Style.

8 If there are attributes in the block, specify an angle for Attribute Text Angle:

If you want to . . .	Then . . .
assign the angle of the attribute text to be the same as the rotation angle of the AEC block	select As Inserted.
set the angle of the attribute text to zero	select Force Horizontal.
be able to read the attribute text from the right direction	select Right Reading.

9 Click Select Layer Key, select a layer key, and click OK.

You can also enter a layer name for Layer Key.

10 Click Next.

11 Enter a name for File Name, or click Browse.

If you want to save the current drawing as the content file, select Current Drawing.

12 Select an image to represent the AEC block in DesignCenter for Icon:

If you want to . . .	Then . . .
specify an existing bitmap image	click New Icon, select an image, and click OK.
specify the default image of the AEC block itself	click Default Icon.

13 Enter a description for Detailed Description.

14 If you want to save the drawing objects in the content file, select Save Preview Graphics.

15 Click Finish.

Creating an AEC Drawing

Use this procedure to create a new AEC drawing that you can open using DesignCenter. An AEC drawing allows you to insert a drawing with all of its content, including styles, blocks, layers, and linetypes.

1 On the Format menu, click AEC Content Wizard.

2 Select Drawing for Content Type, and click Next.

3 Specify an insertion method for Insert Options:

If you want to . . .	Then . . .
specify an elevation	enter a value for Preset Elevation.
specify an anchor type	select a type of anchor for Anchor Type.

4 Specify an insertion scale factor for Scale:

If you want to . . .	Then . . .
scale the AEC drawing instance using a coordinate (*X*, *Y*, *Z*) direction	enter values for X, Y, and Z for Scale.
apply no additional scaling method to the AEC drawing instance	select None for Additional Scaling.
scale the AEC drawing instance by the annotation scale of the drawing you are adding the block to	select Annotation for Additional Scaling.
scale the AEC drawing instance by the drawing units of the drawing you are adding the block to	select Drawing for Additional Scaling.
scale the AEC drawing definition by the drawing units of the drawing you are adding the block to	select Enable AEC Unit Scaling.

5 Specify an angle for Attribute Text Angle:

If you want to . . .	Then . . .
assign the angle of the attribute text to be the same as the rotation angle of the AEC drawing	select As Inserted.
set the angle of the attribute text to zero	select Force Horizontal.
be able to read the attribute text from the right direction	select Right Reading.

6 Click Select Layer Key, select a layer key, and click OK.

You can also enter a layer name for Layer Key.

7 Click Next.

8 Enter a name for File Name, or click Browse.

If you want to save the current drawing as the content file, select Current Drawing.

9 Select an image to represent the AEC drawing in DesignCenter for Icon:

If you want to . . .	Then . . .
specify an existing bitmap image	click New Icon, select an image, and click OK.
specify the default image of the AEC drawing itself	click Default Icon.

10 Enter a description for Detailed Description.

11 Click Finish.

Creating an AEC Multi-View Block

Use this procedure to create a new AEC multi-view block that you can add to your drawing using DesignCenter. You define a multi-view block from view blocks created in your drawing that represent different views of your custom object. The block is saved in a new drawing that can be accessed from DesignCenter. For more information, see "Creating View Blocks".

1 On the Format menu, click AEC Content Wizard.

2 Select Multi-View Block for Content Type.

All of the defined blocks in the current drawing are displayed in Current Drawing.

3 Select a multi-view block for Current Drawing, and click Add.

Only one block can be selected at a time for Current Drawing and added to Content File.

4 Click Next.

5 Specify an insertion method for Insert Options:

If you want to . . .	Then . . .
explode the AEC multi-view block when you add it to your drawing	select Explode on Insert.
have the AEC multi-view block remain a block when you add it to your drawing	clear Explode on Insert.

If you want to . . .	Then . . .
specify an elevation for the AEC multi-view block when adding it to your drawing	enter a value for Preset Elevation.
specify an anchor type to use when adding the AEC multi-view block to your drawing	select a type of anchor for Anchor Type.

6 Specify an insertion scale factor for Scale:

If you want to . . .	Then . . .
scale the AEC multi-view block instance using a coordinate (*X*, *Y*, *Z*) direction	enter values for X, Y, and Z for Scale.
apply no additional scaling method to the AEC multi-view block instance	select None for Additional Scaling.
scale the AEC multi-view block instance by the annotation scale of the drawing you are adding the block to	select Annotation for Additional Scaling.
scale the AEC multi-view block instance by the drawing units of the drawing you are adding the block to	select Drawing for Additional Scaling.
scale the AEC multi-view block definition by the drawing units of the drawing you are adding the block to	select Enable AEC Unit Scaling.

7 If there are attributes in the block, specify a text style for Attribute Text Style:

If you want to . . .	Then . . .
assign the attribute the default text style of AEC content in the current drawing	select As Defined by Content.
assign the attribute the text style of the target drawing	select Target Drawing Text Style.

8 If there are attributes in the block, specify an angle for Attribute Text Angle:

If you want to . . .	Then . . .
assign the angle of the attribute text to be the same as the rotation angle of the AEC multi-view block	select As Inserted.
set the angle of the attribute text to zero	select Force Horizontal.
be able to read the attribute text from the right direction	select Right Reading.

9 Click Select Layer Key, select a layer key, and click OK.

You can also enter a layer name for Layer Key.

10 Click Next.

11 Enter a name for File Name, or click Browse.

If you want to save the current drawing as the content file, select Current Drawing.

12 Select an image to represent the AEC multi-view block in DesignCenter for Icon:

If you want to . . .	Then . . .
specify an existing bitmap image	click New Icon, select an image, and click OK.
specify the default image of the AEC multi-view block itself	click Default Icon.

13 Enter a description for Detailed Description.

14 Click Finish.

Creating an AEC Masking Block

Use this procedure to create a custom AEC masking block that you can add to your drawing using DesignCenter. You create a new AEC masking block from an existing AEC masking block in the current drawing. The AEC mask-

ing block is saved in a new drawing that can be accessed from DesignCenter. For more information about using masking blocks, see "Mask Blocks" on page 2459.

1. On the Format menu, click AEC Content Wizard.
2. Select Masking Block for Content Type.

   All of the defined blocks in the current drawing are displayed in Current Drawing.

3. Select a masking block for Current Drawing, and click Add.

   Only one block can be selected at a time for Current Drawing and added to Content File.

4. Click Next.
5. Specify an insertion method for Insert Options:

If you want to . . .	Then . . .
specify an elevation	enter a value for Preset Elevation.
specify an anchor type	select a type of anchor for Anchor Type.

6. Specify an insertion scale factor for Scale:

If you want to . . .	Then . . .
scale the AEC masking block instance using a coordinate (*X*, *Y*, *Z*) direction	enter values for X, Y, and Z for Scale.
apply no additional scaling method to the AEC masking block instance	select None for Additional Scaling.
scale the AEC masking block instance by the annotation scale of the drawing you are adding the block to	select Annotation for Additional Scaling.
scale the AEC masking block instance by the drawing units of the drawing you are adding the block to	select Drawing for Additional Scaling.
scale the AEC masking block definition by the drawing units of the drawing you are adding the block to	select Enable AEC Unit Scaling.

7 If there are attributes in the block, specify a text style for Attribute Text Style:

If you want to . . .	Then . . .
assign the attribute the default text style of AEC content in the current drawing	select As Defined by Content.
assign the attribute the text style of the target drawing	select Target Drawing Text Style.

8 If there are attributes in the block, specify an angle for Attribute Text Angle:

If you want to . . .	Then . . .
assign the angle of the attribute text to be the same as the rotation angle of the AEC masking block	select As Inserted.
set the angle of the attribute text to zero	select Force Horizontal.
be able to read the attribute text from the right direction	select Right Reading.

9 Click Select Layer Key, select a layer key, and click OK.

You can also enter a layer name for Layer Key.

10 Click Next.

11 Enter a name for File Name, or click Browse.

If you want to save the current drawing as the content file, select Current Drawing.

12 Select an image to represent the AEC drawing in DesignCenter for Icon:

If you want to . . .	Then . . .
specify an existing bitmap image	click New Icon, select an image, and click OK.
specify the default image of the AEC drawing itself	click Default Icon.

13 Enter a description for Detailed Description.

14 Click Finish.

Creating an AEC Custom Command

Use this procedure to create a custom command that you can add to your drawing environment using DesignCenter. You select one or more content blocks, specify a command string, and save a new drawing that contains all of the content in the current drawing. When the custom command is added to a target drawing from DesignCenter, the set of content blocks is copied into the target drawing and the command string is executed enabling the custom command.

The following is a detailed example of a custom command that you can create. The following custom command string adds a schedule tag to a door symbol and automatically creates the leader and tag with the desired style.

_AecAnnoScheduleTagAdd PropertySetDefs.dwg_SYMBOL Aec3_Door_Tag_LEADER_None_DIMSTYLE_Current

The equivalent command line prompts to add a schedule tag to a door symbol and add a leader and tag with the desired style and much longer and tedious.

```
Command: AnnoScheduleTagAdd
Property set definitions drawing <PropertySetDefs.dwg>:
C:\Documents and Settings\All Users\Application
Data\Autodesk\Autodesk Architectural Desktop
2004\R16.0\enu\AEC Content\Imperial\Documentation\Schedule
Tags\PropertySetDefs.dwg
Select object to tag [Symbol/Leader/Dimstyle/Edit]: Symbol
Enter tag symbol name <>: Aec3_Door_Tag
Select object to tag [Symbol/Leader/Dimstyle/Edit]: Leader
Enter leader type [None/STraight/SPline] <None>: None
Select object to tag [Symbol/Leader/Dimstyle/Edit]: Dimstyle
Enter leader dimstyle CURRENT <Aec-Arch-I-96>: Current
Select object to tag [Symbol/Leader/Dimstyle/Edit]:
```

1 On the Format menu, click AEC Content Wizard.

2 Select Custom Command for Content Type.

All of the defined blocks, regardless of type, are displayed in Current Drawing.

3 Select one or more blocks for Current Drawing, and click Add.

4 Enter the command string for Custom String.

You can also click Expand to display the Custom Command String dialog box, and enter the command string.

The command string is limited to 255 characters.

5 Click Next.

6 Specify an insertion method for Insert Options:

If you want to . . .	Then . . .
specify an elevation	enter a value for Preset Elevation.
specify an anchor type	select a type of anchor for Anchor Type.

7 Specify an insertion scale factor for Scale:

If you want to . . .	Then . . .
scale the AEC drawing instance using a coordinate (*X*, *Y*, *Z*) direction	enter values for X, Y, and Z for Scale.
apply no additional scaling method to the AEC drawing instance	select None for Additional Scaling.
scale the AEC drawing instance by the annotation scale of the drawing you are adding the block to	select Annotation for Additional Scaling.
scale the AEC drawing instance by the drawing units of the drawing you are adding the block to	select Drawing for Additional Scaling.
scale the AEC drawing definition by the drawing units of the drawing you are adding the block to	select Enable AEC Unit Scaling.

8 Specify an angle for Attribute Text Angle:

If you want to . . .	Then . . .
assign the angle of the attribute text to be the same as the rotation angle of the AEC drawing	select As Inserted.
set the angle of the attribute text to zero	select Force Horizontal.

If you want to . . .	Then . . .
be able to read the attribute text from the right direction	select Right Reading.

9 Click Select Layer Key, select a layer key, and click OK.

You can also enter a layer name for Layer Key.

10 Click Next.

11 Enter a name for File Name, or click Browse.

If you want to save the current drawing as the content file, select Current Drawing.

12 Select an image to represent the AEC drawing in DesignCenter for Icon:

If you want to . . .	Then . . .
specify an existing bitmap image	click New Icon, select an image, and click OK.
specify the default image of the AEC drawing itself	click Default Icon.

13 Enter a description for Detailed Description.

14 Click Finish.

AEC Dimensions

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AEC dimensions are objects used to describe the relevant measurements of a building object, like the width of a wall or the length of a beam. Dimension presentation can be different according to country and company standards and is defined by styles.

In this chapter

- Dimension Types and Uses
- Logical Dimension Points of AEC and AutoCAD Objects
- Specifying AEC Dimension Preferences
- Creating an AEC Dimension
- Creating an Automatic or Manual AEC Dimension with User-Specified Settings
- Creating an AEC Dimension from an AutoCAD Dimension
- Copying Properties of AEC Dimensions to AutoCAD Dimensions
- Creating an AEC Dimension Tool
- Attaching Objects to Dimensions
- Detaching Objects from Dimensions
- Adding Dimension Points
- Removing and Restoring Dimension Points
- Editing AEC Dimensions
- AEC Dimension Styles

Autodesk®Architectural Desktop offers a number of ways to dimension different types of objects. Each method has special uses and features that make it suited to specific tasks.

Dimensioning methods can be divided in two categories: AEC dimensions and AutoCAD®dimensions. Both have automatic (associative) and manual (non-associative) modes. For their main characteristics and features, see "Dimension Types and Uses" on page 2359.

You can use AEC dimensions and AutoCAD dimensions simultaneously in a single drawing.

NOTE AEC dimension functionality contains specific modifications for European architecture. Illustrations showing AEC dimensions are displayed in metric, not imperial, measurements. You can dimension in imperial measurements as well, but some features like superscripting are not available for imperial units.

Related Topics

- Dimension Types and Uses
- Logical Dimension Points of AEC and AutoCAD Objects
- Considerations for Choosing a Dimension Type
- Specifying AEC Dimension Preferences
- Creating AEC Dimensions Using AEC Dimension Tools
- Creating an AEC Dimension
- Creating an Automatic AEC Dimension with User-Specified Settings
- Creating a Manual AEC Dimension with User-Specified Settings
- Creating an AEC Dimension from an AutoCAD Dimension
- Copying Properties of AEC Dimensions to AutoCAD Dimensions
- Creating an AEC Dimension Tool
- Attaching Objects to Dimensions
- Detaching Objects from Dimensions
- Adding Dimension Points
- Removing and Restoring Dimension Points
- Editing AEC Dimensions
- AEC Dimension Styles
- Q and A for Working with AEC Dimensions

Dimension Types and Uses

Four dimensioning methods are available. The following table lists the differences between them:

Associative AEC dimensions	Manual AEC dimensions	Associative AutoCAD® dimensions	Non-associative AutoCAD dimensions
Logical dimension points taken from AEC or AutoCAD objects	Manual dimension points taken from drawing	Logical dimension points from AutoCAD objects	Manual dimension points taken from drawing
Dimension AEC objects and AutoCAD objects	Dimension specified points in drawing	Dimension AutoCAD objects	Dimension specified points in drawing
Dimension external references	Do not dimension external references	Do not dimension external references	Do not dimension external references
Associative toward object	Associative or non-associative toward points, depending on user settings	Associative toward object	Partly associative toward points
Dimension groups	Dimension groups	Single dimensions	Single dimensions
Support superscripting; support fixed and variable extension lines	Support superscripting; support fixed and variable extension lines	Support no superscripting; support no fixed and variable extension lines	Support no superscripting; support no fixed and variable extension lines
Defined by AEC dimension style and AutoCAD dimension style	Defined by AEC dimension style and AutoCAD dimension style	Defined by AutoCAD dimension style	Defined by AutoCAD dimension style

Related Topics

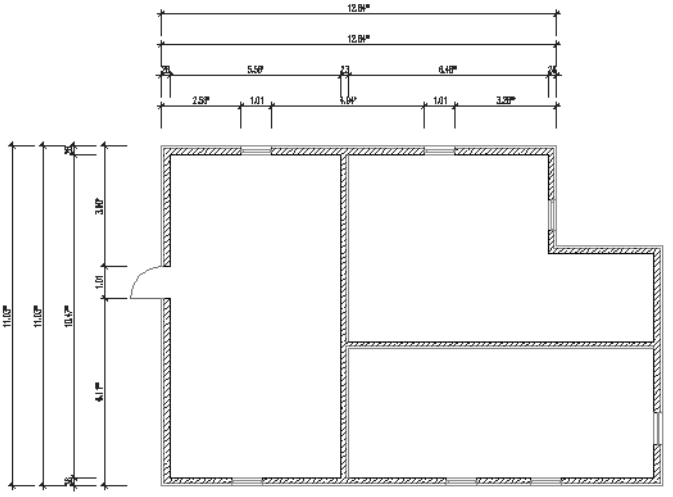
- Associative AEC Dimensions

- Manual AEC Dimensions
- AutoCAD Dimensions

Associative AEC Dimensions

Associative AEC dimensions offer maximum functionality for dimensioning.

Associative dimensioning of logical points



To create associative AEC dimensions, you select architectural objects or AutoCAD®linework and dimension their logical points. You can choose from a number of logical points for every object that can be dimensioned. Before you add the dimension, you decide which of those logical points are relevant for you. For example, you can dimension the following points in an automatic AEC dimension for a wall:

- Outer boundaries of the wall
- Wall lengths
- Width of wall components
- Wall intersections
- Openings in the wall

Logical dimension points react associatively toward building elements or linework. When the dimensioned object changes its measurements, the dimensioned points are updated accordingly. When the dimensioned object is moved, the dimension chains are moved accordingly.

Automatic AEC dimensions can take logical points from AEC objects and AutoCAD objects.

For a complete list of available objects and dimension points, see "Logical Dimension Points of AEC and AutoCAD Objects" on page 2363.

You can define different dimension points for different views. For example, in Plan Low Detail, you might dimension the outer boundaries of a building, and in Plan High Detail dimension additionally wall lengths and openings.

AEC dimensions can be inserted as dimension groups. A dimension group consists of several dimension chains used to dimension the same object, but with different points to measure. When you dimension a house, for example, you can measure the outer boundaries of the dimensioned walls in one dimension chain, and the length of the dimensioned walls in another dimension chain. Dimension groups also have settings for superscripting and variable extension line length.

Automatic AEC dimensions have the ability to dimension objects in external references, even when they are nested multiple levels deep. This is very useful for large drawing projects, where the parts of the building are distributed over various drawing files.

Process Overview: Creating Automatic AEC Dimensions

The general process for creating automatic AEC dimensions involves the following steps:

Step 1: Create an AEC dimension style that contains the following settings:

- number of dimension chains
- object types to be dimensioned (for example, walls or mass elements)
- logical points to be dimensioned (for example, wall components and wall intersections)
- look of the dimension (for example, arrow shapes, color, or linetypes)

TIP Before you create a new style, look through the templates to find an existing style that contains most of your desired settings. You can then modify it for your purposes.

Step 2: Dimension an object in the drawing using the AEC dimension style you created or selected.

Related Procedures

- Logical Dimension Points of AEC and AutoCAD Objects

- Creating an AEC Dimension Style
- Creating an Automatic AEC Dimension with User-Specified Settings

Manual AEC Dimensions

Manual AEC dimensions are similar to automatic AEC dimensions, but do not contain logical dimension points. Therefore, you can dimension any point that you select in a drawing. The manual AEC dimension can react associatively to these points or remain fixed, depending on your settings. For more information about setting the behavior of manual AEC dimensions, see "Setting the Point Mode for Manual AEC Dimensions" on page 2378.

Like automatic AEC dimensions, manual AEC dimensions contain settings for superscripting, for defining fixed or variable extension lines, and for grouping dimension chains into groups.

You can also take non-associative AutoCAD®dimensions and convert them to manual AEC dimensions.

Manual AEC dimensions cannot dimension points in an external reference, but they can snap to points from the external reference when OSNAP is turned on.

Process Overview: Creating Manual AEC Dimensions

Creating manual AEC dimensions involves the following steps:

Step 1: Create an AEC dimension style that contains the following settings:

- number of dimension chains
- look of the dimension (for example, arrow shapes, color, or linetypes)

TIP Before you create a new style, look through the templates to find an existing style that contains most of your desired settings. You can then modify it for your purposes.

Step 2: Specify the dimension point mode.

The dimension point mode determines whether the resulting dimensions are associative or non-associative to their dimensioned points.

Step 3: Create the dimension:

- To dimension points in the drawing, pick them and create a dimension.
- To convert an existing AutoCAD®dimension to a manual AEC dimension, select it and create a manual AEC dimension.

Related Procedures

- Creating an AEC Dimension Style
- Setting the Point Mode for Manual AEC Dimensions
- Adding Manual AEC Dimensions
- Creating an AEC Dimension from an AutoCAD Dimension

AutoCAD Dimensions

Associative AutoCAD®dimensions are associative toward AutoCAD objects like polylines, or rectangles. They are not associative toward AEC objects.

Associative AutoCAD dimensions are turned off by default in Autodesk® Architectural Desktop. To work with the associative AutoCAD dimension feature, set the system variable DIMASSOC to 2 (Associative Dimensions). To create non-associative AutoCAD dimensions, set DIMASSOC to 1 (Non-associative Dimensions).

Non-associative AutoCAD dimensions do not contain logical dimension points. That means that they can dimension any point specified in a drawing.

Non-associative AutoCAD dimensions can't be grouped into dimension groups. They do not have settings for superscripting and cannot have fixed extension lines. Also, AutoCAD dimensions cannot dimension objects in external references.

For more information about AutoCAD dimensions, see "Dimensions and Tolerances" in the *AutoCAD User's Guide*.

Logical Dimension Points of AEC and AutoCAD Objects

This section describes the AEC objects and AutoCAD®objects that you can dimension and the logical dimension points you can choose.

Logical dimension points are defined in the display properties of the dimension or the dimension style. It is recommended that you create a separate style for each set of logical dimension points. For example, you can create an AEC dimension style for walls, which contains only logical points on walls.

For information about how to define dimension content in AEC dimension styles, see "Specifying Dimension Points in AEC Dimension Styles" on page 2405.

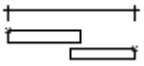
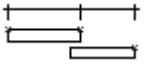
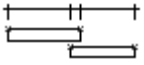
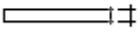
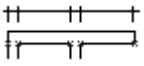
Related Topics

- Walls
- Windows, Doors, and Openings in Walls
- Grids
- Other AEC Objects
- AutoCAD Objects
- External References

Walls

The following logical dimension points are available for walls:

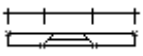
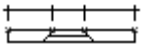
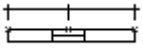
Wall Dimension Points

Selection	Description	Examples
Overall	Dimensions the two outer points of all dimensioned walls.	
Length of Wall: Outer Boundaries	Dimensions the outer boundaries of every selected wall. When wall boundaries overlap, only those visible from the direction of the dimension are dimensioned.	
Length of Wall: Wall Length	Dimensions the length of walls in the selection set.	
Wall Width: Wall Width	Dimensions the overall thickness of a wall.	
Wall Width: Components	Dimensions the thickness of all components in a wall.	
Wall Intersections	Dimensions the intersection points of walls that are connected to the selected walls.	

Windows, Doors, and Openings in Walls

The following logical dimension points are available for windows, doors, and openings within walls:

Window, Door, and Opening Dimension Points

Selection	Description	Examples
Opening Max. Width	Dimensions the maximum width of a window, door or opening in a wall.	
Opening Min. Width	Dimensions the minimum width of a window, door, or opening in a wall.	
Center of Opening	Dimensions the center point of a window, door, or opening in a wall.	

NOTE If you click Options on the Format menu, and then click AEC Object Settings, there are two options under Wall settings: Dimension to Center of Opening and Dimension to Outer Frame of Opening. These settings have no influence on how openings are dimensioned in AEC dimensions.

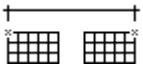
Grids

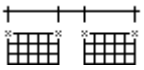
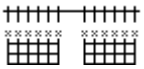
You can use automatic AEC dimensions to dimension the following grid types:

- Column grids
- Ceiling grids
- Layout grids

The following logical dimension points are available for grids:

Grid Dimension Points

Selection	Description	Examples
Overall	Dimensions the two outermost grid lines of all selected grids	

Grid Dimension Points		
Selection	**Description**	**Examples**
Outer Grid Lines	Dimensions the outer grid lines of selected grids	
All Grid Lines	Dimensions all grid lines in selected grids	

Other AEC Objects

The following objects have dimension points that can be set individually:

- Mass elements
- Curtain walls
- Window assemblies
- Structural members (columns/braces/beams)
- Standalone windows/doors/openings

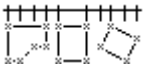
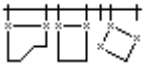
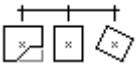
AEC objects not listed here can be dimensioned with automatic AEC dimensions as well, but you cannot set their points individually. They are combined in a group named "Other" and you set dimension points for all of them there. For example, if you select Bounding Box for Others, then all stairs, railings, spaces, roofs, slabs, and areas dimensioned with that style will have dimension points for their bounding boxes.

These objects are combined in the Other group:

- Stairs
- Railings
- Spaces
- Roofs/roof slabs/slabs
- Areas

The following dimension points are available for these objects:

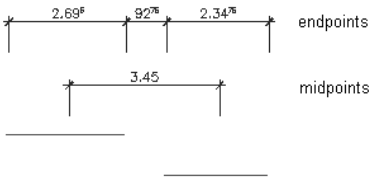
Other Building Object Dimension Points		
Selection	**Description**	**Examples**
Overall	Dimensions the two outer points of dimensioned objects	

Other Building Object Dimension Points *(continued)*		
Selection	**Description**	**Examples**
Bounding Box	Dimensions the bounding box of each object in the selection set	
Edges: All Edges	Dimensions all edges in an object	
Edges: Facing Edges	Dimensions the edges of the object that are visible from the direction of the dimension line	
Center	Dimensions the center point of an object	

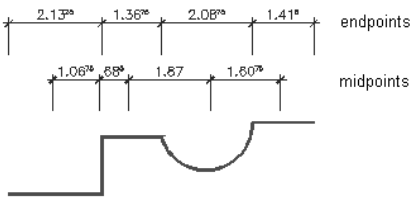
AutoCAD Objects

You can dimension most AutoCAD linework objects with automatic AEC dimensions.

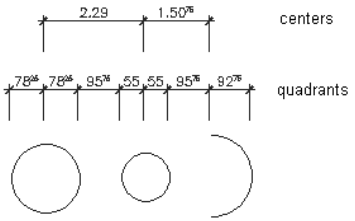
Dimensioning line endpoints and midpoints example



Dimensioning polyline endpoints and midpoints example



Dimensioning circle centers and quadrants example

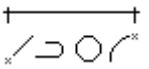
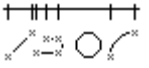
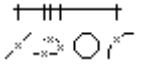


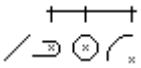
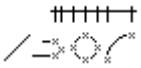
Use automatic AEC dimensions to dimension the following AutoCAD linework objects:

- Lines
- Arcs
- Circles
- Open and closed polylines
- AutoCAD polygons
- Rectangles

The following dimension points are available for AutoCAD linework objects:

AutoCAD Linework Dimension Points

Selection	Description	Examples
Extents	Dimensions the two overall outer points of selected objects.	
Endpoints	Dimensions the endpoints of selected objects. If you selected a polyline with multiple segments, the endpoints of each segment are measured. Endpoints can be measured for all AutoCAD linework objects listed above except circles.	
Midpoints	Measures the midpoints of all segments of the selected object that are lying in the direction of the dimensions. Midpoints can be measured for all AutoCAD linework objects listed above except circles.	

AutoCAD Linework Dimension Points *(continued)*		
Selection	**Description**	**Examples**
Center	Measures the center of the curve of circular objects. Centers can be measured for circles, arcs, and curved polyline segments.	
Quadrant	Measures the quadrants of circles, arcs, and curved polylines segments.	

You cannot use automatic AEC dimensions to dimension the following AutoCAD linework objects:

- Multilines
- Splines
- Ellipses
- Blocks
- AutoCAD dimensions
- Leaders
- Text
- Surfaces
- Images
- OLE frames
- Proxies
- Solids

AutoCAD linework objects include line-based objects, such as lines and open polylines, as well as non-linear geometry, such as closed polylines and circles. The results of using AEC dimensions to dimension these objects can be quite different. For example, for a single line, the options Overall, Bounding Box, All Edges, and Facing Edges look exactly alike. Some objects, like circles, have no edges to dimension.

TIP The best way to handle the different contents for AutoCAD linework is to create a number of AEC dimension styles for the individual objects. For example, you can create a style named "Line," which has only one dimension chain for dimensioning line edges, or a dimension style named "Circle," which dimensions only circle centers and circle quadrants. For more information on creating AEC dimension styles, see "AEC Dimension Styles" on page 2398.

External References

You can dimension objects from external references with AEC dimensions in the following cases:

- Attach an external reference drawing to a host drawing, and dimension objects from the external reference in the host drawing.
- Attach an external reference drawing to a host drawing, and dimension objects from the external reference and the host drawing in the host drawing.
- Attach a nested external reference drawing to a host drawing, and dimension objects from the external reference and its nested external references in the host drawing.
- Attach a nested external reference drawing to a host drawing, and dimension objects from the external reference, its nested external reference and from the host drawing in the host drawing.

Objects from external references are dimensioned in the same way and with the same dimension points as objects from the host drawing.

You can create any level of nesting inside the external reference and still dimension all nested referenced objects.

You will need the ability to dimension external references often when you are working in a project environment. For detailed information on using dimensions in a project, see "Annotating a Building Project" on page 341.

Considerations for Choosing a Dimension Type

To decide which dimensioning method is appropriate for you, consider the following points:

- Do you want to dimension mainly building objects like walls, mass elements and window assemblies? In this case, an automatic AEC dimension is the best choice.
- Do you require full associativity of the dimension toward building objects and AutoCAD® linework objects? Then you should select an automatic AEC dimension.
- Do you need the ability to dimension objects in external references? In that case, you will use an automatic AEC dimension which has advanced referencing capabilities.

- Do you need specific European visuals, like superscripting for millimeters and fixed extension line lengths? In this case, you could use and automatic AEC dimension or copy the properties of an AEC dimension style to an AutoCAD dimension.
- Do you want to dimension mainly arbitrary points in your drawing which are not connected to any building objects? In this case, you would select a manual AEC dimension.
- Do you want the dimension to update automatically when you make changes to the dimensioned object? In this case you could either select an automatic AEC dimension or a manual AEC dimension with transformable dimension points.
- Do you have existing AutoCAD dimensions and want to convert them to AEC dimensions? In that case, you would convert the AutoCAD dimension to a manual AEC dimension.
- Do you need a continued dimension or an angular dimension? In this case, a non-associative AutoCAD dimension would be the best choice.
- Do you want to keep an existing AutoCAD dimension, but give it the look and feel of your AEC dimensions? In that case, you can copy the properties of an AEC dimension style to an existing AutoCAD dimension.

Related Procedures

- Specifying AEC Dimension Preferences
- Creating an Automatic AEC Dimension with User-Specified Settings
- Creating a Manual AEC Dimension with User-Specified Settings
- Creating an AEC Dimension from an AutoCAD Dimension
- Copying Properties of AEC Dimensions to AutoCAD Dimensions

Specifying AEC Dimension Preferences

Use this procedure to specify dimension preferences before you add AEC dimensions to your drawing.

