

**GBS ANALYTICAL RESULTS REGRESSION TESTING SUMMARY SEPTEMBER 8, 2013**

The September 8, 2013 Release of Green Building Studio passed the GBS analytical results regression test.

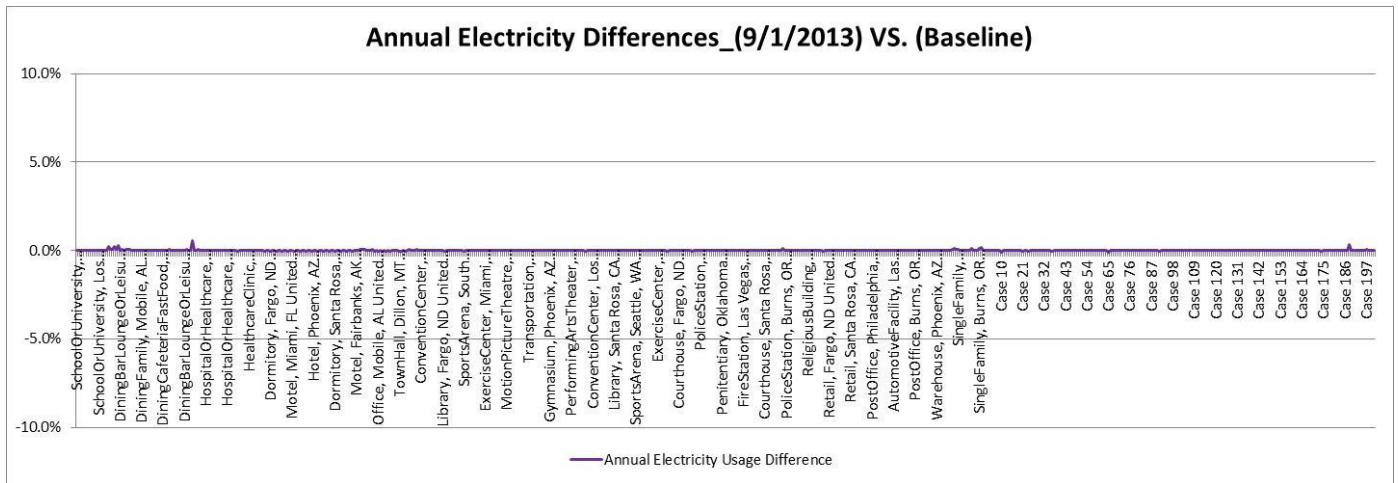
This release addresses Green Building Studio back-end database improvements and navigation bugs.

- The annual energy result changed and all differences are expected
  - A door construction default was revised from and insulation value of R-5 to R-2
  - The order of some polygon vertices coordinates have shifted
  - Azimuth of some shading surfaces rotated

|         | <b>Electricity</b> | <b>Fuel</b> |
|---------|--------------------|-------------|
| Minimum | -0.1%              | -1.0%       |
| Maximum | 0.5%               | 2.1%        |
| Median  | 0.0%               | 0.0%        |

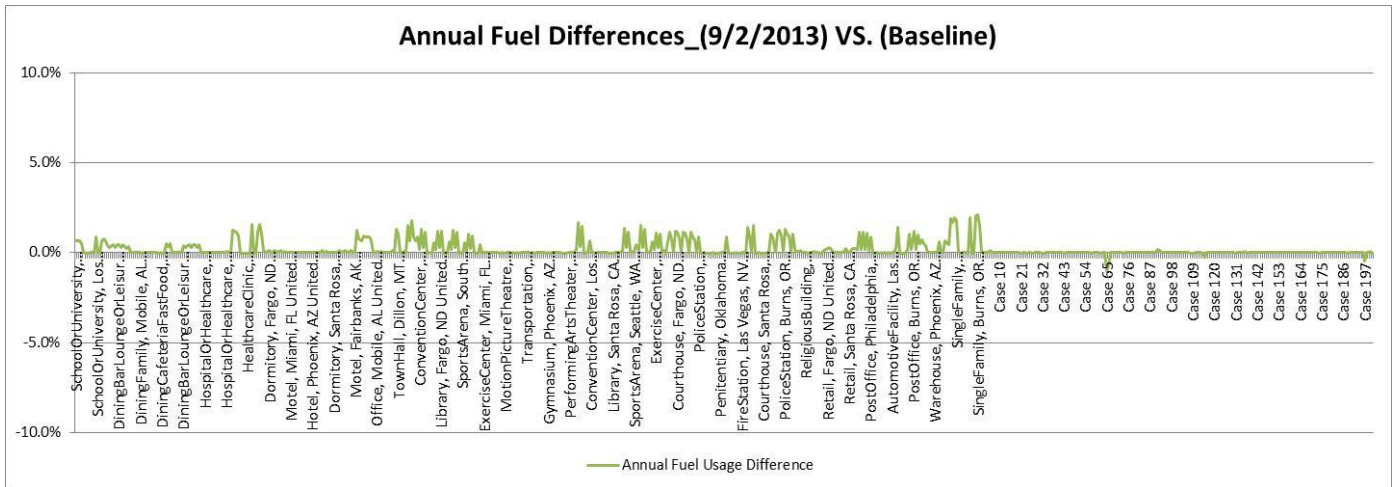
- The surface count differences are all acceptable.
  - The differences are due to GBS breaking the shading surfaces into smaller divisions for DOE-2 simulations. The largest percent change is due to shading surfaces being broken into 10, rather than 8 sections; resulting in the total surface count in the model decreasing from 17 to 15 (-13%). The change in surface sections had no impact on the energy results of the model. (See the dwx file image below)

