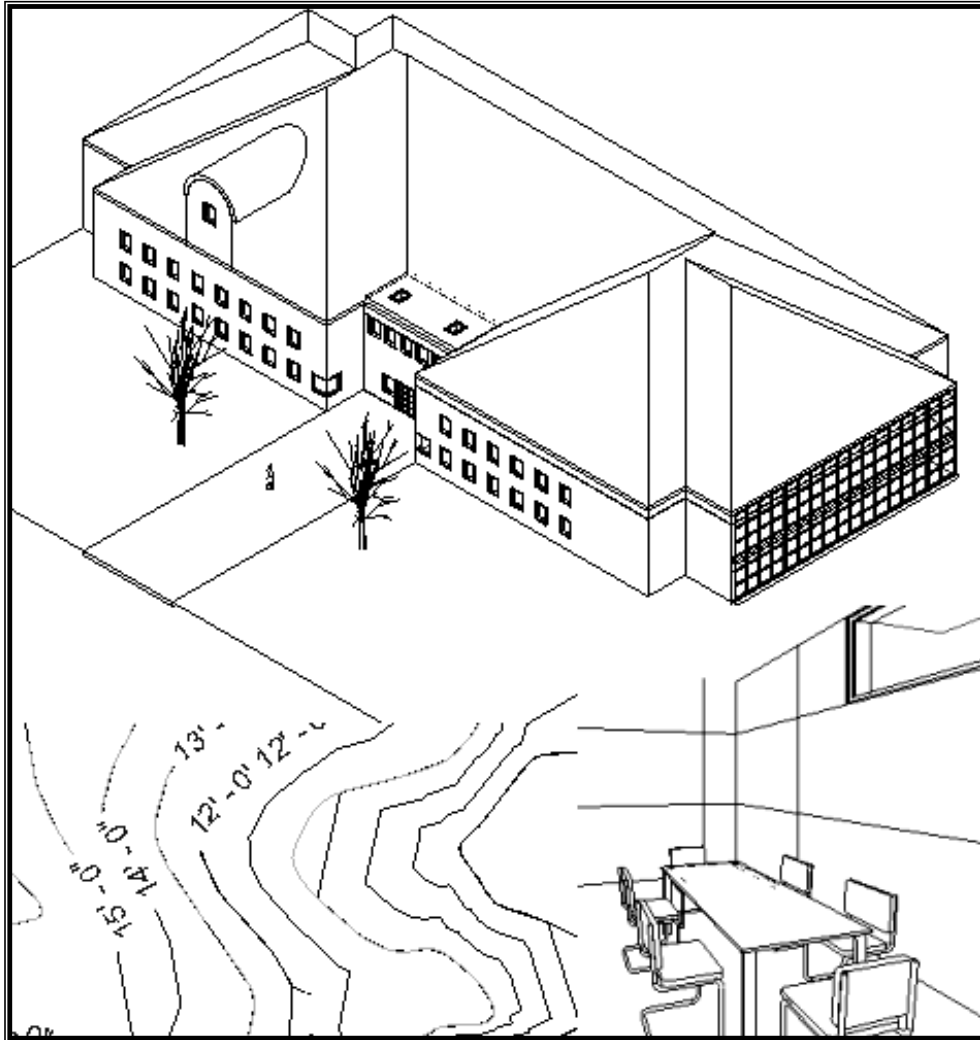


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Revit 6.0 Basics:

Architectural Modeling and Documentation



Elise Moss

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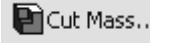

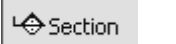


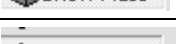
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Lesson 3

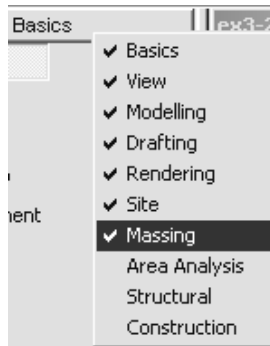
Mass Elements

Mass Elements are used to give you a conceptual idea of the space and shape of a building without having to take the time to put in a lot of detail. It allows you to create alternative designs quickly and easily and get approval before you put in a lot of effort.

