

Exercise duration: ~20 minutes

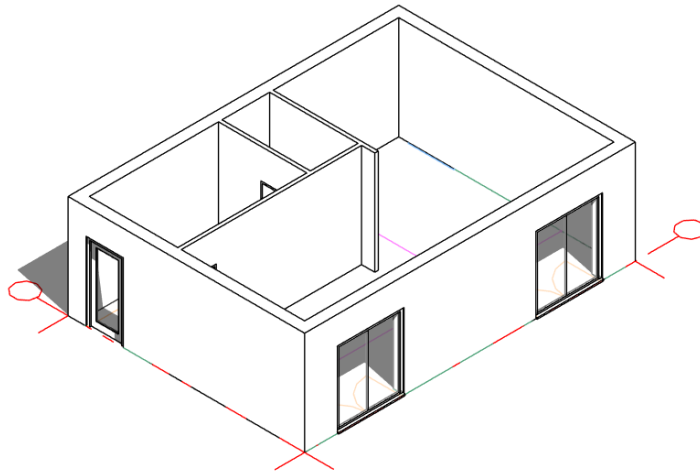
## Practice exercise

### Convert a 2D drawing into a 3D model

Link an AutoCAD drawing file into a Revit project and then convert the 2D lines to 3D walls and place doors into the project model.

#### Learning objectives:

- Link files into a Revit project.
- Create walls using the automated wall tools.
- Add doors to a Revit project model.
- Use 3D and other views to visualize a 3D project model.



*The completed exercise*

1. In Revit, open the provided dataset file, **Grids dataset.rvt**.

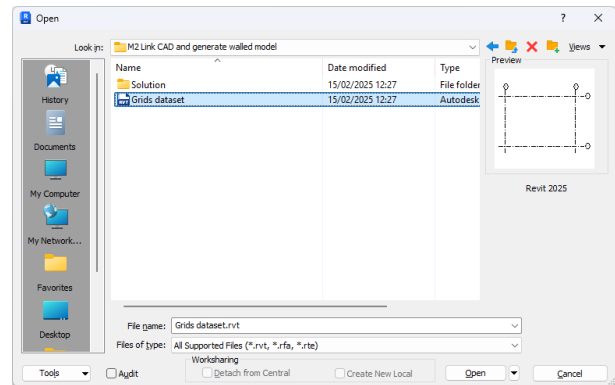


Figure 1. Downloaded dataset files.

2. In the Project Browser, open the Base Level Floor Plan View.

The Base level Floor plan view opens and you should see the four grids that can be used to ensure your project is created in the correct location.

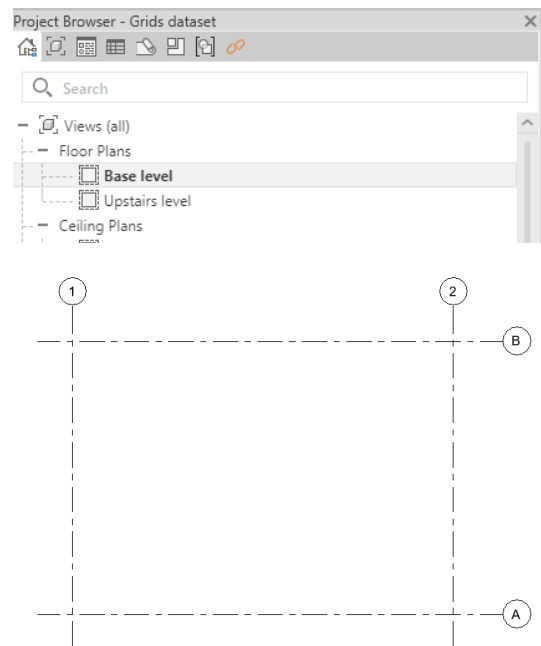


Figure 2. The Base level floor plan.

3. Link the provided DWG file, **Floor Plan - Base level Walls.dwg**, into this project.

Set the positioning to Auto – Center to Center and click Open to link the DWG file into the project.

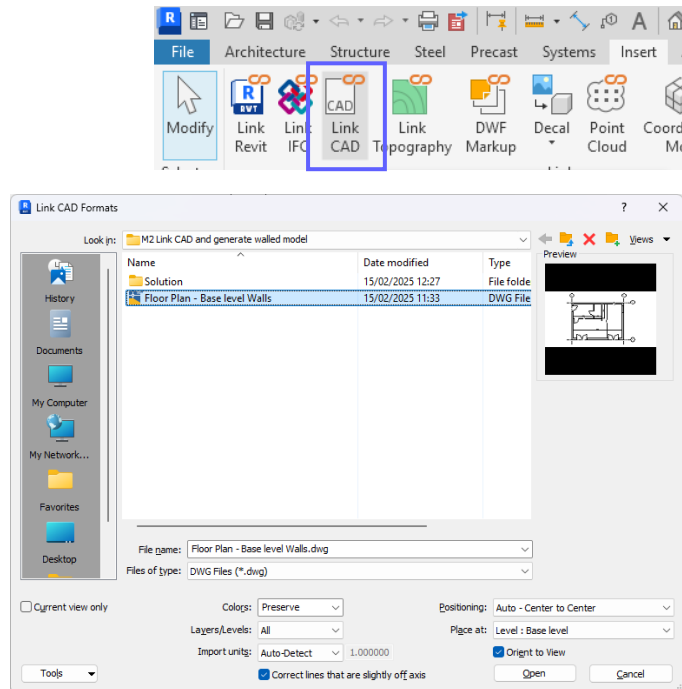


Figure 3. Linking the CAD file from the Insert tab.

4. You will create the exterior wall first.

Create a wall by clicking the Wall tool.

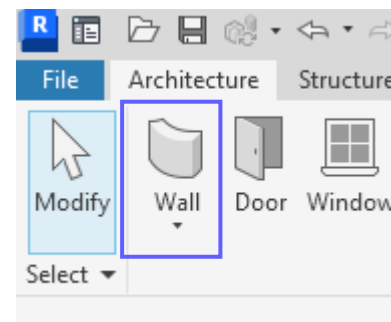


Figure 4. Architecture tab > Wall.

5. Select Pick Lines in the Draw panel and then in the Draw window, hover the cursor near the 2D line.

Revit displays a dotted reference line in the center of the line (indicated by the arrow on the right in Figure 5a), which is where the wall will be created. Figure 5b shows the dotted line in the incorrect position.

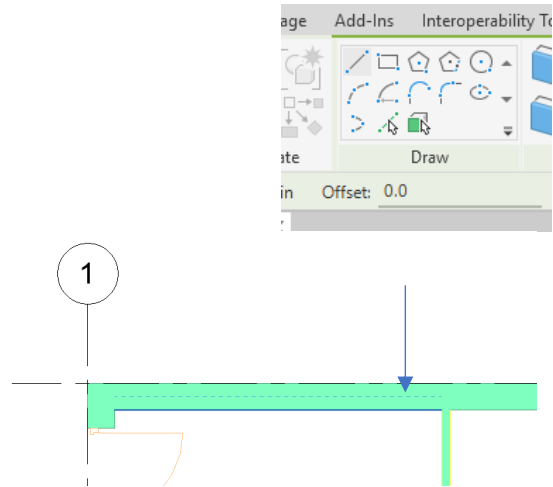


Figure 5a. Reference line in the correct position.