|                | <b>Pre Surface Count</b> | <b>Post Surface Count</b> | <b>Pre Surface Area</b> | <b>Post Surface Area</b> | <b>Pre Opening Count</b> | <b>Post Opening Count</b> | <b>Pre Opening Area</b> | <b>Post Opening Area</b> |
|----------------|--------------------------|---------------------------|-------------------------|--------------------------|--------------------------|---------------------------|-------------------------|--------------------------|
| Minimum Change | 0%                       | 0%                        | 0%                      | 0%                       | 0%                       | 0%                        | 0%                      | 0%                       |
| Maximum Change | 0%                       | -13%                      | 0%                      | 0%                       | 0%                       | 0%                        | 0%                      | -1%                      |
| Median Change  | 0%                       | 0%                        | 0%                      | 0%                       | 0%                       | 0%                        | 0%                      | 0%                       |

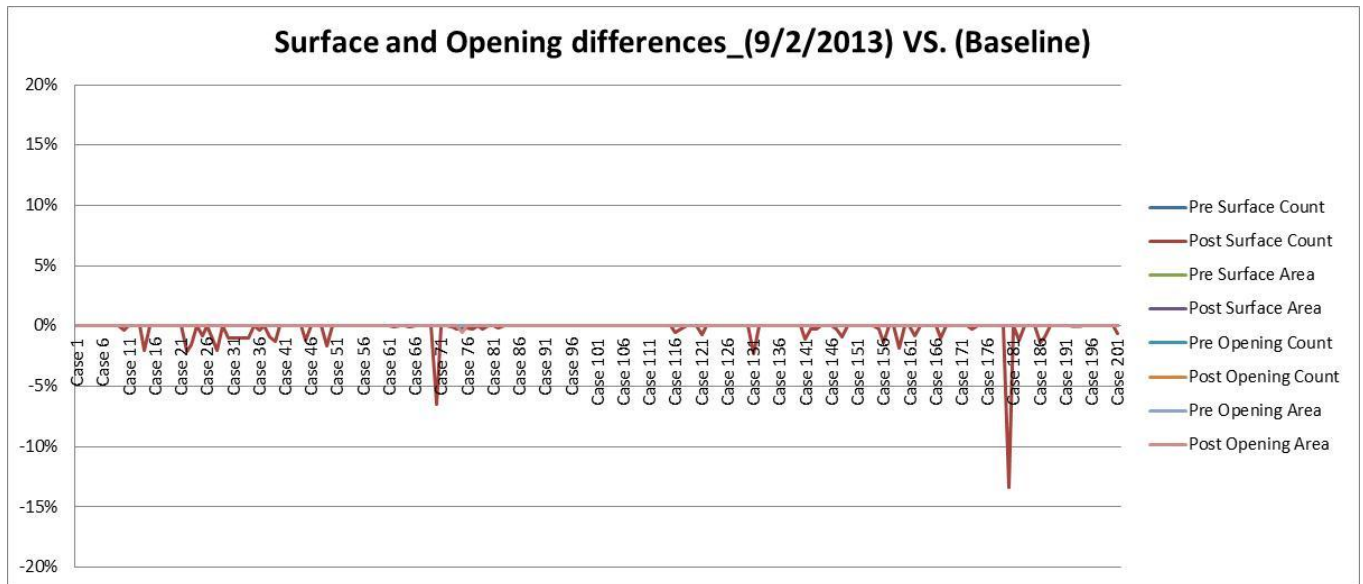


**Electricity usage change**

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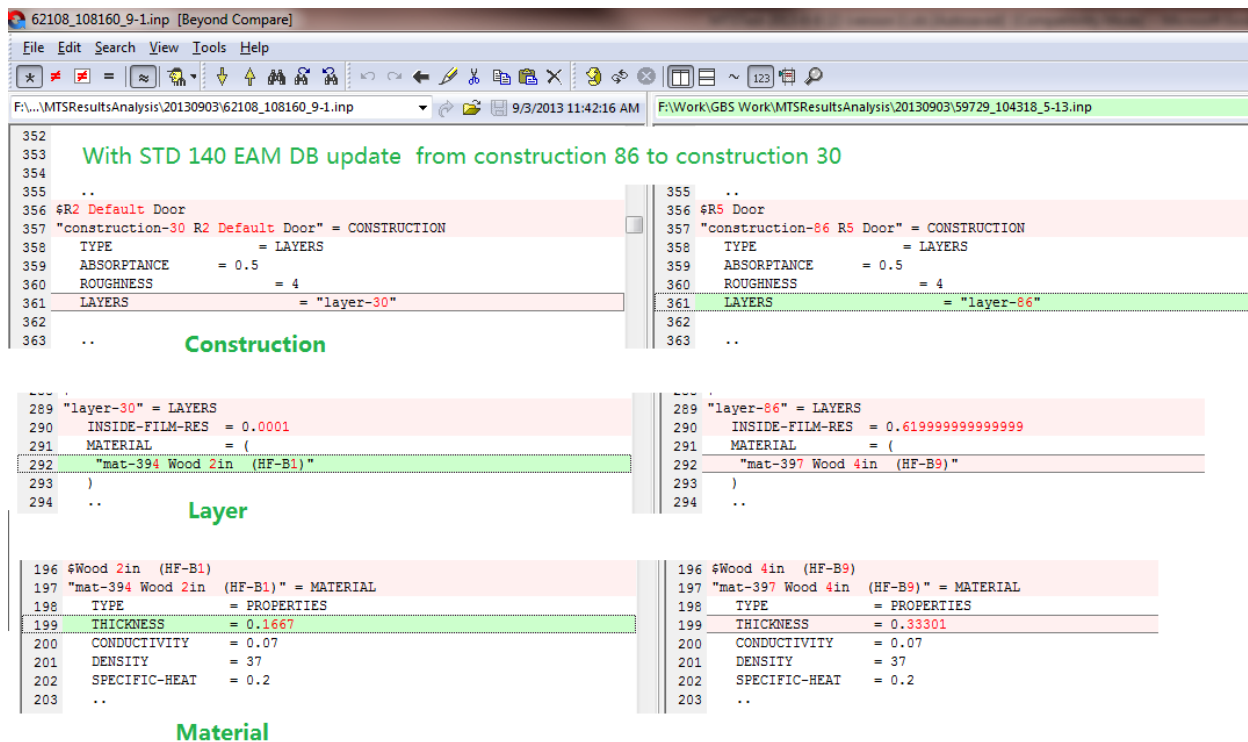


