

4 - Adding Doors and Windows

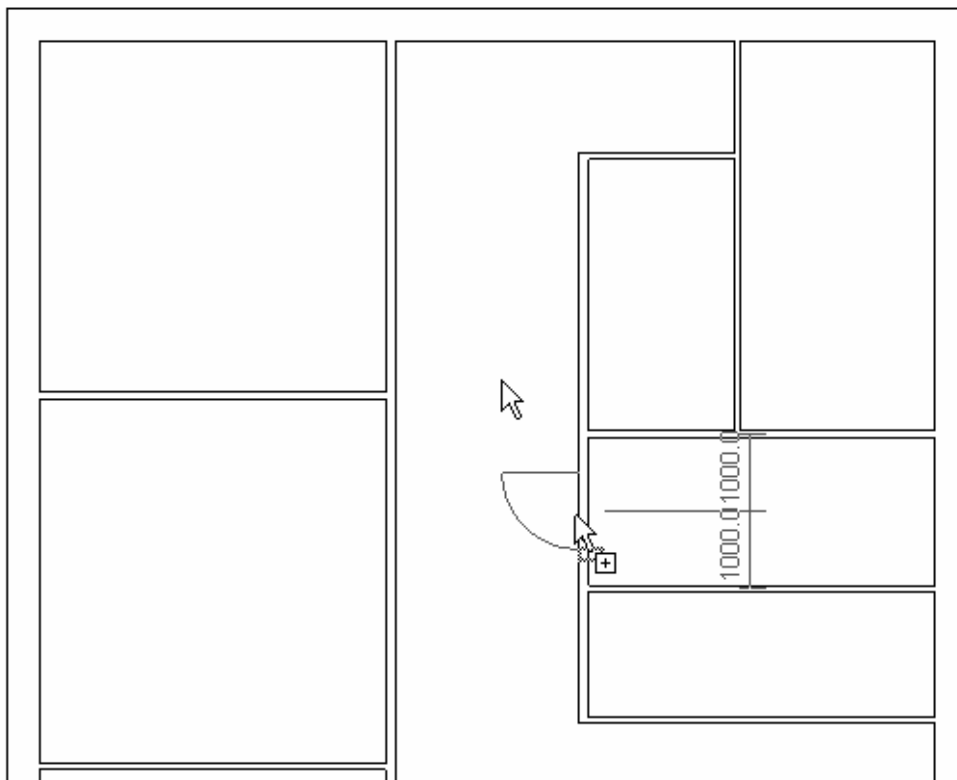
In this exercise, you add doors and windows to the building model. You begin by adding single flush doors. Next, you load multiple new door types and add them to the building model. You then add windows and use the mirror and array tools to save time and ensure consistency. In the final section of the exercise, you use the Paste Aligned tool to copy the window layout to each floor.

This exercise requires the completion of the previous three exercises in this tutorial. You must use the project you saved at the end of the last exercise.

Add single flush doors to the building model

1. On the Basics tab of the Design Bar, click Door.
2. In the Type Selector, select UK_Single-Flush: SO 1010x2410.
3. In the north side of the building model, place the cursor over the right corridor for the room shown in the following illustration.

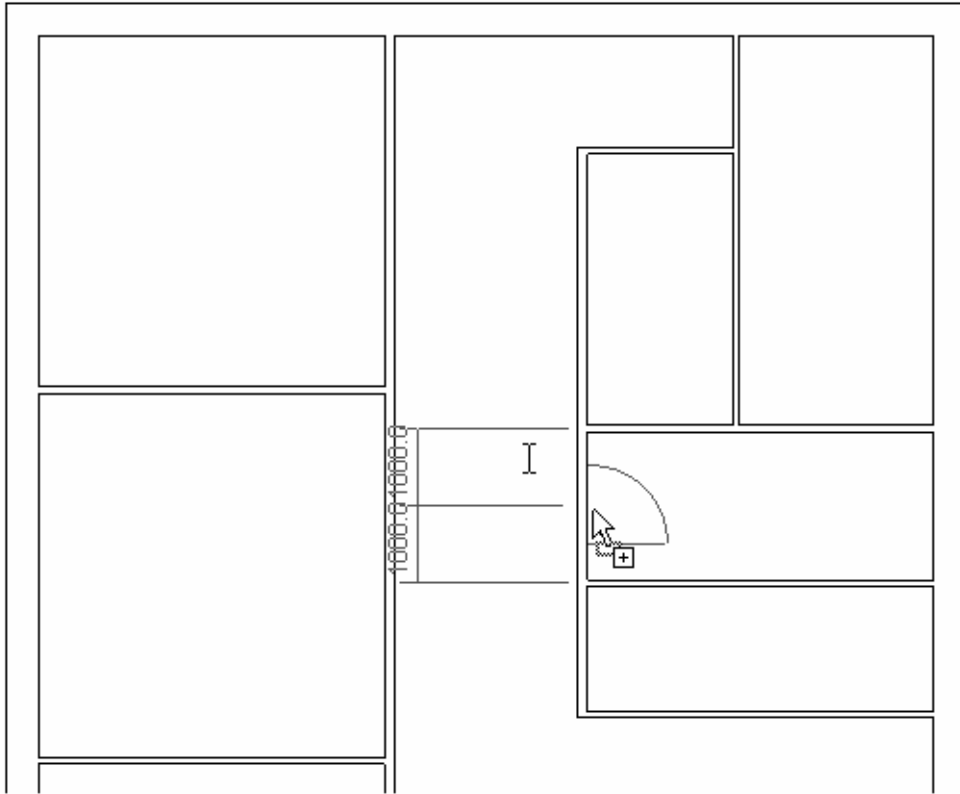
A door symbol displays when the cursor is over the wall. This is the mechanical room. Do not click.



Doors are wall-hosted families and can only be added to a wall. In addition, the door resides on a level line. You can offset the door from the level; however, doors snap automatically to the closest available level. This is most evident when you add a door in an elevation or 3D view.

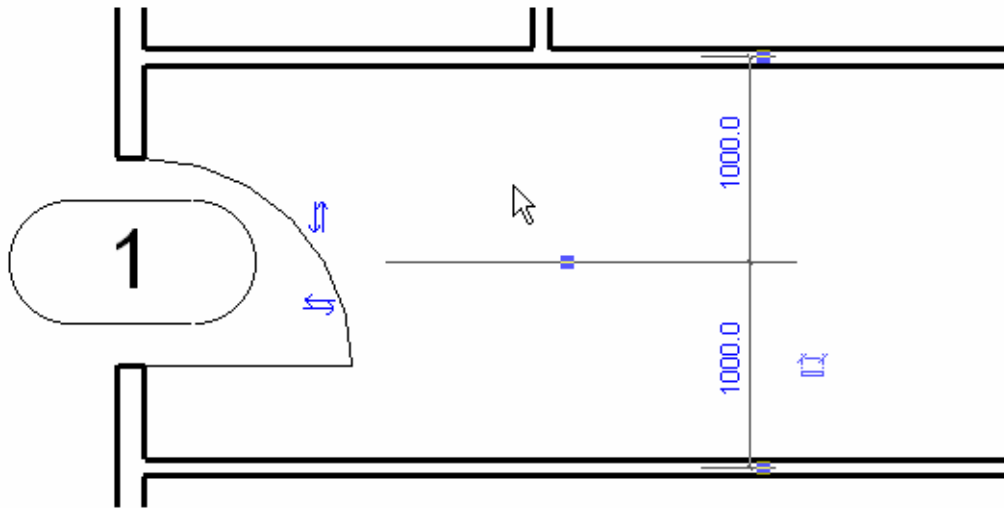
When you add a door, the initial opening direction is based on the wall face from which the cursor approaches. Regardless of the initial placement, you can flip the door opening immediately after placing it.

4. Approach the same location on the corridor wall, but move the cursor just inside the room.



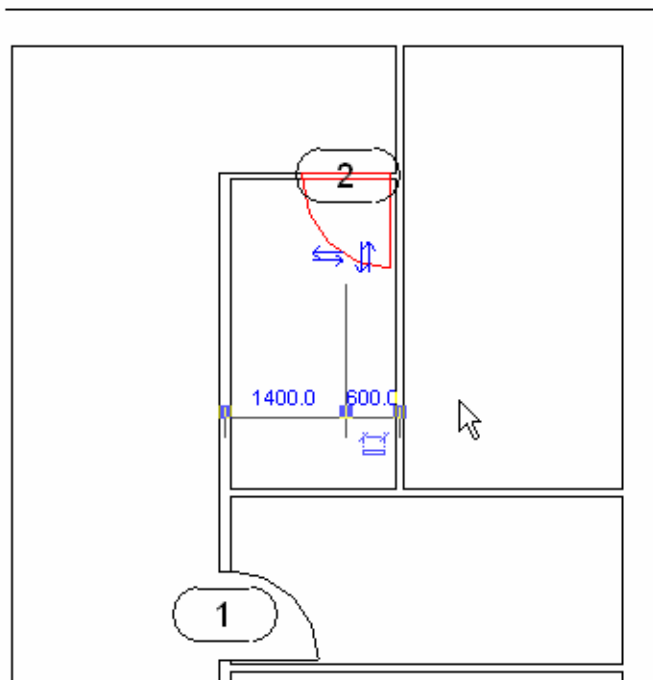
5. Click to add the door so that the opening is inside the room. Do not be concerned with exact placement.

6. Notice the control arrows that control the opening and hand of the door. Click each control to familiarize yourself with how the door controls work. When you are finished, return the door to the position shown in the following illustration. The dimensions are not important.

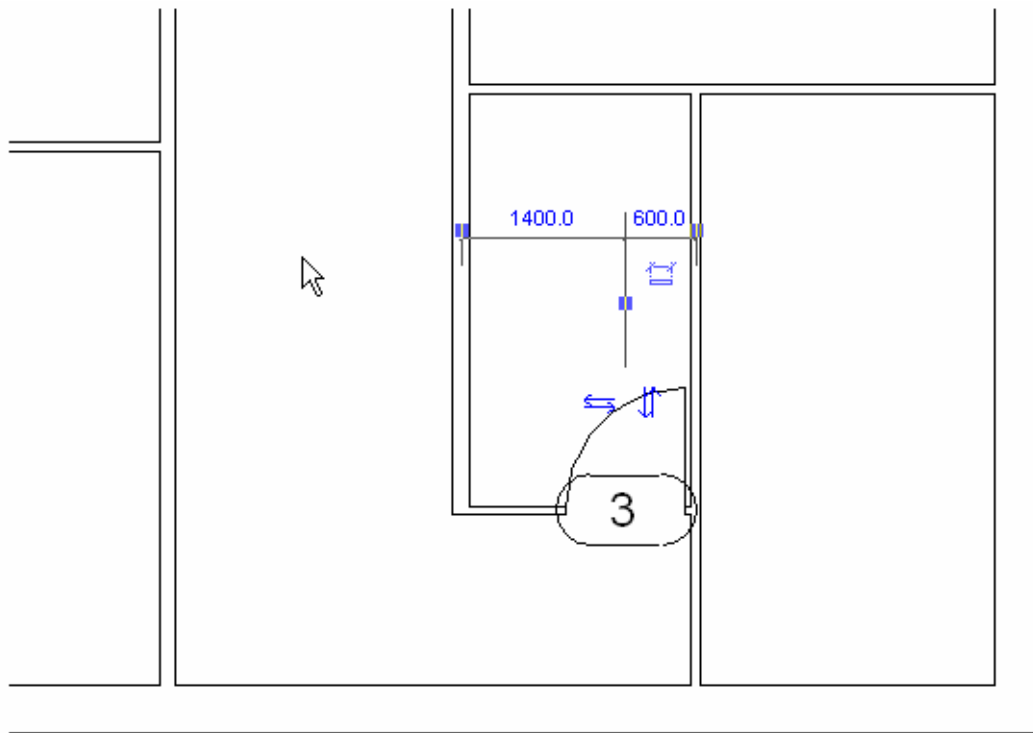


7. Click the temporary dimension value between the door centreline and the lower wall, enter 600 mm, and press ENTER.

8. Add another door of the same type to the small room above the current room. After you add door #2, flip it and specify the temporary dimensions as shown.