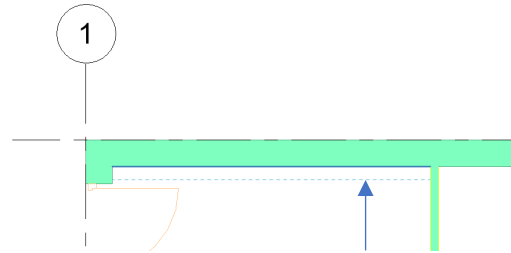


Figure 5b. Reference line shown in the wrong position.

6. When the reference line is in the position as shown in figure 5a, click the left mouse button to create the wall.

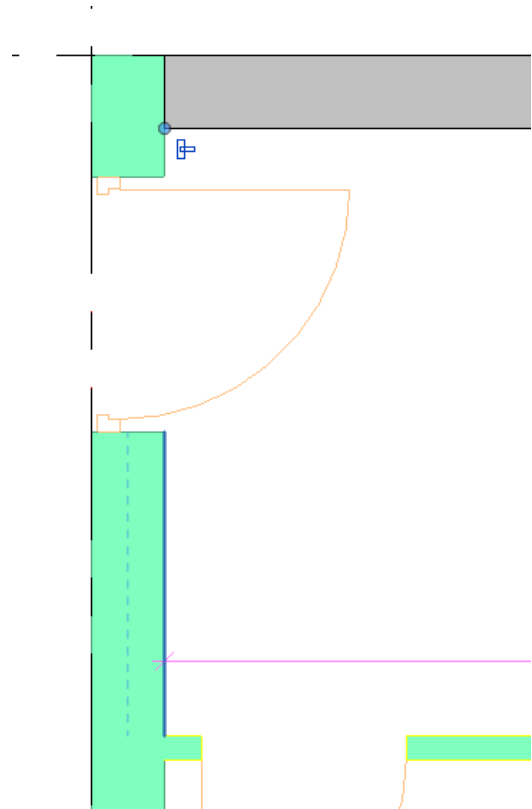


Figure 6. West wall reference line indicating wall location.

7. Repeat this process to create the exterior wall on the East side.  
Again, ensure the reference line is as shown before clicking the left mouse button to create the wall.

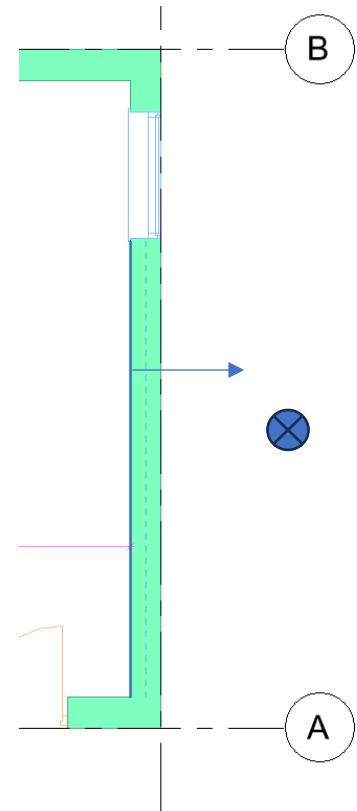


Figure 7. East wall reference line indicating wall location.

8. Repeat this process to create the exterior wall on the South side.  
Again, ensure the reference line is as shown before clicking the left mouse button to create the wall.

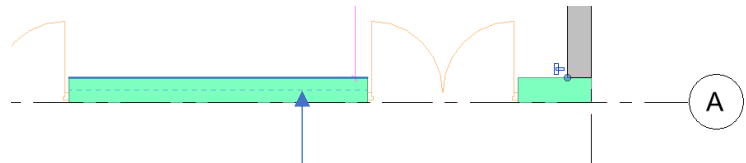


Figure 8. South wall reference line indicating wall location.

9. Repeat this process to create the exterior wall on the West side.  
You should now have 4 exterior walls that need joining.

**Tip:** When finished with a tool, it is good practice to press Escape twice to end the command.

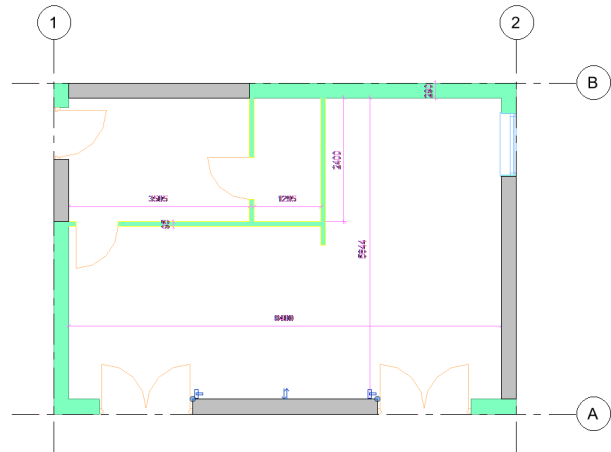


Figure 1. All 4 walls created, however they need length adjusted.

10. Click to select the West exterior wall.  
Blue circles (indicated in the image) represent the wall ends.

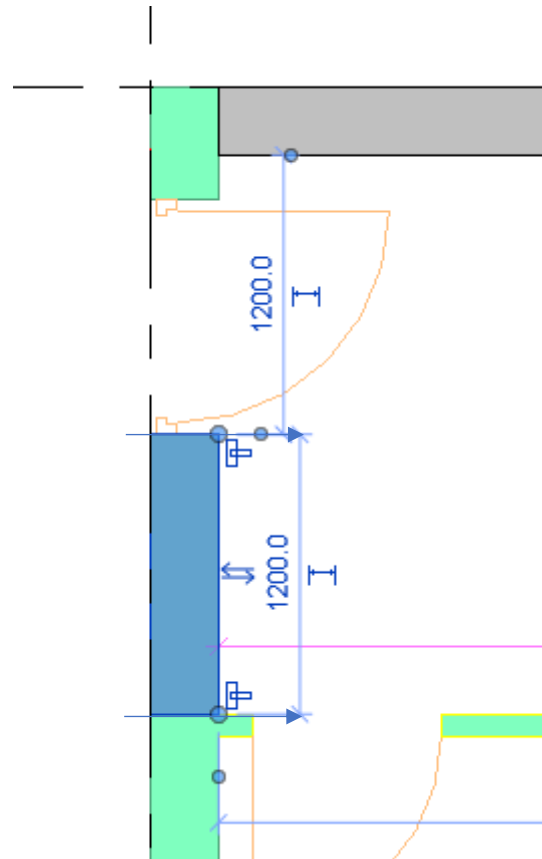


Figure 10. When a wall is selected, wall ends are highlighted by blue circles.

