gbXML Geometry Benchmark Tests
Test Case #1 - Two Walls with Different Thicknesses

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 #1 Instructions and Requirements

Space Name	Your file	
sp-1-Space	confirmed	☐
sp-2-Space	confirmed	☐
sp-3-Space	confirmed	☐
sp-4-Space	confirmed	☐

Table 1

This test (Test Case #1) consists of four spaces. Each space name must adhere to the naming convention shown in column 1 of the table to the left (Table 1). These name strings should appear as the value of the Space element's id attribute. If you are rebuilding this test case to submit to gbXML, you can use the table's checkboxes as a form of quality control for your own internal processes. If the spaces are not named appropriately, then the test will not pass.
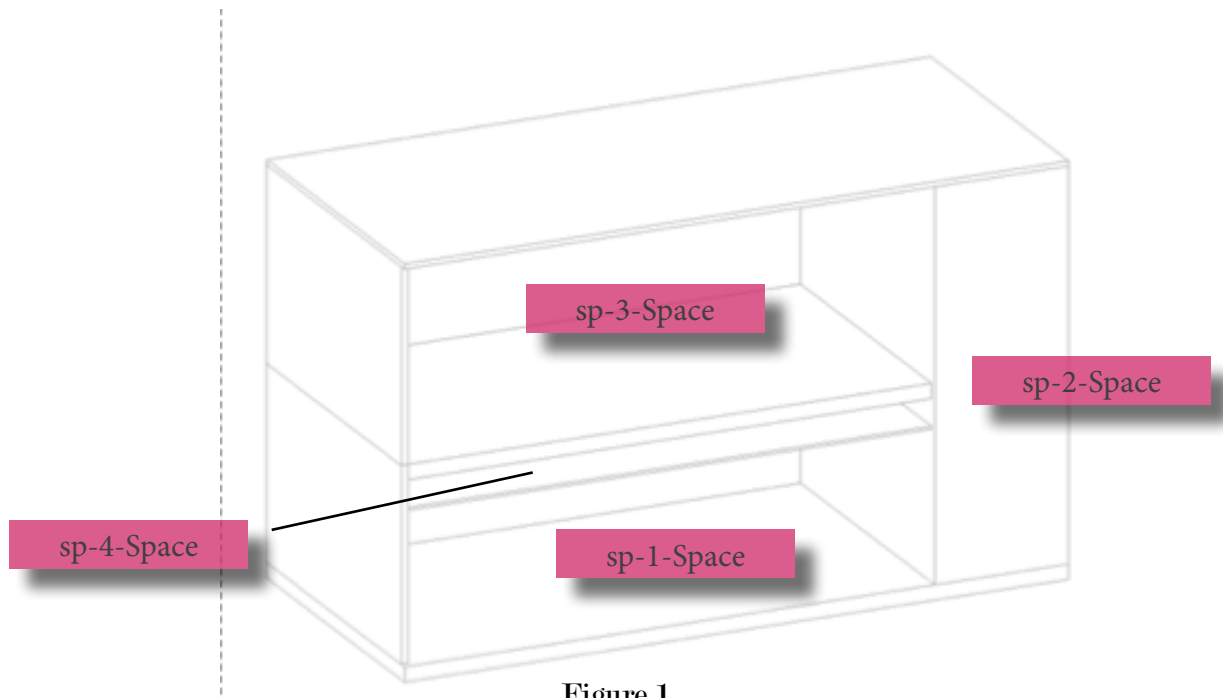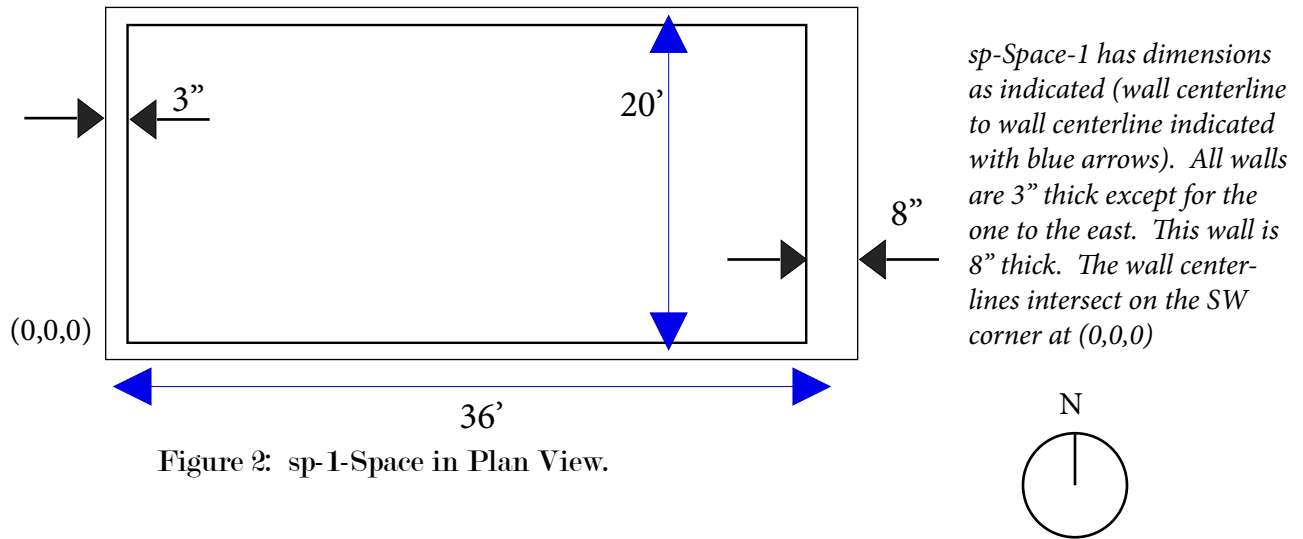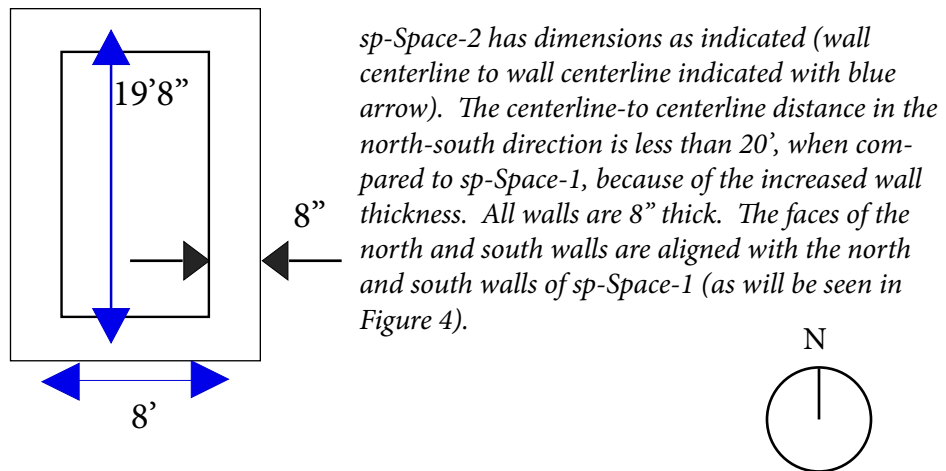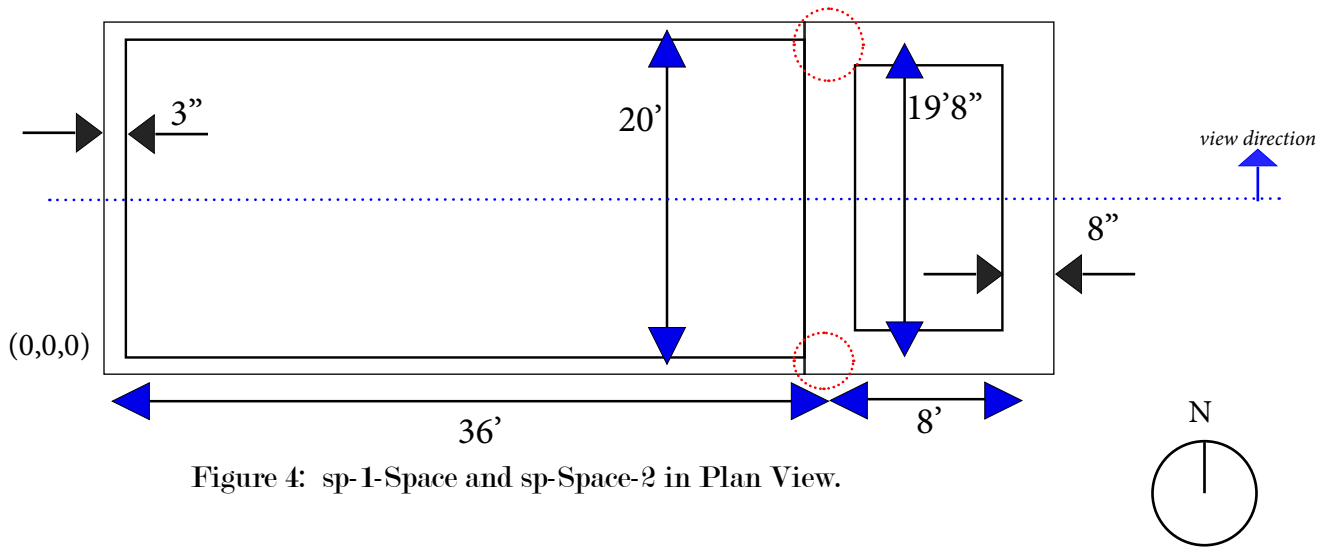
Test Case Spatial Configuration

Figure 1

sp-Space-1 has dimensions as indicated (wall centerline to wall centerline indicated with blue arrows). All walls are 3" thick except for the one to the east. This wall is 8" thick. The wall centerlines intersect on the SW corner at (0,0,0)

Figure 2: sp-1-Space in Plan View.

sp-Space 2 Drawing Instructions and Dimensions

sp-Space-2 has dimensions as indicated (wall centerline to wall centerline indicated with blue arrow). The centerline-to centerline distance in the north-south direction is less than 20', when compared to sp-Space-1, because of the increased wall thickness. All walls are 8" thick. The faces of the north and south walls are aligned with the north and south walls of sp-Space-1 (as will be seen in Figure 4).