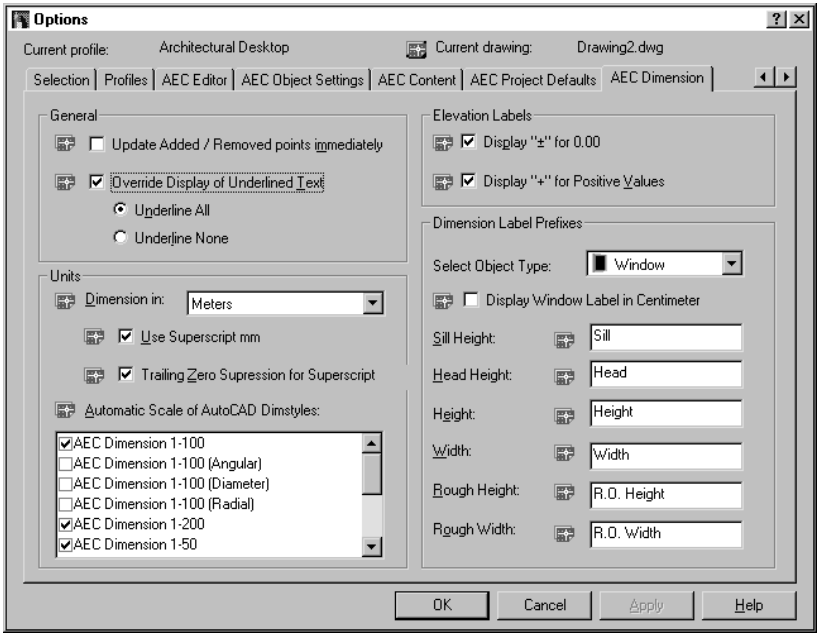
Settings for AEC dimensions include the following:

- Superscript for millimeters
- Dimension display unit
- Automatic rescale of existing AutoCAD®dimension styles
- Update behavior of points added or removed

1 On the Format menu, click Options.

2 Click the AEC Dimension tab.

Settings for AEC dimensions



3 Specify how dimension chains are updated when you remove or add dimension points:

If you want to . . .	Then . . .
update the display after every point you remove from or add to a dimension chain	select Update Added / Removed Points Immediately.
update the display only after you have finished removing or adding dimension points	Clear Update Added / Removed Points Immediately.

For more information, see "Adding Dimension Points" on page 2386 and "Removing Dimension Points" on page 2387.

4 Set the global behavior of manually overridden dimension values:

If you want to . . .	Then . . .
have an automatic underline for each manually overridden dimension value	select Override Display of Underlined Text, and then select Underline All.
have no underline for any overridden dimension value	select Override Display of Underlined Text, and then select Underline None.
set underlines for each overridden dimension value manually	clear Override Display of Underlined Text.

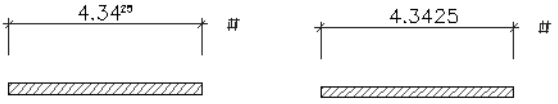
For more information, see "Overriding Dimension Values and Hiding Dimension Segments" on page 2393.

5 Select the unit in which dimensions are to be displayed.

This unit can differ from the drawing unit. For example, you can create a drawing in meters, but have the dimensions displayed in centimeters. This dimension notation is common in Austria.

6 If meters or centimeters are your drawing units, and you want to display the millimeters as superscripted text, select Use Superscript mm.

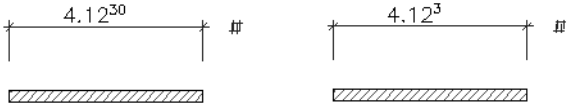
Millimeters superscripted (left) and millimeters not superscripted (right)



7 If you do not want zeros at the end of superscripted numbers, select Trailing Zeros Suppression for Superscript.

You can select this option only if you have selected Use Superscript mm.

Trailing zeroes not suppressed (left) and suppressed (right)



8 Select the AutoCAD dimension styles to be rescaled under Automatic Scale of AutoCAD Dimstyles when you change the drawing units.

Example: You change the drawing units from meters to millimeters. You have selected the AutoCAD dimension style "AEC-Dimension 1-100."

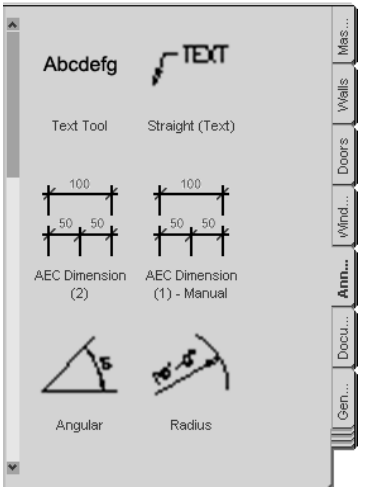
The following settings in the AutoCAD dimension style "AEC-Dimension 1-100" are rescaled:

Description	Variable	AutoCAD Dimstyle	
		Meters	Millimeters
Dimension line spacing	DIMDLI	0.5000	50.0000
Dimension line extension	DIMDLE	0.1250	125
Extension line length	DIMEXE	0.1250	125.0000
Text offset from dimension line	DIMGAP	0.1000	100.0000
Dimension text height	DIMTXT	0.2000	200.0000

Creating AEC Dimensions Using AEC Dimension Tools

Tool palettes provided with Autodesk®Architectural Desktop let you quickly place AEC dimensions by selecting an AEC dimension tool with a specific AEC dimension style and other predefined properties. You can also use the AEC dimension tools to convert AutoCAD dimensions to AEC dimensions and to apply the settings of an AEC dimension tool to existing AEC dimensions.

Tool palettes containing AEC dimension tools



The default tool palettes in the workspace contain sample AEC dimension tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain AEC dimension tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- Mytool catalog

Custom palettes created by your CAD manager or other users may also contain AEC dimension tools with AEC dimension styles and properties that are customized for your projects or office standards.

Related Procedures

- Creating an AEC Dimension
- Creating an Automatic AEC Dimension with User-Specified Settings
- Creating a Manual AEC Dimension with User-Specified Settings
- Creating an AEC Dimension from an AutoCAD Dimension
- Copying Properties of AEC Dimensions to AutoCAD Dimensions
- Creating an AEC Dimension Tool

Creating an AEC Dimension

Use this procedure to add a new AEC dimension that has the properties specified in the AEC dimension tool that you select. To specify settings when you add an AEC dimension, see "Creating an Automatic AEC Dimension with User-Specified Settings" on page 2376, "Creating a Manual AEC Dimension with User-Specified Settings" on page 2378, and "Creating an AEC Dimension from an AutoCAD Dimension" on page 2380.

1. Open the tool palette that you want to use, and select an AEC dimension tool.

   If necessary, scroll to display the tool that you want to use.

2. Select the objects you want to dimension, and press ENTER.

   You can move or hide the Properties palette to expose more of the drawing area.

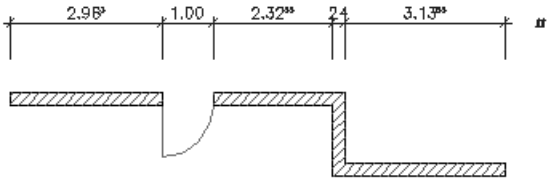
3. Click where you want to insert the AEC dimension.

Creating an Automatic AEC Dimension with User-Specified Settings

Use this procedure to create an automatic AEC dimension with the settings that you specify.

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

An automatic AEC dimension takes its dimension points from the object it dimensions. It updates when the object it dimensions changes.



1 Open the tool palette that you want to use, and select an AEC dimension tool.

   If necessary, scroll to display the tool that you want to use.

2 On the Properties palette, expand Basic, and expand General.

3 Select a style.

4 In the drawing area, select the objects you want to dimension.

   You can move or hide the Properties palette to expose more of the drawing area.

5 Press ENTER.

6 Specify the position, rotation, and direction of the new dimension:

If you want to . . .	Then . . .
insert the AEC dimension parallel or perpendicular to the dimensioned object	drag the cursor in the desired direction and click at the desired insertion point. **NOTE** If your selection set contains objects with different directions, the direction of the first selected object defines the parallel and perpendicular directions.
insert the AEC dimension at a specified rotation	enter **r** (Rotation) on the command line, and press ENTER.Then, enter a rotation angle, either by clicking in the drawing or by entering it on the command line. Press ENTER, and click at the desired insertion point. Alternatively, pressing the SPACE bar rotates the dimension by 90°. **NOTE** If your selection set contains objects with different directions, the rotation is calculated with reference to the first selected object.

If you want to . . .	Then . . .
insert the AEC dimension parallel to an object other than the dimensioned object in the drawing	enter **a** (Align) on the command line, and press ENTER. Then, select the object to which to align the AEC dimension. Press ENTER, and click in the drawing at the desired insertion point. **NOTE** The direction of the AEC dimension is dependent on the rotation of the chosen object. The drawing direction of the object has no influence on the AEC dimension direction.

Creating a Manual AEC Dimension with User-Specified Settings

Manual AEC dimensions take their points not from architectural objects like walls or windows, but from points you specify in your drawing. You can choose whether manual dimension points are associative and are updated every time the dimensioned point is updated, or whether they are static and remain at their absolute position in the drawing.

Related Procedures

- Setting the Point Mode for Manual AEC Dimensions
- Adding Manual AEC Dimensions

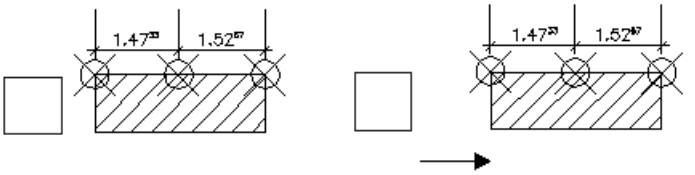
Setting the Point Mode for Manual AEC Dimensions

Use this procedure to define the update behavior of manual AEC dimensions.

When you select associative dimension points for your manual AEC dimensions, at every point you specify in the drawing an AutoCAD® point is inserted. The dimension point is associative to this AutoCAD point. If you move the AutoCAD point, the dimension point is updated accordingly.

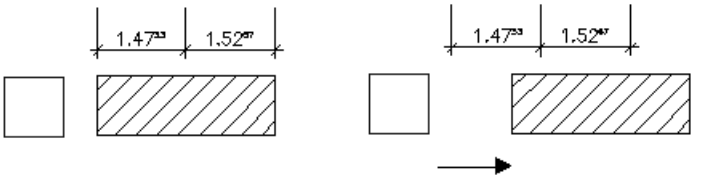
NOTE If you chose associative dimension points but cannot see the inserted AutoCAD points, they are set at a very small size. To change their size and shape, enter **ddptype** on the command line, and edit them as desired.

AEC dimension associative to AutoCAD points



If you chose static dimension points, no AutoCAD points are added to the drawing. The dimension point is simply added at the specified position, and is, from then on, fixed in the drawing.

Static dimension points



1. Enter **DimPointMode** on the command line.
2. Specify the point mode:

If you want to . . .	Then . . .
create dimension points that are associative toward AutoCAD points	enter **t** (Transformable).
create static dimension points that remain fixed in the drawing	enter **s** (Static).

These settings remain valid for all subsequent manual dimensions until you change them again.

After you have set the mode for dimension points, you can create manual AEC dimensions.

Adding Manual AEC Dimensions

Use this procedure to add a manual AEC dimension with the settings you specify.

1. Open the tool palette that you want to use, and select a manual AEC dimension tool.

   If necessary, scroll to display the tool that you want to use.

2. In the drawing area, specify the points you want to dimension.

   TIP Turn on Osnaps to specify points exactly.

3. Press ENTER.

   The points you specified are marked with crosses. That way, you can check that all points are included in your selection set.

4. On the command line, enter **st** (Style) to select a style for your manual AEC dimension.
5. Specify the position of the AEC dimension by clicking the desired position in the drawing.

   For example, the AEC dimension can be placed above or below the selected points.

6. Do any of the following:

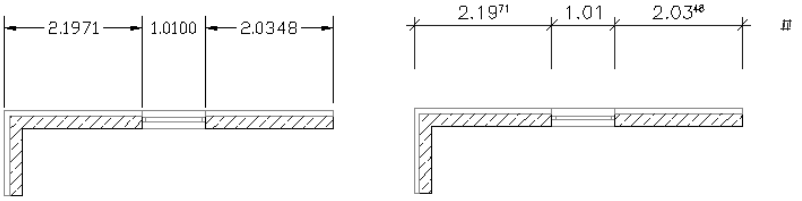
   - Drag the mouse to set the direction of the dimension. The extension lines are drawn into the opposite direction.
   - To place the AEC dimension perpendicular to a point in the drawing, enter **perp** (Perpendicular) on the command line, and specify the point the dimension is perpendicular to.

Creating an AEC Dimension from an AutoCAD Dimension

Use this procedure to create a manual AEC dimension from an AutoCAD® dimension. The manual AEC dimension has the properties of the AEC dimension tool you select. You can edit these properties after creating the AEC dimension.

For detailed information on properties and behavior of manual AEC dimensions, see "Manual AEC Dimensions" on page 2362.

Converting an AutoCAD dimension to an AEC dimension



1 Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

2 Right-click an AEC dimension tool, and click Apply Tool Properties to ➤ AutoCAD Dimension.

3 Select the AutoCAD dimensions, and press ENTER.

4 Do one of the following:

   - If you selected one AutoCAD dimension to convert, proceed to Step 7.
   - If you selected multiple AutoCAD dimensions to convert, proceed to Step 5.

5 Specify the position of the AEC dimension by clicking the desired position in the drawing. The AEC dimension can, for example, be placed above or below the object.

6 Do any of the following:

   - Drag the mouse to set the direction of the dimension. The extension lines are drawn into the opposite direction.
   - To place the AEC dimension perpendicular to a point in the drawing, enter **perp** (Perpendicular) on the command line, and specify the point the dimension is perpendicular to.
   - To set a user-defined angle for the AEC dimension, enter the desired angle on the command line.

NOTE The angle you specify here is calculated in relation to the UCS, and not to the dimensioned object.

---

7 When prompted to erase the original AutoCAD dimension, press ENTER to keep the AutoCAD dimension, or enter **y** (Yes) to erase it.

The resulting AEC dimension is displayed as follows:

If . . .	Then . . .
you selected only one AutoCAD dimension	the new AEC dimension is inserted at the same position as the AutoCAD dimension. If you did not erase the original AutoCAD dimension, the AEC dimension is placed on top of it.
you selected more than one AutoCAD dimension	the new AEC dimension is inserted according to your specifications from steps 6 and 7. If you did not erase the original AutoCAD dimensions, they remain in their original positions.

Copying Properties of AEC Dimensions to AutoCAD Dimensions

Use this procedure to copy the display properties of an AEC dimension to an AutoCAD® dimension without converting the AutoCAD dimension. In this case, a number of display attributes are changed while the functionality and behavior of the AutoCAD dimension are not changed.

NOTE When you copy the properties of an AEC dimension to an associative AutoCAD dimension (DIMASSOC = 2), the associativity of the resulting AutoCAD dimension is lost. Therefore, copy properties to an associative AutoCAD dimension only as the last step in your drawing process, or use traditional, non-associative AutoCAD dimensions (DIMASSOC = 1).

The following dimension display properties are copied from the AEC dimension to the AutoCAD dimension:

- **AutoCAD dimension style:** AEC dimensions have an underlying AutoCAD dimension style, defining settings for the dimension not explicitly set in the AEC dimension style.

  When you copy the properties of an AEC dimension to an AutoCAD dimension, the underlying AutoCAD dimension style of the AEC dimension is applied to the AutoCAD dimension.

  For detailed information about the connection between AutoCAD dimension styles and AEC dimension styles, see "AEC Dimension Styles and AutoCAD Dimension Styles" on page 2399.

- **Superscript settings:** If you have defined superscripted millimeters for AEC dimensions, this is applied to the AutoCAD dimension.

  For more information about superscripts, see "Specifying AEC Dimension Preferences" on page 2371.

- **Extension line length:** The extension length you have defined for your AEC dimension is applied to the AutoCAD dimension.

  When you copy the properties of an AEC dimension to an AutoCAD dimension that has a different extension line length, the definition points of the AutoCAD dimension are adjusted to the new length.

The AutoCAD dimension style and length of the extension lines are view-dependent settings. When you copy the properties of an AEC dimension to an AutoCAD dimension, the settings for the current view are applied.

NOTE Copying the properties of an AEC dimension to an AutoCAD dimension does not apply associative behavior to the AutoCAD dimension. When the AutoCAD dimension is moved, stretched, or otherwise manipulated, the dimension points do not react associatively to the dimensioned object.

1. On the command line, enter **AecDimMatch**.
2. Select the AEC dimension to copy properties from.
3. Select the AutoCAD dimensions to copy properties to.
4. Press ENTER.

Creating an AEC Dimension Tool

Use this procedure to create an AEC dimension tool and add it to a tool palette. You may want to create your own AEC dimension tools if you are placing multiple AEC dimensions of specific styles with additional AEC dimension properties that you want to be the same each time you add an AEC dimension of that type.

1. Open the tool palette where you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from an AEC dimension in the drawing	select the object, and drag it to the tool palette.

If you want to . . .	Then . . .
create a tool from an AEC dimension style in the Style Manager	on the Format menu, click Style Manager. Locate the style you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.
6. Expand Basic, and expand General.
7. Click the setting for Description, enter a description of the AEC dimension created from this tool, and click OK.
8. Specify a layer key and any layer key overrides if you do not want to use the layer assignments specified in the layer key style used in the drawing.
9. Select an AEC dimension style.
10. Select the drawing file containing the style used for this AEC dimension tool.
11. Define whether to create an automatic or manual AEC dimension tool:

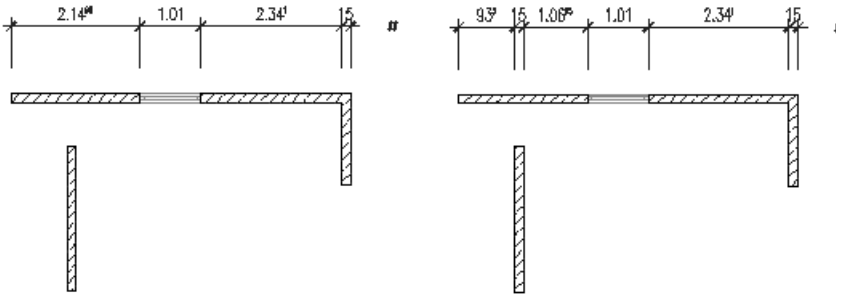
If you want to . . .	Then . . .
create an automatic AEC dimension tool for dimensioning AEC objects and AutoCAD objects	click the setting for Specify Using, and select Linework and Objects.
create a manual AEC dimension for dimensioning points in the drawing	click the Setting for Specify Using, and select Points.

12 Click OK.

Attaching Objects to Dimensions

Use this procedure to add new AEC objects to an automatic AEC dimension.

Adding objects to a dimension



1 Select the AEC dimension to which to add objects to, right-click, and click Attach Objects.

2 Select the objects to add to the AEC dimension.

3 Press ENTER.

Dimension points for the added objects are inserted into the AEC dimension.

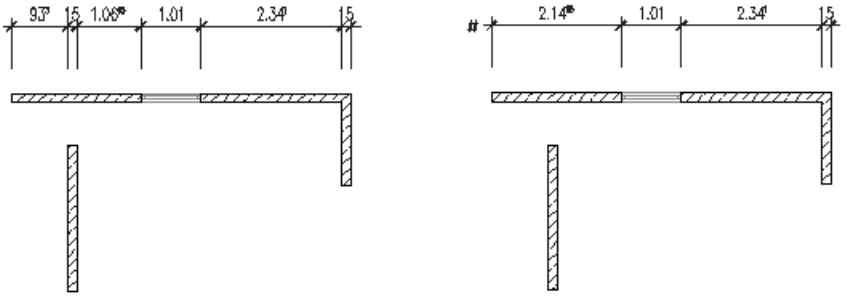
If you do not see any added dimension points, the group might not include points for the new object. For example, if you add a mass element to an AEC dimension that has no point settings selected for mass elements, you cannot see any points for the added mass element. To see the mass element points, change the style or the object display of the dimension so that dimension points for mass elements are displayed.

For information about dimension points, see "Logical Dimension Points of AEC and AutoCAD Objects" on page 2363 and "Specifying Dimension Points in AEC Dimension Styles" on page 2405.

Detaching Objects from Dimensions

Use this procedure to detach objects from automatic AEC dimensions.

Removing objects from a dimension



1. Select the AEC dimension from which you want to detach objects, right-click, and click Detach Objects.
2. Select the objects to detach from the AEC dimension.
3. Press ENTER.

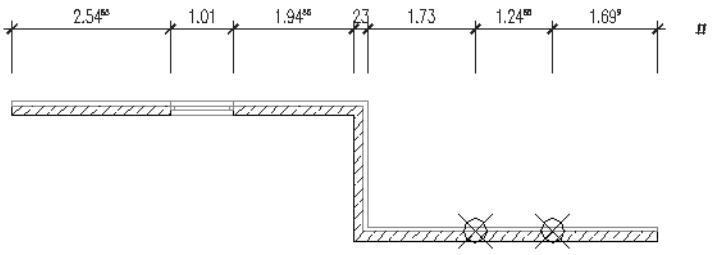
The dimension points belonging to the object are removed from the AEC dimension.

Adding Dimension Points

Use this procedure to add additional dimension points to a manual or automatic AEC dimension. These dimension points behave like the points in manual dimensions. They measure points you specify in the drawing and can be associative or static, depending on your point mode settings.

For more information about setting the mode for manual dimension points, see "Setting the Point Mode for Manual AEC Dimensions" on page 2378.

Adding dimension points



1. Select the AEC dimension to which to add points, right-click, and click Add Dimension Points.
2. Specify the points to add to the dimension.

   The points you specify are marked with crosses. This makes it easy to check that all points are included in your selection set.
3. Press ENTER.
4. Select the dimension chain to which to add the points.

The specified points are added to the dimension chain.

Removing and Restoring Dimension Points

You can remove dimension points from an AEC dimension. When you remove a logical point from an AEC dimension, you can restore it later. When you remove manual point from an AEC dimension, the point is removed permanently.

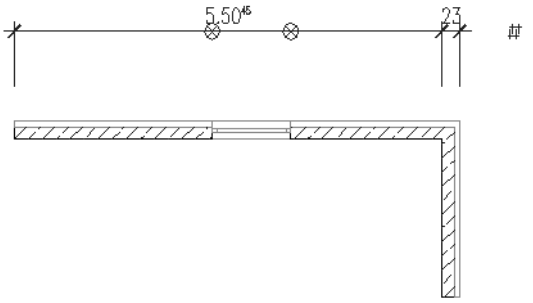
Related Procedures

- Removing Dimension Points
- Restoring Logical Dimension Points

Removing Dimension Points

Use this procedure to remove dimension points from dimension chains. Removed logical dimension points can be restored later. For more information about restoring logical dimension points, see "Restoring Logical Dimension Points" on page 2389.

Removing dimension points



1. Select the AEC dimension from which to remove points, right-click, and click Remove Dimension Points.
2. Select the points on the dimension chain to remove by clicking their extension lines.

   - If you selected Update Added/Removed Points Immediately in the AEC dimension preferences, the removed points are deleted immediately.
   - If you cleared Update Added/Removed Points Immediately in the AEC dimension preferences, the removed points are deleted after you end the command.

   For more information about the update options, see "Specifying AEC Dimension Preferences" on page 2371.

NOTE If the deleted points are still visible as a crossed circle, the display component Removed Points Marker is turned on. If you do not want the removed points marker to appear, turn off the component. For more information about the Removed Points Marker, see "Restoring Logical Dimension Points" on page 2389.

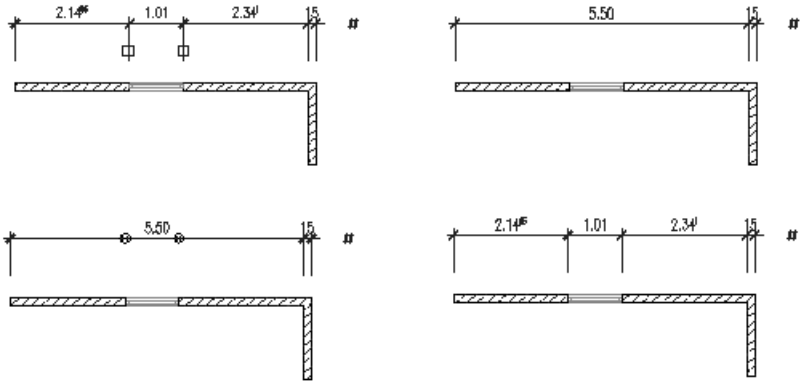
WARNING! When you remove multiple points, some removed points may reappear. This can happen when you have selected the option Update Added/Removed Points Immediately, and the entity display component Removed Points Marker is turned off. The reason for this behavior is that during your current removal operation, you accidentally selected an invisible removed point marker for a dimension point already removed. Removing an already removed point restores it. To avoid this effect, turn on the Removed Points Marker component

in the entity display. For more information about turning components on and off, see "Changing the AEC Dimension Display Components" on page 2402.

Restoring Logical Dimension Points

Use this procedure to restore removed logical dimension points. Logical dimension points belong to an object; therefore, information about type and position of the removed point are still present in the dimension chain.

1) Select dimension points to remove. 2) Remove them. 3) Make removed points visible. 4) Restore them.



1 Select the dimension chain on which to restore a removed dimension point.

2 Verify that the removed point is visible:

If . . .	Then . . .
the point removed is still visible as a crossed circle	proceed to step 9.
the point removed is not visible as a crossed circle	make it visible by following steps 3 through 11.

3 Select the dimension, right-click, and click Object Display.

4 Click the Display Properties tab.

5 Select the display representation on which the changes should appear, and select Object Override.

The display representation in bold is the current one.

6 If necessary, click .

7 Click the Layer/Color/Linetype tab.

8 Select the Removed Points Marker component, and turn on the setting for Visibility.

9 Click OK twice.

The removed dimension point on the dimension chain is now visible, displayed by a crossed circle.

10 Select the AEC dimension again, right-click, and click Remove Dimension Points.

11 Click the center of the circle for the dimension points to restore.

- If you selected Update Added/Removed Points Immediately in the AEC dimension preferences, the restored points appear immediately.
- If you cleared Update Added/Removed Points Immediately in the AEC dimension preferences, the restored points appear after you end the command with ENTER.

For more information about the update options, see "Specifying AEC Dimension Preferences" on page 2371.

Editing AEC Dimensions

You can change the attributes of an AEC dimension, such as the style assigned or the dimension properties. You can also move individual dimension text in crowded plans and override dimension values with "false" values.

Autodesk® Architectural Desktop offers several methods for editing AEC Dimensions:

- You can directly edit AEC dimensions using grips.
- You can change AEC dimensions settings on the Properties palette.
- You can select editing commands from the shortcut menu for a selected AEC dimension.

Related Procedures

- Using Grips to Reposition Dimension Texts, Extension Lines and Dimension Chains

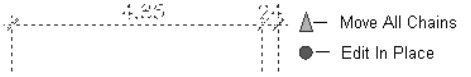
- Resetting Repositioned Dimension Texts, Extension Lines and Dimension Chains
- Changing the AEC Dimension Style
- Overriding Dimension Values and Hiding Dimension Segments
- Attaching Hyperlinks, Notes, and Files to an AEC Dimension

Using Grips to Reposition Dimension Texts, Extension Lines and Dimension Chains

Use this procedure to reposition individual dimension texts, extension lines and dimension chains in an AEC dimension.

The length of extension lines and the distance between dimension chains are usually set in the AEC dimension style, and are identical for all chains and all extension lines in the dimension. In some cases, you need to override those settings, and display different extension lines or chain distances. Also, you might need to move individual dimension texts to a different location.

Viewing AEC Dimension Move All Chains and Edit in Place grips



AEC dimensions offer you the ability to change the display of a dimension with direct editing via grips.

NOTE You can only display and move the in-place grips of an AEC dimension if the underlying AutoCAD dimension style has the correct text placement settings. To ensure this, select the AEC dimension, right-click, and click AEC Dimension Style. Then, select the display representation where you want the changes to appear, and select Style Override. If necessary, click , and click the Other tab. Click Edit, and in the Dimension Style Manager click Modify. Click the Fit tab, and select Over the dimension line, without a leader for Text Placement.

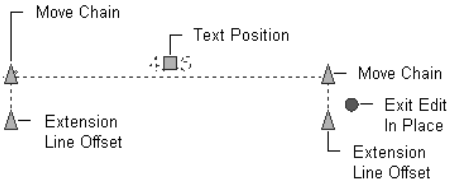
---

1. Select the AEC dimension on which to reposition individual texts, extension lines or dimension chains, and click its Edit In Place grip.

   The dimension now displays grip points for

   - individual texts
   - individual extension lines
   - individual dimension chains

Viewing AEC Dimension Edit In Place grips



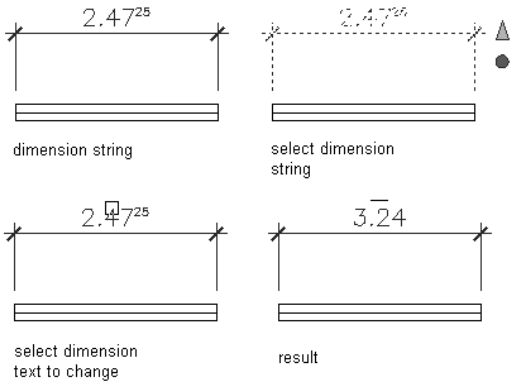
2 Use the grips to reposition dimension texts, lengthen or shorten extension lines, and reposition dimension chains.

NOTE Alternatively, you can select the AEC dimension, right-click, and click Edit In Place.

Resetting Repositioned Dimension Texts, Extension Lines and Dimension Chains

Use this procedure to reset repositioned dimension texts, extension lines and dimension chains.

Overriding text in an AEC Dimension



NOTE You can only reset those dimension texts that you have manually moved to a different place. If dimension texts are offset from their positions because they do not, for example, fit on the appropriate dimension segment, you cannot automatically reset them here. To make sure that your dimension texts are always placed on the dimension segment, set this in the underlying AutoCAD dimension style. Select the AEC dimension, right-click, and click AEC

Dimension Style. Then, select the display representation where you want the changes to appear, and select Style Override. If necessary, click , and click the Other tab. Click Edit, and in the Dimension Style Manager click Modify. Click the Fit tab, and select Always keep text between ext lines under Fit Options.

1. Select the AEC dimension with repositioned components to be reset.
2. Set the components to their original positions:

If you want to . . .	Then . . .
set the extension lines to their style settings	Right-click, and click Remove Overrides ➤ Reset Extension Lines.
set the text strings to their original position	Right-click, and click Remove Overrides ➤ Reset Text to Original Position.

NOTE To reset the distance between dimension chains, set the distance between chains to the original value in the AEC dimension style. For information, see "Selecting the AutoCAD Dimension Styles and Other Properties of AEC Dimension Styles" on page 2406.

Changing the AEC Dimension Style

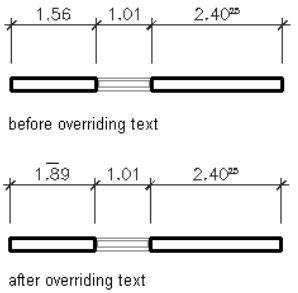
Use this procedure to change the style associated to an AEC dimension. AEC dimension styles contain information about the display of the dimension. For information about how to define AEC dimension styles, see "AEC Dimension Styles" on page 2398.