11. Click and hold the left mouse button on the Wall End as indicated.

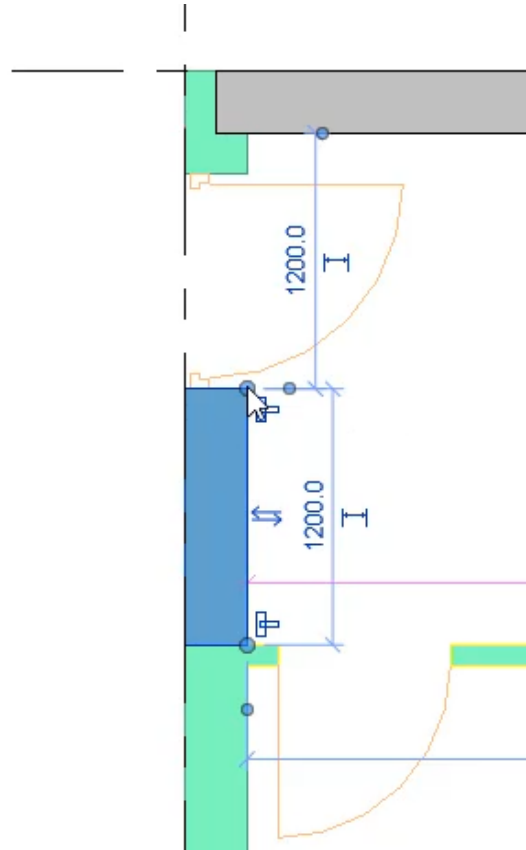


Figure 11. Using your cursor, you can drag Wall Ends to edit the wall length.

12. Drag your cursor up to reposition it. You will see a constraint appear, Vertical and Nearest.

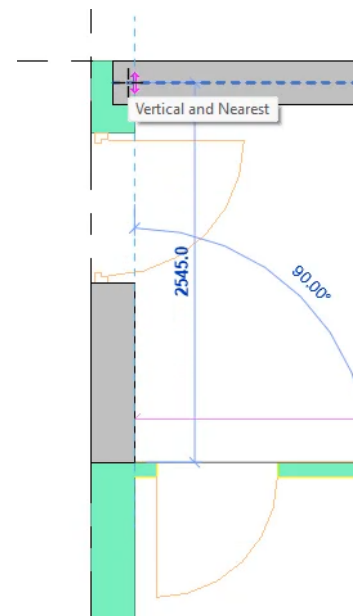


Figure 12. Constraints lock the wall end, such as keeping it vertical.



13. When you see this constraint, release the wall end to reposition the wall end here. Ignore the door symbol for now.

**Note:** In a floor plan, this is how it should be shown, however in a 3D model, the wall will not stop at a door.

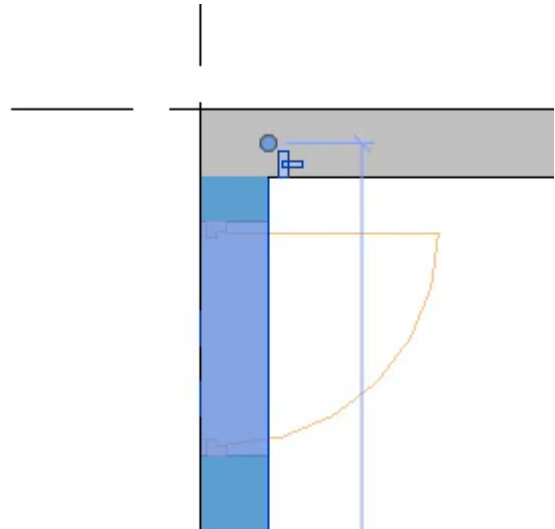


Figure 13. When released, the wall will be the new length.

14. Repeat the process at the other end of the wall. Click and hold the left mouse button to drag the wall end.

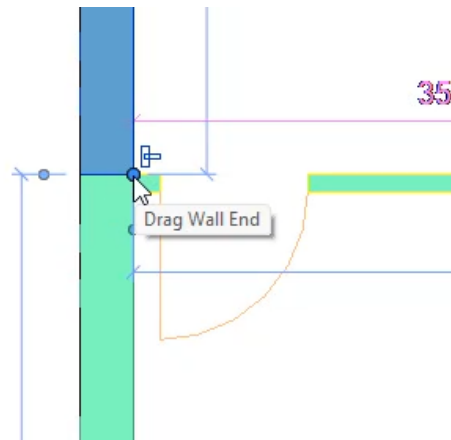


Figure 14. Drag Wall End.

15. Drag the wall end to the linked 2D line as shown. A perpendicular constraint appears. Release the mouse button to complete the edit of the wall ends. The wall is now the correct length.

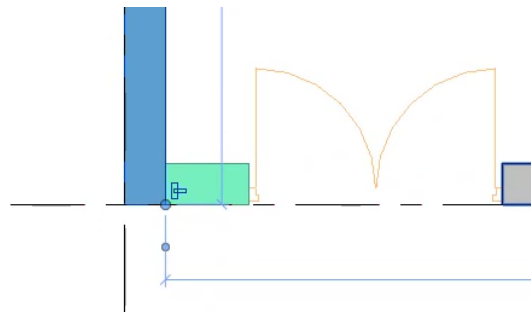


Figure 15. Perpendicular constraint.

16. Repeat the process for the exterior South wall.

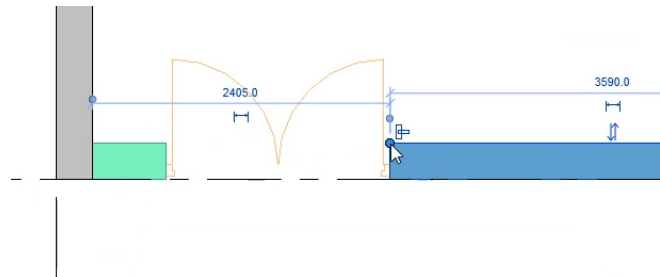


Figure 16. Repeat drag wall End for all walls.

17. Drag the wall end until it meets the West wall.

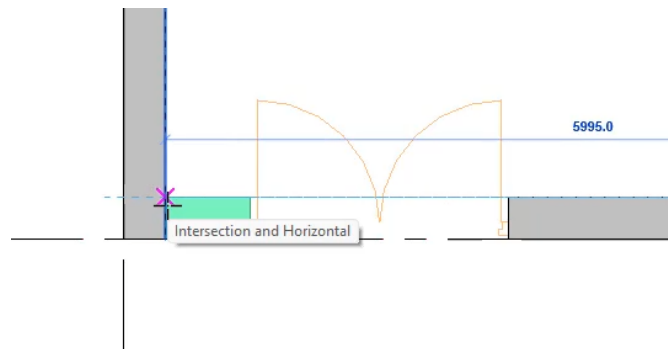


Figure 17. Drag Wall End to meet the West wall.

