

gbXML Geometry Benchmark Tests

Test Case #6 - Multiple Adjacent Overlapping Conditions

Introduction

Geometry benchmark tests help to ensure that, as building geometry produced by building designers becomes more complex, the geometry produced for energy and heating and cooling loads analysis maintains the integrity of information that is required for a proper and detailed analysis.

gbXML.org maintains this battery of benchmark tests for vendors and other interested parties to ensure compliance with gbXML.org's standards for geometry accuracy and completeness. These tests are prescriptive and serve as marks of excellence that identify the ability of a technology to translate geometry properly from its native format to gbXML

Test #8 Instructions and Requirements

Space Name	Your file
Space_0_0	confirmed ☐
Space_1_0	confirmed ☐
Space_2_0	confirmed ☐
Space_3_0	confirmed ☐

Table 1

This test (Test Case #6) is a simplified four-zone model of a building. Three zones are nearly symmetrical, and directly adjacent to one another, sharing one internal wall apiece. The fourth zone straddles portions of one wall of each of the three nearly-symmetric zones. The test is designed to ensure that interior and exterior walls are properly defined by the CAD/BIM authoring tool. There are also large windows in this building model at WWR=90%, and this model was constructed with walls of zero thickness.

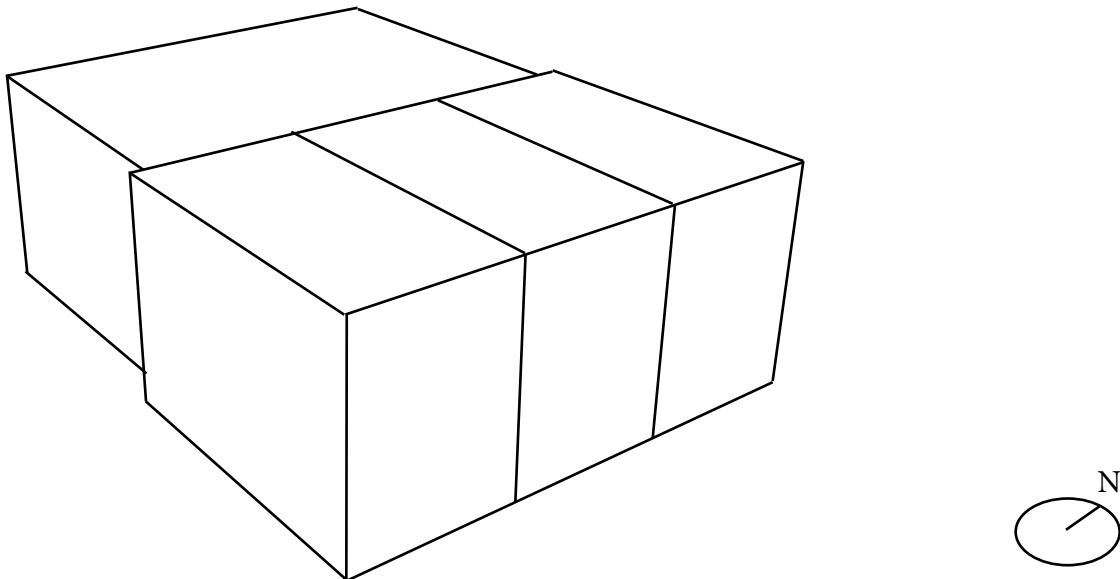


Figure 1: 3D Axonometric View

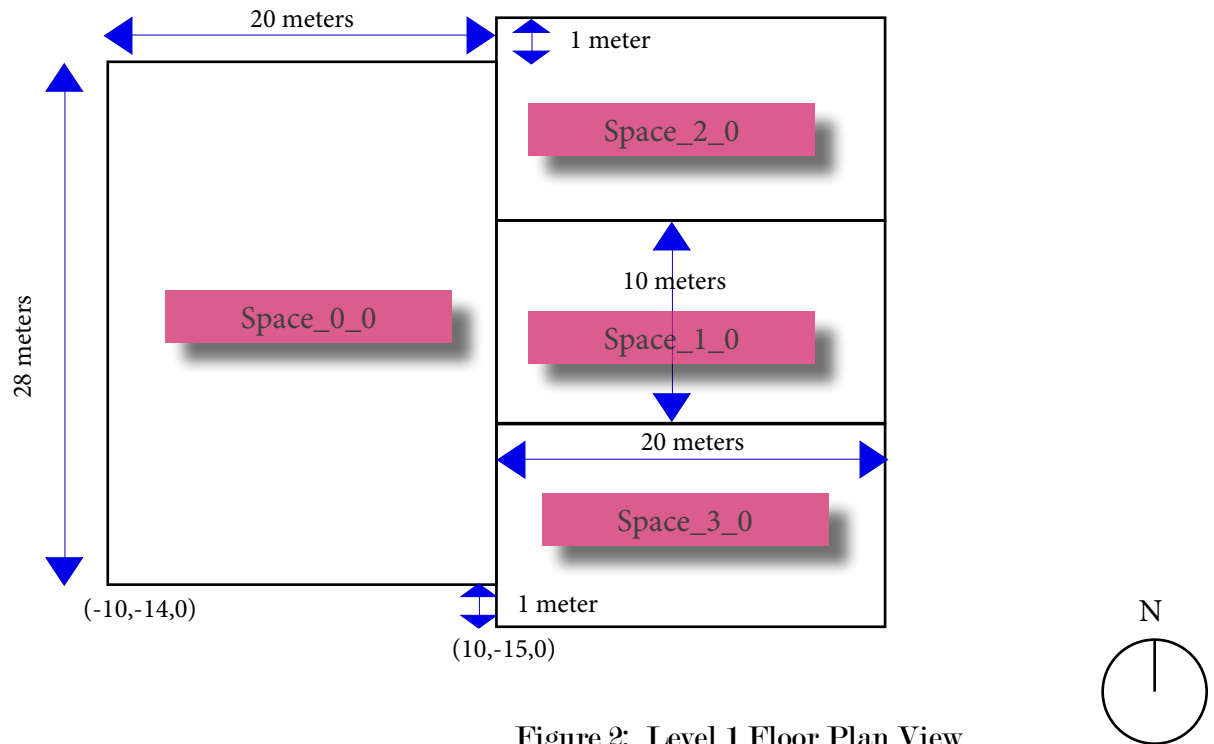


Figure 2: Level 1 Floor Plan View

The floor footprint of Level 1 is shown above for Test 6. It is only a one-story model, so this is the only plan view shown. Each of the smaller zones on the right are identical in size, so the dimensions are only shown once instead of repeating. The ends of the three stacked smaller zones protrude 1 meter on each end, as indicated in the figure above.