9. Zoom in to the bottom right corner of the building model and add a door of the same type to the room. Flip the door and specify the temporary dimensions as shown.



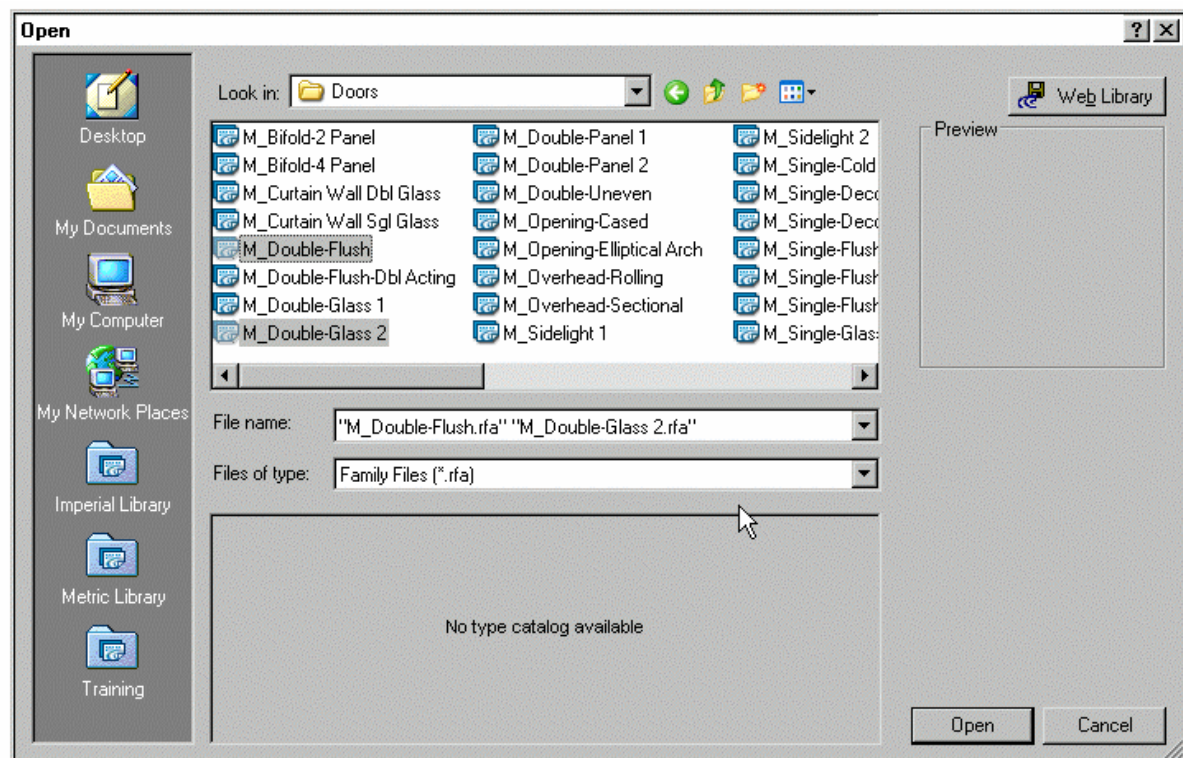
10. On the Basics tab of the Design Bar, click Modify.

Load and apply new door types

11. On the Basics tab of the Design Bar, click Door.
12. On the Options Bar, click Load.
13. In the left pane of the Open dialog box, click Metric Library.
14. Double-click Doors.
15. Select *M_Double-Glass 2*.

Notice that a preview image of the door is displayed in the upper right corner of the dialog box.

16. Press and hold CTRL, and select *M_Double-Flush*.



You can load multiple families at the same time. When more than one family is selected, a preview image does not display.

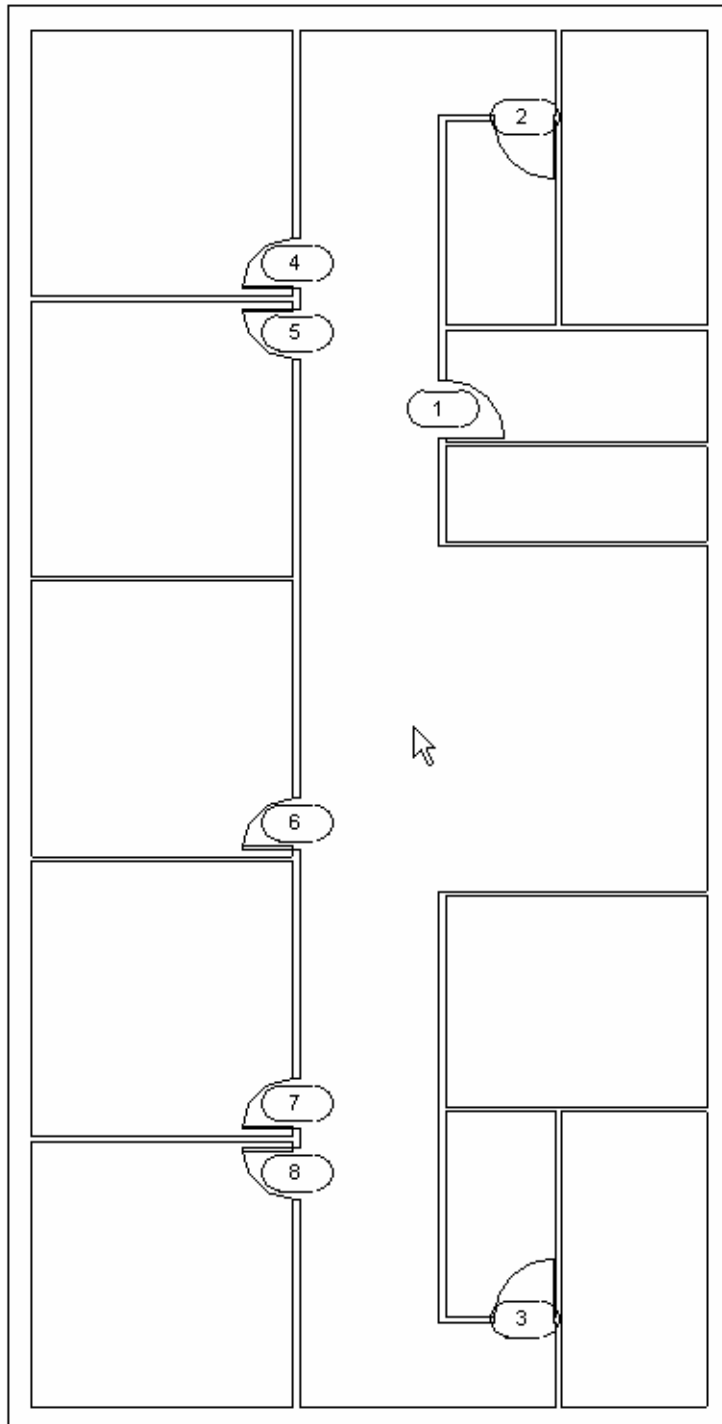
17. Press and hold CTRL, and select *M_Single-Flush Vision*.

18. Click Open to load all three door families into the project.

These door families are now available in the Type Selector.

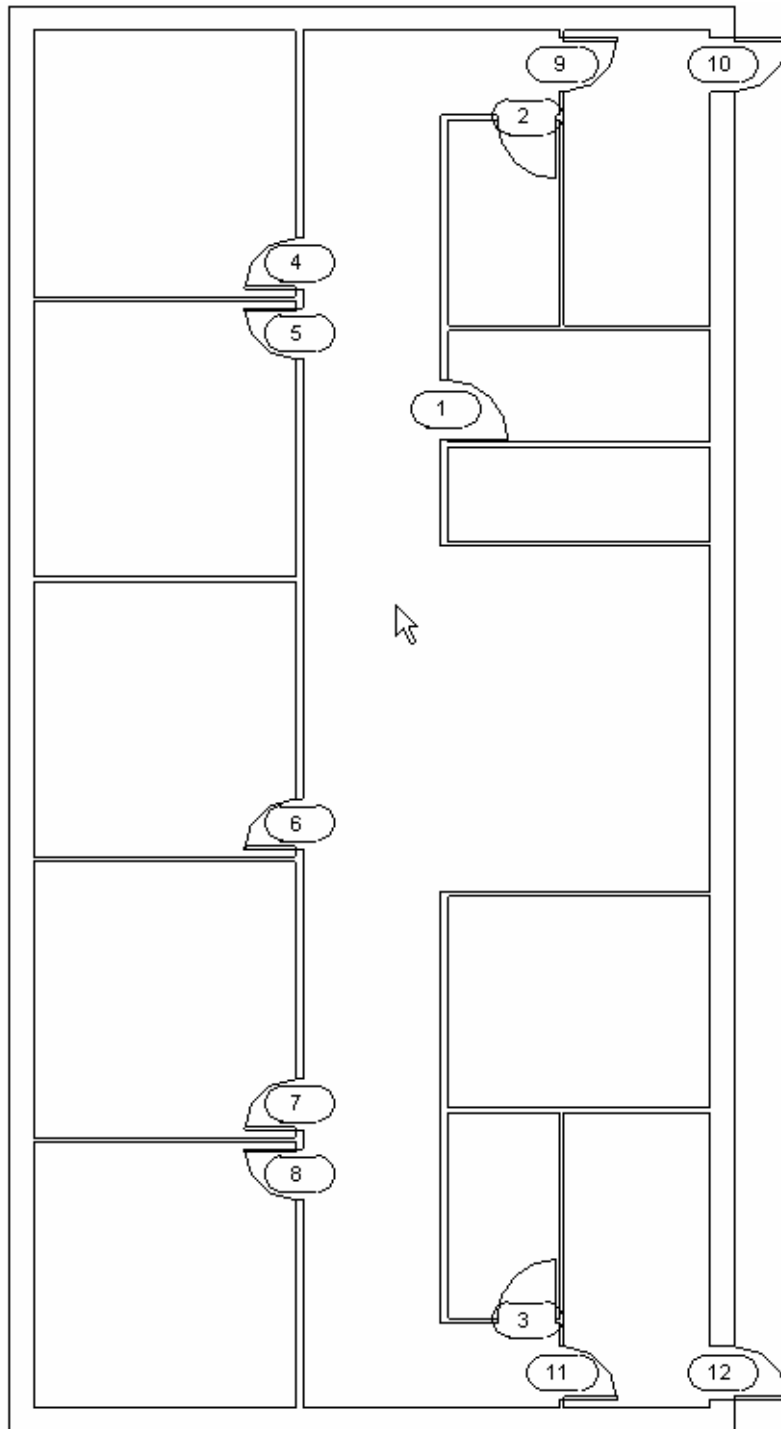
19. In the Type Selector, select *M_Single-Flush Vision: 0864 x 2032mm*.