18. Drag the other end.

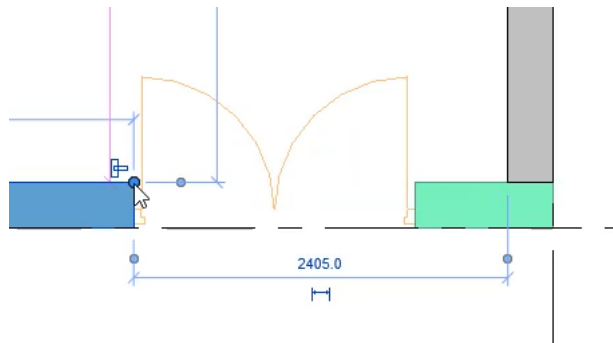


Figure 18. Drag Wall End to lengthen walls.

19. Release the mouse when the constraint appears as shown. This is an endpoint constraint and indicates the endpoint of the East wall.

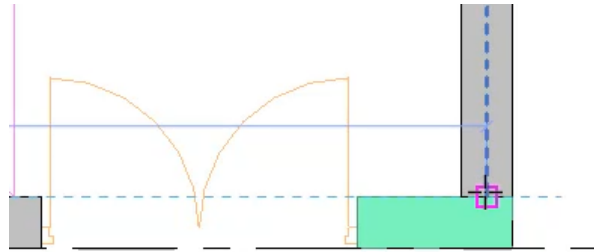


Figure 19. The square symbol indicated an End Point snap.

20. Repeat the process for the other end of the East wall. Drag the wall end upwards.

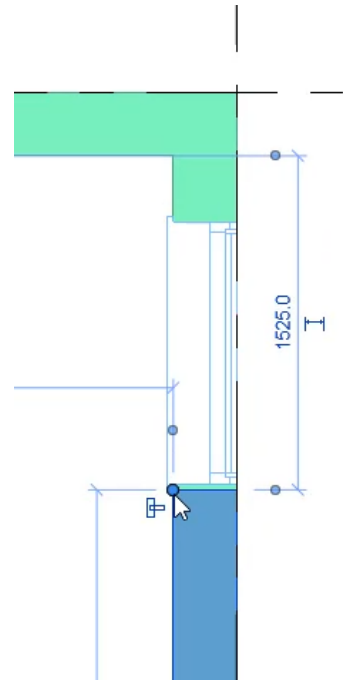


Figure 20. Repeat drag wall End for all walls.

21. As there is no wall to the North, drag it until it touches the 2D exterior wall line.

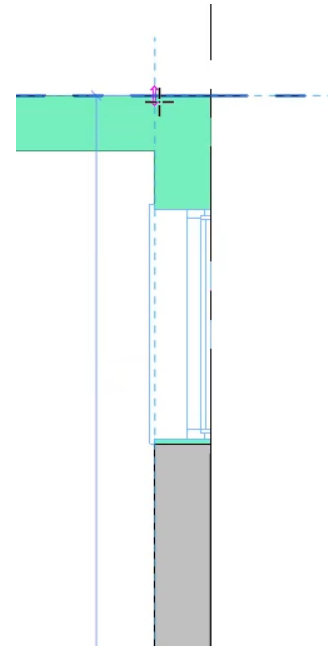


Figure 21. Repeat drag wall End for all walls.

22. Repeat the process for the North wall. Drag the Wall end.

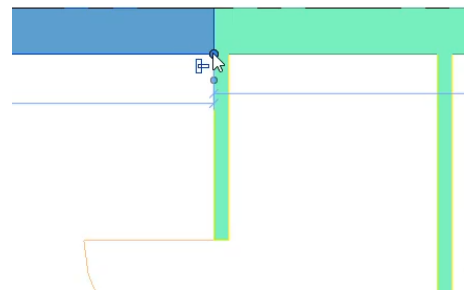


Figure 22. Repeat drag wall End for all walls.

23. Drag it to the East wall until the constraint is shown and release the mouse to complete the 4 exterior walls.

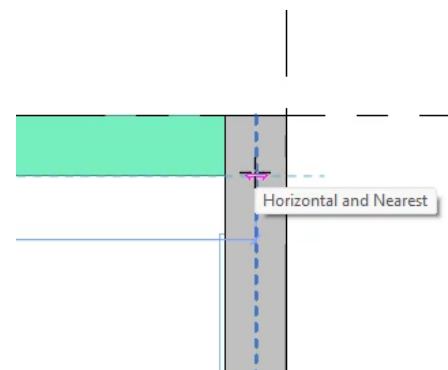


Figure 23. Repeat drag wall End for all walls.

24. Now you'll create the interior walls.

Create a new wall and then click the Type Selector as indicated.

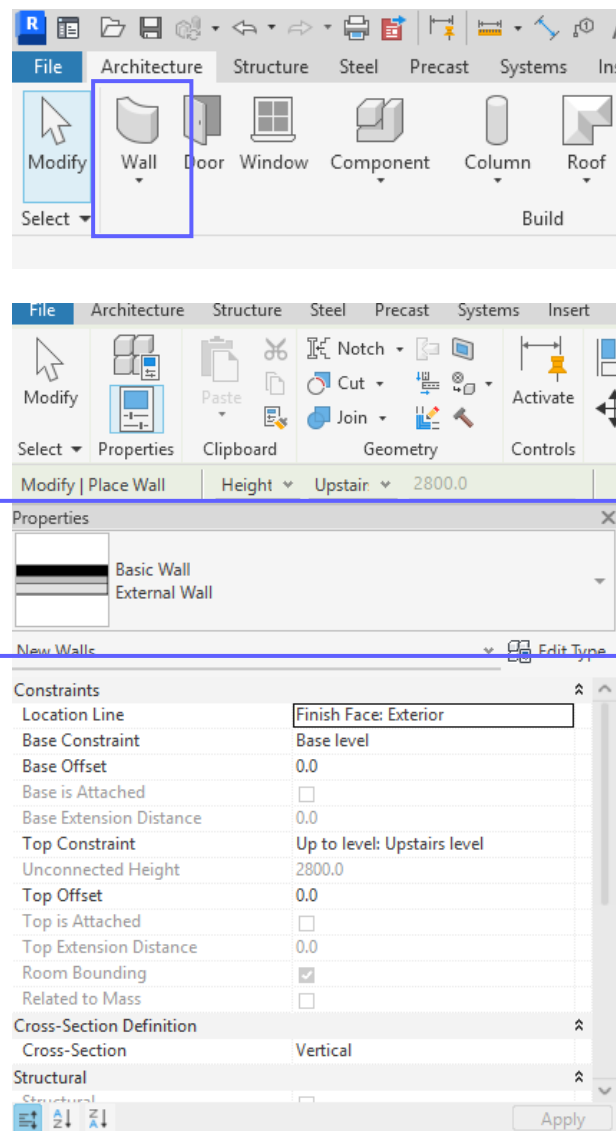


Figure 24. The Type Selector displays the current type of Wall selected.