The x,y,z coordinates of the lower left corner of **Space_0_0** $(-10, -14, 0)$ and **Space_3_0** $(10, -15, 0)$ are shown in the figure above for your reference.

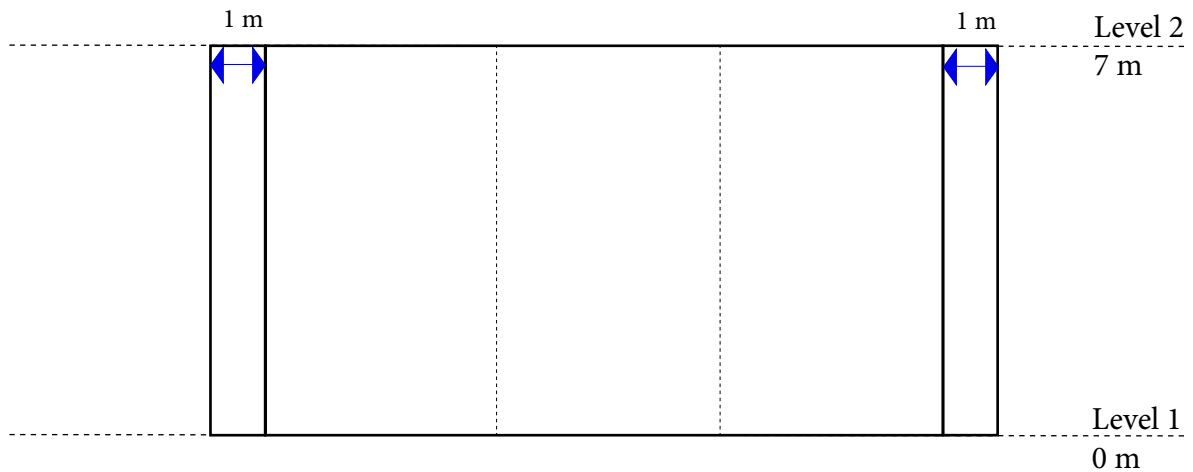


Figure 3: Test Case 6 in Section

A section cut through Space_0_0 looking east. This diagram is basically to show the height of the spaces, and the lack of thickness in any of the surface definitions. The thinner dashed lines show the internal partitions of Space_1_0, Space_2_0 and Space_3_0, behind the opaque interior partition separating Space_0_0 from these three spaces. There are no internal openings or windows in any of the interior partitions. The 1 meter protrusions are shown on each side of Space_0_0.

Test #6 Common Outcomes and Test Results

The most common failure is not all windows are present in the model, or interior windows are created at the same time that exterior windows are created. Most CAD/BIM software tools allow a basic % of window to wall area (WWR) to be defined without having to specify exact window locations. The validator will not check for specific window locations, but will check to see if windows are present in the proper ratios. In the Standard File, each exterior wall has only one window, and none of the interior walls have windows.

- 1. If the Test file has created more than one window, but the WWR is correct, then the Count will be incorrect, but the WWR checks will pass.*
- 2. Sometimes the small sliver walls that are 1 m in width will not have windows included. This can result in failing the WWR check, and could also fail the test of window counts.*
- 3. Sometimes the CAD/BIM authoring tools will add windows to the interior walls. This would result in the interior glazing counts being off the mark.*

Any combination of these three different errors could be possible, but few other issues have cropped up on this test.