20. Starting in the room in the upper left corner of the building model, add doors #4 through #8 to each of the five rooms to the left of the corridor. Each door should open into the room and be positioned so that the door centreline is 600 mm from the wall, as shown.

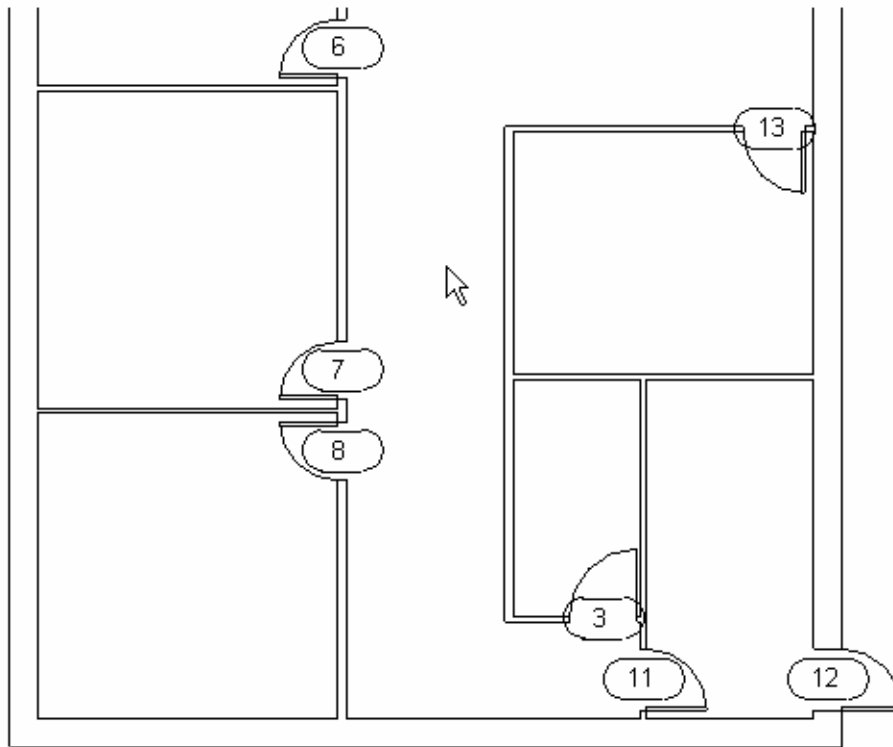


21. In the Type Selector, select M_Single-Flush Vision: 0915 x 2134mm.

22. Add doors #9 and #10 in the upper right corner of the building model, and then add doors #11 and #12 in the lower right corner, as shown.

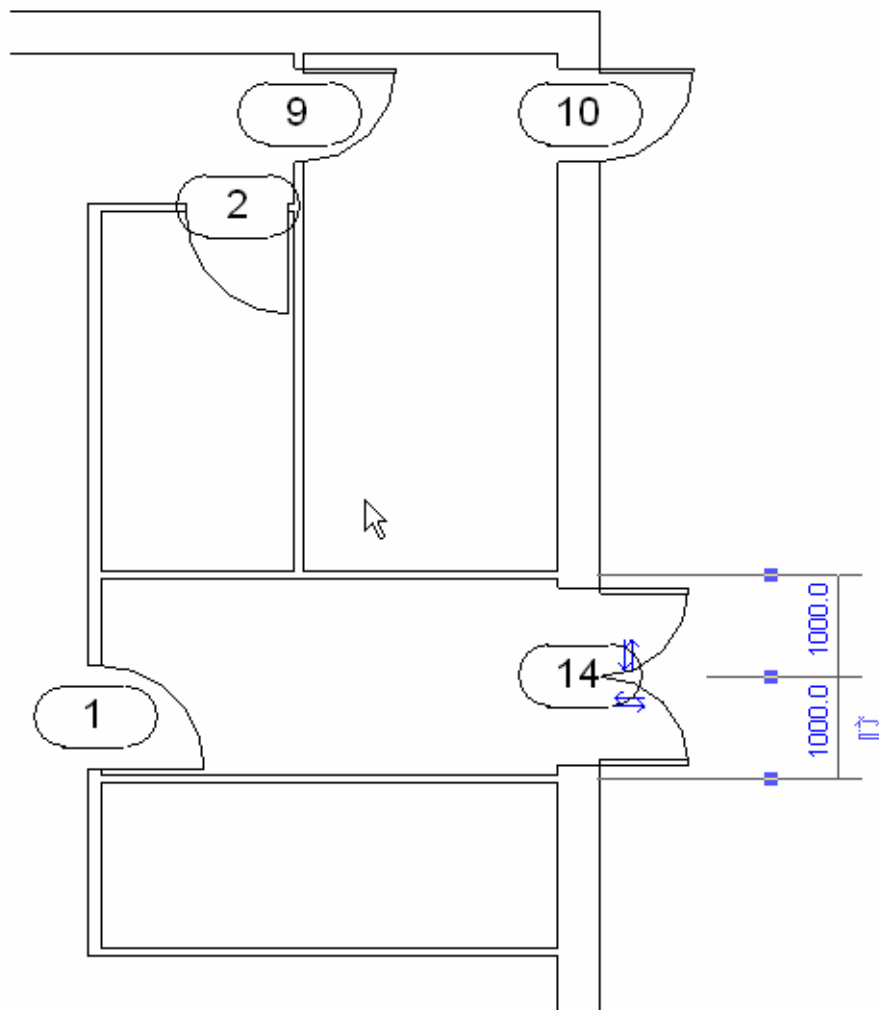


23. Add another M_Single-Flush Vision: 0915 x 2134mm door as door #13 to the room on the right side of the building model as shown.



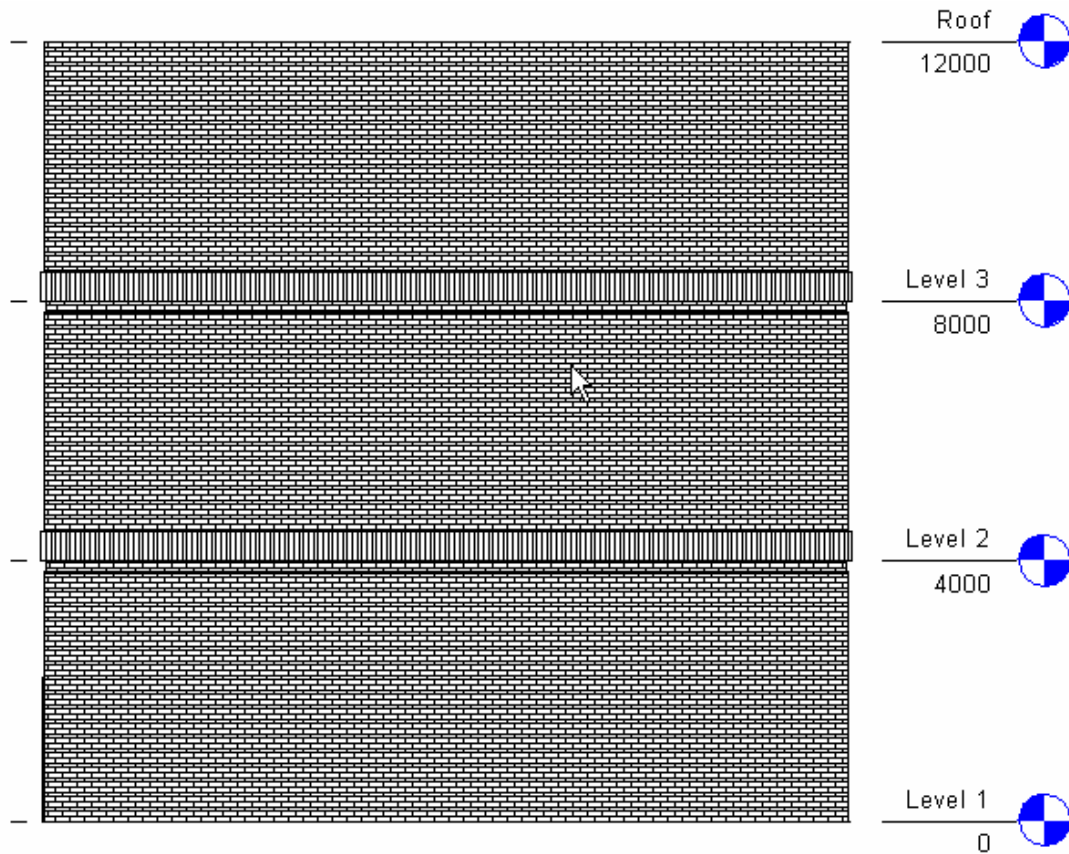
24. In the Type Selector, select M_Double-Flush: 1730 x 2134mm.