Fuel usage change

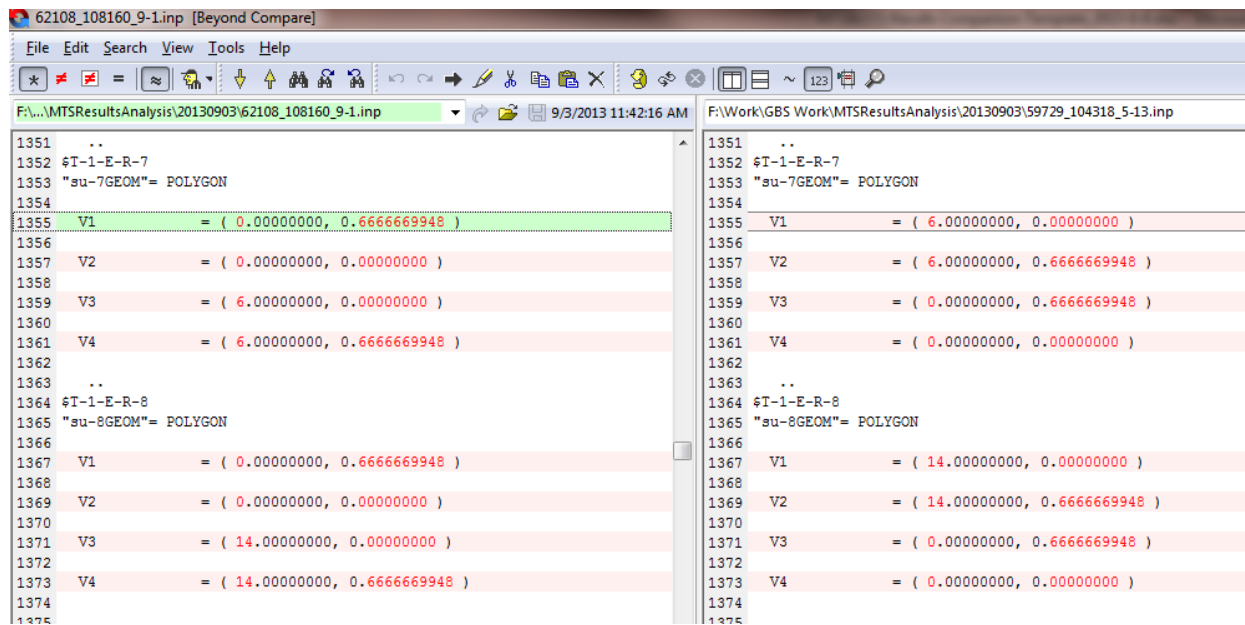


Model Geometry Surface and Opening Differences

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DOE-2 .inp file differences: Construction Update

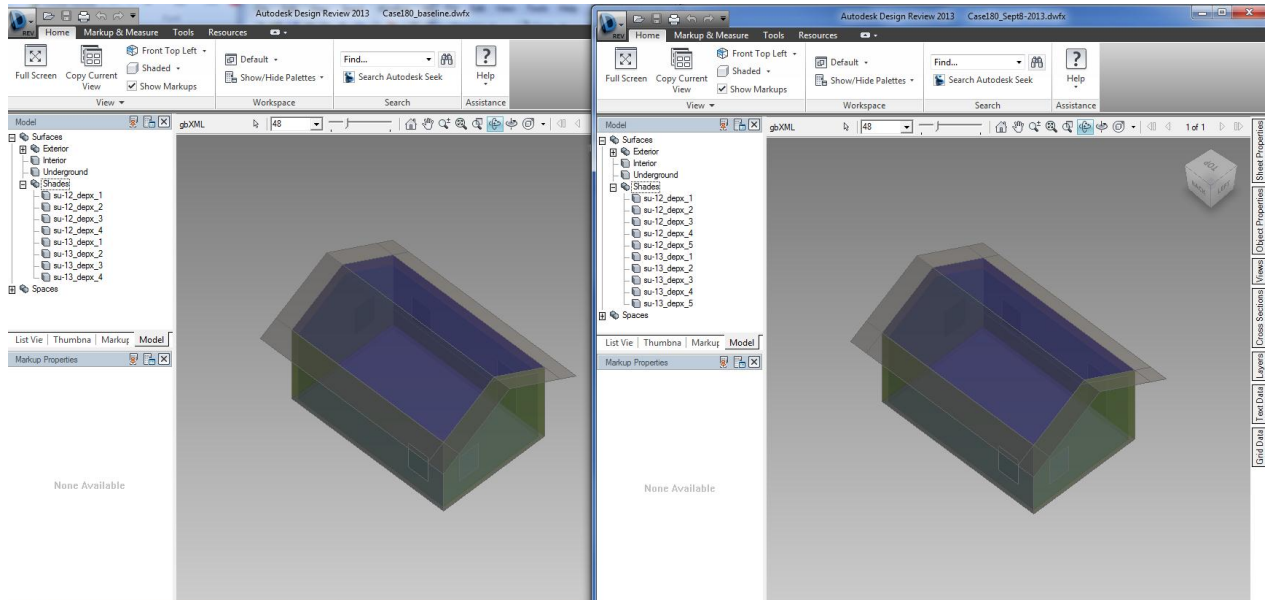


DOE-2 .inp file differences: Coordinate Value Update

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| File   | Line | Value              | File  | Line | Value              |
|--|------|--------------------|---|------|--------------------|
| F:\...\MTRSResultsAnalysis\20130903\62108_108160_9-1.inp | 2336 | AZIMUTH = 90.0     | F:\Work\GBS Work\MTRSResultsAnalysis\20130903\59729_104318_5-13.inp | 2336 | AZIMUTH = 270.0    |
|  | 2337 | X = -12.4071990157 |   | 2337 | X = -12.7405319882 |
|  | 2338 | Y = -1.6579080052  |   | 2338 | Y = 18.3420930118  |
|  | 2339 | Z = -2.00000000    |   | 2339 | Z = -2.00000000    |
|  | 2340 | HEIGHT = 0.333     |   | 2340 | HEIGHT = 0.333     |
|  | 2341 | WIDTH = 12.833     |   | 2341 | WIDTH = 12.833     |

**DOE-2 .inp file differences: Building Shade azimuth rotation**



**dwx images of shading surface division change**