1. Select one or more AEC dimensions and double-click one of them.
2. Expand Basic, and expand General.
3. Select an AEC dimension style.

Overriding Dimension Values and Hiding Dimension Segments

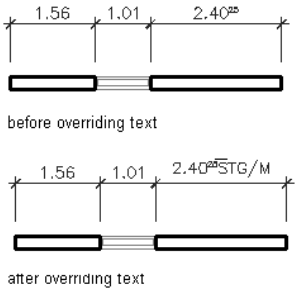
The dimension values in an AEC dimension are the real-life calculated values taken from the objects that are dimensioned. When the dimensioned object is updated, the dimension value is updated accordingly. In some cases you might want to override that value and exchange it for a manually inserted value.

Overriding dimension text with a new value



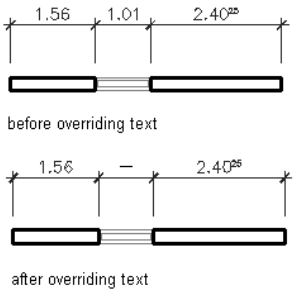
In other cases, you might want to retain the original value, but supplement it with a prefix or suffix.

Overriding dimension text with a suffix



Sometimes, you need to hide a dimension text or a whole dimension segment.

Overriding dimension text by hiding text



Overridden dimension values can be marked in different ways:

- Each manually overridden value, hidden text, or prefixed/suffixed value, is marked by a short overline. For information on how to hide the overline, see "Hiding the Overline of Overridden Dimension Values" on page 2397.
- You can add an underline to each overridden value. For information, see "Overriding Dimension Values" on page 2395.
- You can specify in the drawing setup to underline each override automatically. For information, see "Global Underline Options for Overrides" on page 2396.

When you manually override a dimension value, the correct automatic value still exists. You can remove the override, and restore the correct value again.

Related Procedures

- Overriding Dimension Values
- Removing Overrides from Dimension Values
- Global Underline Options for Overrides
- Hiding the Overline of Overridden Dimension Values

Overriding Dimension Values

Use this procedure to exchange an automatic dimension value for a manually inserted one, to add prefixes and suffixes to dimension values, and to hide dimension texts and segments.

1. Select the dimension on which to override a dimension value, right-click, and click Override Text & Lines.
2. Click the value to override.
3. Specify the value override:

If you want to . . .	Then . . .
hide the selected dimension text	select Hide Text.
hide the selected dimension segment	select Hide Text and Lines.
override the dimension value	enter a value for Text. **NOTE** You can enter all alphanumeric characters here.
mark an overridden value with an underline	select Underline Text.

If you want to . . .	Then . . .
add a prefix to a dimension value	enter one for Prefix.
add a suffix to a dimension value	enter one for Suffix.

4 Click OK.

Removing Overrides from Dimension Values

Use this procedure to remove overrides from dimension values.

The results of removing overrides are as follows:

- Overridden values are reset to their correct value.
- Underlines and overlines are removed.
- Prefixes and suffixes are removed.
- Hidden text and hidden segments are redisplayed.

1 Select the dimension from which to remove an override, right-click, and click Override Text & Lines.
2 Click the value or segment from which to remove an override.
3 Click Remove Override.
4 Click OK.

Global Underline Options for Overrides

Use this procedure to set the underlines of overridden dimension values globally in the drawing.

Documentation guidelines of a company or regional office may require underlining all overridden dimension values. It would be cumbersome to underline each overridden value individually. Autodesk® Architectural Desktop offers you the ability to set underlining of overridden values as the default behavior. This means that whenever you override a dimension value, it is automatically underlined.

Similarly, you might need a quick way to remove all underlines from a plan; for example, to create a preview sheet from a not-yet-finished plan.

In this case, you can set global underlining instead of underlining or removing underlines from individual overrides.

NOTE The global underline setting is applied to existing overrides and new overrides.

1. On the Format menu, click Options.
2. Click the AEC Dimension tab.
3. Select Override Display of Dimensioned Text.
4. Set the global underline behavior:

If you want to . . .	Then . . .
underline all overridden dimension values in the drawing, regardless of individual settings	Select Underline All.
remove the underline from all overridden dimension values in the drawing, regardless of individual settings	Select Underline None.

Hiding the Overline of Overridden Dimension Values

Use this procedure to hide the overline of overridden dimension values.

When you create an override for a dimension value—entering a different value, hiding a text or a segment, adding a prefix/suffix—the override is marked by a small overline above the changed value. The overline is useful for seeing at a glance which values have been overridden.It is also useful when you have hidden texts and segments, to select the hidden segment.

In some cases, however, you might want to hide the overline. The overline is placed on the DEFPOINTS layer, and by default is not plotted. If you want to hide it in the Autodesk Architectural Desktop session as well, you need to hide the DEFPOINTS layer.

1. In the Layer Properties toolbar, select the DEFPOINTS layer.
2. Click the light bulb icon to hide the layer.

NOTE Alternatively, you can hide the DEFPOINTS layer in the Layer Manager.

Attaching Hyperlinks, Notes, and Files to an AEC Dimension

Use this procedure to attach hyperlinks, text notes, and files to an AEC dimension.

1 Double-click the AEC dimension to which to attach information.
2 Click the Extended Data tab.
3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 Click the setting for Notes, and add a note. Then, click OK.
5 Click the setting for Reference Documents.
6 Attach or detach reference files:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

7 Click OK.

AEC Dimension Styles

An AEC dimension style is a group of properties assigned to an AEC dimension that determines the appearance and other characteristics of that object.

You can create and edit AEC dimension styles, import and export AEC dimension styles between drawings, and purge AEC dimension styles that are not in use. When you create, purge, import, export, or edit styles, you access the Style Manager. The Style Manager provides a central location in Autodesk®Architectural Desktop where you can work with styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager" on page 531.

You can create an AEC dimension tool from any AEC dimension style. You can drag the style from the Style Manager onto a tool palette. You can then specify default settings for any AEC dimensions created from the tool. For more information, see "Creating an AEC Dimension Tool" on page 2383.

Related Topics

- AEC Dimension Styles and AutoCAD Dimension Styles
- The AEC Dimension Style Wizard
- Creating AutoCAD Dimension Styles
- Creating an AEC Dimension Style
- Changing the Number of Chains in an AEC Dimension Style
- Changing the AEC Dimension Display Components
- About Dimension Points in AEC Dimension Styles
- Specifying Dimension Points in AEC Dimension Styles
- Selecting the AutoCAD Dimension Styles and Other Properties of AEC Dimension Styles
- Changing Style Properties with the AEC Dimension Style Wizard
- Attaching Notes and Files to an AEC Dimension Style

AEC Dimension Styles and AutoCAD Dimension Styles

Every AEC dimension style has an underlying AutoCAD® dimension style, which controls settings that are not set directly in the AEC dimension style.

The AutoCAD dimension style defines the following properties:

- Color of dimension lines and extension lines
- Lineweight of dimension lines and extension lines
- Shape and size of dimension arrowheads
- Dimension text height and color
- Units, precision, and decimal separator symbol

The AEC dimension style defines the following properties:

- Number of dimension chains
- Contents of dimensions chains
- Distance between dimension chains
- Fixed or variable extension lines
- Display of opening height dimensions

The AEC Dimension Style Wizard

There are two ways of editing a dimension style:

- You can edit the dimension style in the Style Manager. The advantage of this method is that you can edit all AEC dimension style settings here.

- You can edit the dimension style with the AEC Dimension Style Wizard. The advantage of this method is that you can edit the most important display settings of the style in a fast and uncomplicated way. However, you can not change all settings here; for example, chain and content settings can be edited only with the AEC Dimension Styles Properties dialog box. For more information about the AEC Dimension Style Wizard, see "Changing Style Properties with the AEC Dimension Style Wizard" on page 2408.

Creating AutoCAD Dimension Styles

You need to create an underlying AutoCAD®dimension style before you create an AEC dimension style.

Autodesk®Architectural Desktop comes with a number of preset AutoCAD dimension styles specifically designed for use in AEC dimensions. To save time, look at these, to see if you can use them directly or with modifications.

To create an AutoCAD dimension style for use with AEC dimension styles, be sure to specify the following settings:

- Dimension line and extension line settings
- Arrowhead settings
- Text display settings
- Unit settings

1. On the Dimension menu, click Style.
2. In the Dimension Style Manager, click New.
3. Follow the instructions for creating a new AutoCAD dimension style, as described in "Using Dimension Styles" in the *AutoCAD 2004 User's Guide*.

For more information about connecting the AutoCAD dimension style to an AEC dimension style, see "Selecting the AutoCAD Dimension Styles and Other Properties of AEC Dimension Styles" on page 2406.

Creating an AEC Dimension Style

Use this procedure to create an AEC dimension style. You can create a new style with default style properties, or you can create a new style by copying an existing style. After you create the style, you edit the style properties to customize the characteristics of the style.

1. On the Format menu, click Style Manager.
2. Expand Documentation Objects, and expand AEC Dimension Styles.

3 Create a new AEC dimension style:

If you want to . . .	Then . . .
create a new style with default properties	right-click AEC Dimension Styles, and click New.
create a new style from an existing style	right-click the AEC dimension style you want to copy, and click Copy. Right-click, and click Paste.

4 Enter a name for the new AEC dimension style, and press ENTER.

5 To edit the style properties of your new AEC dimension style, right-click the style, and click Edit:

If you want to . . .	Then . . .
change the Layer/Color/ Linetype properties	see "Changing the AEC Dimension Display Components" on page 2402.
change the number of chains in an AEC dimension style	see "Changing the Number of Chains in an AEC Dimension Style" on page 2402.
specify dimension points and objects to dimension	see "Specifying Dimension Points in AEC Dimension Styles" on page 2405.
change the AutoCAD® dimension style and other settings	see "Selecting the AutoCAD Dimension Styles and Other Properties of AEC Dimension Styles" on page 2406.
change an existing AEC dimension style with the AEC Dimension Style Wizard	see "Changing Style Properties with the AEC Dimension Style Wizard" on page 2408.
add notes, files, or documents to the style	see "Attaching Notes and Files to an AEC Dimension Style" on page 2410.

6 When you have finished changing the AEC dimension style properties, click OK.

7 If you want to assign the style to an AEC dimension tool, drag the style from the Style Manager to a tool palette.

You can later rename the tool and specify other properties for it as described in "Creating an AEC Dimension Tool" on page 2383.

8 Click OK.

Changing the Number of Chains in an AEC Dimension Style

Use this procedure to change the number of dimension chains in an AEC dimension style.

To set the contents of individual chains, see "Specifying Dimension Points in AEC Dimension Styles" on page 2405.

1. Open a tool palette that has an AEC dimension tool.
2. Right-click an AEC dimension tool, and click AEC Dimension Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Chains tab.
5. Enter the number of dimension chains to define for this dimension style.
6. Click OK twice.

Changing the AEC Dimension Display Components

Use this procedure to change the properties of the display components of an AEC dimension style.

The following AEC dimension display components are available:

Display components of AEC dimensions

Component	Description
AEC Dimension Group	Use this component only to turn the visibility of an AEC dimension on or off for a specific view. All the other settings, like color, linetype, and lineweight are defined in the underlying AutoCAD® dimension style; any changes you enter here are not displayed.
Removed Points Marker	This component shows removed dimension points. Make it visible if you want to restore removed dimension points, as described in "Removing and Restoring Dimension Points" on page 2387.
AEC Dimension Group Marker	Marker of the dimension base point.

1. Open a tool palette that has an AEC dimension tool.
2. Right-click an AEC dimension tool, and click AEC Dimension Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the Display Properties tab.

5 Select the display representation where you want the changes to appear, and select Style Override.

6 If necessary, click .

7 Click the Layer/Color/Linetype tab.

8 Select the component to change, and select a different setting for the property.

9 Click OK twice.

About Dimension Points in AEC Dimension Styles

The chains of an AEC dimension can contain a large number of logical, associative dimension points for various AutoCAD®and AEC objects.

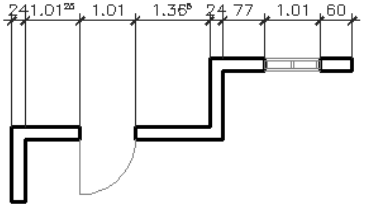
For a complete list of logical dimension points and objects, see "Logical Dimension Points of AEC and AutoCAD Objects" on page 2363.

For conceptual information on dimension points, see "Associative AEC Dimensions" on page 2360.

Each AEC dimension can have from one to ten dimension chains. Each chain can contain dimension points for the objects in a drawing. For more information, see "Changing the Number of Chains in an AEC Dimension Style" on page 2402.

Example 1: You create an AEC dimension style that contains only one chain. This chain contains wall lengths and wall intersections and the maximum opening width of openings within the wall.

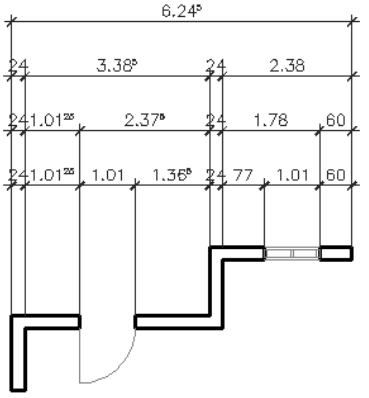
Single AEC Dimension chain example



Example 2: You create an AEC dimension style designed exclusively to dimension walls, but the wall dimension points are distributed on four individual chains:

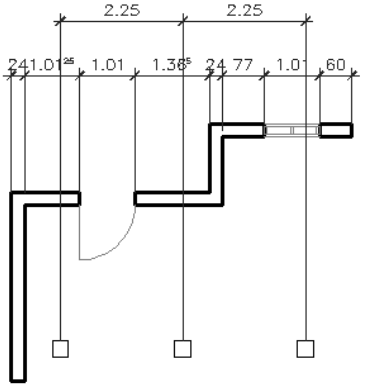
- Chain 1 dimensions the wall lengths and the wall widths.
- Chain 2 dimensions the wall lengths, wall widths and wall intersections.
- Chain 3 dimensions only the wall lengths.
- Chain 4 dimensions the outer boundaries of all selected walls.

Four AEC Dimension chains example



Example 3: You create an AEC dimension style that dimensions the length of walls in a building on one chain, and a row of columns within the building on a second chain.

Two AEC Dimension chains example



The following guidelines can help you to create AEC dimension styles:

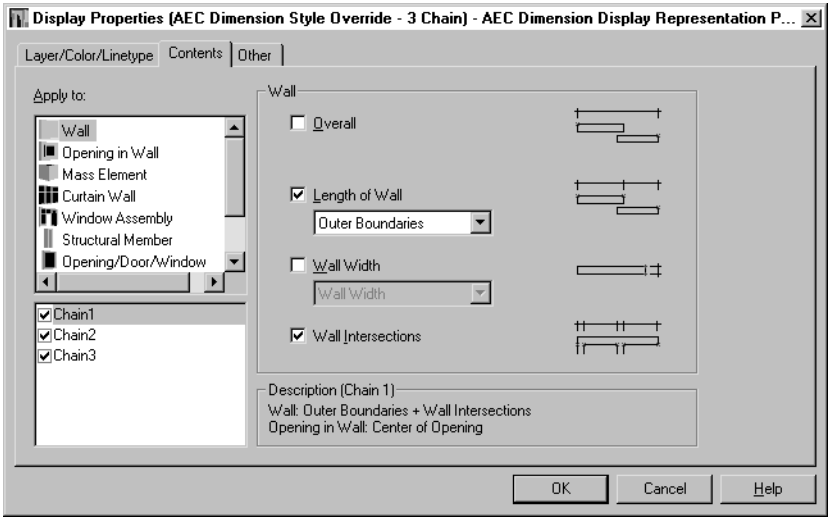
- Create a separate dimension style for each use. For example, create a style that dimensions window assemblies and curtain walls, and another one that dimensions walls and openings in walls.
- Do not include too many dimension points in one dimension chain.
- Do not include too many objects within one dimension style.

Specifying Dimension Points in AEC Dimension Styles

Use this procedure to specify the objects and points to be dimensioned on an AEC dimension style.

1. Open a tool palette that has an AEC dimension tool.
2. Right-click an AEC dimension tool, and click AEC Dimension Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Contents tab.

Selecting the contents of dimension chains



Under Apply To, you find the list of objects that can be dimensioned.

The Other entry combines all AEC objects that are not listed individually. They include stairs, spaces, areas, roofs, and railings.

Below the Apply To list, you find the list of available chains in this AEC dimension style.

8 For Apply To, select the object you want to dimension.

Example: In the first chain, you want to dimension the length of walls and wall intersections. For Apply To, you select Wall.

9 Under Chains, select the chain on which the dimension points to appear.

Example: In the first chain, you want to dimension the length of walls. In the previous step, you selected Wall. Now, you select Chain 1.

NOTE "Selecting" in this context means highlighting the desired chain, and not selecting the check mark. The check mark is set automatically depending on whether dimension points for this chain are selected. Example: If you clear all possible dimension points for a chain, its check is automatically cleared.

---

10 On the right side, select the points to include in the highlighted chain.

Example: In the first chain, you want to dimension the length of walls and wall intersections. In the previous steps, you selected Walls and highlighted Chain1. Now, you select the check box for Length of Wall and choose Wall Length. Then, you select the check mark for Wall Intersections.

11 Repeat steps 7–9 until your dimension contains all objects and points you want to dimension with this style.

12 Click OK twice.

Selecting the AutoCAD Dimension Styles and Other Properties of AEC Dimension Styles

Use this procedure to select the AutoCAD®dimension style underlying the AEC dimension style and these other settings that affect the appearance of the AEC dimension:

- Distance between dimension chains
- Length of extension lines
- Dimension layer
- Display of height of openings

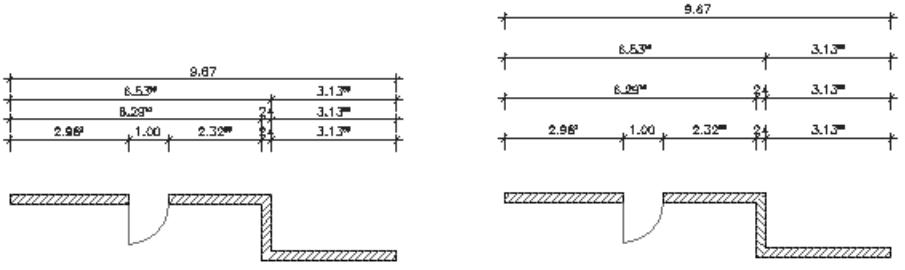
NOTE Activating the display of the opening height takes effect only if you select dimension points for openings in one or more chains of this dimension style. For information on selecting opening dimension points, see"Specifying Dimension Points in AEC Dimension Styles" on page 2405.

1. Open a tool palette that has an AEC dimension tool.
2. Right-click an AEC dimension tool, and click AEC Dimension Styles.
3. Right-click the style you want to edit, and click Edit.
4. Click the Display Properties tab.
5. Select the display representation where you want the changes to appear, and select Style Override.
6. If necessary, click .
7. Click the Other tab.
8. To change the underlying AutoCAD dimension style of the AEC dimension style, select an AutoCAD dimension style.
9. To edit the AutoCAD dimension style, click Edit.

   For more information about AutoCAD dimension styles, see AEC Dimension Styles and AutoCAD Dimension Styles.

   To return to the Other tab in the Entity Properties dialog box, click Close.
10. Specify the distance between the single dimension chains in the AEC dimension.

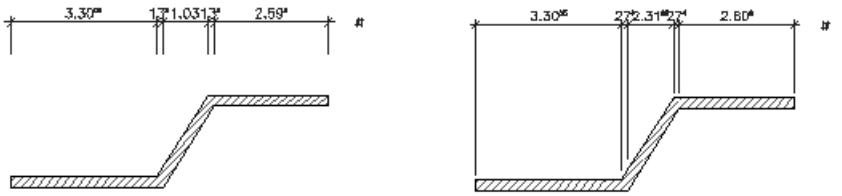
    Different distances between dimension chains



11. Define whether you want or variable extension lines.

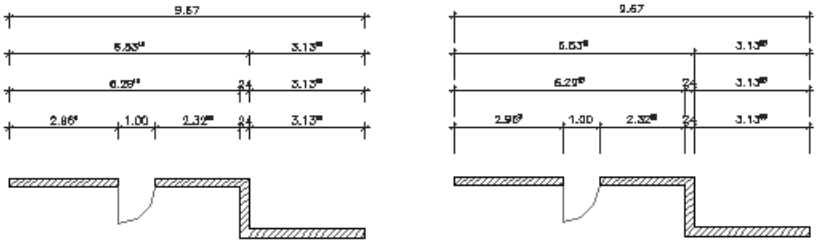
    Fixed extension lines have the same length. Variable extension lines adapt to the outline of the object they dimension. AutoCAD dimensions use variable extension lines.

Fixed extension lines (left) and variable extension lines (right)



12 If you select fixed extension lines, enter the length of the extension lines.

Different lengths of extension lines



13 Specify whether to display the height of openings.

NOTE This opening dimension is used specifically for European working plans, where you need a detailed description of measurements.

14 Click Layer to select the layer on which to place the AEC dimension.

15 Click OK twice.

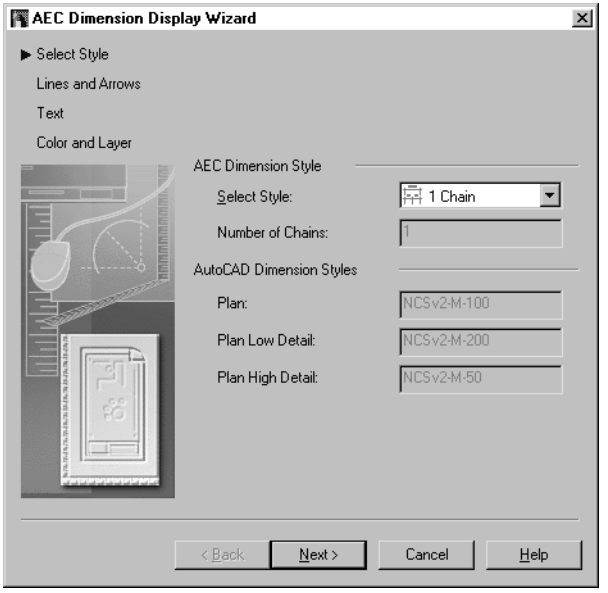
Changing Style Properties with the AEC Dimension Style Wizard

Use this procedure to change a number of AEC dimension style properties with the help of a wizard. The AEC Dimension Style Wizard offers you a fast way of changing these properties of a style:

- Arrowhead shape and size
- Length and color of extension lines
- Color of dimension lines
- Distance between dimension chains

- Dimension text style, size, and color
- Rounding-off value
- Layer assignment

1 On the Format menu, click AEC Dimension Style Wizard.



2 Select the AEC dimension style to edit and click Next.

IMPORTANT If you choose a dimension style that has its property source set to System Default, you get a warning message. If you want to edit the style, close the Wizard, open the style in the Style Manager, and set the display property source to a style override. For more information about working with the Style Manager, see "Style Manager" on page 531.

3 Select the display representation to change.

NOTE If the AEC dimension style you choose to edit is based on the same AutoCAD®dimension style for different display representations, the edits you make apply to all display representations. To avoid this, make sure that the AEC dimension style uses different AutoCAD dimension styles for different display representations. For more information about assigning AutoCAD dimension styles to AEC dimension styles, see Selecting the AutoCAD Dimension Styles and Other Properties of AEC Dimension Styles.

4 Specify line and arrow settings:

- Select new arrowhead symbols.
- Change the size of the arrowheads.
- Define a new length for the extension lines.
- Define a new distance between the individual dimension chains.

5 Click Next.

6 Specify text settings:

- Select a new text style.
- Select a new text height.
- Define a new round-off precision for dimension values.

7 Click Next.

8 Specify Color and Layer settings:

- Select a new text color.
- Select a new dimension line color.
- Select a new extension line color.
- Select a new layer for the dimension.

9 Click Finish.

Attaching Notes and Files to an AEC Dimension Style

Use this procedure to attach text notes and files to an AEC dimension style.

1 Open a tool palette that has an AEC dimension tool.

2 Right-click an AEC dimension tool, and click AEC Dimension Styles.

3 Right-click the style you want to edit, and click Edit.

4 Click the General tab.

5 To add a description to the AEC dimension style, enter the description under Description.

6 Click Notes.

7 To add a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.

If you want to . . .	Then . . .
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK when you are done editing.
detach a reference file	select the file name, click Delete, and click OK.

9 Click OK twice.

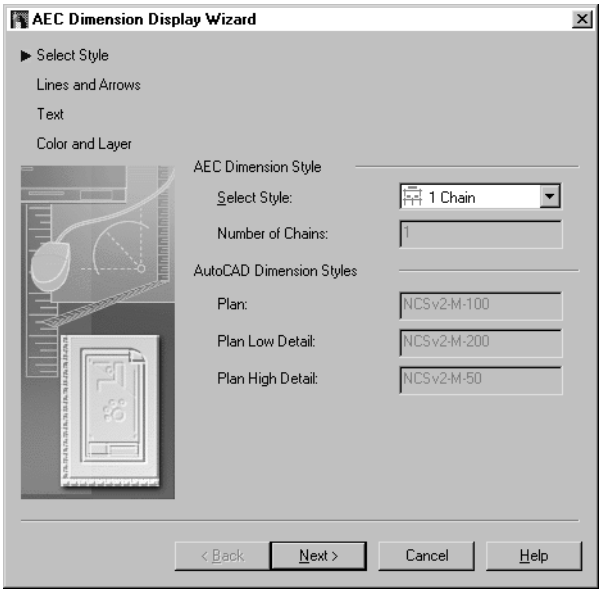
Q and A for Working with AEC Dimensions

This topic contains questions and answers that can help you to achieve the results you want when working with AEC dimensions.

How do I change the color, text size, and arrowheads of an AEC dimension?

Those settings are defined in the AutoCAD® dimension style that underlies the AEC dimension style. To access them easily, use the AEC Dimension Style Wizard.

1 On the Format menu, click AEC Dimension Style Wizard.



2 Select the AEC dimension style to edit and click Next.

IMPORTANT If you choose a dimension style that has its property source set to System Default, you get a warning message. If you want to edit the style, close the Wizard, open the style in the Style Manager, and set the display property source to a style override. For more information about working with the Style Manager, see "Style Manager" on page 531.

---

3 Select the display representation to change.

NOTE If the AEC dimension style you choose to edit is based on the same AutoCAD®dimension style for different display representations, the edits you make apply to all display representations. To avoid this, make sure that the AEC dimension style uses different AutoCAD dimension styles for different display representations. For more information about assigning AutoCAD dimension styles to AEC dimension styles, see Selecting the AutoCAD Dimension Styles and Other Properties of AEC Dimension Styles.

---

4 Specify line and arrow settings:

- Select new arrowhead symbols.
- Change the size of the arrowheads.

- Define a new length for the extension lines.
- Define a new distance between the individual dimension chains.

5 Click Next.

6 Specify text settings:

- Select a new text style.
- Select a new text height.
- Define a new round-off precision for dimension values.

7 Click Next.

8 Specify Color and Layer settings:

- Select a new text color.
- Select a new dimension line color.
- Select a new extension line color.
- Select a new layer for the dimension.

9 Click Finish.

How can I specify that AEC dimensions are updated only on demand?
If you freeze the layer on which an AEC dimension is placed, the AEC dimension is updated only when the layer is thawed again or if you execute the REGEN command.

When you switch to another view, for example, a three-dimensional (3D) view, and then back to a Plan view, the AEC dimension is not updated. Freezing the dimension layer can enhance drawing performance, especially for big drawings.

You can add new AEC dimensions even when the layer is frozen. However, you can edit them only after the layer has been thawed again.

How can I change the text height of superscripted numbers in an AEC dimension?
By default, the text height of superscripted numbers in AEC dimensions is set to 50 percent of the text height of the underlying AutoCAD dimension style (DIMTXT). To change this default, you must change the corresponding value in the Registry file.

WARNING! Making changes in the Registry file can have far-reaching consequences for the whole application. Before you change anything here, make sure that this is what you really want to do. If you are not sure, consult your CAD manager or IT department.

---

1. Open the Windows Registry Editor.
2. Navigate to the entry HKEY_LOCAL_MACHINE\SOFTWARE\Autodesk\ObjectDBX\R16.0\AEC\4.0\AecArchDACHBase\ObjectDefaults\AEC Dimension\ SuperscriptScaleFactor.
3. Enter the desired value. The value here is relative to the AutoCAD dimension text height (DIMTXT).

The AEC dimension for a wall 1 meter high is displayed only with an error symbol. How can I get a correct dimension display?

The cut plane of the AEC dimension is taken from the cut plane of the dimensioned wall in the current display configuration. If the cut plane is set to a higher value, you must change it to include the lower wall into the dimension. For information on setting the wall cut plane, see "Specifying the Cut Plane Display of a Wall Style" on page 1882.

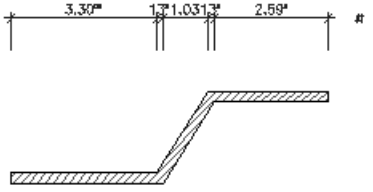
I am dimensioning the intersection points of walls and receive more dimension points than expected on the dimension. How can I check if this dimension is correct?

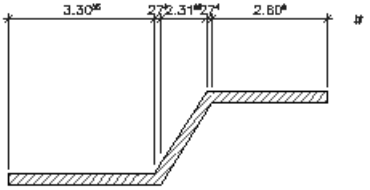
When you receive more wall intersection dimension points than you expect, it is possible that the walls you are dimensioning intersect with other walls that are not included in this dimension chain. To see if this is so, and if your dimension is correct, you can prolong the extension lines so that they actually meet the point they dimension. You can then verify that the dimension points on your chain are placed correctly.

1. Select the dimension on which to prolong the extension lines, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Style Override.
4. If necessary, click .
5. Click the Other tab.
6. Clear Use Fixed Lengths Extension Lines.
7. Click OK twice.

The extension lines of the dimension now reach to the point that they dimension.

Variable extension lines extend to the point they dimension





Dimension Labels

35

Dimension labels are a quick way of adding measurement information to doors, windows, openings, and stairs.

Dimension labels contain information about openings like sill height, head height, width, or the riser/tread ratio in a stair.

You can add any number of dimension labels to a single object.

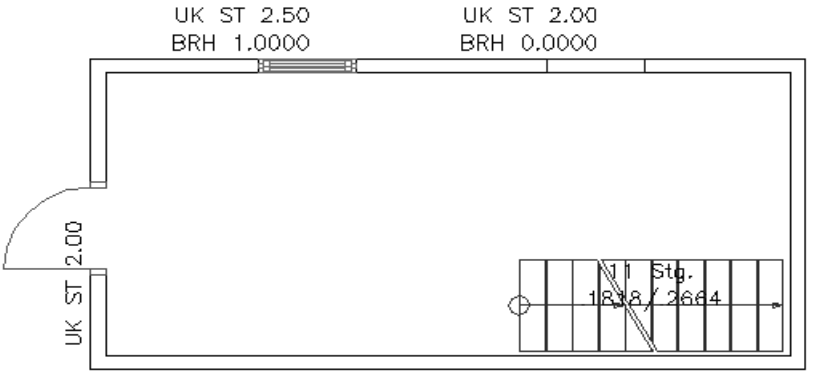
In this chapter

- Standard Dimension Labels
- Specifying Preferences for Dimension Labels
- Specifying Advanced Preferences via the Registry Settings
- Using Dimension Label Tools to Create Dimension Labels
- Creating a Dimension Label
- Creating Dimension Labels with User-Specified Settings
- Creating a Dimension Label Tool
- Modifying Dimension Labels
- Dimension Label Behavior
- Process Overview: Creating User-Defined Dimension Labels

Structure of Dimension Labels

A dimension label contains a number of attributes. Those attributes are values taken from the dimensioned object. You can, for example, have an attribute Sill Height for windows. This attribute is represented in the dimension label as a number with an optional prefix, like SH 2.5.