25. Add door #14 opposite door number 1 in the east exterior wall as shown.



Add a door in elevation view

26. In the Project Browser, under Views (all), under Elevations, double-click North.



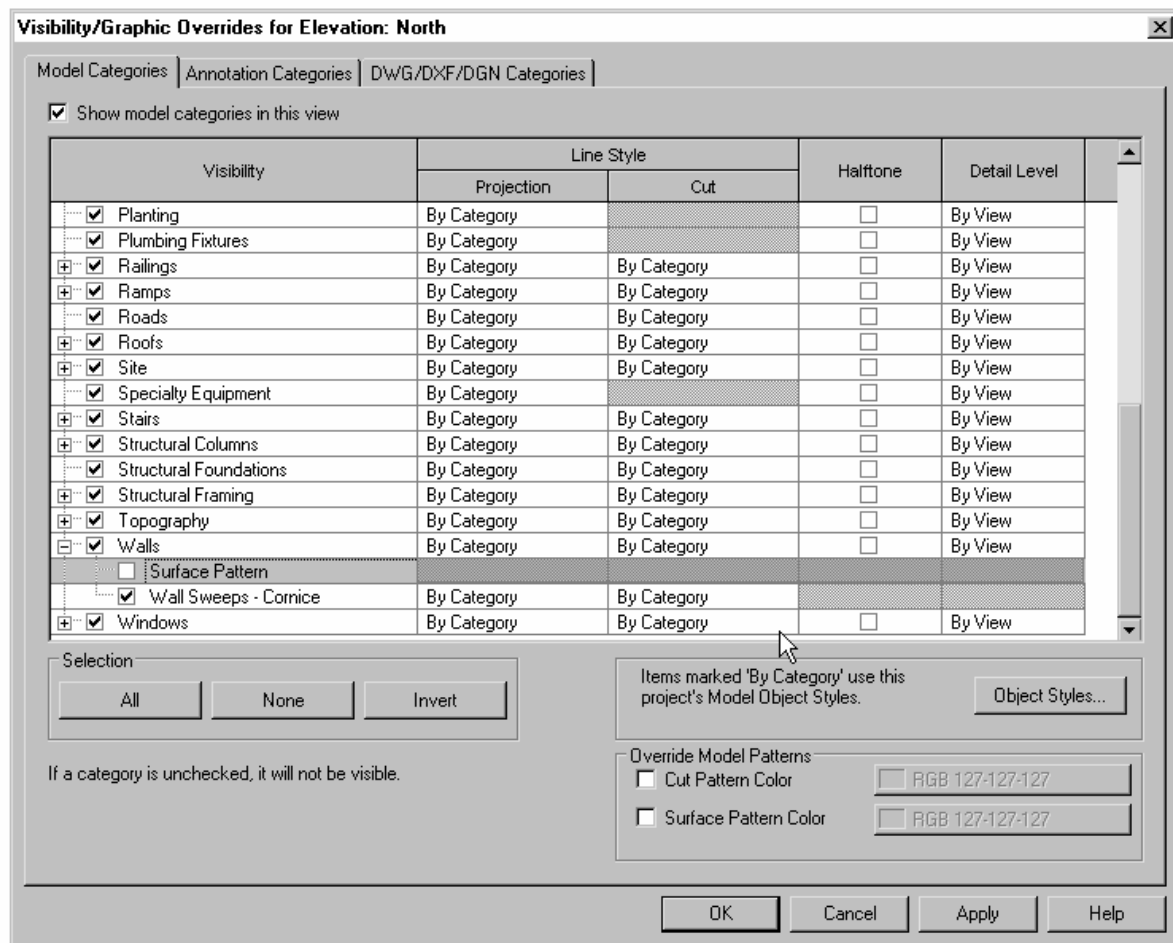
Notice that the brick surface pattern displays in this view.

Note: The display of a surface pattern is zoom-dependant. If your view displays as a solid fill, zoom in until the brick pattern displays.

Although you could add a door in this view, it would be easier you turned off the wall surface pattern visibility.

27. On the View menu, select Visibility Graphics.
28. Click the Model Categories tab, and scroll down to Walls.

29. Expand the Walls category, and clear Surface Pattern.

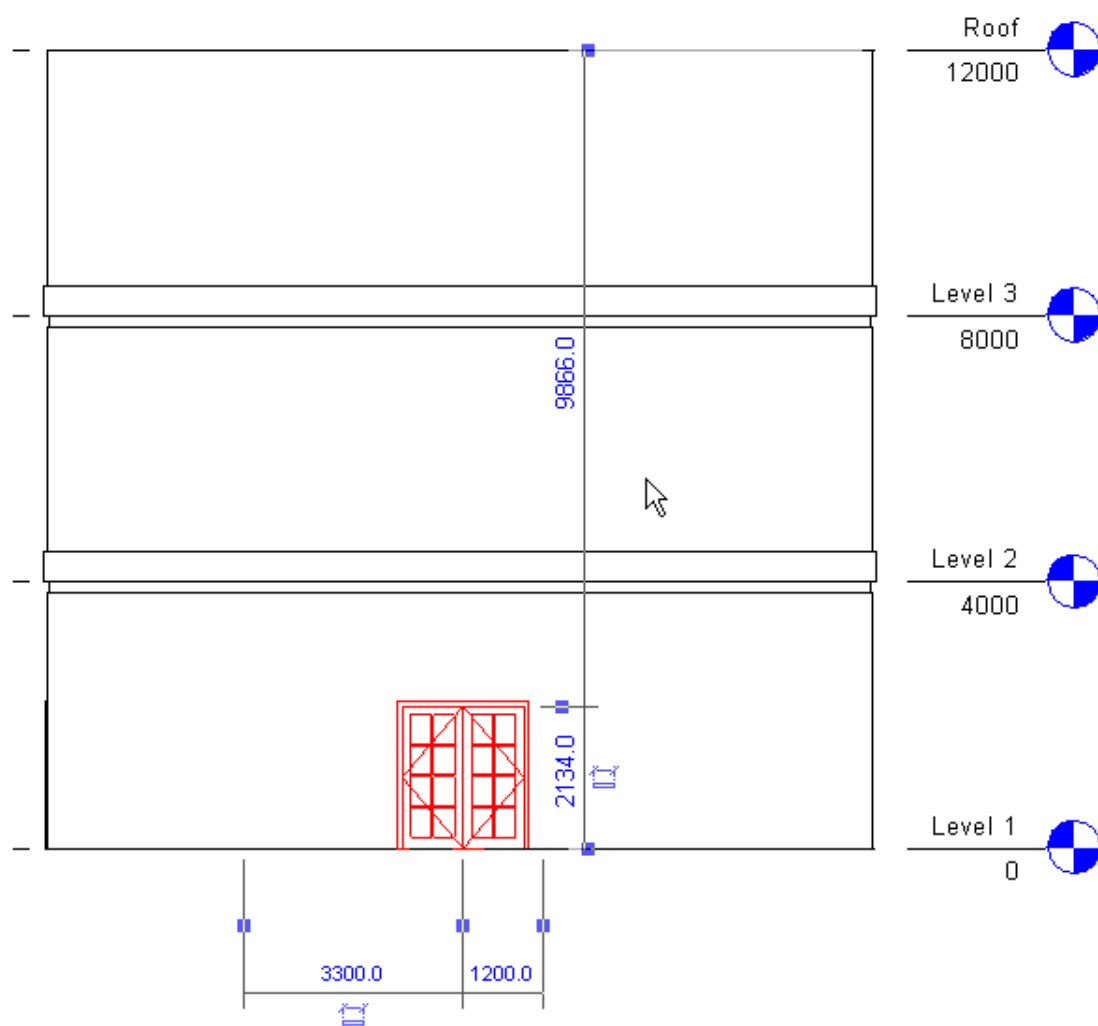


30. Click OK.

Changes to Visibility/Graphics are applied only to the current view.

31. On the Basics tab of the Design Bar, click Door.
32. In the Type Selector, select M_Double-Glass 2: 1830 x 2134mm.

33. Add a door centred the north wall face on Level 1, as shown.

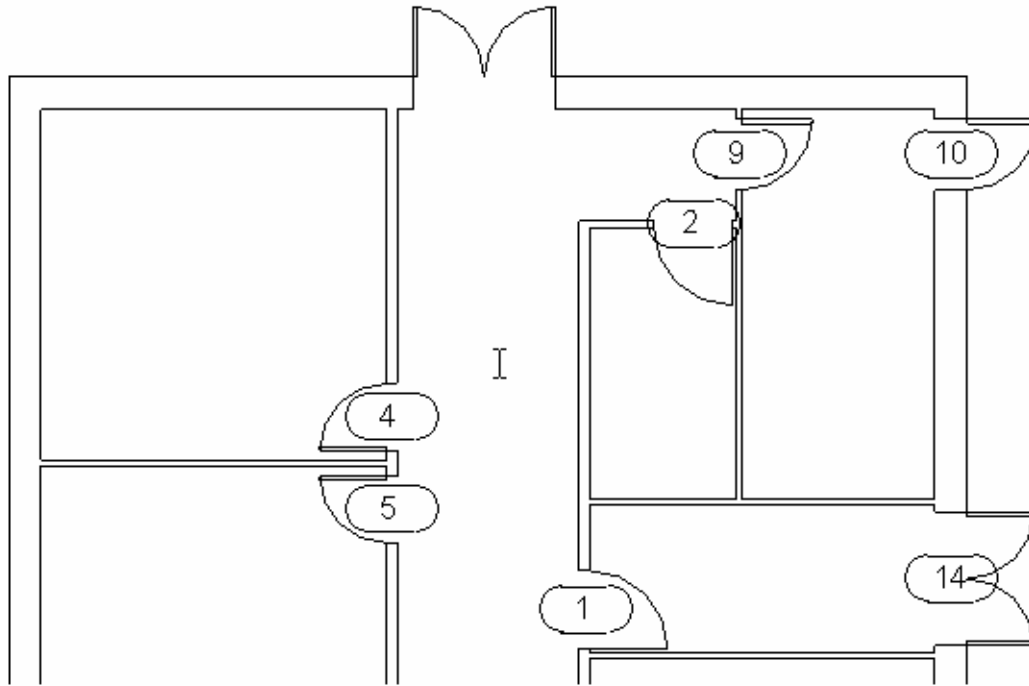


Notice that the door snaps automatically to level 1.

Tag a door in plan view

34. In the Project Browser, under Views (all), under Floor Plans, double-click Level 1.

Notice that the double doors on the north wall display without a tag.

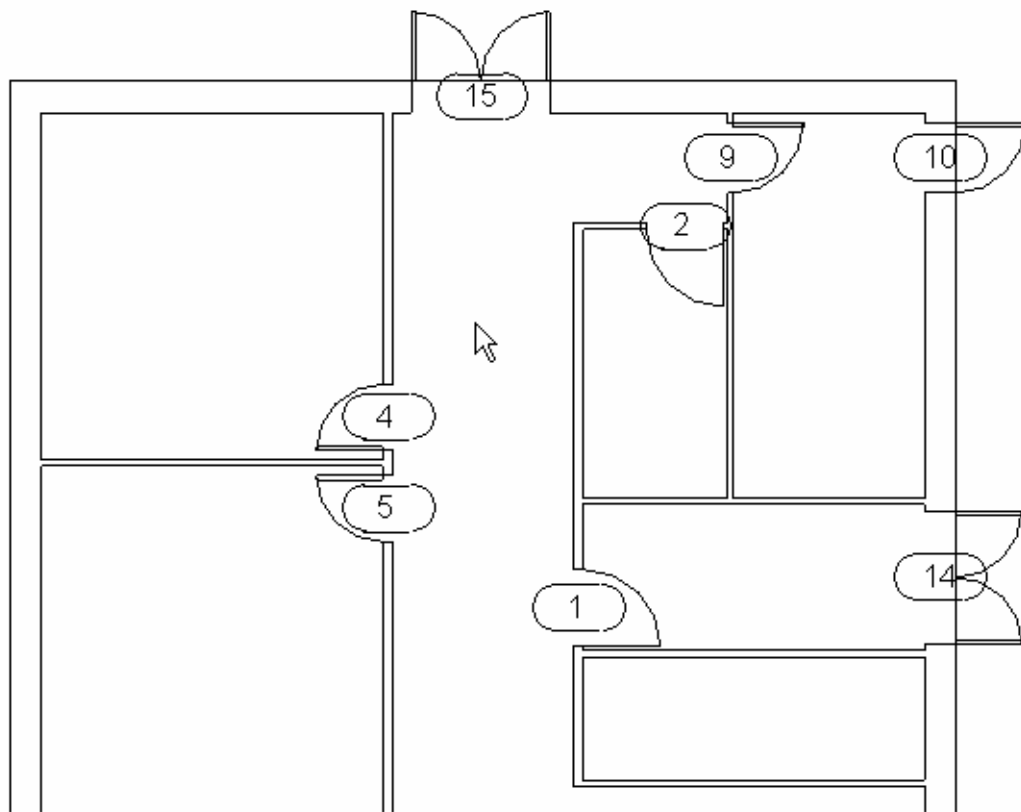


Components are tagged in the view in which they are placed.