Massing Tools

 Add Mass...	Add Mass	Creates a solid shape
 Cut Mass..	Cut Mass	Subtracts a shape from a solid
 Room Tag	Room Tag	Add a tag/label to a room
 Section	Section	Create a section view of a model
 Level	Level	Add a level
 Show Mass	Show Mass	Enables/Disables visibility of Massing Geometry
 Show Shell	Show Shell	Converts Mass objects to their associated Revit elements

You may not see a Massing bar on your Design bar.



Just like toolbars, you can control which bars are active/inactive in your Design bar. To activate/deactivate, simply right click on the top of a bar button to see the list of design buttons. Then, check/pick the desired bar. You will need to activate the Massing bar for this lesson.


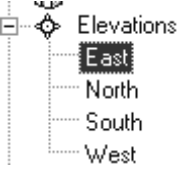


Exercise 3-1
Adding a Level

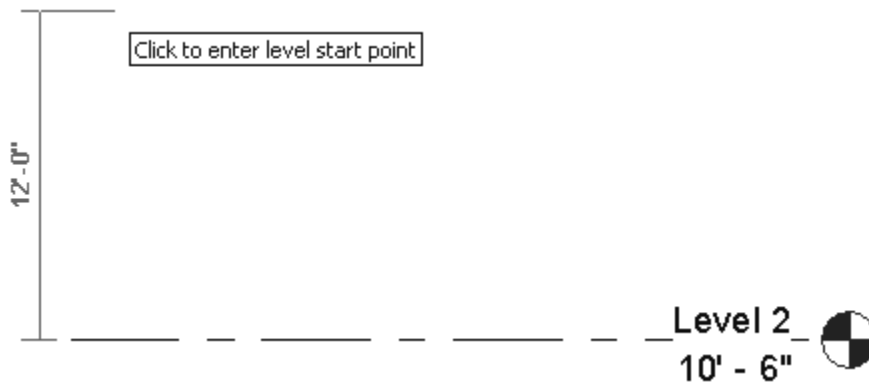
Drawing Name: default.rte
 Estimated Time: 5 minutes


This exercise reinforces the following skills:

- Switching Elevation Views
- Basics
- Add a Level

Revit uses a level to define another floor or story in a building.

1.  Start a new project.
2.  Double click **East** under Elevations.
 This activates the East view orientation.
3.  Select the **Basics** button from the Design bar.
4.  Select the **Level** tool. (This adds a floor elevation.)



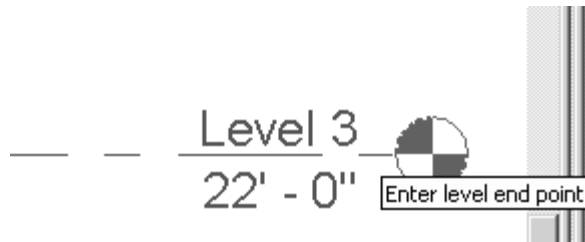
5. Move your mouse to set an elevation of **12'-0"**.
 Pick to start the elevation line.
6.  In the Options bar, enable **Make Plan View**.

This should be enabled if you want Revit to automatically create a floor plan view of this level. If you forget to check this box, you can create the floor plan view later using the View→ New Floor Plan.



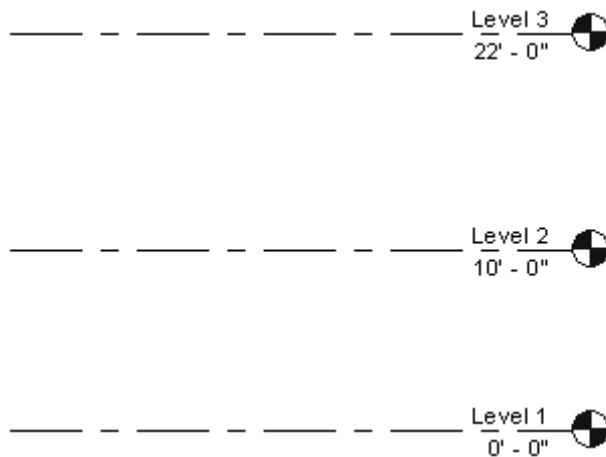
TIP: Double click on the blue elevation symbol to automatically switch to the floor plan view for that elevation.

7.



Pick to place the end point to position the level indicator above the other indicators.