Opening and stair labels



Updating Dimension Labels

The values contained in dimension labels are automatically updated when the object they refer to changes. For example, if you change the height of a window, the dimension label shows the modified height.

Dimension labels are associative. When the object they are dimensioning is moved to another position, the dimension label moves accordingly with it.

For detailed information, see “Dimension Label Behavior” on page 2433.

Related Topics

- Standard Dimension Labels
- Specifying Preferences for Dimension Labels
- Specifying Advanced Preferences via the Registry Settings
- Using Dimension Label Tools to Create Dimension Labels
- Creating a Dimension Label
- Creating Dimension Labels with User-Specified Settings
- Creating a Dimension Label Tool
- Modifying Dimension Labels
- Process Overview: Creating User-Defined Dimension Labels

Standard Dimension Labels

When you install Autodesk®Architectural Desktop, a number of predefined standard dimension label definitions are already set for you. They have been designed to cater to the most frequent uses architects have for dimension labels.

Because a number of these definitions are stored in templates, it is advised that you use templates when you are working extensively with dimension labels. If you start a drawing from scratch, a standard dimension label for each doors, window, openings, and stairs is provided for you.

Dimension labels are view-dependent, and therefore can have different display representations.

A display representation decides how a certain object – in this case the dimension label – is displayed in a display configuration.

For information about views and display representations, see "Display System" on page 435.

A dimension label can look different and contain different information in Plan 1-100 than in Plan 1-50.

The size of the standard dimension label text in Plan 1-100 view is 0.25m. In Plan 1-50 it is 0.15m, but will be plotted with 0.3m. The default font used is Romans.

Related Topics

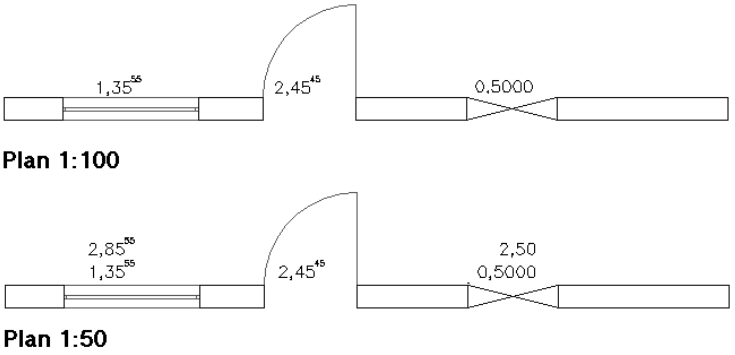
- Standard Door/Window/Opening Labels
- Standard Stair Label

Standard Door/Window/Opening Labels

The default door dimension label that is present when you start a drawing from scratch, contains the head height of the door for all display representations.

The default window and opening dimension labels, which are present when you start a drawing from scratch, contain in Plan 1-100 view the sill height; in Plan 1-50 view, they contain also the measurement for the head height.

Opening labels in Plan 1-100 and Plan 1-50



NOTE Dimension labels for doors, windows, and openings in a wall are inserted with a fixed distance to the wall boundary. The default set by the software is 0.1 meters from the wall boundary. Because this value is stored in the registry, the CAD manager can change it there.

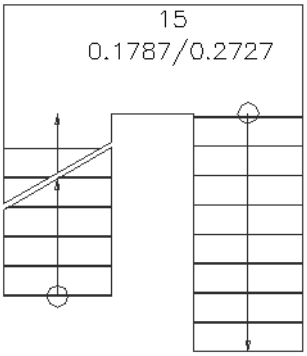
Dimension labels for standalone doors, windows, and openings are inserted with a fixed distance to the object midpoint.

Standard Stair Label

The default stair dimension label, that is present when you start a drawing from scratch, contains values for riser count, riser length, and tread length for all display representations.

Stair labels do not support superscripting. However, you can set them to suppress the decimal separator for values below one meter. For information about these settings, see "Specifying Preferences for Dimension Labels" on page 2421.

Stair label in Plan 1-100 and Plan 1-50 (identical)



NOTE Dimension labels for stairs are inserted at the stair midpoint.

Specifying Preferences for Dimension Labels

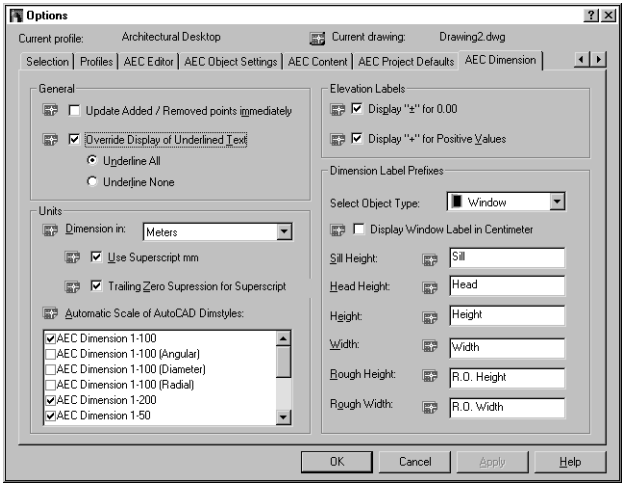
Use this procedure to specify general dimension label preferences and prefixes.

Important settings for dimension labels include the following:

- superscripting for millimeters
- dimension display unit
- prefixes and suffixes for the dimension values

1. On the Tools menu, click Options.
2. Click the AEC Dimension tab.

Settings for dimension labels



3 If meters are your drawing unit, and you want the millimeters displayed as superscripted text, select Use Superscript mm.

4 If you do not want zeros at the end of superscripted numbers, select Trailing Zero Suppression for Superscript.

You can select this option only if you have selected Use Superscript mm.

5 Select the unit in which AEC dimensions, dimension labels and elevation labels are to be displayed.

This unit can differ from the drawing unit.

6 Define prefixes and suffixes for dimension labels:

If you want to . . .	Then . . .
add a prefix for a window dimension label,	for Select Object Type, select Window, and then enter values for sill height, head height, height, width, rough height or rough width in the Window column.
add a prefix for a door dimension label,	for Select Object Type, select Door, enter a value for sill height, head height, height, width, rough height or rough width in the Door column.

If you want to . . .	Then . . .
add a prefix for an opening dimension label,	enter a value for sill height, head height, height, width, in the Opening column.
add a suffix to a stair dimension label	enter a value for the stair suffix.

7 If you want dimension labels always to be measured in centimeters, no matter what the drawing unit or the dimension unit is set to, select Display <Object> Label in Centimeter.

This dimension notation is common in Austria.

If you do not select this setting, the dimension unit selected in step 5 is used.

8 Click OK.

Specifying Advanced Preferences via the Registry Settings

There are a number of advanced display settings you can define in the Registry file of Autodesk Architectural Desktop. These settings fine-tune the appearance of dimension labels within Autodesk Architectural Desktop.

NOTE Editing the Registry manually is an advanced task. If you ware not familiar with the Registry, contact your CAD Manager for information.

Related Procedures

- Specifying the Offset of Superscripted Millimeters
- Specifying the Text Height of Dimension Labels
- Specify the Offset of Dimension Labels from the Wall
- Specifying the Placement of Dimension Labels Relative to the Opening Direction

Specifying the Offset of Superscripted Millimeters

Use this procedure to specify the offset of superscripted millimeters in relation to the regular dimension label text.

As a default, the superscript characters are offset by 10%.

1. Open the Registry Editor on your computer.
2. Navigate to the entry HKEY_LOCAL_MACHINE\SOFTWARE\Autodesk\ObjectDBX\R16.0\AEC\4.0\AECArchDACHBase40\ObjectDefaults\Dimension Label\SuperscriptYOffset.
3. Double-click the entry.
4. For Value Data, enter the desired offset value in Millimeters.
5. Click OK.

Specifying the Text Height of Dimension Labels

Use this procedure to specify the text height of dimension labels for Plan 1:100 and Plan 1:50 display representations.

As a default, the text height of a dimension label is 25 cm for the Plan 1:100 display representation, and 10 cm for the Plan 1:50 display representation. You can change these values in the Registry.

1. Open the Registry Editor on your computer.
2. Navigate to the entry HKEY_LOCAL_MACHINE\SOFTWARE\Autodesk\ObjectDBX\R16.0\AEC\4.0\AECArchDACHBase40\ObjectDefaults\Dimension Label\Unit_MM\TextHeight100
   or
   HKEY_LOCAL_MACHINE\SOFTWARE\Autodesk\ObjectDBX\R16.0\AEC\4.0\AECArchDACHBase40\ObjectDefaults\Dimension Label\Unit_MM\TextHeight50.
3. Double-click the entry.
4. For Value Data, enter the desired text height in Millimeters.
5. Click OK.

Specify the Offset of Dimension Labels from the Wall

Use this procedure to specify the offset of dimension labels to the wall the dimensioned object is anchored to.

Dimension labels are inserted with a fixed distance to the wall in which the dimensioned object is situated.

1. Open the Registry Editor on your computer.
2. Navigate to the entry HKEY_LOCAL_MACHINE\SOFTWARE\Autodesk\ObjectDBX\R16.0\AEC\4.0\AECArchDACHBase40\ObjectDefaults\Dimension Label\Unit_MM\WallOffset
   or
   HKEY_LOCAL_MACHINE\SOFTWARE\Autodesk\ObjectDBX\R16.0\AEC\4.0\AECArchDACHBase40\ObjectDefaults\Dimension Label\Unit_IN\WallOffset.
3. Double-click the entry.
4. For Value Data, enter the desired offset in Millimeters.
5. Click OK.

Specifying the Placement of Dimension Labels Relative to the Opening Direction

Use this procedure to specify the placement of dimension labels relative to the opening direction of the dimensioned object.

You can place dimension labels at the side of the opening or on the opposite side.

1. Open the Registry Editor on your computer.
2. Navigate to the entry HKEY_LOCAL_MACHINE\SOFTWARE\Autodesk\ObjectDBX\R16.0\AEC\4.0\AECArchDACHBase40\ObjectDefaults\Dimension Label\Insert Inside.
3. Double-click the entry.

4 Specify the placement of dimension labels:

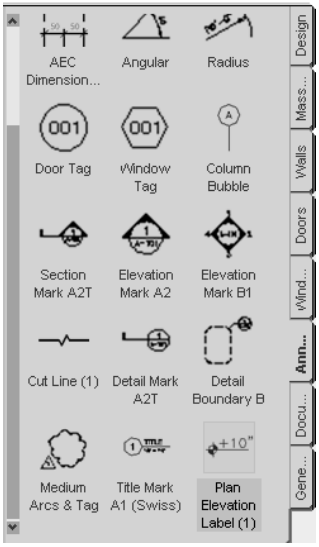
If you want to . . .	Then . . .
place all dimension labels on the side of the opening direction,	enter 1 for Value Data.
place all dimension labels on the opposite side of the opening direction,	enter 0 for Value Data.

5 Click OK.

Using Dimension Label Tools to Create Dimension Labels

Tools provided with Autodesk® Architectural Desktop let you quickly place dimension labels by selecting a dimension label tool with a specific multi-view block definition and other predefined properties. When you place dimension labels using dimension label tools, you can use the default settings of the tool, or you can change settings for the dimension label properties.

Tool palettes containing dimension label tools



The default tool palettes in the workspace contain sample dimension label tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain dimension label tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- Mytool catalog

Custom palettes created by your CAD manager or other users may also contain dimension label tools with multi-view block definitions and properties that are customized for your projects or office standards.

Related Procedures

- Creating a Dimension Label
- Creating Dimension Labels with User-Specified Settings
- Creating a Dimension Label Tool

Creating a Dimension Label

Use this procedure to add a new dimension label that has the properties specified in the dimension label tool that you select. To specify settings when you add a dimension label, see "Creating Dimension Labels with User-Specified Settings" on page 2428.

1. Open the Annotation tool palette, and select a dimension label tool.

   If necessary, scroll to display the tool that you want to use.

2. Select the object to which you want to attach the dimension label, and press ENTER.
3. Click OK in the subsequent dialog box.

Creating Dimension Labels with User-Specified Settings

Use this procedure to add a dimension label with settings that you specify.

1. Open the Annotation tool palette, and select a dimension label tool.

   If necessary, scroll to display the tool that you want to use.

2. Select the object to which you want to attach the dimension label, and press ENTER.

   You can move or hide the Properties palette to expose more of the drawing area.

3. Enter a different scale factor if necessary.
4. Click OK.

Creating a Dimension Label Tool

Use this procedure to create a dimension label tool and add it to a tool palette. You may want to create your own dimension label tools if you are placing multiple dimension labels of specific definitions with additional dimension label properties that you want to be the same each time you add a dimension label of that type.

Dimension labels consist of a multi-view block definition connected to a custom AEC command. Therefore, the process of creating a dimension label tool differs from the process of creating a regular object tool, like a door tool.

To create a dimension label tool, you need first a multi-view block definition with a custom command that is placed in DesignCenter. A number of predefined dimension labels are already in DesignCenter, so you would, as a first step, look there, and determine if the desired dimension label is already there.

If you find no dimension label meeting your needs, you need to create one, as described in "Process Overview: Creating User-Defined Dimension Labels" on page 2434,and put that into DesignCenter.

From DesignCenter, you can easily and comfortably create a dimension label tool.

1. Open the DesignCenter and navigate to the folder containing the dimension label you want to create a tool from.
2. Open the tool palette where you want to create the dimension label tool.
3. Create the tool:

If you want to . . .	Then . . .
create a tool from the DesignCenter	drag the desired dimension label from the DesignCenter to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

4. Right-click the new tool, and click Properties.
5. Enter a name for the tool.
6. Click the setting for Description, enter a description of the tool, and click OK.
7. Click OK.

Modifying Dimension Labels

You can change the attributes of an dimension label, like the rotation or the scaling factor.

Related Procedures

- Changing the Associated Multi-View Block Definition
- Changing the Scale Factor of an Dimension Label
- Changing the Offset of a Dimension Label
- Display the View Blocks and Attributes of a Dimension Label
- Attaching Hyperlinks, Notes, or Files to a Dimension Label

Changing the Associated Multi-View Block Definition

Use this procedure to change the multi-view block associated to an dimension label. For information about how multi-view block definitions are an integral part of dimension labels, see "Process Overview: Creating User-Defined Dimension Labels" on page 2434.

1. Select the dimension labels you want to change, and double-click one of them.
2. Expand Basic, and expand General.
3. Select a different multi-view block definition for Definition.

Changing the Scale Factor of an Dimension Label

Use this procedure to change the scale factor of a dimension label.

1. Select the dimension labels you want to change, and double-click one of them.
2. Expand Basic, and expand Scale.
3. Change the scale factor of the dimension label.

If you want to . . .	Then . . .
change the X scale factor	enter a new value for X.
change the Y scale factor	enter a new value for Y.
change the Z scale factor	enter a new value for Z.

Changing the Offset of a Dimension Label

Use this procedure to change the offset of the dimension label from its insertion point.

When you first add a dimension label to a drawing, the offset value is set to 0. You can change the position of the dimension label in the drawing by offsetting it from its original insertion point.

1. Select the dimension labels you want to change, and double-click one of them.
2. Expand Advanced.
3. Click Insertion Offsets.
4. Select the view block for the appropriate view. For example, if you want to change the offset in Plan 1:100, select a view block that indicates that it belongs to that view (for example, DoorLabel100).
5. Change the offset of the dimension label from its insertion point.

If you want to . . .	Then . . .
change the offset from the X insertion point	enter a new value for X offset.
change the offset from the Y insertion point	enter a new value for Y offset.
change the offset from the Z insertion point	enter a new value for Z offset.

6. Click OK.

Display the View Blocks and Attributes of a Dimension Label

Use this procedure to display the blocks and attributes contained in a dimension label.

A dimension label is created from a multi-view block definition which in turn is built from blocks and attributes. You can display the blocks and attributes to understand how the label is structured.

1. Double-click the dimension label for which you want to display the view blocks and attributes.
2. Expand Advanced.

3 Click Attributes.

In the Multi-View Blocks Attributes worksheet, the blocks of which your dimension label is composed are displayed.

The list on the right lists the attributes the blocks are composed of and their current values.

For more information about multi-view blocks, blocks, and attributes, see "Process Overview: Creating User-Defined Dimension Labels" on page 2434.

NOTE Although you can edit the values in the list, those modifications are not applied; your modified values are overwritten by the actual values the dimension label gets from its coordinate system.

4 Click OK.

Attaching Hyperlinks, Notes, or Files to a Dimension Label

Use this procedure to attach hyperlinks, text notes and files to a dimension label.

1 Double-click the dimension label you want to attach information to.

2 Click the Extended Data tab.

3 To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD®2004 Command Reference*.

4 Click the setting for Notes, and add a note. Then, click OK.

5 Click the setting for Reference Documents.

6 Attach or detach reference files:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.

If you want to . . .	Then . . .
detach a reference file	select the file name, and click .

7 Click OK.

Dimension Label Behavior

Dimension labels are associated with the object they dimension – a door, window, opening or stair. Therefore their behavior in the drawing is dependent on that object. Dimension labels are subordinate to the dimensioned object, which means that the behavior of the object does influence their behavior, but not the other way around. If for example you move a door, the dimension label associated with it does move, too. If, however, you move the dimension label, the door does not move with it.

Below you can find a list of operations you can perform with objects and their associated dimension labels, and how they react with each other

Selection	Action	Reaction
Dimensioned object…	…is moved	Dimension label is moved, too.
	…is rotated	Dimension label is rotated too.
	…is mirrored without deleting the source object	Dimension label stays connected with source object
	…is mirrored with deleting the source object	Dimension label is connected to mirrored object.
	…is deleted	Dimension label is deleted too.
	…is copied	Dimension label is not copied.
Dimension label	…is moved	Dimensioned object is not moved.
	…is rotated	Dimensioned object is not rotated.
	…is mirrored	Dimension label is moved, not mirrored

Selection	Action	Reaction
	..is deleted	Dimensioned object is not deleted.
	..is copied	Copied dimension label is attached to dimensioned object, too.
Dimension label and dimensioned object	..are moved	Dimension label and dimensioned object move.
	..are rotated	Dimensioned object is rotated by the specified value in relation to ECS; Dimension label is rotated by the specified value in relation to dimensioned object.
	..are mirrored without deleting source objects	Dimensioned object and dimension label are mirrored. NOTE Dimension label text can only be mirrored when the MIRRTEXT variable is set to 1.
	..are mirrored with deleting source objects	Dimension label is not mirrored, but is connected to mirrored object.
	..are deleted	Dimension label and dimensioned object are deleted.
	..are copied	Dimension label and dimensioned object are copied.

Process Overview: Creating User-Defined Dimension Labels

The Autodesk® Architectural Desktop templates offer you a number of pre-defined dimension labels.

However, you may want to create your own, specific labels that are not included in any of the templates.

In the following sections, you learn how to select attributes for your own dimension labels, combine them into blocks, and create dimension labels from them.

The creation of a user-defined dimension label consists of these basic steps.

Step 1: Determine the location of the property set definition of the custom label.

Step 2: If necessary, create a new property set definition to use in the custom label.

Step 3: Add attributes from the property set definition to the drawing.

Step 4: Create a block from the attributes.

Step 5: Create a multi-view block from the block.

Step 6: Add the dimension label to the AutoCAD® DesignCenter.

Related Procedures

- Determine the Location of the Property Set Definitions
- Adding Attributes
- Creating a Block
- Creating a Multi-View Block
- Adding the Dimension Label to the DesignCenter

Determine the Location of the Property Set Definitions

Use this procedure to determine the source drawing of the label's property set definition.

When you create a user-defined label for the DesignCenter, you need to save the used property set definition in a drawing file the label can access when it is inserted from the DesignCenter. There are two different locations for the source drawing:

- The Autodesk Architectural Desktop **PropertySetDefs.dwg**: This is the default drawing file for DesignCenter blocks in the software. All existing DesignCenter parts use this drawing as the container for their property set definitions. If you only have a small number of custom tags, it is recommended that you save them in this drawing.
- Your own user-defined property set definition drawing: You can create your own property set definition drawing, when you have large number of custom blocks in your work environment, or want to have separate drawings for different tag types, e.g. PropertySetDefsDoors.dwg, PropertySetDefsWindows.dwg, etc.

NOTE The drawing containing the property set definitions for your tags must be located one folder level above the actual tag drawing. Otherwise, the software cannot find the associated property set definitions. For example, if your tag resides in //Content/Schedules/UserDefined Tags/, then the associated property set definitions drawing needs to be in //Content/Schedules/.

1. Either open the Autodesk Architectural Desktop PropertySetDefs.dwg, or create a new property set definitions drawing.

   NOTE The Autodesk Architectural Desktop PropertySetDefs.dwg is situated in //Autodesk Architectural Desktop/Content/<Metric Imperial Metric DACH>/Schedules/.

2. If necessary, create a property set definition for the user-defined label.
3. Proceed as described in "Adding Attributes" on page 2436.

Adding Attributes

Use this procedure to add attributes to the drawing.

Dimension label attributes are coming from a property set definition. A number of predefined automatic attributes are available if you start with a template or if you have started from scratch and dragged a predefined dimension label from the AutoCAD®DesignCenter into the drawing.

If you want different attributes for your dimension labels, create your own property set definition for dimension labels. For information about creating property set definitions, see "Property Set Definitions" on page 2241.

Dimension Label Attributes

Attribute	Object	Description
OPENING:SILLHEIGHT	Window, Opening	Returns the sill height of a window or opening

Dimension Label Attributes		
Attribute	**Object**	**Description**
OPENING:SILLHEIGHT:MM	Window, Opening	Returns superscripted millimeters for the sill height of a window or opening This value is only displayed if you have set the option Superscripted Millimeters in the AEC dimension preferences. For information, see "Specifying AEC Dimension Preferences" on page 2371.
OPENING:HEADHEIGHT	Window, Opening, Door	Returns the head height of a window, opening or door
OPENING:HEADHEIGHT:MM	Window, Opening, Door	Returns superscripted millimeters for the head height of a window, door or opening This value is only displayed if you have set the option Superscripted Millimeters in the AEC dimension preferences. For information, see "Specifying AEC Dimension Preferences" on page 2371.
OPENING:HEIGHT	Window, Opening, Door	Returns the opening height of a window, opening or door
OPENING:HEIGHT:MM	Window, Opening, Door	Returns superscripted millimeters for the height of a window, door or opening This value is only displayed if you have set the option Superscripted Millimeters in the AEC dimension preferences. For information, see "Specifying AEC Dimension Preferences" on page 2371.
OPENING: WIDTH	Window, Opening, Door	Returns the opening width of a window, opening or door

Dimension Label Attributes

Attribute	Object	Description
OPENING:WIDTH:MM	Window, Opening, Door	Returns superscripted millimeters for the width of a window, door or opening This value is only displayed if you have set the option Superscripted Millimeters in the AEC dimension preferences. For information, see "Specifying AEC Dimension Preferences" on page 2371.
OPENING:ROUGHHEIGHT	Window, Door	Returns the rough height of a window or door (height without sash and frame)
OPENING:ROUGHHEIGHT:MM	Window, Door	Returns superscripted millimeters for the rough height of a window or door This value is only displayed if you have set the option Superscripted Millimeters in the AEC dimension preferences. For information, see "Specifying AEC Dimension Preferences" on page 2371.
OPENING:ROUGHWIDTH	Window, Door	Returns the rough width of a window or door (width without sash or frame)
OPENING:ROUGHWIDTH:MM	Window, Door	Returns superscripted millimeters for the rough width of a window or door This value is only displayed if you have set the option Superscripted Millimeters in the AEC dimension preferences. For information, see "Specifying AEC Dimension Preferences" on page 2371.
STAIR:RISERCOUNT	Stair	Returns the riser count of a stair
STAIR:TREADRISER	Stair	Returns the length of the stair riser and the length of the stair tread

1. On the command line, enter **ddattdef**.
2. In the Tag field, enter one of the attributes described above. If you want, for example, create an attribute for the rough height of windows and doors, enter OPENING:ROUGHHEIGHT here.
3. Proceed to adding the attribute as described in "Working with Attributes" in the *AutoCAD 2004 User's Guide*.
4. Repeat steps 1-3 for each attribute you want to add to the dimension label.

As a result, you have a number of attributes in your drawing. For a user defined dimension label containing the rough height and rough width of a window with superscript settings it could look like this:

Attribute block for dimension label

Creating a Block

Use this procedure to create a block which contains the attributes added in the previous step.

1. On the Draw menu, click Block ➤ Make.
2. Enter a name for the block.
3. Click Select Objects, and select the attributes you want to include in the dimension label.
4. From the Insert units list, select Unitless.
5. Proceed to creating the block as described in "Defining Blocks" in the *AutoCAD 2004 User's Guide*.

Creating a Multi-View Block

Use this procedure to create a multi-view block from one or several blocks created in the previous step.

For detailed information about multi-view blocks, see "Multi-View Blocks" on page 2481.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects and expand Multi-View Block Definitions.
3. Right-click Multi-View Block Definitions, and click New.
4. Enter a name for the new multi-view block definition and press ENTER.
5. Select the new multi-view block definition, right-click and select Edit.
6. Click the View Blocks tab.
7. Select a display representation for the dimension label.
8. Click Add.
9. Select the block you have defined in "Creating a Block", and click OK.

10 Select the view directions for the block.

11 Repeat Steps 6-9 for each display representation in which you want the dimension label to appear.

12 Click OK twice.

Adding the Dimension Label to the DesignCenter

Use this procedure to add a dimension label to the AutoCAD®DesignCenter. To add the dimension label to the DesignCenter, you need to create a **.dwg* file in the AEC Content Wizard. In this section you find a short description of how to add user-defined dimension labels to the DesignCenter. For a detailed description of the AEC Content Wizard, see "Custom Content" on page 2343.

1 On the Desktop menu, click Create AEC Content to open the Create AEC Content Wizard.

2 Select Custom Command.

3 Select the multi-view block you have created in "Creating a Multi-View Block" on page 2439, and click Add to add it to the Content File.

4 On the command line, enter **AecAnnoScheduleTagAdd**, a space and then the name of the multi-view block, and its parameters. The command is built up as follows:

_AecAnnoScheduleTagAdd <Name of the drawing containing the property set definition>.dwg **_SYMBOL** <name of the multi-view block created>**_LEADER** _None **_DIMSTYLE** Current

In our example, the custom command could look like this:

_AecAnnoScheduleTagAdd DimLabelPropertySetDefs.dwg **_SYMBOL** DoorDimLabelMVBlock **_LEADER** _None **_DIMSTYLE** Current

5 Click Next.

6 Select Enable AEC Unit Scaling.

7 Select a layer key for the label.

NOTE The default layer key for dimension labels is DIMLINE.

8 Click Next.

9 Enter a filename and a directory for the label.

NOTE Make sure to save the custom label in a folder one level below the used property set definition drawing. If the property set definition drawing is saved in //Autodesk Architectural Desktop/Content/Schedules/, then the custom label could be saved in //Autodesk Architectural Desktop/Content/Schedules/Dimension Labels/.

10 Click Finish to exit the Create AEC Content Wizard.

The new dimension label appears now in the DesignCenter at the location you have specified in the AEC Content Wizard. From here, you can drag it into your drawing.

Elevation Labels

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Elevation labels are used to dimension height values in plan and section views.

They are a component of the Autodesk®Architectural Desktop dimensioning features, which contains AEC dimensions, dimension labels and elevation labels.

In this section, you learn how to add elevation labels to your drawing, change their values, and define your own elevation labels.

In this chapter

- Using Elevation Label Tools to Create Elevation Labels
- Creating an Elevation Label
- Creating Elevation Labels with User-Specified Settings
- Creating an Elevation Label Tool
- Modifying Elevation Labels
- Process Overview: Creating User-Defined Elevation Labels

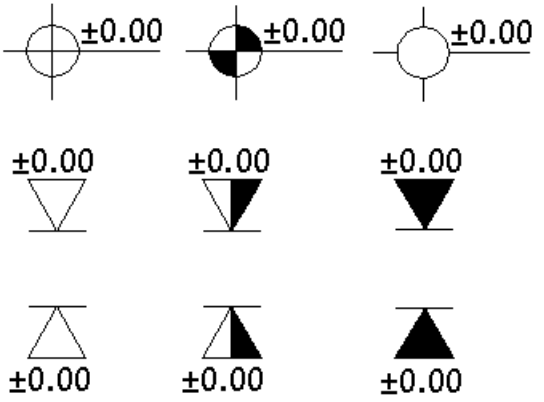
Elevation Labels and Coordinate Systems

Elevation labels are interactive multi-view blocks used for dimensioning heights in a drawing. They are anchored to either the world coordinate system (WCS) or a named user coordinate system (UCS). Elevation labels are used primarily for measuring the heights of building elements like walls or windows, but they can be used to measure every point in your drawing. You can add elevation labels in plan and section views. Autodesk®Architectural Desktop offers you a number of predefined blocks for commonly used elevation labels. You can also define your own elevation labels.

When elevation labels are moved along the *Z*-axis, their Z-values change accordingly. Elevation labels can, however, be anchored only to a named UCS or the WCS; not to any building object. If the object height is changed, the value of the elevation label is not updated automatically.

An elevation label measures the height of a point with relation to the reference height. The reference height can be taken from the *Z*-coordinate of the WCS or the *Z*-coordinate of a named UCS.

Frequently used elevation labels



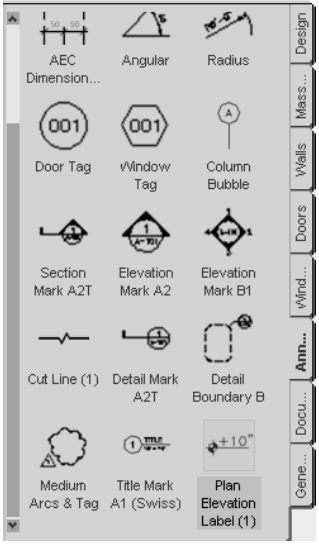
Related Procedures

- Using Elevation Label Tools to Create Elevation Labels
- Creating an Elevation Label
- Creating Elevation Labels with User-Specified Settings
- Creating an Elevation Label Tool
- Modifying Elevation Labels
- Process Overview: Creating User-Defined Elevation Labels

Using Elevation Label Tools to Create Elevation Labels

Tools provided with Autodesk®Architectural Desktop let you quickly place elevation labels by selecting an elevation label tool with a specific multi-view block definition and other predefined properties. When you place elevation labels using elevation label tools, you can use the default settings of the tool, or you can change settings for the elevation label properties.