Note: Because door tags are not specified to display in an elevation view, the tag does not display for a door added to an elevation view.

35. On the Drafting tab of the Design Bar, click Tag.
36. On the Options Bar, clear Leader.

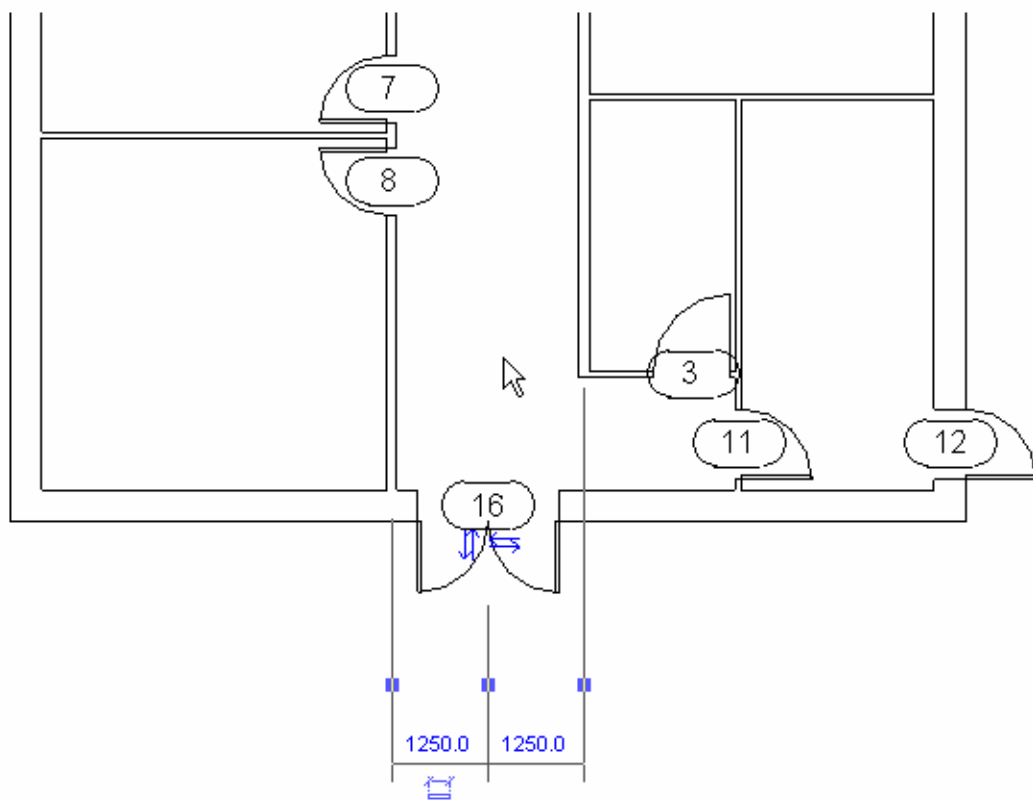
37. Click on the double doors in the north exterior wall to add a tag to them.



Add double doors to the south exterior wall

38. Zoom in to the south wall.
39. On the Basics tab of the Design Bar, click Door.
40. In the Type Selector, verify that M_Double-Glass 2: 1830 x 2134mm is selected.

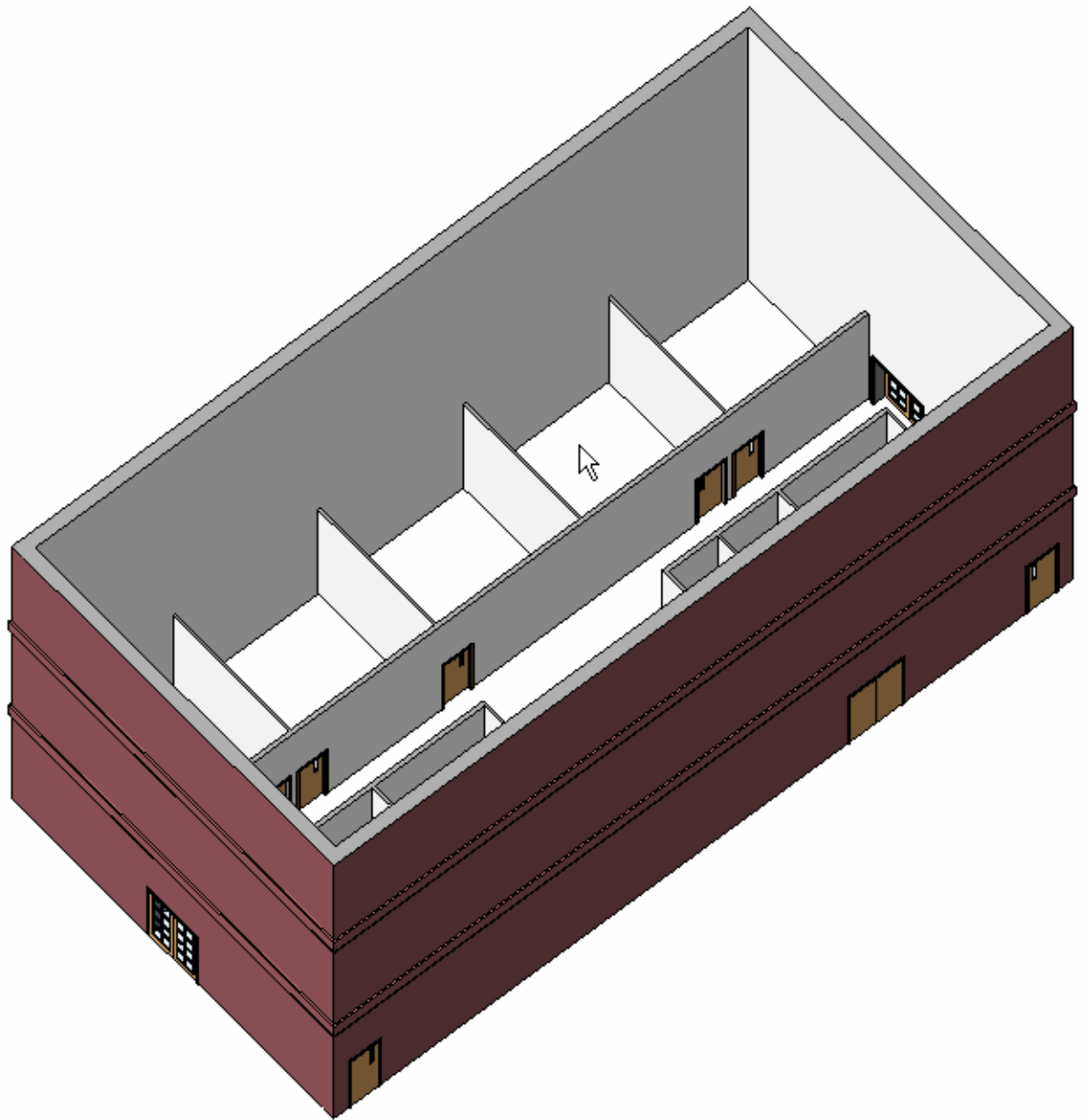
41. Add the final door to the south wall, as shown.



42. On the View toolbar, click. 

43. On the View toolbar, click. 

44. Spin the model, and notice the doors you added.



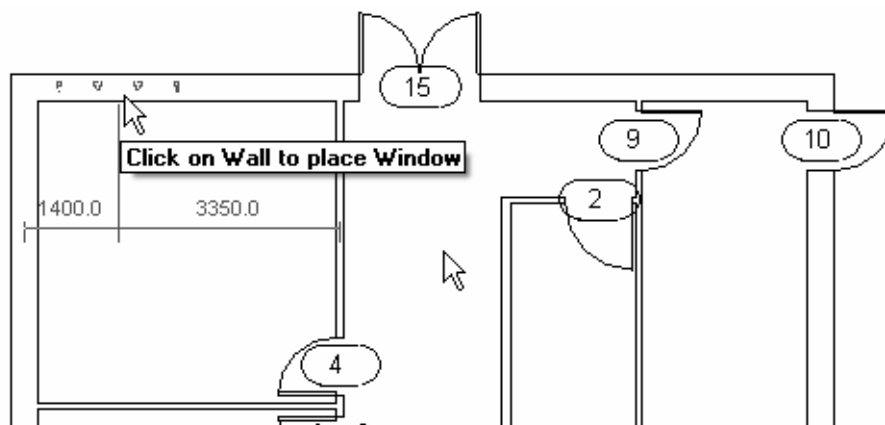
Add windows to the building model

45. In the Project Browser, under Views (all), under Floor Plans, double-click Level 1.
46. Zoom in to the north wall.
47. On the Basics tab of the Design Bar, click Window.
48. In the Type Selector, select m_Andersen 400 C35: C35.

Windows are wall-hosted components, just like doors. As you move the cursor over a wall, the window appears at the cursor. The window exterior is placed based on the direction from which the cursor approaches the wall. Like doors, you can flip windows after placement.

You can add windows in plan, elevation, and 3D views. When you add a window in a plan view, the default head or sill height is used to set the initial height of the window.

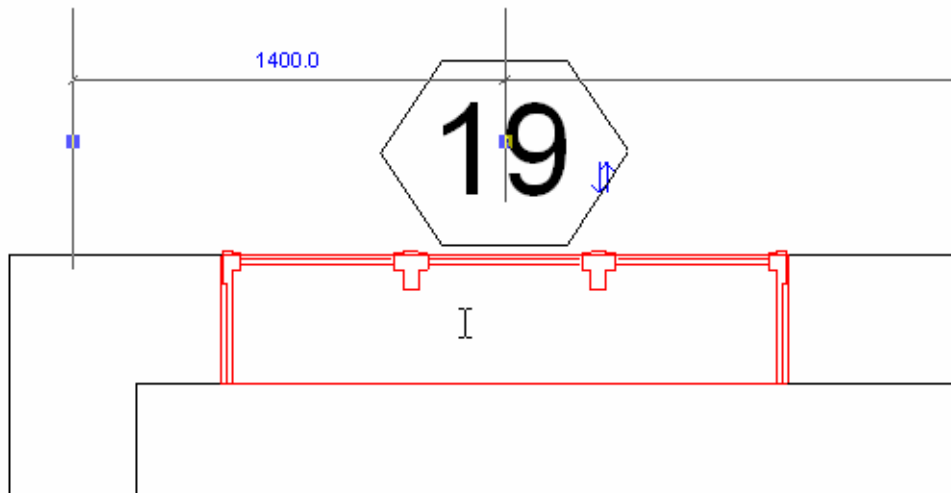
49. Move the cursor over the exterior face of the left side of the north wall.
50. When the window displays at the tip of the cursor, click to place it.



51. On the Basics tab of the Design Bar, click Modify.
52. On the View toolbar, click. 

This is the Thin Lines tool.