25. Select the Internal wall type.

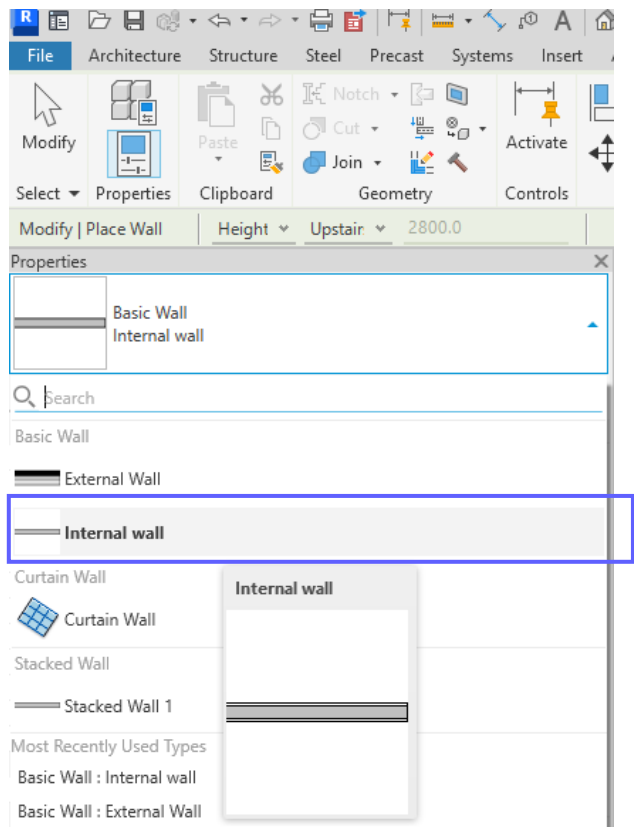


Figure 25. Clicking a new type, results in a new type of wall being created.

26. In the Draw panel, click Pick Lines.

Hover the cursor over the 2D line as indicated by the dotted line in the center of the line.

Again, ensure the reference line is as shown.

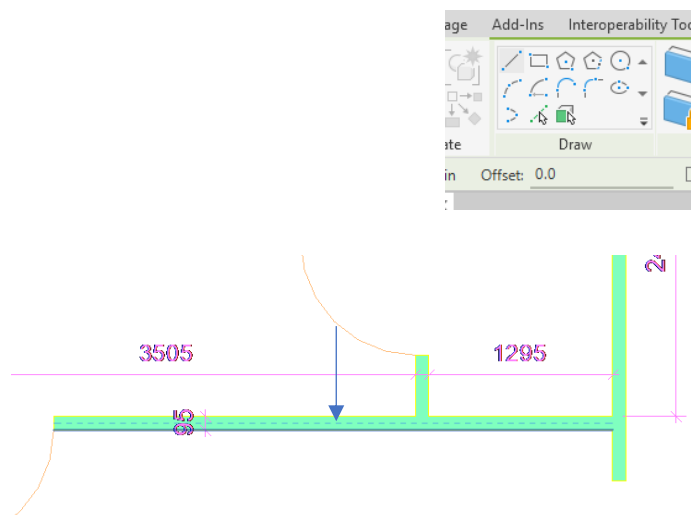


Figure 26. Reference line indicates the position of the wall if created.

27. Click to create the internal wall.

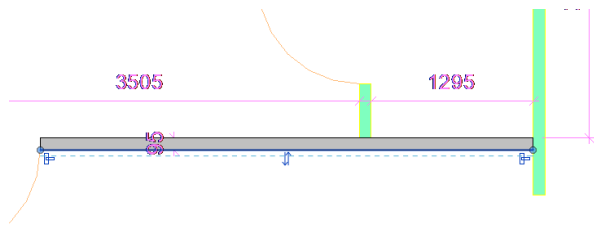


Figure 27. Internal wall created.

28. Repeat the process to create the internal wall as shown.

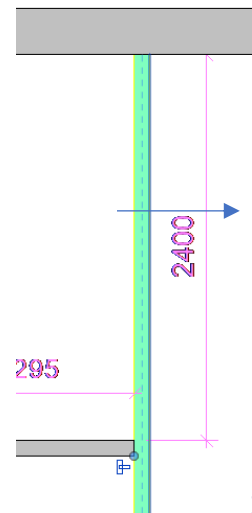


Figure 28. Reference line indicates the position of the wall if created.

29. Click to create the wall.

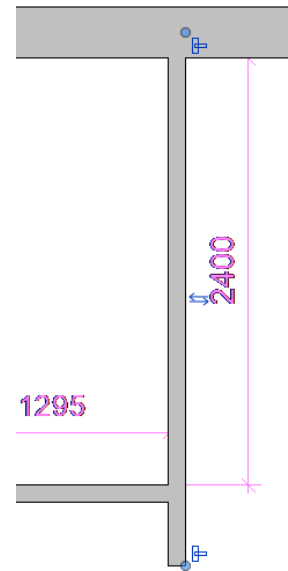


Figure 29. Internal wall created.

30. Create the final interior wall by hovering your mouse over the 2D line as shown.

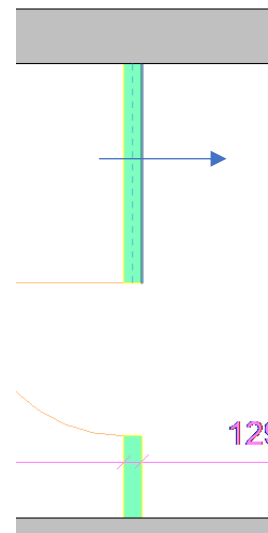


Figure 30. Reference line indicates the position of the wall if created.



31. Click to create the wall.

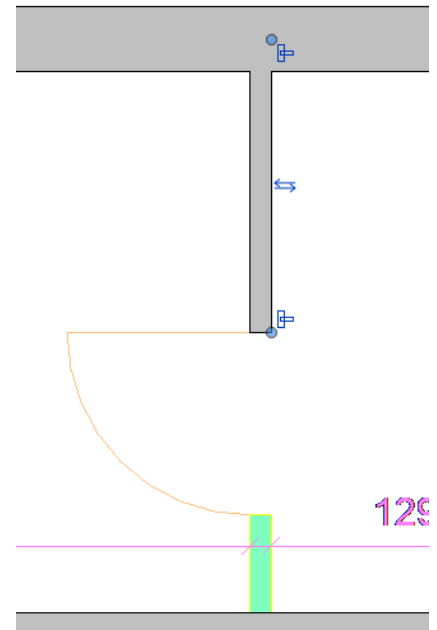


Figure 31. Internal wall created.

32. Drag the wall end.

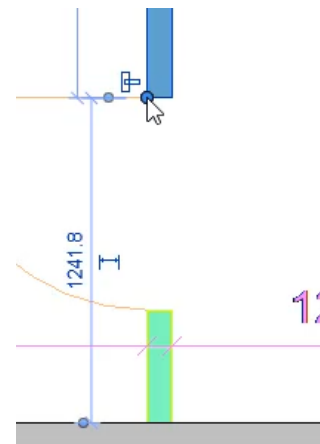


Figure 32. Drag Wall End to correct wall length.