Tool palettes containing elevation label tools



The default tool palettes in the workspace contain sample elevation label tools that you can use and customize as needed. In addition, the following catalogs provided with the software contain elevation label tools that you can add to your tool palettes:

- Stock Tool catalog
- Autodesk Architectural Desktop Sample Palette catalog
- Mytool catalog

Custom palettes created by your CAD manager or other users may also contain elevation label tools with multi-view block definitions and properties that are customized for your projects or office standards.

Related Procedures

- Creating an Elevation Label
- Creating Elevation Labels with User-Specified Settings
- Creating an Elevation Label Tool

Creating an Elevation Label

Use this procedure to add a new elevation label that has the properties specified in the elevation label tool that you select. To specify settings when you add an elevation label, see "Creating Elevation Labels with User-Specified Settings" on page 2446.

1. Open the Annotation tool palette, and select an elevation label tool.
   If necessary, scroll to display the tool that you want to use.
2. Specify the insertion point of the elevation label.
   You can move or hide the Properties palette to expose more of the drawing area.
3. Click OK in the subsequent dialog box.

Creating Elevation Labels with User-Specified Settings

Use this procedure to add an elevation label with settings that you specify.

1. Open the Annotation tool palette, and select an elevation label tool.
   If necessary, scroll to display the tool that you want to use.
2. In the drawing area, specify the insertion point of the elevation label.
   You can move or hide the Properties palette to expose more of the drawing area.
3. Select the coordinate system the elevation label is relative to.

If you want to . . .	Then . . .
select an existing coordinate system from the drawing	under UCS, select the coordinate system from the list.

If you want to . . .	Then . . .
create a new named user coordinate system (UCS)	click (Define UCS), and define the new UCS on screen. For information on creating user coordinate systems, see "Use Coordinates and Coordinate Systems" in the *AutoCAD 2004 User Guide*.
use the UCS of an existing elevation label,	click (Match UCS) and select the elevation label on screen.

4 Enter the elevation value of your label.

The value you enter here is always calculated in relation to the coordinate system you have selected. When you redefine the coordinate system, the *Z*-value of the elevation label is recalculated accordingly.

For example, you have a UCS named "First Floor" with its *Z*-origin at 3 m. When you insert an elevation label in WCS and set it to 2 m, and then change the coordinate system to "First Floor" the *Z*-value of the elevation label is changed to -1 m.

5 If needed, enter a prefix and suffix for the elevation label.

6 Click OK.

Creating an Elevation Label Tool

Use this procedure to create an elevation label tool and add it to a tool palette. You may want to create your own elevation label tools if you are placing multiple elevation labels of specific definitions with additional elevation label properties that you want to be the same each time you add an elevation label of that type.

Elevation labels consist of a multi-view block definition connected to a custom AEC command. Therefore, the process of creating an elevation label tool differs from the process of creating a regular object tool, like a door tool.

To create an elevation label tool, you need a multi-view block definition with a custom command that is placed in AutoCAD DesignCenter. Predefined elevation labels are available in DesignCenter, so check to see if the desired elevation label is already there.

If you find no elevation label meeting your needs, create one, as described in "Process Overview: Creating User-Defined Elevation Labels" on page 2452, and place that into AutoCAD DesignCenter.

From AutoCAD DesignCenter, you create an elevation label tool.

1. Open the AutoCAD DesignCenter and navigate to the folder containing the elevation label from which you want to create a tool.
2. Open the tool palette where you want to create the elevation label tool.
3. Create the tool:

If you want to . . .	Then . . .
create a tool from the AutoCAD DesignCenter	drag the desired elevation label from the AutoCAD DesignCenter to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from a tool catalog	open the catalog in the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

4. Right-click the new tool, and click Properties.
5. Enter a name for the tool.
6. Click the setting for Description, enter a description of the tool, and click OK.
7. Click OK.

Modifying Elevation Labels

You can change the attributes of an elevation label, such as the associated UCS or the scaling factor.

Autodesk®Architectural Desktop offers several methods for editing elevation labels:

- You can change elevation label settings on the Properties palette.

- You can select editing commands from the shortcut menu for a selected elevation label.

Related Procedures

- Changing the Elevation of an Elevation Label
- Changing the Coordinate System of an Elevation Label
- Changing the Associated Multi-View Block Definition
- Changing the Scale Factor of an Elevation Label
- Changing the Offset of an Elevation Label
- Display the View Blocks and Attributes of an Elevation Label
- Attaching Hyperlinks, Notes, or Files to an Elevation Label

Changing the Elevation of an Elevation Label

Use this procedure to change the elevation value of an elevation label.

The value of an elevation label is always calculated in relation to the coordinate system of the label.

1. Select the elevation label of which you want to change the elevation, right-click, and click Elevation Label Modify.
2. Enter the new elevation value.
3. Click OK.

Changing the Coordinate System of an Elevation Label

Use this procedure to change the coordinate system of an elevation label.

For more information on how elevation labels are dependent on coordinate systems, see "Elevation Labels" on page 2443.

1. Select the elevation label of which you want to change the coordinate system, right-click, and click Elevation Label Modify.
2. Select a new coordinate system for the elevation label from the list.
3. Click OK.

Changing the Associated Multi-View Block Definition

Use this procedure to change the multi-view block definition associated to an elevation label. For information about multi-view block definitions and ele-

vation labels, see "Process Overview: Creating User-Defined Elevation Labels" on page 2452.

1. Select the elevation labels you want to change, and double-click one of them.
2. Expand Basic, and expand General.
3. Select a different multi-view block definition for Definition.

Changing the Scale Factor of an Elevation Label

Use this procedure to change the scale factor of an elevation label.

1. Select the elevation labels you want to change, and double-click one of them.
2. Expand Basic, and expand Scale.
3. Change the scale factor of the elevation label:

If you want to . . .	Then . . .
change the *X* scale factor	enter a new value for X.
change the *Y* scale factor	enter a new value for Y.
change the *Z* scale factor	enter a new value for Z.

Changing the Offset of an Elevation Label

Use this procedure to change the offset of the elevation label from its insertion point.

When you first add an elevation label to a drawing, the offset value is set to 0. You can change the position of the elevation label in the drawing by offsetting it from its original insertion point.

1. Double-click the elevation label for which you want to change the insertion offset.
2. Expand Advanced.
3. Click Insertion Offsets.
4. Select the view block for the appropriate view. For example, to change the offset in Plan 1:100, select a view block to indicate that it belongs to that view (for example, ElevationLabel100).

5 Change the offset of the elevation label from its insertion point:

If you want to . . .	Then . . .
change the offset from the *X* insertion point	enter a new value for X offset.
change the offset from the *Y* insertion point	enter a new value for Y offset.
change the offset from the *Z* insertion point	enter a new value for Z offset.

6 Click OK.

Display the View Blocks and Attributes of an Elevation Label

Use this procedure to display the blocks and attributes contained in an elevation label.

An elevation label is created from a multi-view block definition which, in turn, is built from blocks and attributes. You can display the blocks and attributes to understand how the label is structured.

1 Double-click the elevation label for which to display blocks and attributes.

2 Expand Advanced.

3 Click Attributes.

In the Multi-View Blocks Attributes worksheet, the blocks from which your elevation label is composed are displayed.

The list on the right shows the attributes of the blocks and their current values.

For more information about multi-view blocks, blocks, and attributes, see "Process Overview: Creating User-Defined Elevation Labels" on page 2452.

NOTE Although you can edit the values in the list, those modifications are not applied; your modified values are overwritten by the values the elevation label gets from its coordinate system.

4 Click OK.

Attaching Hyperlinks, Notes, or Files to an Elevation Label

Use this procedure to attach hyperlinks, text notes and files to an elevation label.

1. Double-click the elevation label you want to attach information to.
2. Click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

   For more information about adding hyperlinks, see the *AutoCAD®2004 Command Reference*.
4. Click the setting for Notes, and add a note. Then, click OK.
5. Click the setting for Reference Documents.
6. Attach or detach reference files:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

7. Click OK.

Process Overview: Creating User-Defined Elevation Labels

The Autodesk® Architectural Desktop templates provide a number of predefined elevation labels. You may, however, want to create specific labels that are not included in any of the templates.

In the following sections, you can learn how to choose attributes for your own elevation labels, combine them into blocks, and create elevation labels from them.

Creating a user-defined elevation label consists of these basic steps.

Step 1: Determine the location of the property set definition of the custom label.

Step 2: If necessary, create a new property set definition to use in the custom label.

Step 3: Create a graphic symbol.

Step 4: Add attributes from the property set definition to the drawing.

Step 5: Create a block from the attributes.

Step 6: Create a multi-view block from the block.

Step 7: Add the elevation label to AutoCAD®DesignCenter.

Related Procedures

- Determining the Location of the Property Set Definitions
- Creating a Graphic Symbol
- Adding Attributes
- Creating a Block
- Creating a Multi-View Block
- Adding the Elevation Label to the AutoCAD DesignCenter

Determining the Location of the Property Set Definitions

Use this procedure to determine the source drawing of the label's property set definition.

When you create a user-defined label for the DesignCenter, you must save the used property set definition in a drawing file the label can access when it is inserted from the DesignCenter. There are two different locations for the source drawing:

- The Autodesk Architectural Desktop *PropertySetDefs.dwg*: This is the default drawing file for DesignCenter blocks in the software. All existing DesignCenter parts use this drawing as the container for their property set definitions. If you have only a small number of custom tags, it is recommended that you save them in this drawing.
- A user-defined property set definition drawing: You can create your own property set definition drawing when you have numerous custom blocks

in your work environment, or if you want to have separate drawings for different tag types, for example PropertySetDefsDoors.dwg, PropertySetDefsWindows.dwg, and so on.

NOTE The drawing containing the property set definitions for your tags must be located one folder level above the actual tag drawing. Otherwise, the software cannot find the associated property set definitions. For example, if your tag resides in //Content/Schedules/UserDefined Tags/, then the associated property set definitions drawing needs to be in //Content/Schedules/.

1. Open the Autodesk Architectural Desktop *PropertySetDefs.dwg*, or create a new property set definitions drawing.
2. If necessary, create a property set definition for the user-defined label.

   For information on creating property set definitions, see "Creating a Property Set Definition" on page 2247.
3. Proceed as described in "Creating a Graphic Symbol" on page 2454.

Creating a Graphic Symbol

Elevation labels usually consist of a graphic symbol and a number of attributes defining elevation height and other information.

You can create a graphic symbol with any of the drawing commands in AutoCAD®, as well as importing a symbol from another drawing or from a symbol library.

For information about drawing objects in AutoCAD, see "Create and Insert Symbols (Blocks)" in the online *AutoCAD 2004 User's Guide*.

Adding Attributes

An elevation label usually contains one or several attributes displaying the elevation, prefixes, and suffixes.

Elevation label attributes come from a property set definition. Predefined automatic attributes are available when you start with one of the templates,

or when you start from scratch and drag a predefined elevation label from AutoCAD® DesignCenter into the drawing.

Elevation label attributes

Attribute/Tag	Description
ELEVATION	Displays the height of an elevation label in relation to the coordinate system chosen
ELEVATION:MM	Displays the millimeters of the elevation value in superscript. You need this attribute only when working with metric units.
PREFIX	To to enter a prefix for the elevation label, you must add this attribute. For information about entering prefixes, see "Creating Elevation Labels with User-Specified Settings" on page 2446.
SUFFIX	To enter a suffix for the elevation label, you must add this attribute. For information about entering suffixes, see "Creating Elevation Labels with User-Specified Settings" on page 2446.

To use different attributes in elevation labels, create your own Property Set Definition for elevation labels. For information about creating property set definitions, see "Property Set Definitions" on page 2241.

1. On the command line, enter **ddattdef**.
2. For Tag, enter one of the attributes from the table above. If you want, for example, to create an attribute for the height of the elevation, enter **ELEVATION**.
3. Proceed with creating the attribute. For more information, see "Attach Data to Blocks" in the online *AutoCAD 2004 User's Guide*.
4. Repeat steps 1–3 for each attribute you want to add to the elevation label.

Creating a Block

Use this procedure to create a block from the attributes you have created.

1. On the Draw menu, click Block ➤ Make.
2. Enter a name for the block.
3. Click Select Objects and select the graphic symbol and the attributes to include in the elevation label.
4. For Insert Units, select Unitless.

5 Proceed with creating the block as described in "Create Blocks" in the online *AutoCAD 2004 User's Guide*.

Creating a Multi-View Block

Use this procedure to create a multi-view block for the elevation label.

For detailed information about multi-view blocks, see "Multi-View Blocks" on page 2481.

1 On the Format menu, click Style Manager.
2 Expand Multi-Purpose Objects, and expand Multi-View Block Definitions.
3 Right-click Multi-View Block Definitions, and click New.
4 Enter a name for the new multi-view block definition and press ENTER.
5 Select the new multi-view block definition, right-click and click Edit.
6 Click the View Blocks tab.
7 Select a display representation for the elevation label.
8 Click Add.
9 Select the block you defined in "Creating a Block" on page 2455, and click OK.
10 Select the view directions for the block.
11 Repeat steps 6–9 for each display representation where you want the elevation label to display.
12 Click OK twice.

Adding the Elevation Label to the AutoCAD DesignCenter

To add the elevation label to AutoCAD® DesignCenter, you need to create a **.dwg* file in the AEC Content Wizard. In this section is a short description of how to add user-defined elevation labels to AutoCAD DesignCenter. For a detailed description of the AEC Content Wizard, see "Custom Content" on page 2343.

1 On the Format menu, click Create AEC Content to open the Create AEC Content Wizard.
2 Select Custom Command.
3 Select the multi-view block you created in "Creating a Multi-View Block" on page 2456, and click Add to add it to the Content File.

4. On the command line, enter **AecAnnoScheduleTagAdd**, a space and then the name of the multi-view block, and its parameters. The command is built up as follows:

   _AecAnnoScheduleTagAdd <name of the drawing containing the property set definition>.dwg **_SYMBOL** <name of the multi-view block created>**_LEADER** _None **_DIMSTYLE** Current

   In our example, the custom command could look like this:

   _AecAnnoScheduleTagAdd ElevationLabelPropertySetDefs.dwg **_SYMBOL** ElevationLabelMVBlock **_LEADER** _None **_DIMSTYLE** Current

5. Click Next.
6. Select Enable AEC Unit Scaling.
7. Select a layer key for the label.

   NOTE The default layer key for elevation labels is DIMLINE.

8. Click Next.
9. Enter a file name and a folder for the label.

   NOTE Be sure to save the custom label in a folder one level below the used property set definition drawing. If the property set definition drawing is saved in //Autodesk Architectural Desktop/Content/Schedules/, then the custom label could be saved in //Autodesk Architectural Desktop/Content/Schedules/Elevation Labels/.

10. Click Finish to exit the Create AEC Content Wizard.

Mask Blocks

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A mask block is a two-dimensional (2D) block that covers, or "masks," part of the graphic display of an AEC object in a plan view. You can use mask blocks to clean up or correct objects in your drawings or to create custom 2D shapes from predefined drawing objects, such as walls or grids.

For example, attach a light fixture as a mask block to a ceiling grid in a plan view. If the light fixture is bigger than one or more of the ceiling grid bays, the light fixture masks, or covers, the ceiling grid lines that would visibly pass through the light fixture if it had been defined as a regular AutoCAD® block.

Before you can begin to mask objects in your plan view drawings, you must have an existing mask block or a mask block definition created in your drawing. You can find predefined mask blocks on the General Drafting tool palette and in the Autodesk Architectural Desktop Stock Tool catalog. You can also create a mask block with the AEC Content Wizard. For more information about custom content, see "Creating an AEC Masking Block" on page 2350.

After you have selected a mask block, add it to your drawing in plan view. Adding the mask block to your drawing is like adding a regular AutoCAD® block: specify an insertion point or scale factors and a rotation angle. The mask block and the object that you want to mask must be coplanar, that is, on the same plane, for the mask object to cover the other object.

In this chapter

- Creating Mask Block Definitions
- Adding Mask Blocks Using Mask Block Tools
- Creating a Mask Block Tool
- Attaching Mask Blocks to Objects
- Detaching Mask Blocks from Objects
- Editing Mask Blocks

After you insert a mask block in your drawing, attach the objects to be masked. The mask block clips the graphics of the objects that you are masking when the objects regenerate themselves in a plan view. Only the objects that you attach to the mask block are clipped. The masked objects are plotted as you see them on your screen.

If you change your drawing from a 2D view to a three-dimensional (3D) view, the mask block is still displayed, but it no longer masks the objects that are attached to it. You can detach the mask block from the objects at any time. You can also import and export mask block definitions. If you create a mask block definition that you decide not to use in your drawings, you can purge it.

Related Procedures

- Creating a Mask Block Definition from a Polyline
- Creating a Mask Block Definition from an Existing Mask Block Definition

Creating Mask Block Definitions

You can define a mask block by selecting a closed polyline in the drawing and defining it as a mask block, by copying and editing an existing mask block, or by using the AEC Content Wizard.

Use the AEC Content Wizard to save mask blocks in content drawings for convenient reuse. For more information, see "Creating an AEC Masking Block."

Managing Mask Block Definitions

To create, edit, copy, or purge mask block definitions, use the Style Manager.

The Style Manager provides a central location in Autodesk® Architectural Desktop, where you can work with definitions and styles from multiple drawings and templates. For more information about using the Style Manager, see "Style Manager".

Related Procedures

- Creating a Mask Block Definition from a Polyline
- Creating a Mask Block Definition from an Existing Mask Block Definition
- Importing Mask Block Definitions
- Exporting Mask Block Definitions to a New Drawing
- Exporting Mask Block Definitions to an Existing Drawing
- Editing a Mask Block Definition

- Attaching Hyperlinks, Notes, and Files to a Mask Block
- Purging Mask Block Definitions

Creating a Mask Block Definition from a Polyline

Use this procedure to create a mask block definition from one or more closed 2D polylines. If you use more than one polyline to create your mask block definition, the polylines must be completely within or completely outside each other: they cannot overlap or touch. Polylines that are within each other can be specified as void areas that become holes when the mask block is created. After you create the definition, edit the definition properties to customize the characteristics of the definition.

1. On the Format menu, click the Style Manager.

   The Style Manager is displayed, with the current drawing expanded in the tree view.

2. Expand Multi-Purpose Objects, right-click Mask Block Definitions, and click New.
3. Enter a name for the new mask block definition, and press ENTER.
4. Right-click the new mask block definition name, and click Set From.
5. Select the closed polyline that you want to use to create the mask block definition.
6. Do one of the following to complete the mask block definition:

   - Press ENTER to create the mask block definition from a single polyline.
   - Enter **y** (Yes) to select additional polylines to add to the mask block definition. These polylines must be entirely within or outside each other; they cannot overlap or touch. Polylines that are within other rings can be specified as void areas that become holes in the mask block.

7. Specify an insertion base point for the mask block.
8. Select additional graphics to include in the mask block definition, or press ENTER if you do not want to include any additional graphics.

   NOTE You can select text or symbols to include in the mask block definition.

9. Click OK.

A mask block definition is created from the polyline or polylines that you selected. The new mask block definition is listed in the mask block definition tree and can be viewed in the graphics screen of Style Manager. The original polylines remain in the drawing.

Creating a Mask Block Definition from an Existing Mask Block Definition

Use this procedure to create a mask block definition from a mask block definition that already exists in a drawing. After you create the new definition, you edit the definition properties to customize the characteristics of the definition.

1. On the Format menu, click the Style Manager.

   The Style Manager is displayed, with the current drawing expanded in the tree view.

2. Expand Multi-Purpose Objects, and expand Mask Block Definitions.
3. Right-click the mask block definition you want to copy, and click Copy.
4. Right-click, and click Paste.
5. Right-click the new mask block definition, and click Rename.
6. Enter a name, and press ENTER.
7. Click OK.

Importing Mask Block Definitions

Use this procedure to import a mask block definition from another drawing. After you create the definition, you edit the definition properties to customize the characteristics of the definition.

1. On the Format menu, click the Style Manager.

   The Style Manager is displayed, with the current drawing expanded in the tree view.

2. On the File menu, click Open drawing to browse for the drawing that contains the definition that you want to copy to your current drawing.
3. Select the drawing with the definition that you want to copy, and click Open.
4. Expand Multi-Purpose Objects, and expand Mask Block Definitions.
5. Right-click the mask block definition you want to copy, and click Copy.
6. Select the current drawing, and expand Multi-Purpose Objects.

7 Right click Mask Block Definitions, and click Paste.

The definition is copied into the current drawing. If the current drawing already contains a definition with the same name, the duplicate names are displayed in the Import/Export - Duplicate Names Found dialog box.

8 To resolve any duplicate definition names, select one of the following options:

- To *not* replace the existing definition in the drawing with the new definition of the same name, select Leave Existing, and click OK.
- To replace the existing definition in the drawing with the new definition, select Overwrite Existing, and click OK.
- To rename the new definition so both definitions exist in the drawing, select Rename to Unique, and click OK. New definition names are appended with a numeral in the Style Manager.

9 Click OK.

Exporting Mask Block Definitions to a New Drawing

Use this procedure to copy mask block definitions from your current drawing to a new drawing. After you create the definition, you edit the definition properties to customize the characteristics of the definition.

1 On the Format menu, click the Style Manager.

The Style Manager is displayed, with the current drawing expanded in the tree view.

2 On the File menu, click New drawing to create the new drawing to copy the definition to.

3 Enter a name for the new drawing, and click Save.

The new drawing opens in the Style Manager.

4 In the current drawing, Expand Multi-Purpose Objects, and expand Mask Block Definitions.

5 Right-click the mask block definition you want to copy to the new drawing, and click Copy.

6 Select the new drawing, and expand Multi-Purpose Objects.

7 Right click Mask Block Definitions, and click Paste.

8 Click OK.

Exporting Mask Block Definitions to an Existing Drawing

Use this procedure to copy mask block definitions from your current drawing to another drawing. After you create the definition, you edit the definition properties to customize the characteristics of the definition.

1. On the Format menu, click the Style Manager.

   The Style Manager is displayed, with the current drawing expanded in the tree view.

2. On the File menu, click Open drawing to browse for the existing drawing that you want to copy the definition to.
3. Select the drawing that you want to copy the definition to, and click Open.

   The drawing opens in the Style Manager.

4. In the current drawing, Expand Multi-Purpose Objects, and expand Mask Block Definitions.
5. Right-click the mask block definition you want to copy to the second drawing, and click Copy.
6. Select the second drawing, and expand Multi-Purpose Objects.
7. Right click Mask Block Definitions, and click Paste.

   The definition is copied into the second drawing. If the drawing already contains a definition with the same name, the duplicate names are displayed in the Import/Export - Duplicate Names Found dialog box.

8. To resolve any duplicate definition names, select one of the following options:

   - To *not* replace the existing definition in the drawing with the new definition of the same name, click Leave Existing, and click OK.
   - To replace the existing definition in the drawing with the new definition, click Overwrite Existing, and click OK.
   - To rename the new definition so both definitions exist in the drawing, click Rename to Unique, and click OK. New definition names are appended with a numeral in the Style Manager

9. Click OK.

Editing a Mask Block Definition

Use this procedure to edit a mask block definition:

- You can change the objects or styles to which the mask block can be attached.
- You can add and remove properties.
- You can change the name, description, type, and format of properties.

Changes that you make to a mask block definition are immediately applied to any objects or styles to which the mask block created from the definition is attached.

1. On the Format menu, click the Style Manager.

   The Style Manager is displayed, with the current drawing expanded in the tree view.

2. Expand Multi-Purpose Objects, and expand Mask Block Definitions.
3. Select the mask block definition, right-click, and click Edit.
4. Click the Classification tab.
5. Select a classification for the classification definition.

   For more information, see "Classification Definitions" on page 2289.

6. Click the Display Properties tab.
7. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

8. If necessary, click .
9. Click the Layer/Color/Linetype tab.
10. Select the component to change, and select a different setting.
11. Click OK.
12. Click the General tab.
13. Enter new text for Description.
14. Click Notes.
15. Click the Notes tab, and enter a note.
16. Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Enter the description, and click OK.

If you want to . . .	Then . . .
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click Delete.

17 To attach or edit schedule data, click Property Sets. For more information, see "Attaching Property Set Data to Objects" and "Entering Manual Properties for Objects".

18 Click OK twice.

Adding Classifications to a Mask Block Definition

Use this procedure to specify classifications for any classification definition applied to a mask block definition. Classifications enable you to track objects by construction status, vendor, or other criteria. For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1 Open a tool palette that has a mask block definition tool.

2 Right-click a mask block definition tool, and click Mask Block Definitions.

3 Right-click the definition that you want to change, and click Edit.

4 Click the Classifications tab.

By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to mask block definitions.

5 For each classification definition, select the classification you want to apply to the current mask block definition.

6 Click OK twice.

Purging Mask Block Definitions

Use this procedure to purge mask block definitions from your drawing. You have the option to purge any mask block definition unless it is currently applied as a mask block in the drawing.

1 On the Format menu, click the Style Manager.

The Style Manager is displayed, with the current drawing expanded in the tree view.

2 Expand Multi-Purpose Objects, and expand Mask Block Definitions.

3 Purge mask block definitions:

If you want to . . .	Then . . .
purge one unused mask block definition style	right-click the style you want to remove, and click Purge.
purge all unused mask block definition styles	right-click Mask Block Definitions, and click Purge. When prompted, verify that the styles you want to purge are selected, and click OK.

4 Click OK.

Adding Mask Blocks Using Mask Block Tools

Tool palettes provided with Autodesk®Architectural Desktop let you place mask blocks by selecting a mask block tool with a specific mask block definition and other predefined properties. You can also use mask block tools to apply the settings of a mask block tool to existing mask blocks.

Mask block tools may be found in the following locations:

Location	Tool
General Drafting tool palette	a mask block tool for the Standard mask block definition style and default settings for other mask block properties
Helper Tools category in the Autodesk Architectural Desktop Stock Tool catalog	a mask block tool for the Standard mask block definition style and default settings for other mask block properties
custom tool palettes created by your CAD manager	Mask block tools with mask block definition styles and properties customized for your projects or office standards

NOTE The Standard mask block definition style is imported if you create your drawing with a template. It does not exist if you start your drawing from scratch. For more information, see "About Templates" on page 550.

When you place mask blocks using mask block tools, you can use the default settings of the tool, or you can change settings for any mask block properties

that are not controlled by the mask block definition style. For more information, see "Creating a Mask Block Tool" on page 2469.

Related Procedures

- Adding a Mask Block
- Adding a Mask Block with User-Specified Settings
- Creating a Mask Block Tool
- Attaching Mask Blocks to Objects

Adding a Mask Block

Use this procedure to add a new mask block that has the properties specified in the mask block tool that you select. To specify settings when you add a mask block, see "Adding a Mask Block with User-Specified Settings" on page 2469. You can add a mask block to a drawing if the drawing contains a mask block definition. For more information, see "Creating Mask Block Definitions" on page 2460.

TIP When you add mask blocks to your drawing, insert them on a separate layer. You can turn the layer off in 3D views, where the mask blocks no longer mask any objects.

1. If a mask block does not already exist in the current drawing, then create or import a mask block definition. For more information, see "Importing Mask Block Definitions" on page 2462.
2. Open the tool palette that you want to use, and select a mask block tool.

   A mask block tool is located on the General Drafting tool palette and in the Helper Tools category in the Autodesk Architectural Desktop Stock Tool catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.
3. Specify the insertion point of the mask block.

   You can move or hide the Properties palette to expose more of the drawing area.

   NOTE If you are using mask blocks to mask walls, the mask block must be located at the baseline of the wall (Z = 0). Even though the wall components are at different heights, the plan display representation draws them at the height of the baseline, as they would be drawn on paper.

4 Continue adding mask blocks, and press ENTER .

The mask block is displayed in the drawing at the insertion point you specified. To use the mask block to clean up or correct an object in the drawing, attach the object to the mask block.

Adding a Mask Block with User-Specified Settings

Use this procedure to add a mask block with settings that you specify.

TIP To ensure that the Properties palette is displayed before you select a tool, right-click in the drawing area, and click Properties.

1 Open the tool palette that you want to use, and select a mask block tool.
2 On the Properties palette, expand Basic, and expand General.
3 Select a definition.
4 Expand Scale.
5 Enter the *X*, *Y*, and *Z* scale of the mask block. The *X*, *Y*, and *Z* scales represent the distance from the insertion point.
6 Alternately, expand Location, and select Yes for Specify scale on screen. Use your pointing device to designate the scale of the mask block.
7 In the drawing area, specify the insertion point of the mask block.

You can move or hide the Properties palette to expose more of the drawing area.

8 Continue adding mask blocks, and press ENTER.

To use the mask block to clean up or correct an object in the drawing, attach the object to the mask block.

Creating a Mask Block Tool

Use this procedure to create a mask block tool and add it to a tool palette. You may want to create your own mask block tools if you are placing multiple mask blocks of specific definition styles with additional properties that you want to be the same each time.

You can use any of the following methods to create a mask block tool:

- Drag a mask block that has the properties you want to a tool palette.

IMPORTANT Make sure that the mask block is in a drawing that has been saved and that will be available in the future.

- Drag a mask block definition from the Style Manager to a tool palette, and then customize the properties of the new tool.
- Drag a copy of a tool from another palette to the current palette, and then customize the properties of the new tool.
- Copy an existing tool in the current palette and then customize the properties of the new tool.
- Drag a tool from a tool palette in the Content Browser to a tool palette and then customize the properties of the new tool.

1. Open the tool palette where you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a mask block in the drawing	select the mask block, and drag it to the tool palette.
create a tool from a mask block definition in the Style Manager	on the Format menu, click Style Manager. Locate the mask block definition you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Right-click the tool, and click Copy. Open the other palette, and click Paste.
copy a tool from a tool palette in the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.

   This description is used as the tool's tooltip on the tool palette, and to describe the tool if it is stored in a tool catalog.

6 Expand Basic, and expand General.

7 Specify properties for the mask block created from the tool:

If you want to . . .	Then . . .
enter a description of the mask block that you can create using this tool	click Description, enter a description of the tool, and click OK.
specify a unique layer key for the object type	click Layer Key, select a layer key, and click OK.
specify a layer override for the tool	click Layer Overrides, clear Do not specify Layer Overrides, specify the override, and click OK.
specify a definition	click Definition, select a mask block definition, and click OK.
specify a definition location	click Definition location, select the file containing the mask block definition you want to use, click Open , and click OK.

8 Expand Scale.

9 Specify the scale for the mask block created from the tool:

If you want to . . .	Then . . .
use your pointing device to designate the scale for the mask block	click Yes for Specify scale on screen.
specify the scale of the mask block on the Properties palette	click No for Specify scale on screen, and enter the *X*, *Y*, and *Z* scale for the mask block.

10 Expand Location.

11 Specify the rotation for the mask block created from the tool:

If you want to . . .	Then . . .
use your pointing device to designate the angle for the mask block	click Yes for Specify rotation on screen.

If you want to . . .	Then . . .
specify the angle of the mask block on the Properties palette	click No for Specify rotation on screen, and enter the angle for Rotation.