53. Zoom in on the window and select it.



In this project, the window is assigned a type tag that displays the window type number rather than the window mark. You can load and assign tags that display the specific information you need in the format you prefer.

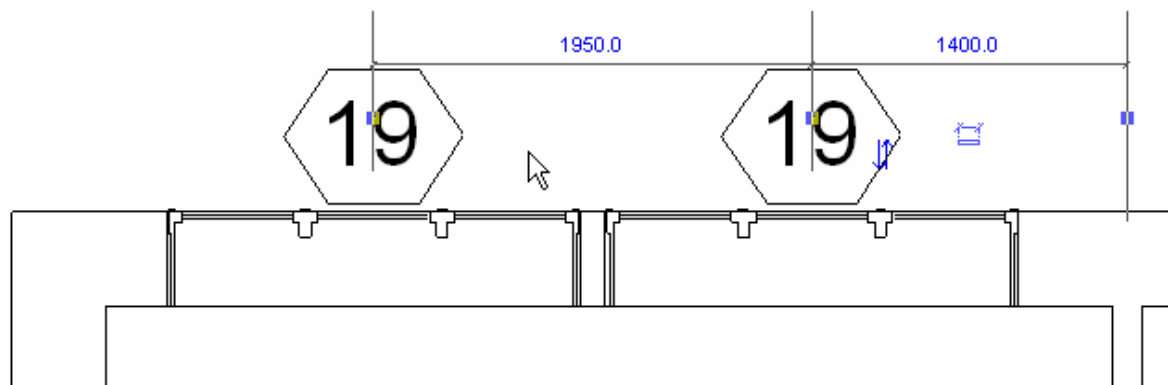
54. Make sure the distance between the window centreline and the left wall centreline is 1400 mm. If necessary, click the temporary dimension value and specify the distance.

55. On the Options Bar, click. 

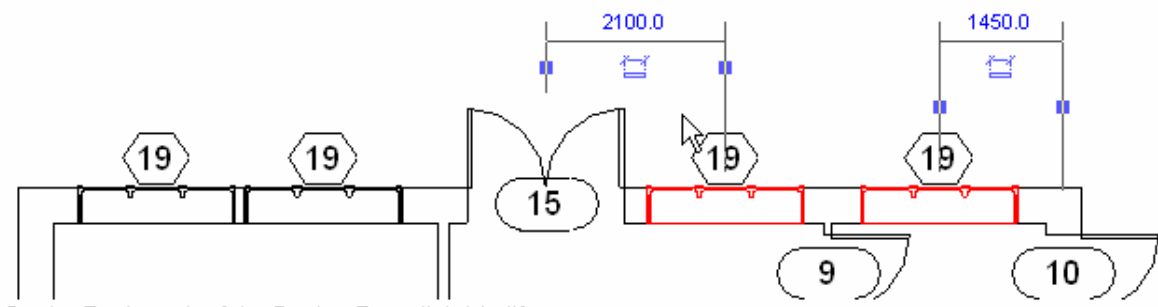
Notice the list of instance parameters available for modification. The list of parameters can vary depending on the window family design. In the family editor, you can allow modifications as instance or type parameters. You can also create a window with few modifiable parameters. If you want to modify a window but an instance or type parameter is not available, you must first open the window in the family editor, modify it, and then reload it into the project.

56. Click Cancel.
57. Zoom out to see the entire wall.
58. On the Basics tab of the Design Bar, click Window.

59. Add a window to the right of the existing window.



60. Zoom out so you can see the entire north exterior wall.
61. Add two windows to the right of the exterior double door, as shown.



62. On the Basics tab of the Design Bar, click Modify.

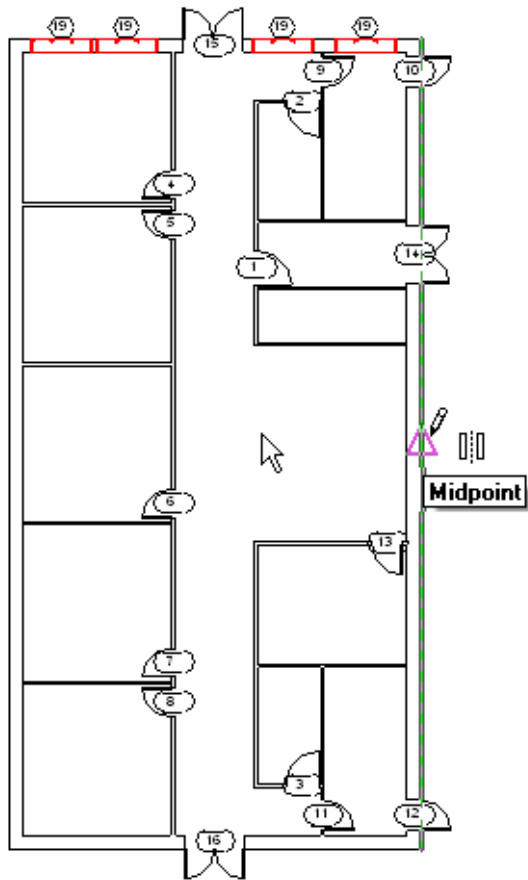
Mirror the windows

63. Zoom out on the building model.
64. Select one of the windows in the north exterior wall, press and hold CTRL, and then select the three remaining windows.
65. On the Edit menu, click Mirror.

When you mirror a component or components, you can pick or draw the mirror axis. You also have the option to mirror a copy rather than the selected component or components. The copy option is selected by default.

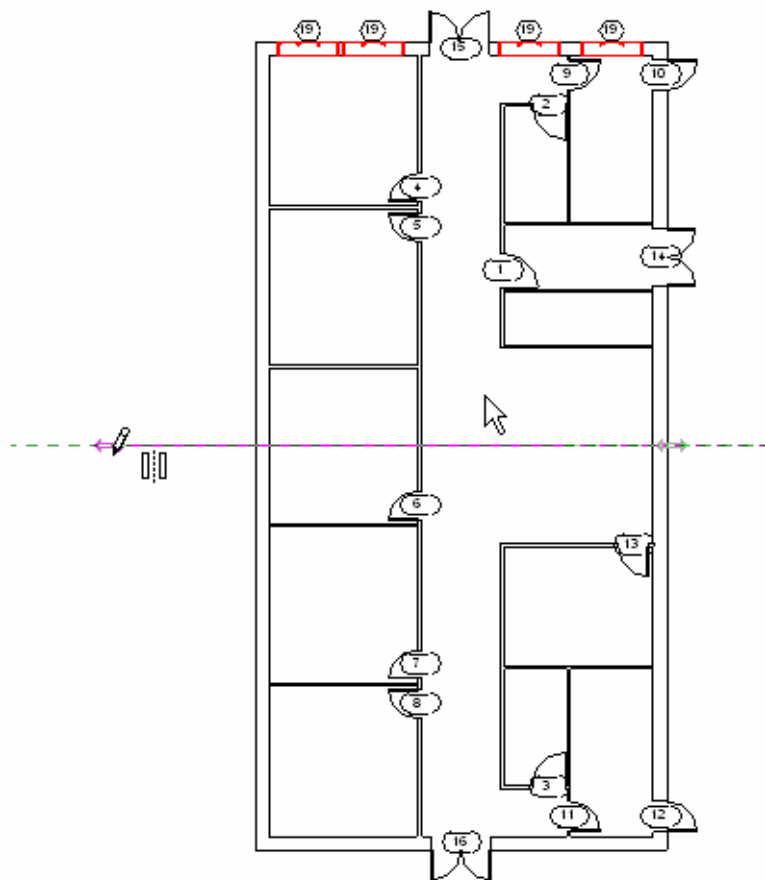
66. On the Options Bar, click , and verify that Copy is selected. In this case, you mirror the selected windows about a horizontal axis occurring at the midpoint of the east exterior wall.

67. Place the cursor over the middle of the exterior face of the east exterior wall. A tooltip is displayed, indicating that the midpoint of that component is ready to be selected.

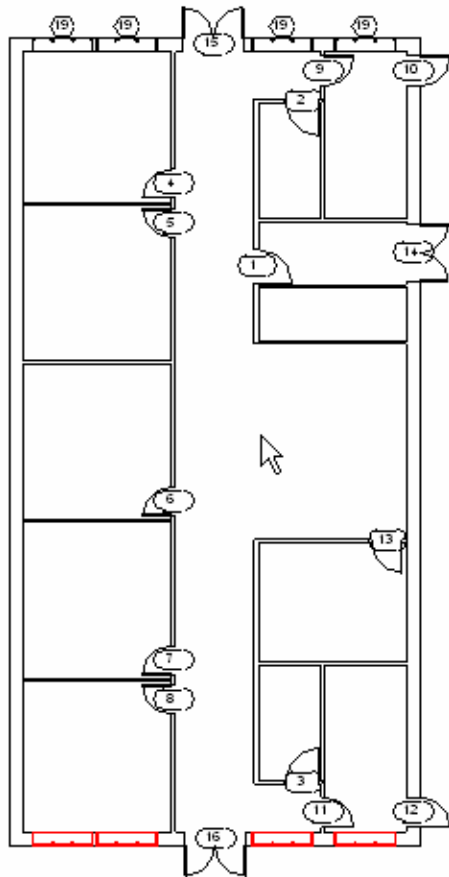


68. When the triangular midpoint symbol is displayed on the exterior face of the wall, click to select it.

69. Move the cursor to the left, and click to set the mirror axis.



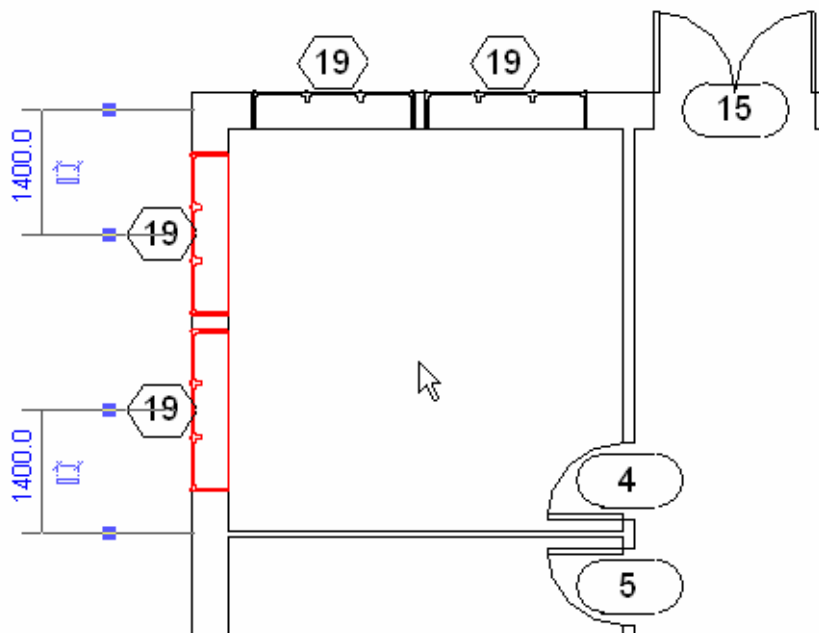
The windows are mirrored immediately after setting the mirror axis. Notice that the mirrored windows are not tagged. You tag the windows later in the exercise.