33. Drag the wall end to the wall directly below it on the plan as shown.

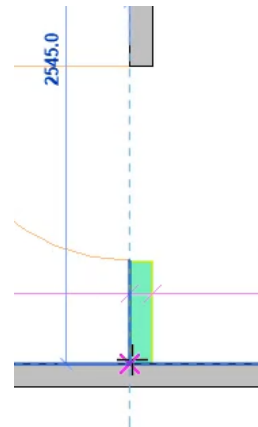


Figure 33. Drag Wall End to correct wall length.

34. In the Project Browser, double click to activate the 3D view.

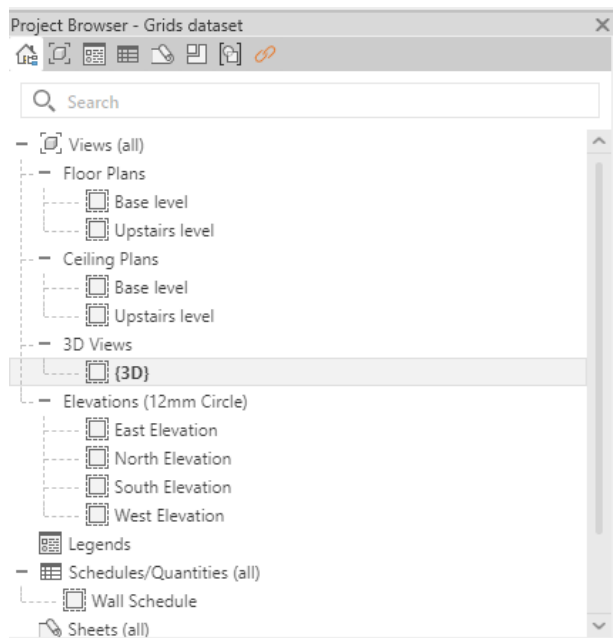


Figure 34. Project Browser.

35. Drag the ViewCube to orbit the 3D wall model.

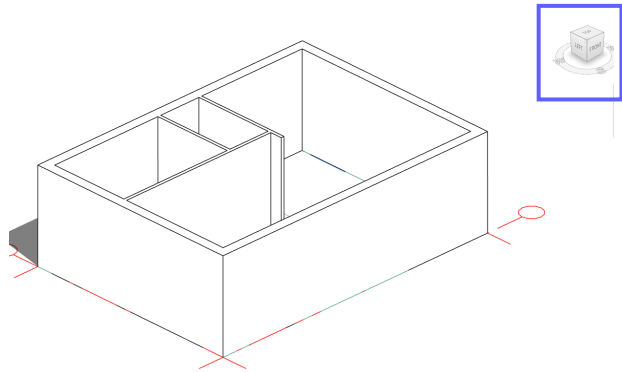


Figure 35. ViewCube in 3D view.

36. Now you'll create the doors.

Modeling and creation of doors should be done in a plan view so go ahead and activate the Base level Floor Plan view.

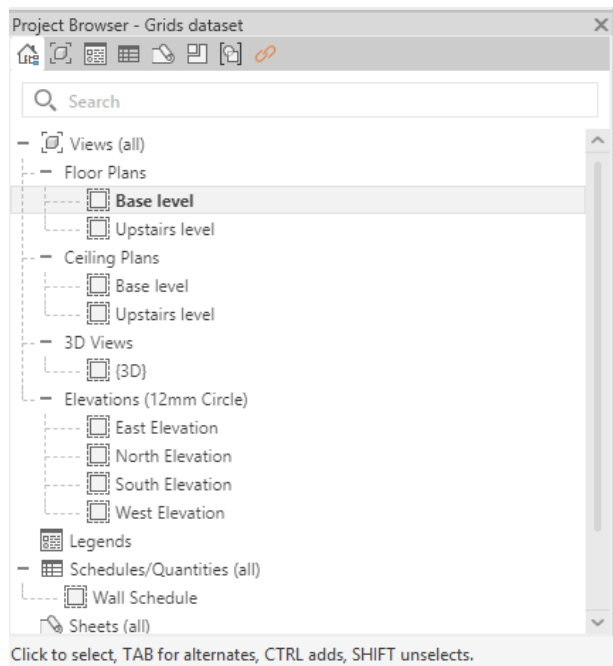


Figure 36. Project Browser.

**37. Create a door.**

In the Type Selector, ensure that Type 42 is selected and active.

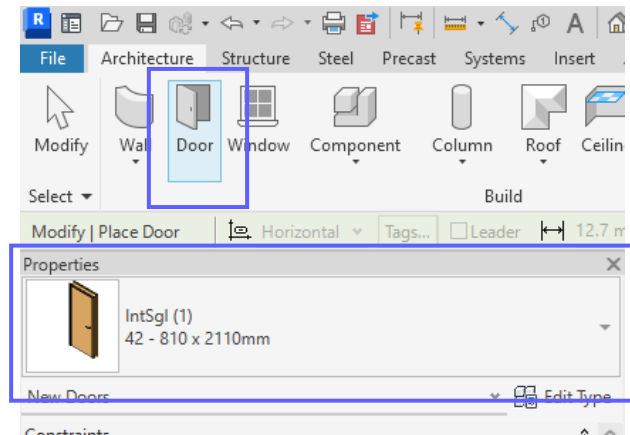



Figure 37. Selecting the Type 42 door.

- 38.** Hover your cursor over the 2D symbol of a door in the drawing window.  
Moving your cursor to  results in the door opening in the direction shown.

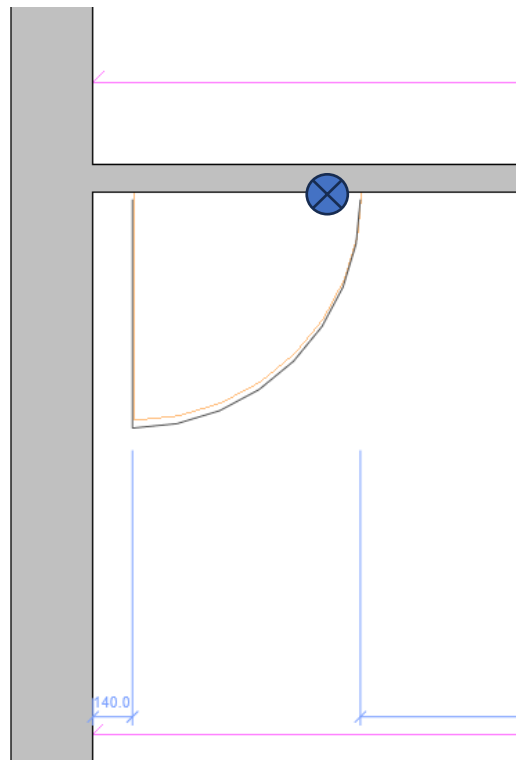



Figure 38. Position of door is indicated by a reference.

39. Moving your cursor to  results in it opening in a different direction. You can also press the Spacebar to flip the door swing.