12 Click OK.

Attaching Mask Blocks to Objects

Use this procedure to mask an object by attaching the mask block to the object after you have the mask block placed correctly.

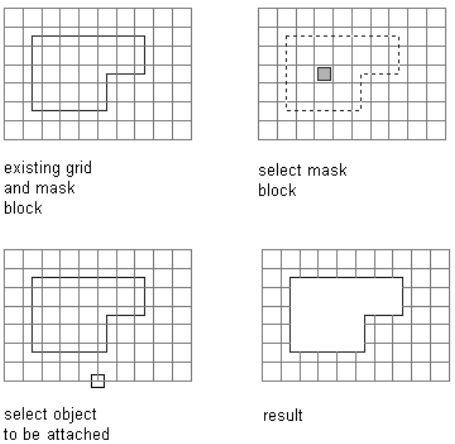
1 Select the mask block or blocks that you want to attach to an object, and right click.

2 Click Attach Objects.

3 Select the object that you want to mask.

4 Select a display representation from the list of current display representations, and click OK.

Attaching a mask block to an object



The object is now hidden by the mask block.

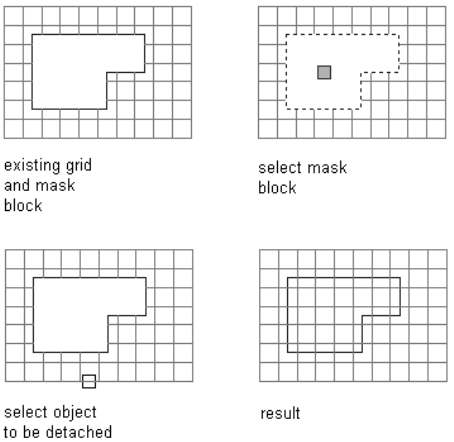
Mask blocks mask Autodesk®Architectural Desktop objects only and mask them only in plan views. Mask blocks are visible in 3D views but do not mask the objects that are attached to them.

Detaching Mask Blocks from Objects

Use this procedure to unmask an object in plan view by detaching the object from the mask block.

1. Select the mask block that you want to detach from an object, right-click, and click Detach Objects.
2. Select the object that you want to detach from the mask block.

Detaching an object from a mask block



The object is detached from the mask block and is no longer hidden by the mask block.

Editing Mask Blocks

Autodesk® Architectural Desktop offers several methods for editing mask blocks:

- Change the location using grips.
- Change settings on the Properties palette.
- Edit the profile.
- Select commands from the context menu.
- Change how a mask block is displayed.

Related Procedures

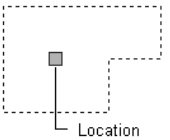
- Using Grips to Move Mask Blocks
- Changing the Location of a Mask Block
- Editing the Profile of a Mask Block
- Applying Tool Properties to a Mask Block
- Changing the Location of a Mask Block
- Attaching Hyperlinks, Notes, and Files to a Mask Block

Using Grips to Move Mask Blocks

Use this procedure to change the location of a mask block with grips.

1. Select the mask block.
2. Select the highlighted grip.

   Viewing Mask Block Location grip



3. Move the grip until the door is in the desired location, and click once.

Changing the Location of a Mask Block

Use this procedure to change the rotation, elevation and location of the mask block on the Properties palette.

You can relocate a mask block by changing the coordinate values of its insertion point. The mask block also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the mask block are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the mask block by aligning its normal with another axis. You can also rotate the mask block on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD® 2004 User's Guide*.

1. Double-click the mask block you want to change.
2. On the Properties palette, expand Basic, and expand Location.

3 Specify the placement of the mask block:

If you want to . . .	Then . . .
change the rotation	enter a new value for Rotation Angle.
change the elevation	enter a new value for Elevation.

4 Click Additional information to specify location of the mask block :

If you want to . . .	Then . . .
relocate the mask block	enter new coordinate values under Insertion Point.
locate the mask block on the *XY* plane	make the normal of the mask block parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the mask block on the *YZ* plane	make the normal of the mask block parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the mask block on the *XZ* plane	make the normal of the mask block parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the mask block	enter a new value for Rotation Angle.

Editing the Profile of a Mask Block

Use this procedure to edit the geometry of a mask block.

NOTE If you want to replace the geometry of the mask block with newly drawn polylines, ellipses, or circles, draw them before you start this procedure.

1 Select the mask block that you want to change, right-click, and click Edit Profile In Place.

2 If prompted that the profile is not drawn to size, click Yes.

A temporary profile is created for you to edit the geometry of the mask block.

NOTE After you perform an editing task from the context menu, you may need to select the profile again to perform another editing task. If you do not see the editing commands that you expect on the context menu, select the profile, and right-click to display the context menu.

3 Edit the profile:

If you want to . . .	Then . . .
change the shape of the perimeter of the profile or its rings	select the profile, and use grips to adjust the shape.
add vertices to the profile	select the profile, right-click, and click Add Vertex. Select a point for each new vertex, and press ENTER.
remove vertices from the profile	select the profile, right-click, and click Remove Vertex. Select each vertex to remove, and press ENTER.
replace an existing ring of the profile with new geometry	select the profile, right-click, and click Replace Ring. Select the ring to replace, and select the new geometry. Press ENTER to keep the geometry, or enter **n** (No) to erase it.
add a ring to the profile	select the profile, right-click, and click Add Ring. Select the geometry to define the ring. Press ENTER to keep the geometry, or enter **n** (No) to erase it.
remove a ring from the profile	select the profile, right-click, and click Remove Ring. Select the ring to remove, and press ENTER.

4 Save or discard the changes:

If you want to . . .	Then . . .
restore the mask block to its original shape	select the profile, and click .

If you want to . . .	Then . . .
save the changes to the current mask block	select the profile, and click . The mask block uses the edited profile to define its geometry. Any other objects or styles that use this profile are also updated with the edited geometry.

Applying Tool Properties to a Mask Block

Use this procedure to apply the properties of a mask block tool to one or more existing mask blocks. The properties include the mask block definition and any other settings specified in the tool you select.

1. Open the tool palette that you want to use.

   If necessary, scroll to display the tool that you want to use.

2. Right-click a mask block tool, and click Apply Tool Properties to ➤ Mask Block.
3. Select the mask blocks, and press ENTER.
4. Edit the properties of the mask blocks in the Properties palette, if needed.

Changing Display Properties of Mask Blocks

In most cases, you want the appearance of objects that belong to the same style to be consistent throughout a drawing. To achieve this, you specify the display properties of the mask blocks in each mask block definition style. However, in certain instances, you may need to override a display property for an individual mask block to achieve a specific result. All the display properties that you can specify in mask block definition styles are available for individual mask blocks:

- The visibility of mask block components
- The layer, color, and linetype of mask block components
- The lineweight, linetype scale, and plot style of mask block components

NOTE If the mask block is attached to a grid, you can change the anchor properties as well.

When you change the display properties of a mask block, the changes apply only to that mask block. Other mask blocks of the same definition style are

not affected. To change the display properties of all mask blocks of a specific definition style, see "Creating Mask Block Definitions" on page 2460.

Related Procedures

- Changing the Display Properties of a Mask Block

Changing the Display Properties of a Mask Block

Use this procedure to change the properties of the display components of an individual mask block:

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

To change these display properties for all mask blocks of the same mask block definition style, see "Creating Mask Block Definitions."

1. Select the mask block you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation where you want the changes to appear, and select Object Override.

   The display representation in bold is the current display representation.

4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Attaching Hyperlinks, Notes, and Files to a Mask Block

Use this procedure to attach hyperlinks, enter notes, or attach reference files to a mask block in a drawing. You can also edit notes and edit or detach reference files from a mask block.

1. Double-click the mask block you want to attach information to.
2. On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click next to Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 To add or edit a note, click next to Notes, enter text, and click OK.

5 Click next to Reference documents, and attach, detach, or edit a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

Multi-View Blocks

38

A multi-view block is an Autodesk ®Architectural Desktop object that can have different representations in different view directions. You create a multi-view block from AutoCAD blocks that represent the different views of the custom object that you are creating.

In this chapter

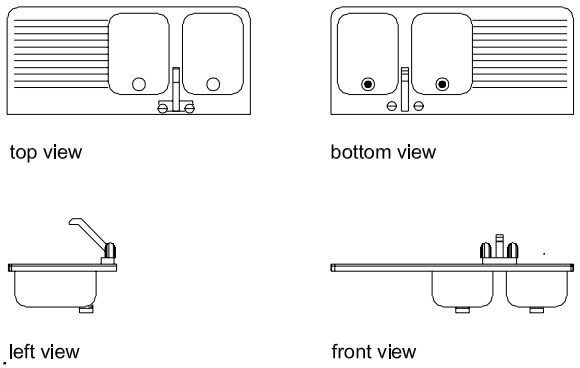
- Creating Multi-View Block Definitions
- Adding Multi-View Blocks to a Drawing
- Modifying Multi-View Blocks

Understanding Multi-View Blocks

A multi-view block can represent different types of objects in Autodesk Architectural Desktop. They are typically used to represent the following items:

- Furniture and fixtures, such as tables and kitchen sinks
- Annotation components, such as revision clouds or fire rating signs
- Schedule tags, such as door numbers

Multi-view blocks can be displayed differently in each view direction and each display representation. For example, the top view of a multi-view block representing a kitchen sink shows the top of the sink; the bottom view shows the bottom of the sink; and there are representations for left, right, front, and back views. Additionally, you can define a different group of displays for each display representation, so that you can have one set of views for Plan view and another one for Reflected view.



You can use a multi-view block as a cutout in objects such as walls, slabs, and curtain walls. You create a view block to represent the cutting body. The block forms the body that will be subtracted from objects applying the multi-view block as interference. For example, you can create a skylight as a multi-view block and specify the block as a subtractive boolean in a slab.

Predefined Multi-View Blocks

The content folders of Autodesk Architectural Desktop contain a large number of predefined multi-view blocks for a number of design purposes. These contain multi-view blocks for furniture elements, electrical appliances, annotation symbols, schedule tags, and other useful elements. You can access these multi-view blocks from DesignCenter™. For information on DesignCenter, see "Design Content" on page 2321

Related Topics

- Creating Multi-View Block Definitions

- Adding Multi-View Blocks to a Drawing
- Modifying Multi-View Blocks

Creating Multi-View Block Definitions

Each multi-view block in a drawing is based on a multi-view block definition. The multi-view block definition specifies the display representations in which the block can be viewed, and the views available in each representation. From a multi-view block definition, you can create as many actual multi-view blocks as you need.

Multi-view blocks typically represent 3D architectural objects. For example, you can create customized cabinetry by drawing plan, elevation, and model views, and saving each view as an individual AutoCAD block. You assign each block to a view when you create the multi-view block definition. The blocks (top, bottom, front, back, left, right, and model views) are used to define the custom object as a single multi-view block. By adding points to your views on the defpoints layer prior to defining the block, you can identify additional insertion points for the view block. You set the display representations and view directions in the process of defining the multi-view block.

You can see the individual blocks of your custom object in plan, elevation, and isometric views as one assembly after inserting them in the drawing as a multi-view block. For more information about working with blocks, see "Overview of Blocks" in the online *AutoCAD User's Guide*. For more information about display representations, see "Display Representations."

Related Procedures

- Process Overview: Creating Multi-View Block Definitions
- Creating View Blocks
- Creating a New Multi-View Block Definition
- Connecting View Blocks to View Directions
- Attaching Notes and Files to a Multi-View Block Definition
- Adding Classifications to a Multi-View Block Definition
- Adding a Multi-View Block Definition to DesignCenter
- Creating a Multi-View Block Tool

Process Overview: Creating Multi-View Block Definitions

There are four general steps for creating a multi-view block:

Step 1: Create a set of view blocks for each view direction in each display representation you need.

For example, if you need a multi-view block definition that displays in Model view and Reflected Plan view, create a set of views for each representation. You need to create views only for those view directions where you want a different result. For example, if the top and bottom views are supposed to look the same in the Reflected Plan display representation, you need to draw the view block only once and then assign it to both view directions.

Step 2: Create a multi-view block definition where you assign the view blocks to view directions in individual display representations.

Step 3: If you want the new multi-view block definition to be available through DesignCenter, add the definition to DesignCenter.

Step 4: If you want the new multi-view block definition to be available from a tool palette, add it to a palette.

Related Procedures

- Creating View Blocks
- Creating a New Multi-View Block Definition
- Connecting View Blocks to View Directions
- Adding a Multi-View Block Definition to DesignCenter
- Creating a Multi-View Block Tool

Creating View Blocks

Use this procedure to create the AutoCAD blocks to represent each view of the multi-view block definition in the needed display representations.

1 Draw the views you need for a specific display representation:

If you want to . . .	Then . . .
create views for the front and back directions	draw them on the *XZ* plane.
create views for the left and right directions	draw them on the *YZ* plane.

If you want to . . .	Then . . .
create views for the top and bottom directions	draw them on the *XY* plane.
create a block for an interference condition	create a block containing objects, such as mass elements, to be used as the subtractive body

2 Specify additional insertion points on the defpoints layer through the AutoCAD point command if necessary.

NOTE The points added to view blocks are cumulative. For example, if you add one point to a view block used for the top view and two points to the view block used for the model view, you have a total of four points to cycle through. The fourth point is the regular basepoint defined during the creation of the block.

3 Select the World Coordinate System before making blocks from these individual views.

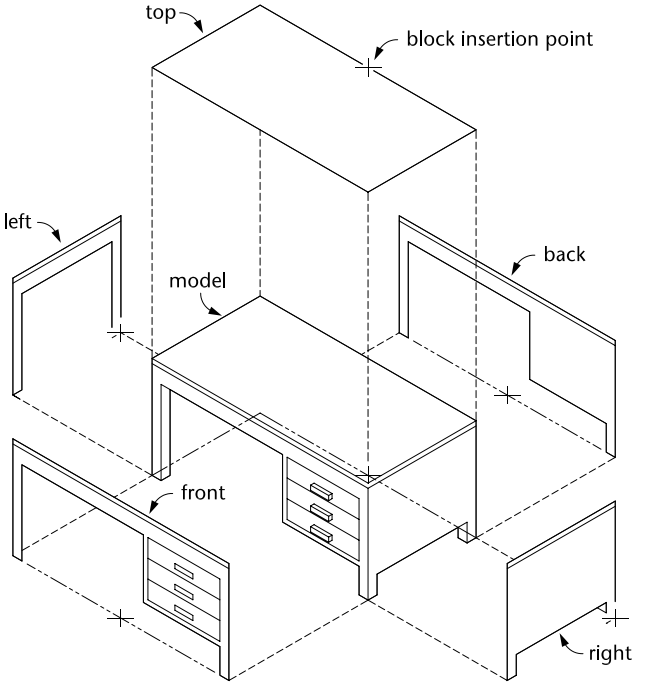
For more information about coordinate systems, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD User's Guide*.

4 Define each view as a block, and coordinate the location of the insertion base point as you define each block.

For example, if you specify the insertion base point of the model view block as the midpoint of the bottom edge on the back side, the front and back view blocks have an insertion base point at the midpoint of the bottom edge. Then, the left and right view blocks have an insertion base point at the back bottom corner, with the insertion base point for the top and bottom view blocks at the midpoint of the back edge.

For more information about blocks, see "Create Blocks" in the online *AutoCAD User's Guide*.

Creating individual blocks for multi-view block definition



TIP It is helpful to have a naming convention as you save your views as blocks. For example, name the plan view block *desk-p,* and name the right view block *desk-r.*

Creating a New Multi-View Block Definition

Use this procedure to create a multi-view block definition from the view blocks you created to represent different views of a custom object.

1. On the Format menu, click Style Manager.
2. Expand Multi-Purpose Objects.
3. Right-click Multi-View Block Definitions, and click New.
4. Enter a name for the new multi-view block definition, and press ENTER.

5 To edit the new multi-view block definition, right-click its name, and click Edit:

If you want to . . .	Then . . .
connect view blocks to the view directions of the different display representations	see "Connecting View Blocks to View Directions" on page 2487.
add notes and files to the multi-view block definition	see "Attaching Notes and Files to a Multi-View Block Definition" on page 2488.
add classifications to a multi-view block definition	see "Adding Classifications to a Multi-View Block Definition" on page 2489.
specify a cut body for the multi-view block when the block is used as interference in other objects (for example, walls, curtain walls, spaces, slabs)	click Set Interference Block, select a block, and click OK.

6 Click OK.

Connecting View Blocks to View Directions

Use this procedure to connect view blocks to the view directions of the individual display representations.

1 On the Format menu, click Style Manager.

2 Expand Multi-Purpose Objects, and expand Multi-View Block Definitions.

3 Right-click the multi-view block definition to which you want to connect view blocks, and click Edit.

4 Click the View Blocks tab.

5 Select the display representation to which you want to connect view blocks.

There are six display representations available for multi-view blocks:

Display Representation	Is used for . . .
General	all Plan views, Section views, and Sketch views
Model	all Model views.

Display Representation	Is used for . . .
Plan	all Plan views.
Plan High Detail	all Plan High Detail views.
Plan Low Detail	all Plan Low Detail views.
Reflected	all Reflected views.

6 Click Add, and select a view block for the display representation.

7 Click OK.

8 Select the view directions that correspond with the selected block.

For example, to connect the view block to the left side of the multi-view block definition, select Left and clear all other directions.

You can connect a view block to multiple view directions. For example, if you have a symmetrical element that looks identical from left and right, you can select Left and Right.

The Other view direction represents a view that displays the block three-dimensionally. It is used for non-orthogonal (isometric or perspective) views of the custom object.

To ensure that the multi-view block is visible in all views, assign a block to every view direction.

9 To specify view blocks in other display representations, continue from step 5.

10 Click OK.

Attaching Notes and Files to a Multi-View Block Definition

Use this procedure to enter notes and attach reference files to a multi-view block definition. You can also edit notes and edit or detach reference files from a multi-view block.

1 On the Format menu, click Style Manager.

2 Expand Multi-Purpose Objects, and expand Multi-View Block Definitions.

3 Right-click the multi-view block definition to which you want to attach notes or files, and click Edit.

4 Click the General tab.

5 To add a description to the multi-view block, enter the description under Description.

6 Click Notes.

7 To add or edit a note, click the Notes tab, and enter the note.

8 Click the Reference Docs tab, and attach, edit, or detach a reference file:

If you want to . . .	Then . . .
attach a reference file	click Add, select a file, and click OK.
edit the description of a reference file	select the file, and click Edit. Edit the description, and click OK.
edit a reference file	double-click the reference file name to start its application. Click OK when you are done editing.
detach a reference file	select the file name, click Delete, and click OK.

9 Click OK twice.

Adding Classifications to a Multi-View Block Definition

Use this procedure to specify classifications for any classification definition applied to a multi-view block definition.

For more information about creating and applying classification definitions, see "Classification Definitions" on page 2289.

1 Open a tool palette that has a multi-view block definition tool.

2 Right-click a multi-view block definition tool, and click Multi-View Block Definitions.

3 Right-click the definition that you want to change, and click Edit.

4 Click the Classifications tab.

By default, the classification for all classification definitions is Unspecified. If no classification definitions are listed, none are applied to multi-view block definitions.

5 For each classification definition, select the classification you want to apply to the current multi-view block definition.

6 Click OK twice.

Adding a Multi-View Block Definition to DesignCenter

Use this procedure to add a multi-view block to DesignCenter. When you have added a multi-view block definition to DesignCenter, you can create new multi-view blocks by dragging and dropping them from DesignCenter to your drawing. To add a multi-view block definition to DesignCenter, you need to create a *.*dwg* file using the AEC Content Wizard.

For a detailed description of the AEC Content Wizard, see "Using Design Content" on page 2321.

1. On the Format menu, click AEC Content Wizard.
2. Select Multi-View Block.
3. Under Current Drawing, select a multi-view block definition, and click Add to add it to the Content File list.
4. Click Next.
5. Select the layer key to use when the multi-view block is inserted, and specify any additional properties:

If you want to . . .	Then . . .
automatically explode the multi-view block when it is inserted in a drawing	select Explode on Insert.
specify an elevation for the multi-view block	enter a value for Preset Elevation.
associate an anchor with the multi-view block	select an anchor type.
specify the scale for the multi-view block	enter X, Y, and Z scale values, and select an option for Additional Scaling.
scale the multi-view block based on the drawing units specified in the Drawing Setup dialog box	select Enable AEC Unit Scaling
specify properties for attributes associated with the multi-view block	select options for Attribute Text Style and Attribute Text Angle.

6. Click Next.

7 Specify the drawing file in which to store the multi-view block definition:

If you want to store the multi-view block . . .	Then . . .
in the current drawing	select Current Drawing.
in a different drawing	clear Current Drawing, and then either enter a file name or click Browse to specify a file.

8 Select the icon to represent the multi-view block in DesignCenter:

If you want to . . .	Then . . .
use a bitmap of the drawing as the icon	click Default Icon.
specify a bitmap (*.bmp*) file containing the image to be used as the icon	click New Icon, and select a bitmap file.

9 Enter a description of the multi-view block.

The description is displayed in DesignCenter, along with the icon representing the multi-view block.

10 Select Save Preview Graphics to enable previewing in DesignCenter, or clear Save Preview Graphics to disable previewing.

11 Click Finish.

Creating a Multi-View Block Tool

Use this procedure to create a multi-view block tool and add it to a tool palette. You may want to create your own multi-view block tool for customized multi-view blocks you plan to use repeatedly in your drawing. For example, you are creating an office floor plan in which each conference room and office contains a floor lamp. Conference rooms and executive offices get the deluxe model floor lamp, and all other rooms get the standard model. You define multi-view blocks to represent each type of floor lamp, and then create a floor lamp tool for each type. You can then select the appropriate tool to place a floor lamp in each room.

You can use any of the following methods to create a multi-view block tool:

- Drag a multi-view block that has the properties you want to a tool palette.

- Drag a multi-view block definition from the Style Manager to a tool palette, and then customize the properties of the new tool.
- Copy an existing multi-view block tool, and then customize the properties of the new tool.
- Drag a multi-view block tool from a tool catalog in the Content Browser, and then customize the properties of the tool.

1. Open the tool palette where you want to create a tool.
2. Create the tool:

If you want to . . .	Then . . .
create a tool from a multi-view block in the drawing	select the multi-view block and drag it to the tool palette.
create a tool from a multi-view block definition in the Style Manager	on the Format menu, click Style Manager. Locate the definition you want to copy, and drag it to the tool palette. Click OK to close the Style Manager.
copy a multi-view block tool from a tool catalog	in the Content Browser, locate the multi-view block tool you want to copy, then click the icon associated with the tool and drag it to the tool palette in the workspace.
copy a tool in the current palette	right-click the tool, click Copy, and click Paste.
copy a tool from another palette	open the other tool palette. Right-click the tool, and click Copy. Open the other palette, and click Paste.

3. Right-click the new tool, and click Properties.
4. Enter a name for the tool.
5. Click the setting for Description, enter a description of the tool, and click OK.

   This description is used as the tool's tooltip on the tool palette, and to describe the tool if it is stored in a tool catalog.

6. Expand Basic and expand General.
7. Enter a description of the tool.
8. If you do not want to use the default layer key for multi-view blocks, select a Layer Key.

9 If you want to override the default layer name for multi-view blocks, select a Layer Override.

10 Select a multi-view block definition.

11 For Style location, select the drawing file containing the definition used for this multi-view block, or select Browse and use a standard file selection dialog box to select the file.

12 Expand Scale.

13 Specify the scale of the multi-view block:

If you want to . . .	Then . . .
specify fixed values for the scale	select No for Specify scale on screen, and enter X, Y, and Z values for the scale.
allow users to specify the scale of the object upon insertion	select Yes for Specify scale on screen.

14 Expand Location.

15 Specify the rotation of the multi-view block:

If you want to . . .	Then . . .
specify a fixed value for the rotation	select No for Specify rotation on screen, and enter a value for Rotation.
allow users to specify the rotation of the object upon insertion	select Yes for Specify rotation on screen.

16 Expand Advanced.

17 Click Insertion offset, and enter X, Y, and Z offsets for each view block in the multi-view block, as needed.

18 Click OK.

19 Click Attributes, and edit the prompt and value of each attribute, as needed.

20 Click OK twice.

Adding Multi-View Blocks to a Drawing

Multi-view blocks are inserted in a drawing by referencing their definitions in one or more of the following locations:

- DesignCenter
- Tool palettes
- Tool catalogs

Predefined multi-view blocks supplied with Autodesk Architectural Desktop are available with DesignCenter. These blocks represent items such as furniture elements, electrical appliances, pipes, ducts, annotation symbols, and schedule tags.

A generic multi-view block reference tool is supplied in the Autodesk Architectural Desktop Stock Tool catalog. This tool is in the General Purpose Tools category, Helper Tools subcategory.

How you access a custom multi-view block definition—for example, blocks that you or someone else in your organization defined—depends on what you do with the block after you define it. You can use the multi-view block definition to create AEC content in DesignCenter, or to create a multi-view block tool that can be stored in a tool palette or tool catalog.

When you insert a multi-view block reference in a drawing, you are prompted to specify the insertion point for the block. Depending on how the multi-view block was defined, you may be prompted to specify rotation angle and scale values.

Related Procedure

- Inserting a Multi-View Block

Inserting a Multi-View Block

Use this procedure to add a multi-view block to a drawing.

1 Find the multi-view block definition and begin the insertion process:

If the multi-view block is . . .	Then . . .
stored as AEC content	use DesignCenter to locate the AEC content, and double-click the content.

If the multi-view block is . . .	Then . . .
inserted using a tool on a tool palette	open the palette containing the multi-view block tool, and click the tool.
inserted using a tool stored in a tool catalog	use the Content Browser to locate the tool, then click the icon associated with the tool and drag it to the drawing area.

2 Specify the insertion point for the block.

If you added additional insertion points to the view blocks, you can cycle through all of the points with the CTRL key.

3 Specify the scale, if prompted:

If you want to . . .	Then . . .
specify a scale value	enter a value at the Command prompt.
dynamically set the scale	use the pointing device, and click when you see the appropriate scale.
set the scale to match that of another multi-view block in the drawing	enter **m** (match) at the Command prompt, and select a multi-view block to match in scale.

4 Specify the rotation angle, if prompted:

If you want to . . .	Then . . .
specify a rotation value	enter a value at the Command prompt.
dynamically set the rotation	use the pointing device, and click when you see the appropriate rotation.
set the rotation to match that of another multi-view block in the drawing	enter **m** (match) at the Command prompt, and select a multi-view block to match in rotation.

5 To insert additional references to the multi-view block, continue from step 2.

6 Press ENTER to finish inserting blocks.

Modifying Multi-View Blocks

You can change the attributes of a multi-view block in a drawing. For example, you can change the rotation or the scaling factor.

Related Procedures

- Changing the Rotation of a Multi-View Block
- Changing the Associated Multi-View Block Definition
- Changing the Scale Factor of a Multi-View Block
- Changing the Offset of a Multi-View Block
- Changing the Location of a Multi-View Block
- Attaching Hyperlinks, Notes, or Files to a Multi-View Block
- Editing the Attributes of a Multi-View Block
- Updating Multi-View Block Attributes

Changing the Rotation of a Multi-View Block

Use this procedure to change the rotation of a multi-view block.

1. Double-click the multi-view block whose rotation you want to change.
2. On the Properties palette, expand Basic, and expand Location.
3. Enter a value for Rotation.

Changing the Associated Multi-View Block Definition

Use this procedure to change the multi-view block definition associated to the multi-view block. For information about the relationship between multi-view blocks and multi-view block definitions, see "Creating Multi-View Block Definitions" on page 2483.

1. Double-click the multi-view block you want to change.
2. On the Properties palette, expand Basic, and expand General.
3. Click Definition, and select a new multi-view block definition for the multi-view block.

Changing the Scale Factor of a Multi-View Block

Use this procedure to change the scale factor of a multi-view block.

1. Double-click the multi-view block you want to change.

2 On the Properties palette, expand Basic, and expand Scale.

3 Change the scale factor as needed:

If you want to . . .	Then . . .
change the X scale factor	enter a new value for X.
change the Y scale factor	enter a new value for Y.
change the Z scale factor	enter a new value for Z.

Changing the Offset of a Multi-View Block

Use this procedure to change the offset of a multi-view block from its insertion point.

When you first add a multi-view block to a drawing, the offset value is set to 0. You can change the position of the multi-view block by offsetting it from its original insertion point.

1 Double-click the multi-view block you want to change.

2 On the Properties palette, expand Advanced.

3 Click Insertion Offsets.

4 Select the view block to change.

5 Change the offset of the view block from its insertion point:

If you want to change the offset . . .	Then . . .
from the X insertion point	enter a new value for X.
from the Y insertion point	enter a new value for Y.
from the Z insertion point	enter a new value for Z.

6 Click OK.

Changing the Location of a Multi-View Block

Use this procedure to relocate an existing multi-view block by changing the coordinate values of its insertion point. The multi-view block also has an orientation with respect to the WCS or the current UCS. For example, if the top and bottom of the multi-view block are parallel to the *XY* plane, its normal

is parallel to the *Z* axis. You can change the orientation of the multi-view block by aligning its normal with another axis. You can also rotate the multi-view block on its plane by changing the rotation angle.

For information about the world coordinate system (WCS) and the user coordinate system (UCS), see "Use Coordinates and Coordinate Systems" in the online *AutoCAD User's Guide*.

1. Double-click the multi-view block you want to relocate from its original insertion point.
2. On the Properties palette, expand Basic, and expand Location.
3. Click Additional Information.
4. Specify the location of the multi-view block:

If you want to . . .	Then . . .
relocate the multi-view block	enter new coordinate values under Insertion Point.
locate the multi-view block on the *XY* plane	make the normal of the multi-view block parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the multi-view block on the *YZ* plane	make the normal of the multi-view block parallel to the *X* axis: under Normal, enter **1** for X, and enter **0** for Y and Z.
locate the multi-view block on the *XZ* plane	make the normal of the multi-view block parallel to the *Y* axis: enter **1** for Y, and enter **0** for X and Z.
change the rotation of the multi-view block	under Rotation, enter a new value for Angle.

5. Click OK.

Attaching Hyperlinks, Notes, or Files to a Multi-View Block

Use this procedure to attach hyperlinks, enter notes, or attach reference files to a multi-view block in a drawing. You can also edit notes and edit or detach reference files from a multi-view block.

1. Double-click the multi-view block you want to attach information to.
2. On the Properties palette, click the Extended Data tab.
3. To add a hyperlink, click the setting for Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD®2004 Command Reference*.

4 To add or edit a note, click next to Notes, enter text, and click OK.

5 Click next to Reference documents, and attach, detach, or edit a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

Editing the Attributes of a Multi-View Block

Use this procedure to display the attributes defined for a multi-view block.

1 Double-click the multi-view block whose attributes you want to edit.
2 On the Properties palette, expand Advanced.
3 Click Attributes.
4 Edit each attribute, as needed.
5 Click OK.

Updating Multi-View Block Attributes

Use this procedure to update the attributes of blocks in your drawing, using the current attributes defined for the view blocks upon which each multi-view block is based. You need to do this if you change attribute definitions in one or more of the block definitions that the multi-view block is based on.