Figure 3: sp-2-Space in Plan View.

**Figure 4: sp-1-Space and sp-Space-2 in Plan View.**

Referring to Figure 1, it should be clear how sp-Space-1 and sp-Space-2 relate to one another. sp-Space-3 and sp-Space-4 have identical dimensions to sp-Space-1 in plan view, but are in a different z-plane. Figure 5 below shows a section view of test case 1. The section plane is shown above as the blue dotted line in Figure 4.

Figure 5: section cut of Test Case 1
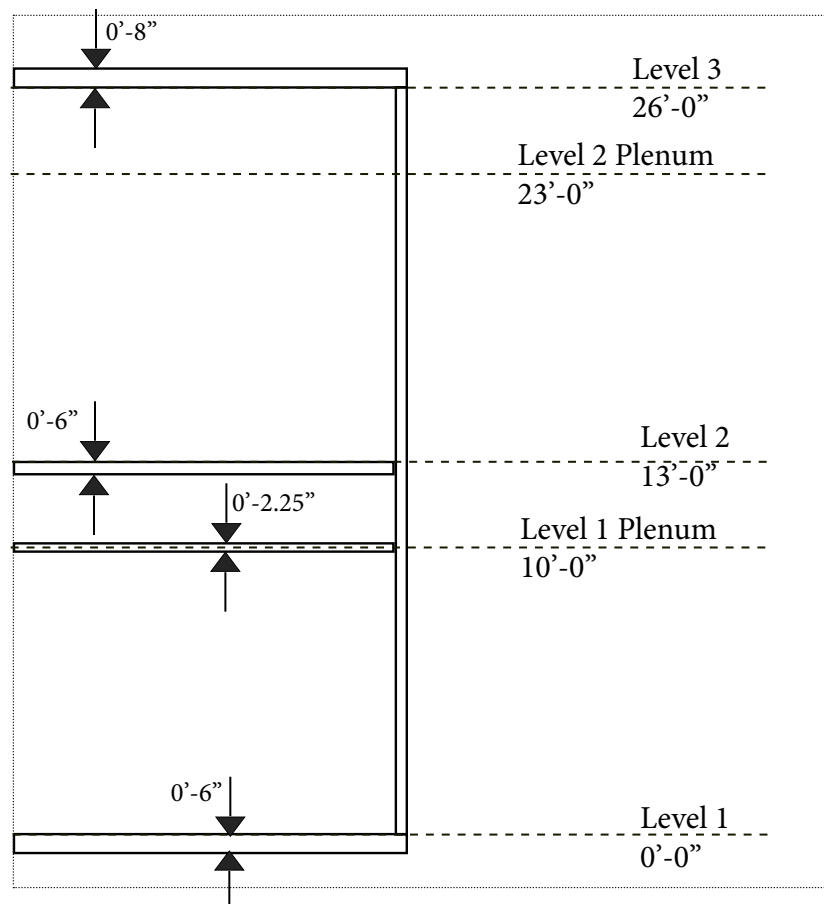
Test #1 Common Outcomes and Test Results

The most common occurrence in this test is the addition of extra sliver walls where the thin and thick walls. These intersections are indicated in red circles in Figure 4. These extra sliver wals help to enclose the spaces along the discontinuities that form where the centerlines for walls of different thicknesses are parallel but not coincident.

These extra sliver walls will be found during the gbXML validation and flagged in the output. While technically not a failure of the test overall, it is an indication of a problem, because these extra sliver walls are not the intention of the building creator, as these sliver walls are almost always removed or, in some other way, corrected by the end user. These sliver walls should not be present in the model.

Typical validator output when wall slivers are present:

1. *The Surface Count Test will show that the number of surfaces in the test file and the standard file do not match.*
2. *The Exterior Wall Surface Count Test or the Interior Wall Surface Count Test will show that the number of surfaces do not match.*

The second most common occurrence in the incorrect treatment of slab and roof thicknesses in the gbXML output. Slab thicknesses receive different treatment than wall thicknesses in gbXML. See the gbXML Implementation Agreement document for more information on how location of the slab and wall thicknesses affect the gbXML PolyLoop descriptions.

Typical validator output in this case:

1. *The Space Volumes Tests will not pass.*
2. *The Detailed Surface Checks will fail when trying to locate identical walls floors, and roofs. There will likely be multiple failures here.*