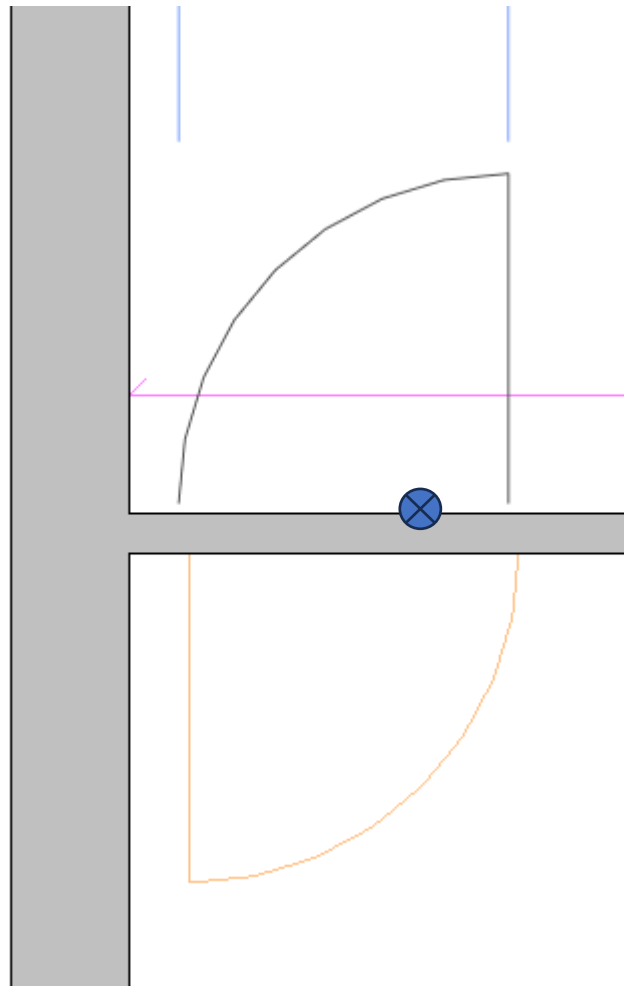


Figure 39. Wall face dictates the opening direction of the door.

- 40.** When in the correct place and direction, click the left mouse button to place the door.
- Note how when created, the door cuts the wall similar to the AutoCAD 2D view.

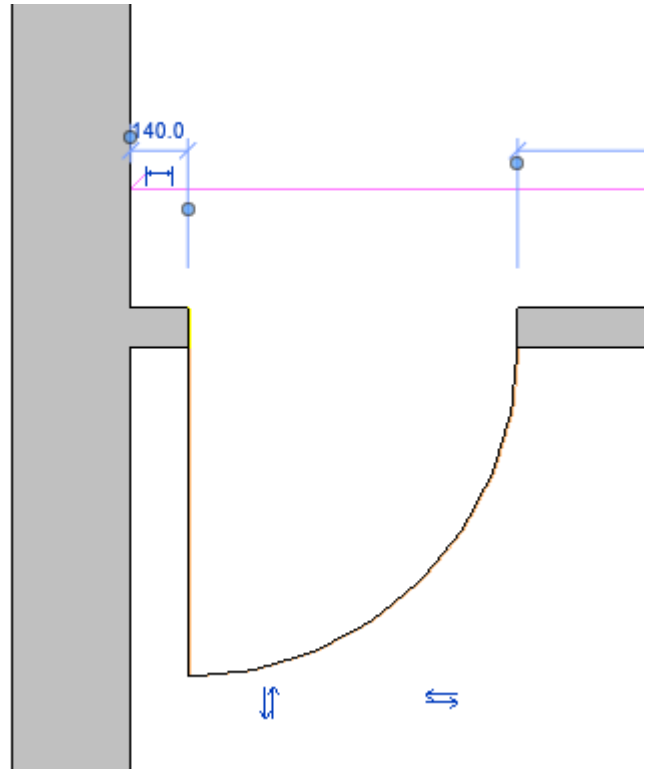


Figure 40. Door created.

- 41.** The Door command remains active so there is no need to reactivate it (unless you press Esc twice). To create another door, move the cursor to another door location.

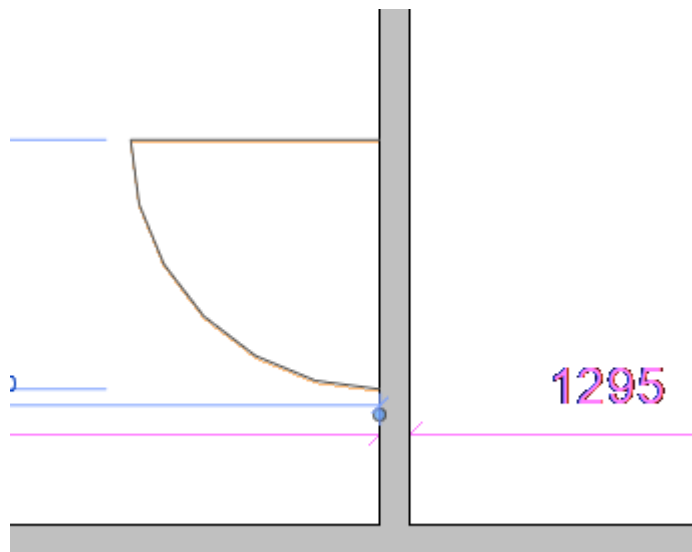


Figure 41. Door position indicated by the reference door.

42. When in the correct location and direction, click the left mouse button to create the door.

**Note:** When created, a door's "facing" and "hand" can be changed by clicking on the arrows.

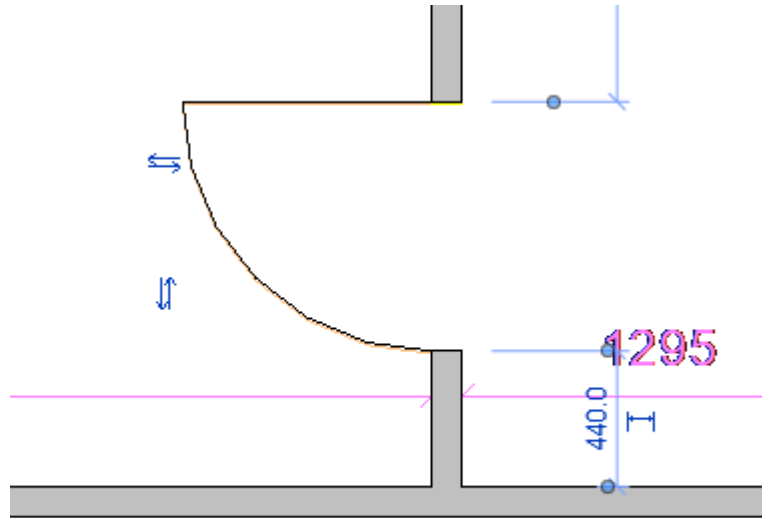


Figure 42. Door created.