Add and array windows

70. Zoom in to the room in the upper left corner of the building model.

71. On the Basics tab of the Design Bar, click Window, and add two windows to the east exterior wall, as shown.



72. On the Basics tab of the Design Bar, click Modify.

73. Select the two windows on the east exterior wall.

74. On the Edit menu, click Array.

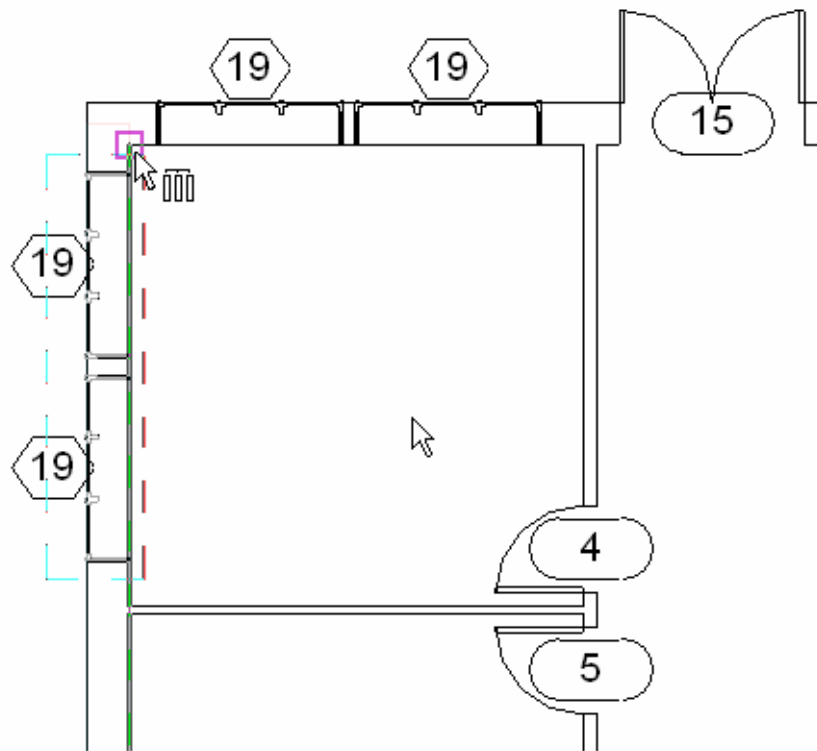
Rather than manually add the rest of the windows on the east exterior wall, you can use the array tool to finish the job. Because all of the rooms on this side of the building model are equally spaced, it is an ideal situation to use an array.

75. On the Options Bar, specify the following options:

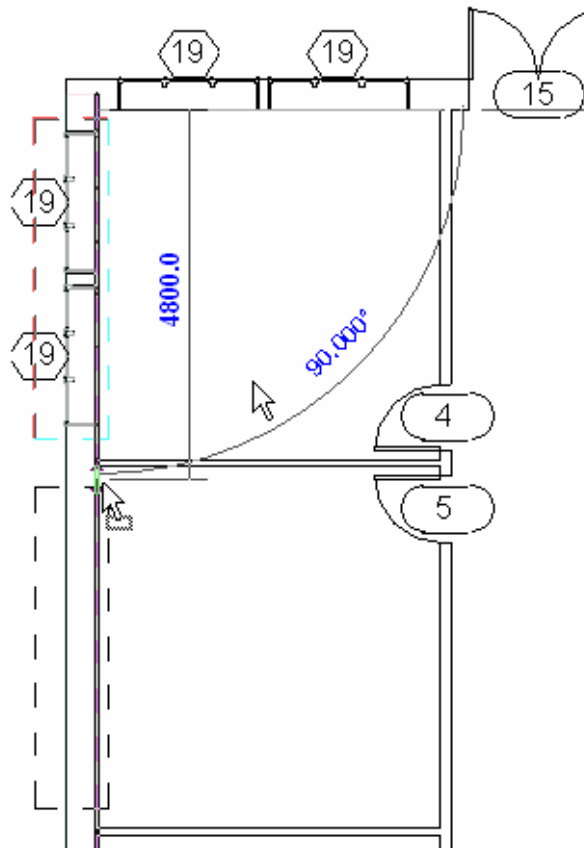
- Verify that  is selected for a linear array.
- Clear Group and Associate.
- Enter 5 for Number.
- Select 2nd for Move to.
- Select Constrain.

Creating an array is a three-step process. You first click a point to specify the array start point. You then move the array to the second or last location, and click to specify the array end point.

76. At the intersection of the north and west exterior walls, move the cursor over the interior corner, and click to set the array start point.

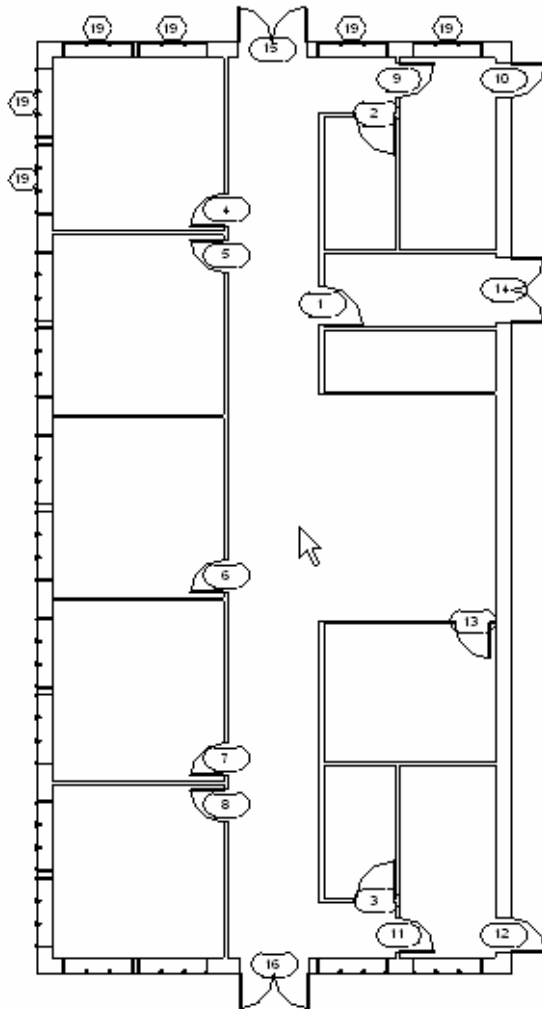


77. Move the cursor down until the arrayed window group is centred in the room below the starting point, and click to set the array end point.



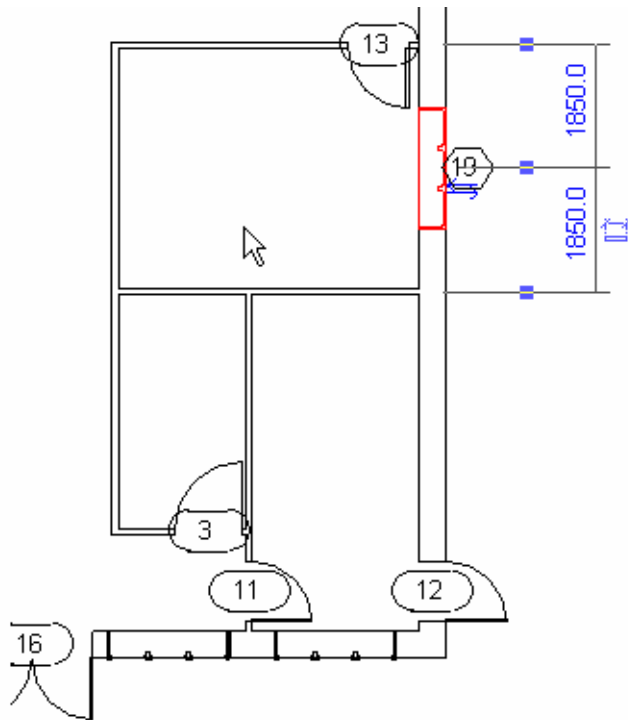
Note: It is extremely important to make sure the new array is centred between the walls of the next room. Because the rooms on the left side of the building model are of equal size, any misplacement has a multiplier effect as the array continues down the wall. If you make a mistake placing the array, undo the step and try again.

Notice the arrayed windows are not tagged.



78. On the Basics tab of the Design Bar, click Window.

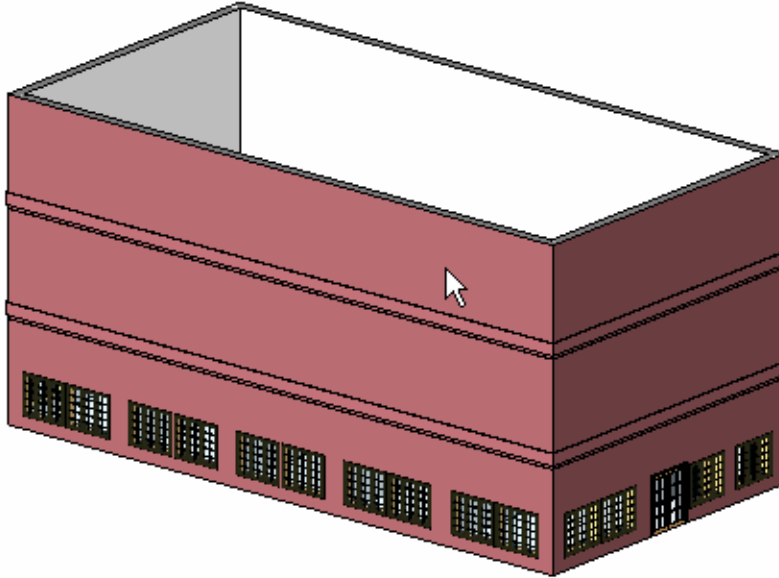
79. Add the final window to Level 1 in the second room from the bottom on the right side of the building model, as shown.