1 On the Format Menu, click Multi-View Block, and click Multi-View Block Update.
2 Select the multi-view blocks to be updated.
3 Press ENTER.

4. Enter **y** (Yes) to include text style properties (for example, width factor, oblique, mirroring) when updating attributes, or **n** (No) to update all attributes properties except those relating to text style.
5. Press ENTER to end the update process.

Cameras

39

The camera is a visualization tool, modeled after a real camera, using a point-and-shoot process to help you view the drawing as if you were standing within it. You can save perspective views of your drawing by using a camera.

You can use camera grips to modify the view and see the results in selected viewports. You can add any number of camera views to your drawing. You can also create a video dry run of your design model with the camera.

NOTE To create more complex perspective view setups, for example using clipping planes, use the AutoCAD® 3D dynamic view (DVIEW).

Tool palettes provided with Autodesk® Architectural Desktop let you quickly place cameras by selecting a camera tool with predefined properties.

In this chapter

- Inserting a Camera
- Inserting a Camera with User-specified Settings
- Creating a Camera Tool
- Using Grips to Change the Camera View
- Editing Camera Settings
- Changing the Location of a Camera
- Applying Tool Properties to an Existing Camera
- Creating a Camera View
- Adjusting the Camera Position
- Creating a Video Dry Run
- Creating a Video
- Specifying the Display Properties of a Camera

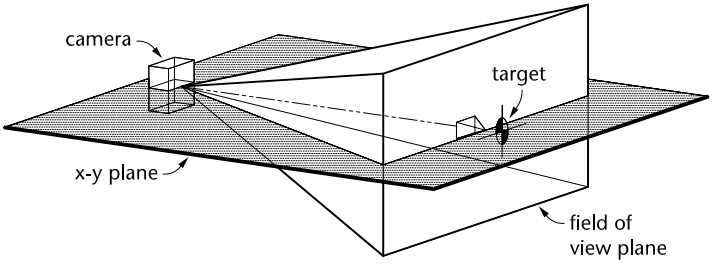
Related Procedures

- Inserting a Camera
- Inserting a Camera with User-specified Settings
- Creating a Camera Tool
- Using Grips to Change the Camera View
- Editing Camera Settings
- Changing the Location of a Camera
- Applying Tool Properties to an Existing Camera
- Creating a Camera View
- Adjusting the Camera Position
- Creating a Video Dry Run
- Creating a Video
- Specifying the Display Properties of a Camera

Inserting a Camera

Use this procedure to add a camera to a drawing. You generally insert cameras within plan views. You specify a source point (camera insertion point) and a target point (what the camera is looking at), and then adjust the camera's zoom to change its field of view (FOV).

Camera view parameters



1 Open the tool palette that you want to use, and select a camera tool.

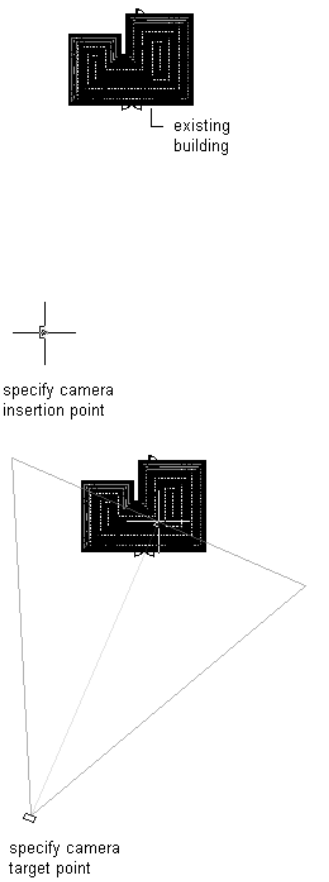
A camera tool is located with Helper Tools in the Autodesk® Architectural Desktop Stock Tool Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

TIP You can enter *X*, *Y*, and *Z* values for the camera source point and the camera target point.

2 Specify the insertion point for the camera.

3 Specify the target point for the camera.

Adding a camera



You can change camera settings, such as Zoom, and how the camera displays, such as the color of the viewing cone. For more information about camera settings, see "Editing Camera Settings" on page 2509. For more information about camera display properties, see "Specifying the Display Properties of a Camera" on page 2517.

Inserting a Camera with User-specified Settings

Use this procedure to insert a camera with settings that you specify. If you are adding single-use cameras, you might want to specify a special setting.

1 Open the tool palette that you want to use, and select a camera tool.

A camera tool is located with Helper Tools in the Autodesk® Architectural Desktop Stock Tool Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

TIP You can enter *X*, *Y*, and *Z* values for the camera source point and the camera target point.

2 On the Properties palette, expand Basic, and expand General.

If you want to . . .	Then . . .
specify a name for the camera	enter a name for Name.
add a description	enter text for Description.
specify a focal length for the field of view	enter a value for Zoom.
generate a perspective view after specifying the insertion and target points for the camera	select Yes in Generate view after add.
remain in plan view after specifying the insertion and target points for the camera	select No in Generate view after add.

3 Expand Location.

4 Enter a height value for Eye Level.

5 In the drawing area, specify the insertion point of the camera.

You can move or hide the Properties palette to expose more of the drawing area.

6 Specify the camera target point.

Creating a Camera Tool

Use this procedure to create a camera tool and add it to a tool palette. You may want to create your own camera tools if you are placing multiple cameras that will use the same properties.

For example, you are creating camera views of trim details in an office. Although all cameras use the same zoom factor, the eye level for the camera view of the baseboard is different than that for the crown molding. To work efficiently, create camera tools for each eye level. Then select the appropriate camera tool to place the cameras with the correct eye level in each area of the floor plan.

You can use any of the following methods to create a camera tool:

- Drag a camera tool containing the desired properties to a tool palette.
- Drag a copy of a tool from another palette to the current palette, and then customize the properties of the new tool.
- Copy an existing tool in the current palette and then customize the properties of the new tool.
- Drag a tool from the Content Browser to a tool palette and then customize the properties of the new tool.

1 Open the tool palette where you want to create a tool.

2 Create the tool:

If you want to . . .	Then . . .
create a tool from a camera in the drawing	select the camera, and drag it to the tool palette.
copy a tool in the current tool palette	right-click the tool, and click Copy. Right-click, and click Paste.
copy a tool from another tool palette	open the other tool palette. Press CTRL, and drag the tool you want to copy to the tool palette.
copy a tool from the Content Browser	open the Content Browser, and locate the tool you want to copy. Position the cursor over the i-drop handle, and drag the tool to the tool palette.

3 Right-click the new tool, and click Properties.

4 Specify properties for the tool:

If you want to . . .	Then . . .
name the image on the tool palette	enter text for Name.
add a tooltip description to the image	enter text for Description.

5 Expand Basic, and expand General.

6 Specify properties for the camera created from the tool:

If you want to . . .	Then . . .
name the tool	enter text for Name.
enter a description of the tool	click Description, enter a description of the tool, and click OK.
specify a unique layer key for the object type	click Layer Key, select a layer key, and click OK.
specify a layer override for the tool	click Layer Overrides, clear Do not specify Layer Overrides, select the Layer Overrides, and click OK.
specify a focal length for the field of view	enter a value for Zoom, and press ENTER.
generate a perspective view after adding a camera	select Yes for Generate view after add.
remain in plan view after adding a camera	select No for Generate view after add.
select the last used setting for generating views	select -- for Generate view after add.

7 Expand Location.

8 Enter a height value for Eye Level.

9 Click OK.

Using Grips to Change the Camera View

You can change the field of view and the source and target points of a camera using grips. Refer to the illustrations and steps in this topic to use grips to edit cameras.

If you use grips to edit the camera in plan view, the *Z* axis is ignored. You cannot accidentally snap the camera to a set of objects with a different *Z* value. The camera is effectively locked to the viewing plane.

You can also change the camera view on the Properties palette.

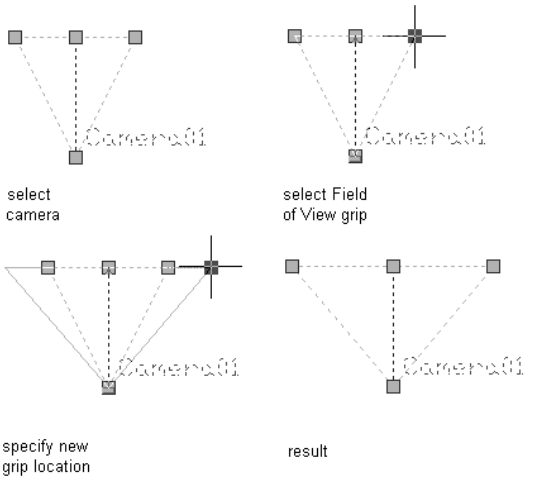
NOTE When a camera is not selected, only the small camera icon is displayed. Selecting the camera displays the field of view.

Changing the Camera Field of View

1. Select the camera.
2. Select a grip at either end of the field of view, and move the grip to encompass what you want to see.

   The Zoom property updates to reflect the new magnification.

Using grips to change a Camera field of view

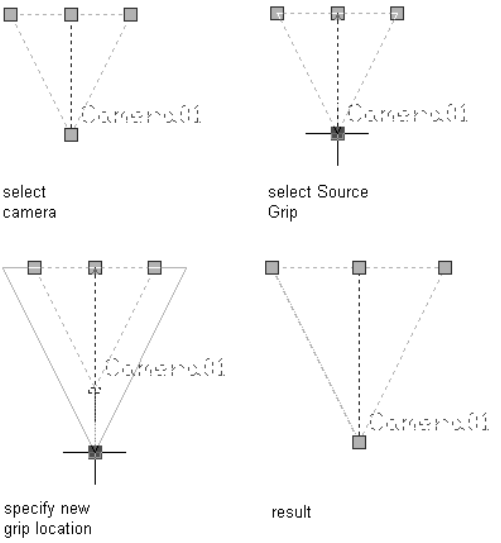


Changing the Camera Source Point

1. Select the camera.
2. Select the source point grip, and move the camera source point to a new location.

   The Rotation property updates to reflect the new position.

Using grips to change a Camera source point

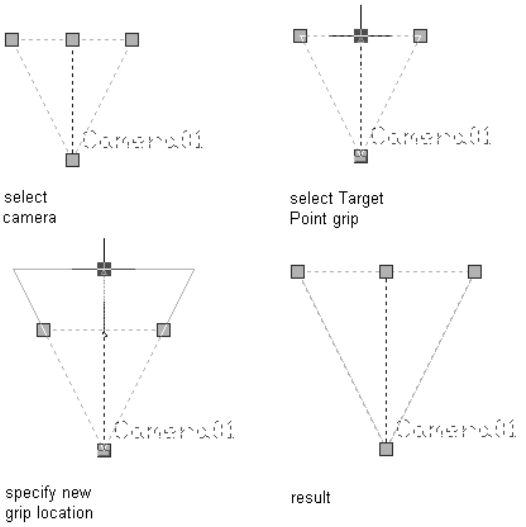


Changing the Camera Target Point

1. Select the camera.
2. Select the target point grip, and move the camera target point to a new location.

   The Rotation property is updated to reflect the new position.

Using grips to change a Camera target point



Editing Camera Settings

Use this procedure to modify the settings on the Properties palette as needed for a camera. You can also change the camera view graphically. For more information, see "Using Grips to Change the Camera View" on page 2507.

1 Double-click the camera you want to change.

2 On the Properties palette, expand Basic, and expand General.

3 Change general information of the camera:

If you want to . . .	Then . . .
change the name of the camera	enter a name for Name.
change the description	enter text for Description.
change the layer	select a layer for Layer.
change the focal length for the field of view	enter a value for Zoom.

4 Expand Location.

5 Change where the camera is placed in the drawing:

If you want to . . .	Then . . .
change the rotation angle	enter a value for Rotation.
change the height value	enter a value for Eye Level.

For more information, see "Changing the Location of a Camera" on page 2510.

Related Procedures

- Changing the Location of a Camera

Changing the Location of a Camera

Use this procedure to relocate a camera by changing the coordinate values of its insertion point. The camera has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the camera are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the camera by aligning its normal with another axis. You can also rotate the camera on its plane by changing the rotation angle.

1 Double-click the camera you want to change.
2 On the Properties palette, expand Basic, and expand Location.
3 Click Additional information.
4 Specify the placement of the camera:

If you want to . . .	Then . . .
relocate the camera	enter new coordinate values under Insertion Point.
locate the camera on the *XY* plane	make the normal of the camera parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the camera on the *YZ* plane	make the normal of the camera parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.

If you want to . . .	Then . . .
locate the camera on the *XZ* plane	make the normal of the camera parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the camera	enter a new value for Rotation Angle.

5 Click OK.

Related Procedures

- Editing Camera Settings

Applying Tool Properties to an Existing Camera

Use this procedure to apply the properties of a camera tool to one or more cameras. The properties include any settings specified in the tool you select.

1 Open the tool palette you want to use.

2 Right-click the camera tool, and click Apply Tool Properties to Camera.

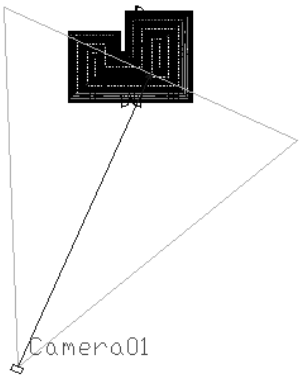
3 Select the cameras, and press ENTER.

Creating a Camera View

Use this procedure to create a final representation of your perspective view.

1 Select the camera from which to generate a view, right-click, and click Create View.

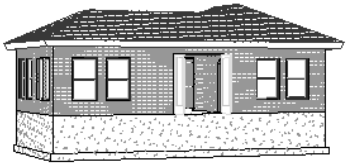
Viewing a camera and target



A perspective view is displayed in the current viewport.

Resulting perspective view

perspective view



hidden-line
perspective view

2 Enter HIDE or SHADE to create a simple shaded view of the objects in your drawing.

TIP To return to a plan view, press ALT. Enter **v** (View), **3** (3D Views), and **t** (Top).

Adjusting the Camera Position

Use this procedure to change the camera view incrementally in various directions.

1. Select the camera you want to adjust, right-click, and click Adjust View.
2. Click the appropriate button to adjust the view.

   - Change the Step value: This value controls how far each click of the following buttons moves the camera: Forward, Back, Left, Right, Up, and Down.
   - Change the Angle value: This value controls how far each click of the following buttons moves the camera angle: Turn Left, Turn Right, Look Up, and Look Down.
   - Change the Zoom percentage: This value controls how far each click of the button zooms the camera for Zoom In and Zoom Out.
   - Click Hide to view the drawing with hidden lines removed.

   If the view in the drawing wasn't the camera's view, then the first selected button places the drawing into the camera's view.

   As you click each button, the view changes in increments determined by values in the Adjustment Increments section. If Auto View is selected, you can see the change after you click each button. If Auto View is cleared, click View to see the changes.

3. Click OK.

Creating a Video Dry Run

Use this procedure to watch the movement of a camera along a specified path before recording a video. You can use a polyline or wall as a path for the camera. The camera path is determined by the direction that the selected polyline or wall was drawn. With a dry run, you can confirm that the angle of the camera and the relationship of the camera to the building is correct. A dry run shows the path of the camera and is not a preview of how the video will appear.

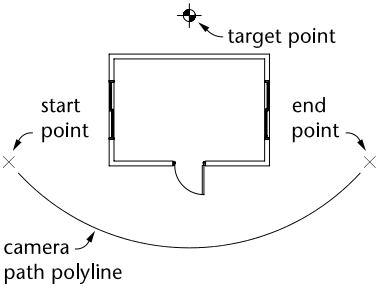
Producing a dry run in a 2D wireframe view results in better performance.

1. Select the camera from which to develop a video, right-click, and click Create Video.

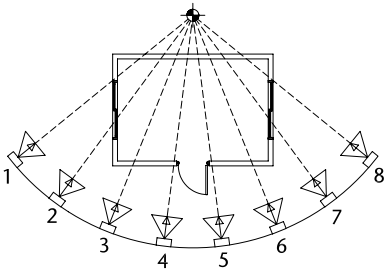
2 Under Camera Path, click Pick Path and select an existing polyline path in the drawing for the camera to follow, or click Pick Point to select a point for the camera to move to.

If you select a path, enter a name for the path, and click OK.

Generating a video by specifying a camera path



specify camera path and target point



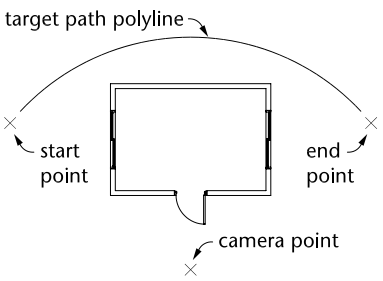
camera position @ each frame

3 Under Target Path, either click Pick Path and select a polyline path for the camera to focus on as it moves, or click Pick Point to select a point for the camera to focus on.

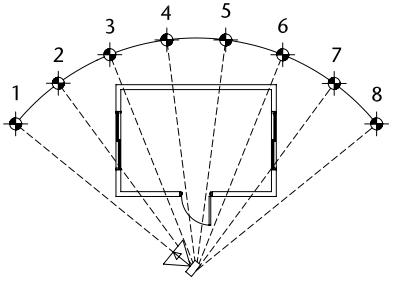
If you select a path, enter a name for the path, and click OK.

If you select the camera path as the target path, the camera maintains its original view direction.

Generating a video by specifying a target path



specify camera point and target path



target position @ each frame

4 Specify the number of frames and the rate at which you want the frames to appear on your screen.

5 Select Dry Run.

6 Select Corner Deceleration if you want the camera to move more slowly as it turns a corner.

7 Click OK.

The camera moves along the camera path, pointing at the target path or target point.

Creating a Video

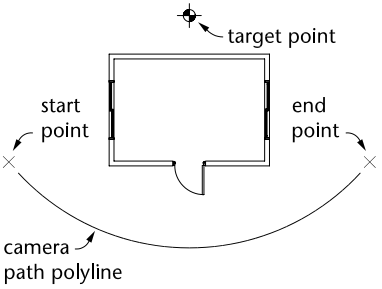
Use this procedure to create a video file of the camera moving in your drawing, pointing at a stationary point or along its own path. You can use the settings from a dry run or specify new settings. The camera follows the direction in which the polyline was drawn.

1 Select the camera from which to develop a video, right-click, and click Create Video.

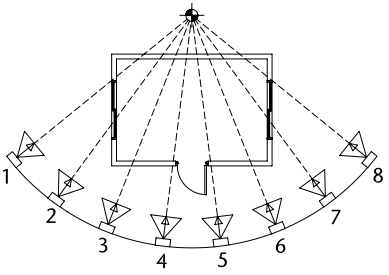
2 Under Camera Path, click Pick Path, and select an existing polyline path for the camera to follow, or click Pick Point to select a point for the camera to move to.

If you select a path, enter a name for the path, and click OK.

Generating a video by specifying a camera path



specify camera path and target point



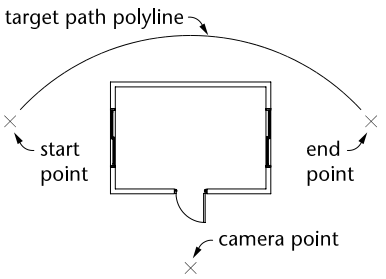
camera position @ each frame

3 Under Target Path, either click Pick Path and select a polyline path for the camera to focus on as it moves, or click Pick Point to select a point for the camera to focus on.

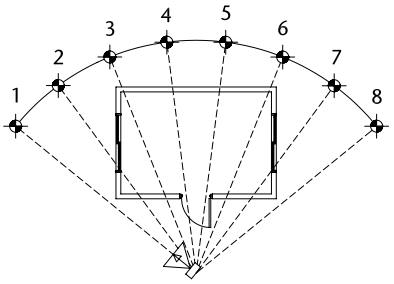
If you select a path, enter a name for the path, and click OK.

If you select the camera path as the target path, the camera maintains its original view direction.

Generating a video by specifying a target path



specify camera point and target path



target position @ each frame

4 Select the Regen type:

If you want to . . .	Then . . .
run the video with the current display settings	select As Displayed.
run the video with all frames in a hidden view	select Hide.
run the video with all frames in a shaded color view	select Shade - 256 Color.
run the video with all frames in a shaded edge view	select Shade - 256 Edge.
run the video with all frames in a shaded view	select Shade - Filled.

Selecting a regen option other than As Displayed performs a full regeneration of each frame and specifies the shading options for the AVI file generated.

It is much quicker to select a 3D shading option in your drawing before you create your video, and then select the As Displayed regen option. For more information, see "Add Simple Shading to 3D Objects" in the *AutoCAD® 2004 User's Guide*.

5 Specify the number of frames and the rate at which you want the frames to appear on your screen.

6 Clear Dry Run.

7. Select Corner Deceleration if you want the camera to move more slowly as it turns a corner.
8. Click OK.
9. Specify a location for the file, and enter the name of the AVI (audio/video interleave) file.
10. Click Save.
11. Select the Compressor and Compression Quality for the video.
12. Click OK.

    The video is displayed as it is created.
13. Click Yes to view the video, or click No to close the dialog box.

    You can view the video later by using the AVI file you created.

Specifying the Display Properties of a Camera

Use this procedure to change the properties of the following display components of an individual camera:

- Visibility (display component is on or off)
- Layer
- Color
- Linetype
- Lineweight
- Linetype scale

1. Select the camera you want to change, right-click, and click Edit Object Display.
2. Click the Display Properties tab.
3. Select the display representation in which the changes should appear, and select Object Override.
4. If necessary, click .
5. Click the Layer/Color/Linetype tab.
6. Select the component to change, and select a different setting for the property.
7. Click OK twice.

Napkin Sketch

40

Use Napkin Sketch to create freehand sketch geometry from objects in a drawing. Create a napkin sketch to reflect ambiguity in a work-in-progress design or to present a more artistically pleasing version of a drawing. You can also generate a napkin sketch of a portion of a drawing that you want to designate as still in the design stage.

You can create a napkin sketch from an entire drawing or from a portion of a drawing. You can select both AutoCAD® and AEC objects to include in your napkin sketch.

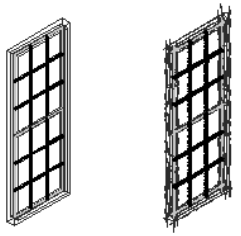
In this chapter

- Creating a Napkin Sketch
- Editing a Napkin Sketch

How Objects Appear in a Napkin Sketch

When you generate a napkin sketch, random bumpy line segments are created along objects that you select to include in your sketch. The bumpy lines are short line segments that emulate the freehand strokes of a traditional sketch. Lines where segments cross each other are extended in the napkin sketch.

Generating a napkin sketch

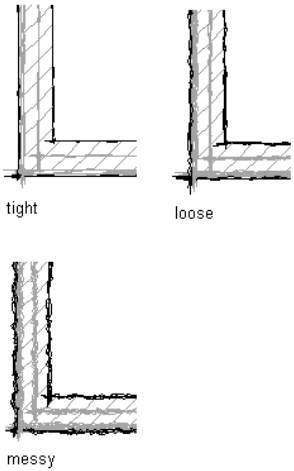


Line Formats for Napkin Sketches

When you generate the napkin sketch, you choose from one of three line formats that control the appearance of the sketch:

- Tight line format traces the selected geometry once to create the appearance of a more accurate sketch.
- Loose line format, the default setting, traces the selected geometry twice.
- Messy line format traces the selected geometry three times.

Line format options



Each pass at tracing the geometry adds more artistic flare to the sketch.

Managing Napkin Sketches

When you create a napkin sketch, the geometry is packaged in a named block and placed on top of the original objects in model space. This means that you can move the original drawing and the sketch drawing independently of each other. You can also edit the napkin sketch as you do with other referenced blocks. Each of the sketch segments retains the layer and color of the original geometry from which it is generated.

Depending on the line format you select, up to three complex polylines are generated for each selected object in your drawing. This can significantly increase your drawing size when you generate the napkin sketch. To keep your drawing size down, you can cut and paste your napkin sketches into new drawings.

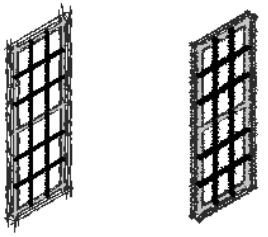
When you are working with three-dimensional (3D) drawings or complex models, first create a hidden line projection, two-dimensional (2D) section, or 2D elevation object. Unless your drawing is very simple, generating your napkin sketch from these 2D objects saves line work and time.

When you are working with external references, double-click on the napkin sketch and edit it like any other block. For more information about editing external references, see "Managing Xrefs" on page 573.

Napkin Sketch and Intended Plot Scale

You can also specify the intended plot scale to control the size of the sketch segments and extensions. Select a larger scale to increase the size of the sketch segments and extensions in the final sketch.

Specifying a plot scale



Related Procedures

- Creating a Napkin Sketch
- Editing a Napkin Sketch

Creating a Napkin Sketch

Use this procedure to produce a napkin sketch in a plan, isometric, or elevation view. Unless your drawing is very simple, generate the napkin sketch from a two-dimensional (2D) hidden line projection, section, or elevation when you are working with three-dimensional (3D) drawings. For more information, see "Creating a Hidden Line Projection," "Sections,"and "Elevations."

1. Open a tool palette that contains a napkin sketch tool.

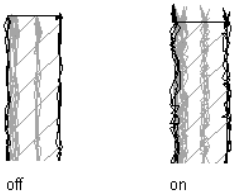
   A napkin sketch tool is located with the Helper Tools in the Stock Tool catalog. For more information, see "Content Browser."

2. Select a napkin sketch tool.
3. Select the objects to include in the napkin sketch, and press ENTER.
4. Enter a name for the block created of the napkin sketch.
5. Specify a line format for generating the napkin sketch geometry.

If you want to . . .	Then . . .
trace over objects once to create the appearance of a more accurate sketch	select Tight.
trace over objects twice to create a looser sketch	select Loose.
trace over objects three times to create a very loose sketch	select Messy.

6. Clear Extend Sketch Lines At Corners if you do not want the extended lines to appear on the napkin sketch.

Extending sketch lines at corners



7 Under Intended Plot Scale, select the scale at which you intend to plot your sketch, or select Other and enter a custom scale.

8 Click OK.

The napkin sketch geometry is generated and placed as a block reference over the drawing objects that you selected. Use the Move command to relocate the sketch block reference in the drawing, or cut and paste it into a new drawing.

Editing a Napkin Sketch

Use this procedure to edit the block reference generated when you create a napkin sketch. For more information about editing external references, see "Overview of Blocks" in the*AutoCAD® 2004 User's Guide*.

1 Select the napkin sketch that you want to edit, right-click, and click Edit Block in-place.

The Reference Edit dialog box opens. For more information, see "Reference Edit dialog box" in the *AutoCAD® 2004 User's Guide*.

2 Select the reference to edit if necessary.

3 Specify how nested objects in the napkin sketch are selected:

If you want to . . .	Then . . .
make changes to the sketch lines or any component of the object that the sketch was drawn from	select Automatically select all nested objects.
work with specific nested objects within a napkin sketch, such as a hatch pattern	select Prompt to select nested objects.

4 Specify lock settings for the napkin sketch.

If you want to . . .	Then . . .
allow changes to be made to objects other than those selected as your working set	select the Settings tab, and clear Lock objects not in working set.

If you want to . . .	Then . . .
prevent changes from being made to objects other than those you selected as your working set	select the Settings tab, and select Lock objects not in working set.

For information about the Settings tab, see "Reference Edit dialog box" in the *AutoCAD® 2004 User's Guide*.

5 Click OK.

The block reference that represents the napkin sketch is highlighted in your drawing, and the Refedit toolbar opens on your drawing screen.

6 Make changes to the block reference as you would to any drawing object.

7 Use the Refedit toolbar to save or discard changes made to the napkin sketch:

If you want to . . .	Then . . .
not save any of the changes you made to the napkin sketch	select changes to reference.
save edits made to the named napkin sketch	select back changes to reference.

8 Click OK.

Converting Objects to 3D Solids

41

You can convert objects to 3D solids when preparing to use CNC machining applications to create a physical building model from a computer-generated building model. You may also want to convert objects to 3D solids if you want the objects to interact with other 3D solids.

You cannot convert the following objects or blocks:

- Objects with no integral 3D presence, such as building grids or cameras
- 3D sections
- Objects in a block or an external reference
- Multi-view blocks and multi-view parts (MvParts)
- Custom display blocks created from 3D solids

For more information, see "Create 3D Solids" in the *AutoCAD® 2004 User's Guide*.

In this chapter

- Converting Objects to 3D Solid Objects

Converting Objects to 3D Solid Objects

Use this procedure to convert objects, such as walls, doors, and mass elements into three-dimensional (3D) solid AutoCAD®objects.

TIP Convert custom display blocks to Free Form mass elements, and then convert the mass elements to 3D solids.

1. Open a tool palette that contains a Convert to 3D Solid tool.

   A default Convert to 3D Solid tool is located with the Modeling Tools in the Autodesk ®Architectural Desktop Stock Tools catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Select the objects to convert, and press ENTER.
3. Enter **y** (Yes) to erase the selected geometry after conversion, or enter **n** (No) to keep the geometry in the drawing.
4. Press ENTER.

   Any selected objects that cannot be converted are filtered out during the conversion. Highly-faceted objects, such as curved railing and stairs, may take a longer time to convert.

After you convert an object to a solid, you can convert it to a Free Form mass element and modify it using grips or the Properties palette. You can then convert the Free Form mass elements back to a 3D solid. For more information, see "Using the Model Explorer to Create Mass Models" on page 646.

Visual Audit

42

Visual Audit is a utility that helps you manage the integrity of your design data by identifying non-AEC objects, such as AutoCAD® objects and exploded AEC objects, in your drawings. Autodesk® Architectural Desktop does not schedule properly or respect changes in the display system for non-AEC objects.

When you perform a visual audit, all of the AEC objects in the drawing are temporarily removed from the display, leaving only non-AEC objects in view. You can inspect the remaining objects more closely to see if they should be replaced with AEC objects.

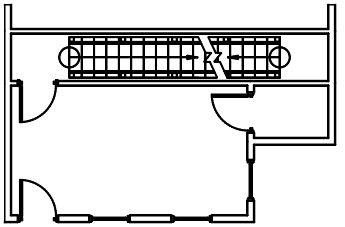
To add clarity to the audit, a visual audit also removes single and multi-line text, leaders, and dimension objects from the display. Attribute text remains visible in the drawing. All objects are displayed again when you end the visual audit.

In the following illustration, the railing, door, and the framed opening are exploded AEC objects.

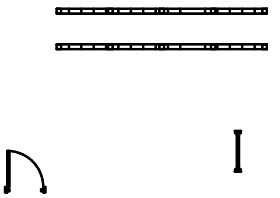
In this chapter

- Performing a Visual Audit

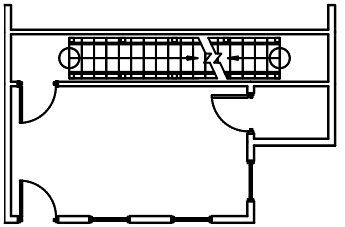
Performing a visual audit with AEC and non-AEC objects in the drawing



viewing all drawing objects



viewing all non-AEC objects



viewing all restored drawing objects

Performing a Visual Audit

Use this procedure to perform a visual audit on your drawing.