43. Click the Type Selector to see all of the doors loaded into the project.

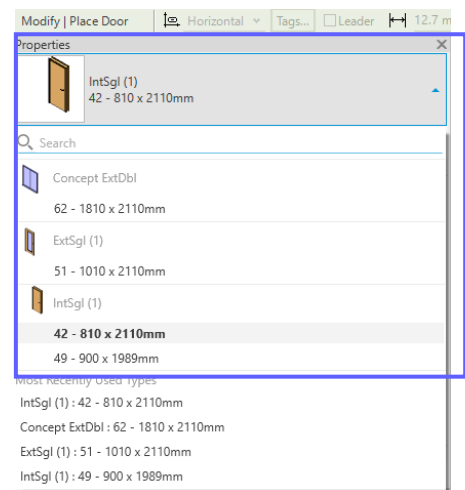


Figure 43. Door Type Selector.

44. Select the door type 51.  
Repeat the process in steps 39-41 to create the door.

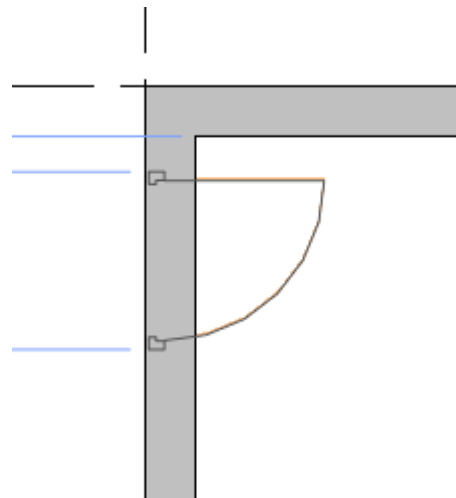
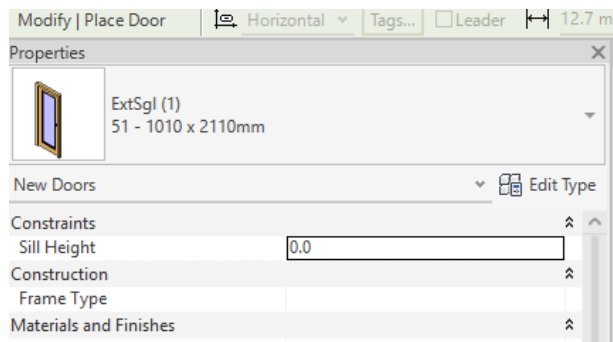
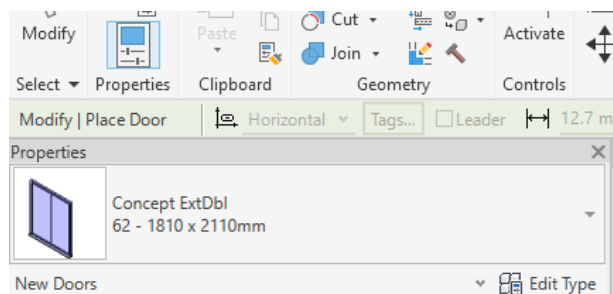


Figure 44. Create a door Type 51.

45. From the Type Selector, select type 62 and repeat the process to create the door.





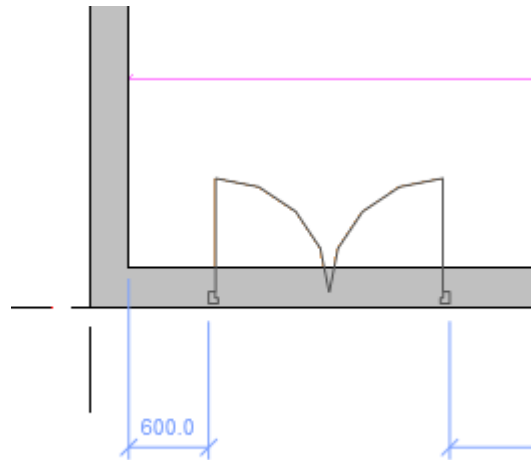


Figure 45. Create a door Type 62.

**46.** The floor plan view should now look like Figure 46.

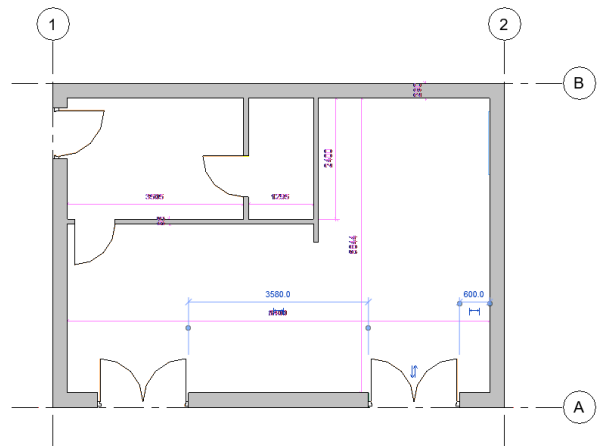


Figure 46. Completed model in Floor Plan view.

**47.** Activate the 3D view.

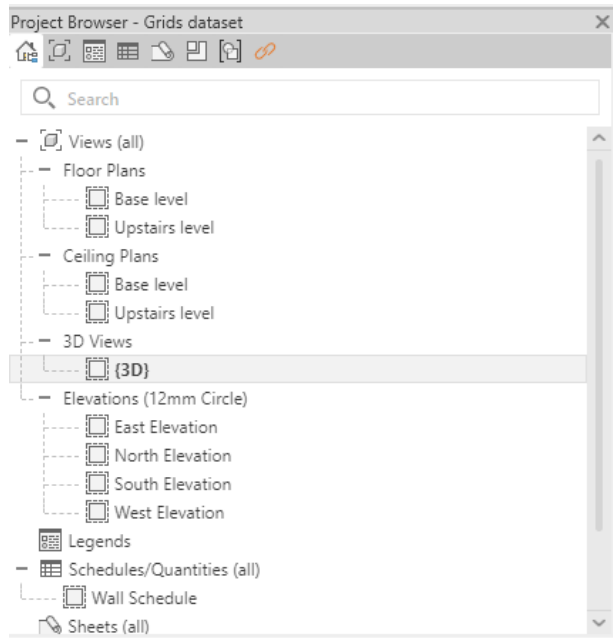


Figure 47. Project Browser.

**48.** Use the ViewCube to investigate the 3D model containing walls and doors.

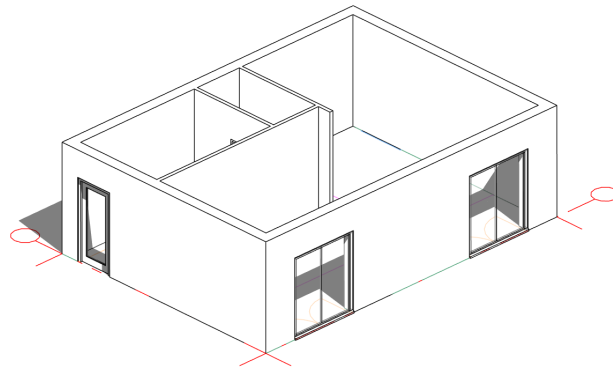


Figure 48. Completed 3D model.