80. If you are still using Thin Lines mode, turn it off by clicking  on the View toolbar.

81. On the View toolbar, click. .

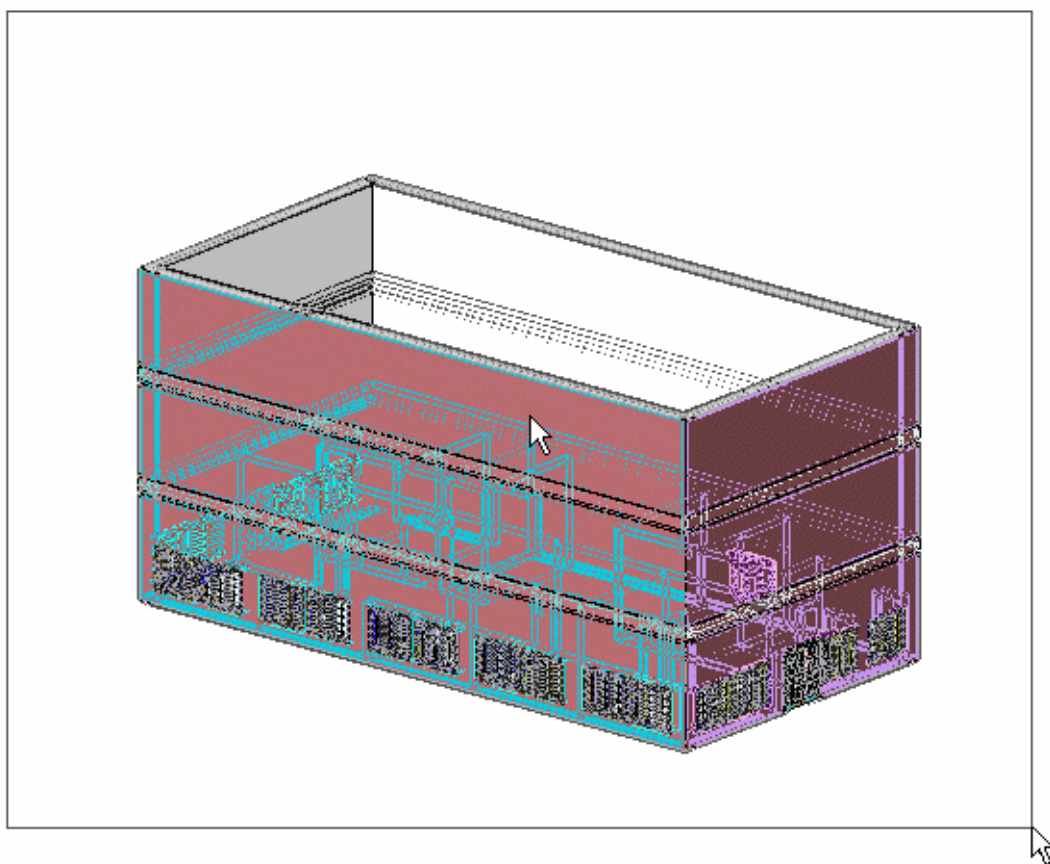
82. On the View toolbar, click. 
83. Spin the model, and notice the windows you added.



Paste align windows to Levels 2 and 3

84. On the Basics tab of the Design Bar, click Modify.

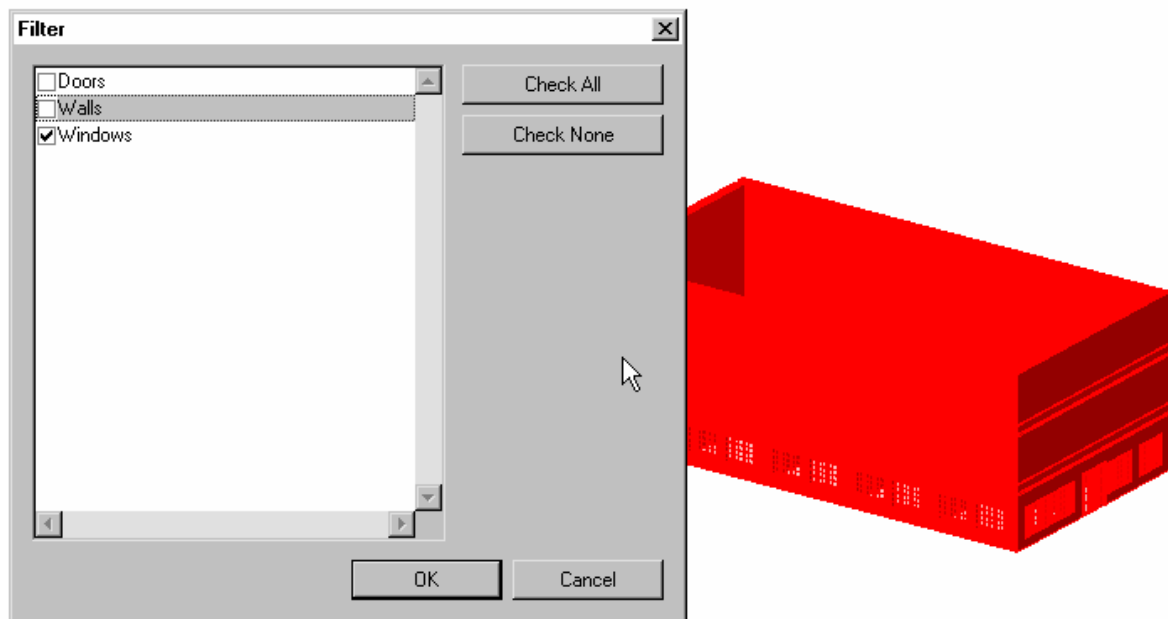
85. In the Drawing area, drag a select box around the entire building model.



This selects every component in the building model.

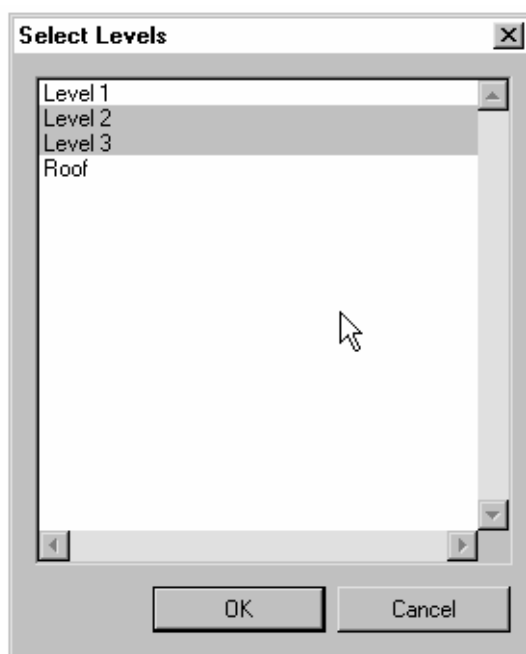
86. On the Options Bar, click. 

87. In the Filter dialog box, clear walls and doors from the selection, and click OK.



This leaves only the windows selected within the 3D view.

88. On the Edit menu, click Copy to Clipboard.
89. On the Edit menu, click Paste Aligned - Select Levels by Name.
90. Select Level 2, press and hold CTRL, select Level 3, and click OK.



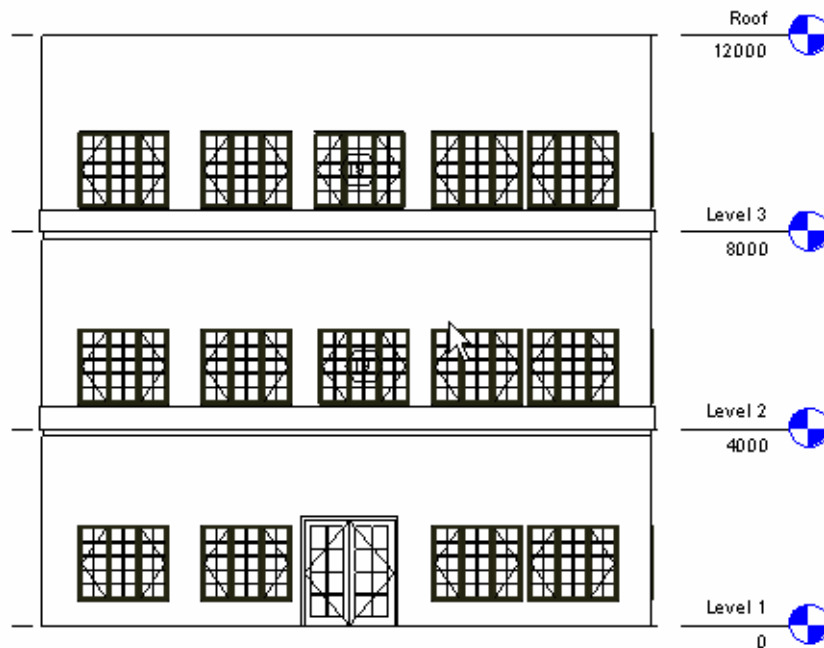
After the windows are added to Level 2 and Level 3, notice that windows need to be added above the double doors on the north and south walls.

91. In the Project Browser, under Views (all), under Elevations, double-click North.

92. On the Basics tab of the Design Bar, click Window.

93. Add a window in the centre of Level 2 and Level 3.

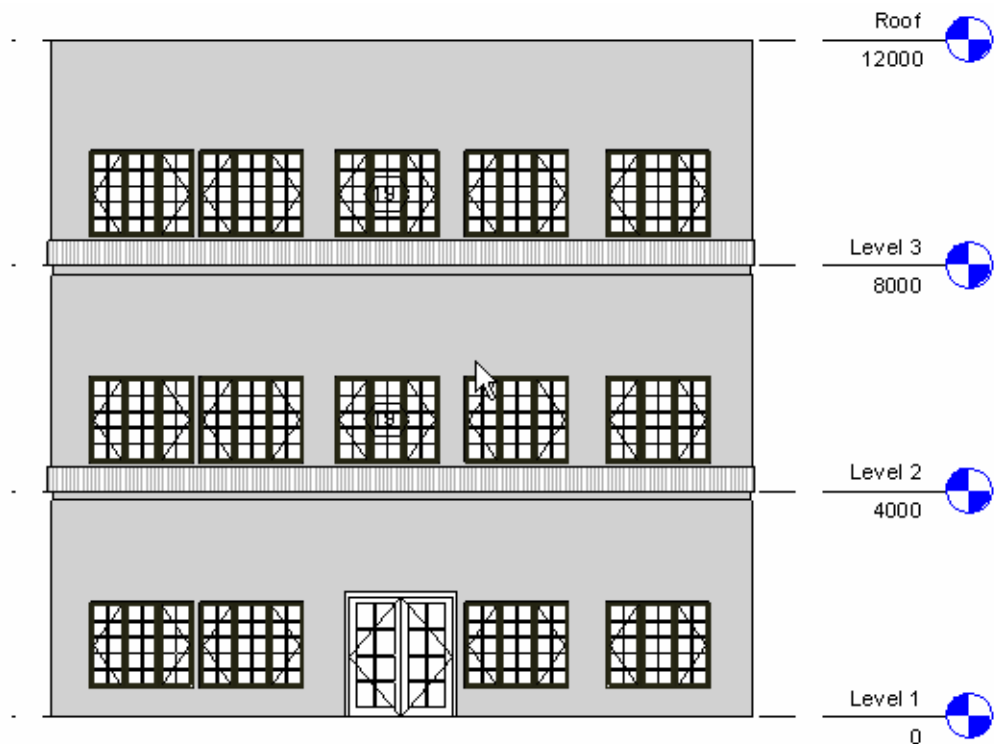
Notice that when you add a window in elevation view, the window snaps to the default sill or head height.



94. In the Project Browser under Elevations, double-click South.

95. On the Basics tab of the Design Bar, click Window.

96. Add windows to the centre of Levels 2 and 3 as you did in the previous steps.



97. In the Project Browser, under Views (all), under Floor Plans, double-click Level 1.

98. Zoom out until you can see the entire building model.

99. On the Drafting tab of the Design Bar, click Tag All Not Tagged.

100. Select Window Tags, and click OK.

Notice that all the windows in the view are tagged.

101. On the File menu, click Save.

In this exercise, you learned how to add doors and windows to a building model. In addition, you learned how to use important tools such as mirror, array, and paste aligned.

This project is required for continuation to the next exercise.