NOTE For best results, perform a visual audit in a 2D wireframe view.

1. On the Window menu, click Pulldowns, and click CAD Manager Pulldown.
2. On the CAD Manager menu, click Visual Audit.

   All AEC objects are removed from the display. Attribute text remains visible in the drawing.
3. Pan and Zoom to inspect the drawing:

If you want to . . .	Then . . .
access zoom options	enter '**z** (Zoom). You can use real time zoom or right-click to access additional zoom options.

If you want to . . .	Then . . .
access pan options	enter **'p** (Pan). You can pan or right-click to access pan options.

4 Press ENTER.

All objects are restored to the display.

Quick Slice

43

You can create a "quick slice" through an object or objects in your drawing. The Quick Slice command extracts a polyline from objects that you can use to create profile shapes.

Related Procedures

- Creating a Quick Slice

In this chapter

- Creating a Quick Slice

Creating a Quick Slice

Use this procedure to extract a polyline outline of a "slice" through one or more 3D objects. The Quick Slice command generates a plane that slices through objects to produce a single polyline on the current layer rather than the several polyline segments that section objects and slice objects produce. Unlike slices created with the Generate Slice command, a "quick slice" does not have a slice marker. For more information about the Generate Slice command, see "Generating a Slice" on page 318.

For example, if you have a 3D model of stairs in your current drawing, you can use a quick slice to create a polyline outline of the stair in a section view instead of using the section object. You can use the Quick Slice command to produce profile shapes, such as roof trusses, or to slice through mass groups.

You can also slice through both AutoCAD®blocks and xrefs. For more information about section views, see "Sections" on page 2089.

The slice plane creates a polyline outline from the objects that you sliced through. Any overlapping parts of the outline are combined in a Boolean operation and converted into a polyline that is inserted on the current layer. You can select the quick slice and then open the Object Viewer to view the slice polyline.

1. Open the tool palette that you want to use, and select a quick slice tool.

   A quick slice tool is located with the Helper Tools in the Stock Tool Catalog. You can add this tool to any tool palette. For more information, see "Content Browser" on page 171.

2. Select one or more objects that you want to slice through, and press ENTER.
3. Specify a starting point for the slice plane.
4. Specify a second point to complete a slice plane through the objects.

Reference AEC Objects

44

You can create reference copies of objects that are updated automatically when you change the original object. You can add identical objects, such as columns, to your drawing.

Related Procedures

- Creating an AEC Entity Reference

In this chapter

- Creating an AEC Entity Reference

Creating an AEC Entity Reference

You can create an entity reference from all Autodesk® Architectural Desktop and AutoCAD® objects. These entity references are automatically updated when you change the original object. When you select an object to reference, you must specify a point on the original object as an insertion point for the marker of the entity reference. A reference marker is displayed in the drawing to mark the insertion point.

You can place the entity reference in the drawing at any location or rotation angle. The distance between the entity reference and the reference marker remains equal to the distance between the original object and the insertion point specified. You can change this distance by specifying a new insertion point at a new location in relation to the original object.

When you change the properties of the original object or edit it with grips, the reference object reflects the changes. For example, if you want to add custom-shaped mass elements to a drawing, you can add one mass element and reference it. If you make changes to the original, the entity reference is updated.

Related Procedures

- Adding a Reference to an Object
- Attaching an Object to an Existing Entity Reference
- Attaching Hyperlinks, Notes, and Files to an Entity Reference
- Changing the Location of an Entity Reference

Adding a Reference to an Object

Use this procedure to create a entity reference from another object.

1. Open the tool palette that you want to use, and select an AEC entity reference tool.

   An AEC entity reference tool is located in the Helper Tools category of the Autodesk Architectural Desktop Stock Tool catalog. For more information, see "Content Browser" on page 171.

2. Enter **ad** (Add), and press ENTER.
3. Select the object that you want to reference.
4. Specify a point on the original object to use as the insertion point for the entity reference marker.
5. Specify a location for the entity reference in the drawing.

The distance between the entity reference and the reference marker is equal to the distance between the original object and the insertion point that you specified.

6 Enter a rotation angle for the entity reference, or press ENTER for zero rotation.

7 Press ENTER.

The entity reference and reference mark are placed in the drawing at the specified location and rotation angle. If you edit the original object, the same changes are made to the entity reference.

Attaching an Object to an Existing Entity Reference

Use this procedure to attach an object to an existing entity reference.

1 Open the tool palette that you want to use, and select an AEC entity reference tool.

An AEC entity reference tool is located in the Helper Tools category of the Autodesk Architectural Desktop Stock Tool catalog. For more information, see "Content Browser" on page 171.

2 Enter **at** (Attach), and press ENTER.

3 Select the reference marker that you want to use.

4 Select the new object that you want to use to replace the entity referenced, and press ENTER.

The new entity reference replaces the former entity reference. The original object is unchanged.

Attaching Hyperlinks, Notes, and Files to an Entity Reference

Use this procedure to attach hyperlinks, enter notes, or attach reference files to an entity reference in a drawing. You can also edit notes and edit or detach reference files from an entity reference.

1 Double-click the entity reference to which to attach information.

2 On the Properties palette, click the Extended Data tab.

3 To add a hyperlink, click next to Hyperlink, and specify the link.

For more information about adding hyperlinks, see the *AutoCAD® 2004 Command Reference*.

4 To add or edit a note, click next to Notes, enter text, and click OK.

5 Click next to Reference documents, and attach, detach, or edit a reference file:

If you want to . . .	Then . . .
attach a reference file	click , select a file, and click Open.
edit the description of a reference file	enter text under Description.
edit a reference file	double-click the reference file name to start its application.
detach a reference file	select the file name, and click .

6 Click OK twice.

Changing the Location of an Entity Reference

Use this procedure to relocate an existing entity reference by changing the coordinate values of its insertion point. The entity reference also has an orientation with respect to the world coordinate system (WCS) or the current user coordinate system (UCS). For example, if the top and bottom of the reference object are parallel to the *XY* plane, its normal is parallel to the *Z* axis. You can change the orientation of the entity reference by aligning its normal with another axis. You can also rotate the entity reference on its plane by changing the rotation angle.

For more information about the world coordinate system and the user coordinate system, see "Use Coordinates and Coordinate Systems" in the online *AutoCAD® 2004 User's Guide*.

1 Double-click the entity reference you want to relocate or reorient.
2 On the Properties palette, expand Basic, and expand Location.
3 Click Additional information.
4 Specify the location of the entity reference:

If you want to . . .	Then . . .
relocate the entity reference	enter new coordinate values under Insertion Point.

If you want to . . .	Then . . .
locate the entity reference on the *XY* plane	make the normal of the entity reference parallel to the *Z* axis: under Normal, enter **1** for Z, and enter **0** for X and Y.
locate the entity reference on the *YZ* plane	make the normal of the entity reference parallel to the *X* axis: under Normal, enter **1** for X and enter **0** for Y and Z.
locate the entity reference on the *XZ* plane	make the normal of the entity reference parallel to the *Y* axis: under Normal, enter **1** for Y, and enter **0** for X and Z.
change the rotation of the entity reference	enter a new value for Rotation Angle.

5 Click OK.

Hidden Line Projection

45

You can create flat 2D projections with hidden background lines from a 3D view of objects in your drawing. The Hidden Line Projection command produces quick sections and elevations of objects in your drawings that are not updated automatically when you make changes to your 3D model.

Related Procedures

- Creating a Hidden Line Projection

In this chapter

- Creating a Hidden Line Projection

Creating a Hidden Line Projection

Use this procedure to create a 2D graphic from a 3D view of one or more objects in your drawing. The 2D graphic that you create is a flattened representation of the objects in the current 3D view, with hidden background lines. Use the Hidden Line Projection command to create quick 2D elevations and sections.

After you create an elevation or section hidden line projection, you can hatch or shade the cut areas. You can also use hidden line projections to create detail drawings. For more information about creating elevations and sections, see "Elevations" on page 2147 and "Sections" on page 2089.

When you create hidden line projections, the 3D objects that you select are copied and collected into an unnamed (also called anonymous) 2D block. The unnamed block can be placed in your drawing in the current 3D view, or placed parallel to the *XY* plane to be viewed in plan view. You can edit or explode the inserted block. If you want to insert the block in another drawing as a named block, define the block. For more information about inserting blocks, see "Insert Blocks" in the online *AutoCAD® 2004 User's Guide*.

NOTE Your 2D hidden line projections are not dynamically linked to the objects in the 3D view. Therefore, if you edit the original object or objects in 3D view, the 2D graphic does not change. You must edit or re-create the 2D hidden line projection to reflect any changes that you make to the original objects.

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1. Open the tool palette that you want to use, and select a hidden line projection tool.

   A hidden line projection tool is located with the Helper Tools in the Stock Tool Catalog. For more information, see "Content Browser" on page 171.

2. In a 3D view select one or more objects that you want to use to create your hidden line projection, and press ENTER.
3. Specify an insertion point in your current drawing for the 2D hidden line projection.
4. Specify the insertion point for the 2D hidden line projection into your drawing:

   - Press ENTER to insert the 2D block in plan view.
   - Enter **n** (No) to insert the 2D block in the current view.

Object Viewer

46

The Object Viewer displays objects you select in your drawing, based on the current display configuration in the drawing.

Related Procedures

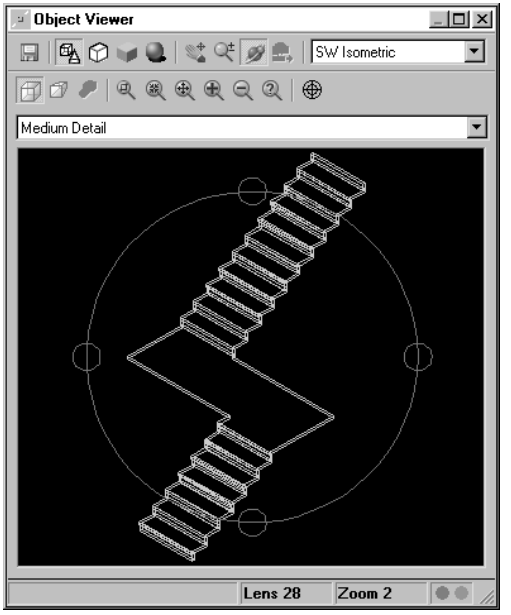
- Using the Object Viewer

In this chapter

- Using the Object Viewer

Using the Object Viewer

The Object Viewer displays objects you select in your drawing, based on the current display configuration in the drawing. You can manipulate the viewing angle and then set the drawing view equal to the view in the Object Viewer.



To display objects from your drawing in the Object Viewer, select the objects, right-click, and click Object Viewer.

The view in the Object Viewer is the same as the drawing view. If the drawing is in plan view, the objects in the Object Viewer are in 2D plan view. If you are viewing your drawing in 3D, then the objects are displayed in 3D.

Icon	Description
	Wireframe: Displays objects in the current viewport with all lines present, including those hidden by other objects.
	Hidden: Displays objects in the 3D wireframe representation with hidden lines.

Icon	Description
	Flat Shaded: Shades objects in a 3D view between the polygon faces. Objects appear flatter and less smooth than Gouraud shaded objects.
	Gouraud Shaded: Shades objects in a 3D view and smooths the edges between polygon faces. Objects appear smoother and more realistic than flat shaded objects. AEC objects use a faceted representation, so there is no visible change when you switch from flat shading to Gouraud shading.
	Pan Realtime: Pans the view in the graphics area of the Object Viewer.
	Zoom Realtime: Real-time Zooms the Object Viewer display as you move your pointing device.
	3D Orbit: Sets the display window to 3D orbit view.
	Move: Displays objects a specified distance in a specified direction.

From the list at the right side of the Object Viewer, you can select the following.

- **Top, Bottom, Left, Right, Front, or Back:** Sets the current view to the selected view.
- **SW Isometric, SE Isometric, NE Isometric, or NW Isometric:** Sets the current view to the selected isometric view.

Named views are also available from this list.

Icon	Description
	Save Image: Saves the current view as a separate file. The supported file formats are .png, .jpg, .bmp and .tif.
	Parallel: Sets the view to a parallel plane.
	Perspective: Sets a perspective view.
	Set View: Sets the view in the drawing equal to the view in the Object Viewer.

You can choose the following zoom options from the Object Viewer: Zoom Window, Zoom Center, Zoom Extents, Zoom In, Zoom Out, or Zoom Factor.

Increases or decreases the apparent size of objects in the current viewport.

From the directly above the image in the Object Viewer, you can select the display configuration.

- **Display Configuration:** Sets which display configuration is shown in the viewer.

NOTE Hold down SHIFT and click to pan in the Object Viewer. Hold down CTRL and click to zoom in the Object Viewer.

Glossary

A

additive
1. To expand the volume of a mass group by joining one or more mass elements with it.

2. A Boolean operation that manages 3D objects as true solids.

AEC content
Content, such as architectural symbols, object styles, and annotation routines unique to Architectural Desktop, that you can access in the Custom view in AutoCAD DesignCenter.

AEC Object Enabler
A distributable utility which allows users without Autodesk AEC applications to use Autodesk AEC objects in AutoCAD 2000, Volo View Express, AutoCAD Map 2000, and 3D Studio VIZ 3.0.

AEC profile
Outline to delineate custom elements, such as openings or extrusions. Profiles can be created from one or more closed polylines and may contain voids.

AIA
American Institute of Architects

anchor
1. A feature that creates a relationship between two objects.

2. To fasten, or anchor, an object to another object. The anchored object's movement and/or size is constrained by the object to which it is anchored.

annotation
Text, dimensions, symbols, or reference marks. For example, Architectural Desktop annotation includes break marks, leaders, bar scales, revision clouds, detail boundaries, elevation marks, and arrows.

apply
To put to specific use. For example, after making changes in a dialog box, click Apply to execute and view the changes.

attach
To establish a relationship between two objects, for example, between a mass element and a mass group, or between a mass group and a slice representing a floor plate.

AutoCAD DesignCenter
A window that is displayed in the drawing area from which the user can use selection aids to find, load, and import drawings and drawing components. In the Custom view in AutoCAD DesignCenter, the user can choose AEC content from the hierarchical tree in the Architectural Desktop folder, and drag the content from the palette into an open drawing.

automatic property definition
Properties that are built into objects and styles when you create them, such as width, length, and height, or data automatically retrieved from other sources, such as information from the project or the object's material. Typically, you attach automatic properties to object styles, rather than objects.

B

base curve
A curve used to define particular drawing objects, such as lines, polylines, arcs, mass elements, and walls. For example, the base curve of a wall is at its base elevation, located at the justification position (where left, right, center, or baseline grips display). Many objects, such as doors, windows, or mvblocks, do not have a base curve and must be used with the curve anchor or layout curve commands.

baseline
An established, but imaginary line on which objects can rest. The baseline of a wall establishes the line from which all component edge offsets are measured.

bay
In grid layouts, a regularly repeated spatial element defined by gridlines.

Boolean
Type of action performed by mathematical operations (add, subtract, intersect) when 3D solid objects are combined. For example, mass elements perform Boolean operations when they join to make a mass group, and their common, or overlapping, areas combine.

boundary
A delineation of an interior space which will later become a wall. Boundaries are created from spaces or drawn to enclose spaces. Spaces can be linked with boundaries so that when either is changed, the correct relationship between boundary and space is retained.

break mark
Notation that signifies that an object has been broken, or has a piece removed.

C

camera
A display feature that correlates with adjusting the view of an object as if looking through the lens of a camera.

category
The internal structure of a building project. Each category is represented by a folder containing elements, constructs, views or sheets.

ceiling grid
A rectangular arrangement of parallel lines forming a pattern for laying out ceiling tile and fixtures in a building.

cell
An area within which an AEC object can be attached. Controls the width and depth of the object, in addition to its position and rotation.

cell anchor
A feature that fastens, or anchors, an object to the cell position of a 2D or 3D layout object. The anchored object's movement and size is constrained by the cell.

classification property definition
Classification properties in a property set definition are used for schedules and enable you to report classification data for the objects in a schedule.

classifications
A definition for a group of named properties or characteristics that you can assign to objects of a particular style. Classifications enable you to track objects by construction status, project phase, building element, vendor, or any other criteria that you need. Classifications can have property sets attached.

cleans up
Joins appropriate parts of two different walls by lengthening, shortening, or breaking lines that represent boundaries of the wall components.

clipping boundary
A boundary which automatically adjusts the size of a ceiling grid to fill a given area, such as a space.

column grids
An arrangement, either rectangular or radial, of spaces, or bays, delineated with parallel or radial lines. At the line intersection points are column positions.

component
A fundamental element of an object, such as the frame of a door, or the hatching of a wall.

Communication Center
An in-product notification system that keeps you up-to-date on service pack availability as well as information for Autodesk Subscription Program members, such as extension availability, product tips and tricks, and product support information.

conceptual design phase
Initial design phase of a building project, including mass modeling and space planning. Sometimes also referred to as schematic design.

construct
A type of project file within a building project. Constructs represent unique portions of the building and have at least one level and one division assigned.

construction documents
The working drawings, schedules, and specifications required to construct a building. Also referred to as CDs.

construction documents phase
The phase during which the architect produces construction documents.

Construction Line
The location in stairs at which the tread length is calculated.

Construction Specifications Institute
(CSI): A professional association that provides technical information and products to the construction industry, such as the five-digit MasterFormat numbering system used to organize one of the imperial content menus included with AutoCAD Architectural Desktop. *See* **MasterFormat**.

content
User definable, pre-configured elements, which are provided with Architectural Desktop to aid in getting started on a project. Examples of supplied content are templates, styles, and symbols.

Content Browser
An independent application within Autodesk® Architectural Desktop that lets you store, share, and exchange Autodesk Architectural Desktop content, tools, and tool palettes. The Content Browser allows you to exchange tools and tool palettes with other Autodesk applications, such as VIZ® Render.

CSI
A professional association that provides technical information and products to the construction industry, such as the five-digit MasterFormat numbering system used to organize one of the imperial content menus included with AutoCAD Architectural Desktop.

curve anchor
A feature that fastens, or anchors, an object to the base curve of another object. The anchored object's movement is constrained by the object it is anchored to.

cut-plane
The height at which an object is cut to produce the plan representation. The cut-plane determines the position of the break mark in plan representation of a stair and railing.

D

default
A predefined, or previous value for objects or parameters.

design content
Generic blocks that represent real-world building components, such as appliances, electrical fixtures, furniture, etc. Design content can be accessed from the AEC DesignCenter.

design development phase
The phase during which the architect develops the conceptual design into a completed building. Sometimes referred to as preliminary design.

detach
To remove the relationship between two objects, for example, between a mass element and a mass group or between a mass group and a slice representing a floor plate.

detail mark
Notation that references another drawing which contains a detail of the original drawing.

direction dependent
A condition where the display of an object is dependent on the view direction. For example, a door might appear open in plan view, but closed in elevation view.

display configuration
The arrangement of how objects are displayed in individual viewports. Display configurations could be a fixed view or a direction-dependent view. Each display configuration will have one or more display sets associated with it.

display range
A user-defined range above and below the global cut plane that can be included in the Plan view. Many objects have specific display components for displaying above and below the cut plane.

display representation
A level of display control in which the user can specify display settings for individual components of objects, such as layer, color, linetype, and visibility display properties, to affect how a particular object is displayed.

display set
A saved set of display representations, which can be associated with a display configuration.

division (wing)
A division, or wing, segments a building in the vertical plane. Divisions in Autodesk Architectural Desktop are created and organized in the Drawing Management feature.

documentation
Any output records of an architectural project, consisting of working drawings, specifications, schedules, and other information pertaining to the building.

Drawing Management
A new feature facilitating the creation an maintenance of large drawing projects.

Drawing management uses external reference and XML technology as the basis of the drawing project.

E

edge offset
The distance from the face of a component to a specific base line. For wall components, the edge offset determines where the width of the component is measured from.

element
A type of project file within a building project. Elements represent generic, re-usable portions of the building.

endcap
A user definable end condition for the end of a free-standing wall or the vertical edges at a door or window opening.

entity reference
An object that makes a reference to another object, and which will update dynamically if the referenced object is altered. Entity references are similar to blocks, except that their "definitions" must remain as objects in the drawing editor.

entref
An object that makes a reference to another object, and which will update dynamically if the referenced object is altered. Entity references are similar to blocks, except that their "definitions" must remain as objects in the drawing editor.

extrusion
A custom mass element created by extruding a planar profile along the Z axis.

F

Floating Viewer
A separate window that displays objects with orbit commands.

formula property definition
A property definition with values computed based on the values of other properties on an object. Formulas can contain variables, operators, and functions allowed in VBScript functions.

G

global cut plane
A cut plane that is set globally for a display configuration in a drawing. the global cut plane can be overridden by an object-specific cut plane.

Graphics Path
The path in stairs containing symbols that show the up and down direction of the stair independent of the construction line.

I

in-place editing
Direct manipulation on screen of profiles and polylines, such as wall endcaps and roof/floor lines. Changes made with in-place editing can be saved back to the style.

intersect
1. To reduce the volume of a mass group to that which is shared with the mass element creating a new region from the area common to two or more overlapping regions.

2. A Boolean operation that manages 3D objects as true solids.

L

layer keying
A method of automatically placing objects in a specific layer as they are drawn. A particular layer key (for example, "WALL") can be assigned to any predefined layer name (for example, "A-WALL"). This layer name is controlled by the current layer key style.

layer key style
A set of layer keys with their associated layer names.

Layer Manager
A utility used for grouping layers by industry standards or by user-defined designations.

layer snapshots
A combination of layer property settings that can be saved.

layer standard
A pre-defined list of layer names or layer group names, and a set of rules determining how new layer names are created.

layout curve
A linear grid that attaches node points to an object with a base curve, for example, walls, mass elements, and polylines.

layout mode
A setting by which the nodes in a grid can be spaced evenly, repeatedly, or manually.

level
A level segments a building in the horizontal plane. Levels in Autodesk Architectural Desktop are created and organized in the Drawing Management feature.

location property definition
A property definition with values obtained from property data on AEC polygons, areas, or spaces in or near where an object is located. An object with a location property definition has a Data Location grip which is used to retrieve the data.

M

manual property definition
A property definition you need to enter values for when you attach them to objects or object styles. Typically, manual properties are added to objects rather than object styles.

masking block
A special block which can be used to mask the graphic display of part of an object in a particular view. Masking blocks can add additional graphics over the masked section.

mass element
A primitive object representing a specific shape and having definable parametric behaviors. Some Architectural Desktop mass elements shapes are gable, arch, cone, column, and cylinder.

mass group
An assemblage of mass elements combined in a specific order with Boolean (add, subtract, intersect) operations.

MasterFormat
A system provided by the Construction Specifications Institute (CSI) used to organize construction resources using a five-digit numbering system. One of the imperial content menus provided with AutoCAD Architectural Desktop uses the CSI MasterFormat system to organize its design content.

material
Corresponds to a specific structural finish material in a building model, such as brick, concrete or glass.

material component
Display components that determine the appearance of object components to which a material has been assigned.

material property definition
A property definition with values that are obtained from an object's component materials or from property data specified for an object's component materials.

model
A two- or three-dimensional representation of one or more objects.

Model Explorer
A separate display window that contains a hierarchical tree pane in which the user can control the organization of mass groups and mass elements. It also contains a preview pane in which the user can view and navigate drawing objects.

multi-view block
(mvblock): A special Architectural Desktop block which can contain multiple AutoCAD blocks set to display differently in different views.

mvblock
A special Architectural Desktop block which can contain multiple AutoCAD blocks set to display differently in different views.

N

net to gross offset
The distance between the net area outline of a space and the gross area outline.

node anchor
A feature that fastens, or anchors, an object to the node position of an object. The anchored object's movement is constrained by the other object.

nodes
Points to which an AEC object can be attached. Controls the position and rotation of the object.

O

object
A collection of one or more graphical elements, such as lines, circles, polylines, text, or dimensions, treated as a single element for creation, manipulation, and modification. An Architectural Desktop object is a special entity with predefined behavior and display characteristics.

object anchors
1. A feature that creates a relationship between two objects.

2. To fasten, or anchor, an object to another object. The anchored object's movement and/or size is constrained by the object to which it is anchored.

Object Enabler
A distributable utility which allows users without Autodesk AEC applications to use Autodesk AEC objects in AutoCAD 2000, Volo View Express, AutoCAD Map 2000, and 3D Studio VIZ 3.0.

object-specific cut plane
A cut plane that is set for one individual object or object style. The object-specific cut plane overrides the global cut plane-

Object Viewer
A separate window that can display any drawing objects. You can manipulate and view the objects with orbit commands.

operation
A mass element property which determines how the mass element contributes its volume to a mass group.

orbit
To navigate an object in a graphics display window, such as the Floating Viewer, Object Viewer, or Model Explorer, with user-selected view geometry rotating around a center axis. 3D orbit allows the user to inspect the object in real time. The user can right-click to display a shortcut menu with more viewing options.

ortho close
A special command, available when adding multiple walls and space boundaries, which closes the defined space by automatically placing the last segment perpendicular to the first. It is most useful when creating rectangular rooms.

P

plan hatch
Material component used for hatching display components in plan views, such as wall component hatches, mass element hatches, and slab hatches.

priority
The parameter which determines component cleanup at wall intersections. The lower the priority number, the higher the priority. For example, a priority 1 component will extend through a priority 2 component at an intersection.

profile
Outline to delineate custom elements, such as openings or extrusions. Profiles can be created from one or more closed polylines and may contain voids.

project
An umbrella structure for all DWG and XML files stored in a building model created with the Drawing Management feature. The project is saved in an APJ file, which is an XML format.

project property definition
Properties with values that are obtained from the Drawing Management project in which an object is located.

A project property definition is a type of automatic property, because the value it displays is determined automatically based on its definition and cannot be edited directly.

Properties palette
Centralized location to enter and change the properties of an object. You can enter information about the style, dimensions, location, schedule data and other important characteristics of an object in the Properties palette.

property data format
A property data format is applied to each property definition within a property set definition. Property data formats specify how the data for each property displays in a schedule table, schedule tag, or the property palette.

property set data
Data drawn from an object with property set definitions. A property set definition "Height" could, for a specific object, return the property set data "1.4 meters."

property set definition
A group of property definitions, or related properties of objects and object styles, that you want to report in a schedule. Once attached to an object or its style, a property set becomes the container for the data associated with the object. The values for the properties are obtained directly from the object or are entered manually for the object or the style.

Q

Quick Slice
A plane generated from two selected points and an entity used to slice through an AEC object, such as roof and mass groups. The resultant profile becomes a polyline which is added to the current layer.

R

radial column grid
A circular pattern of spaces, or bays, around a central axis point. At the line intersection point of the bays are column positions.

rectangular column grid
A pattern of spaces, or bays, delineated by lines at right angles. At the line intersection points are column positions.

representation sets
A saved set of display representations, which can be associated with a display configuration.

S

schedule
A tabulation of data extracted from objects in the drawing.

schedule table
The graphic representation, in tabular form, of schedule data extracted from the drawing, and formatted based on rules set in a schedule table style.

schedule tag
A special annotation tag, linked to a drawing object by a schedule anchor, for the purpose of extracting schedule data, and displaying it on the drawing.

section
1. A representation of an object as it would appear if cut by an imaginary plane, showing the internal structure.

2. A representation of a building, or portion thereof, drawn as if it were cut vertically to show the interior.

section hatch
A material component used for hatches on object faces cut by a section line.

section/elevation mark
Notation used to designate where source objects are being cut to generate a section/elevation view.

sheet (plotting sheet)
A type of project file within a building project. Sheets reference views to create a plot of a specific building view.

shrink wrap
The union of all object faces cut by a section line, merged into one component with one hatch pattern. This is a frequently used view of a 2D section.

slice
An object representing a horizontal section, or slice, through any collection of AEC objects. Usually used to create floor plate footprints from a mass grouping.

slice elevation
The height at which the floor plate footprint outline is cut.

solid form
A boundary segment type with user-defined width that is used to capture preliminary wall information and to control space layout.

space boundaries
A delineation of an interior space which will later become a wall. Boundaries are created from spaces or drawn to enclose spaces. Spaces can be linked with boundaries so that when either is changed, the correct relationship between boundary and space is retained.

spaces
Areas or sections in the interior of a building designated for specific use. Spaces have a ceiling and floor boundaries, height, width, and length.

stair flight
The stairs between landings, usually including any landing extensions, excepting railing heights and automatic extensions.

stair run
The entire stair, from one floor to another, including landings.

stair walking path
The defining path of a stair. Treads are generally perpendicular to this polyline, except in the case of winder turn types. Stair edges may not intersect this line. If they do, then a defect marker is displayed.

stock tool catalog
A catalog within the Content Browser that contains a collection of tools for all basic Autodesk Architectural Desktop objects and object-related commands. These tools cannot be edited or deleted.

straight length
The overall length of the stair as if it had no landings. It's equal to the number of risers minus one times the tread depth.

styles
Group of preset characteristics assigned to an object that determine appearance and function.

Style Manager
A centralized location in Autodesk Architectural Desktop where you can create, modify, move, and delete object styles and definitions.

subtractive
1. To reduce the volume of a mass group by removing the common area that a mass element shares with it.

2. A Boolean operation that manages 3D objects as true solids.

surface hatch
1. A hatch pattern on three-dimensional (3D) objects that display in 3D model views and elevation views

2. A material component used for hatching display components in 3D model views, sections, and elevations

T

target
A value guideline to help the user maintain preferred length and area of spaces.

title mark
Notation that identifies a drawing.

tool
Represents an individual objects you can add to a drawing. A tool contains properties, style, and display information about the object it represents. Whenever you add an object with a specific object tool, it has all of the settings you have defined in the tool. This eases the design process immensely and enhances consistency across a project.

tool catalog
An XML based file containing a collection of tools or tool palettes. Tool catalogs are created and maintained in the Content Browser.

tool catalog library
A collection of tool catalogs in the Content Browser. A number of predefined tool catalogs are shipped with Autodesk Architectural Desktop, but you can also create your own user-defined tool catalogs and add them to a catalog library.

tool package
Collections of tools in the Content Browser that users can select and use. For example, a tool package may contain a set of productivity tools and utilities.

tool palette
Page within the tool palettes set containing a number of user-selected tools. Tool palettes can be grouped by object, by design phase or by any other systematic. You can add and remove tool palettes.

tool palettes set
the visual representation of a tool catalog in Autodesk Architectural Desktop. The tool palettes set contains the tool palettes you are using in the current Autodesk Architectural Desktop session.

V

view
A type of project file within a building project. Views reference constructs to create a partial or complete view of the building.

volume
Similar to a cell, volume controls all three dimensions of an attached object, in addition to its position and rotation.

W

wall anchor
A feature that fastens, or anchors, an object to the base curve of a wall. The anchored object's movement is constrained by the wall.

workspace
The new user interface of Autodesk Architectural Desktop. The workspace includes menus, toolbars, tool palettes, the Properties palette, the Project Navigator Palette, and the status bar. You can save a specific workspace configuration in a user profile.

X

XML (Extensible Markup Language)
A markup technology used for data exchange. In Autodesk Architectural Desktop, XML is used for the Structural Member catalog and for the Drawing Management feature.

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