Basically, you place a new level by picking two points at the desired height.



Revit is always looking for references even among annotations, you will notice that your level tags snap and lock together so when you move one to the right or left, all those in line with it will follow.

If you need to adjust the position of the tag, just click on the line, 3 blue grips will appear. These can be clicked and dragged as needed. You can also right click on a level tag and select 'Hide annotation in view' and the tag and level line will disappear in that view only.

8. Hide Annotation in View is only enabled if an object is selected first.
9. Save the file as *ex3-1.rvt*.

Exercise 3-2


Adding Mass Elements

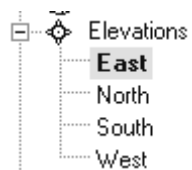
Drawing Name: ex3-1.rvt

Estimated Time: 5 minutes

This exercise reinforces the following skills:


- Switching Elevation Views
- Add Mass

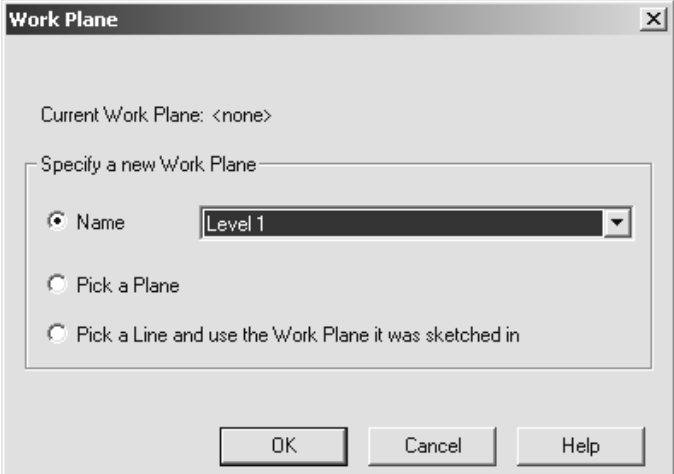
1.  Open or continue working in the file *ex3-1.rvt*.

2.  Activate the **East** Elevation view.

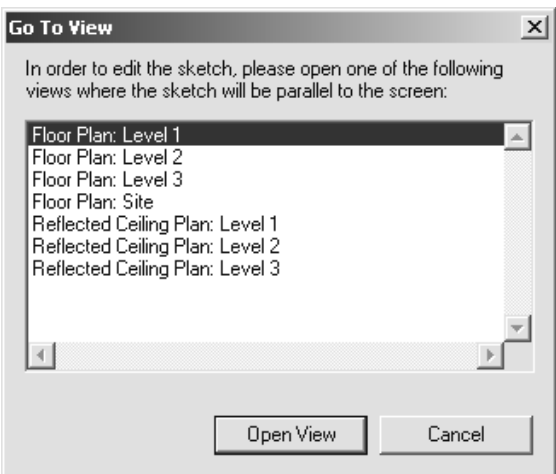
3.  Select the **Massing** tool from the Design bar.

4.  Select the **Add Mass** tool.


5.  Enable **Extrude** and press **OK**.

6. 

Enable **Name**.
Select **Level 1** from the drop-down.
Select **OK**.

7. 

Highlight **Floor Plan: Level 1**.
Select **Open View**.

8. 

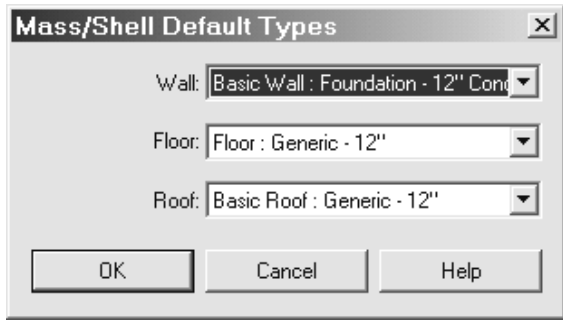
Go to **Settings**→**Mass/Shell**.

The '**Show Shell**' converts mass elements as follows:

- Vertical faces, including horizontal arc shapes, become walls
- Horizontal faces lying at the base of each level of the shape become floors
- All other horizontal planes become footprint roofs

All other faces, such as slanted planes or curved surfaces, become in-place roofs.

9.



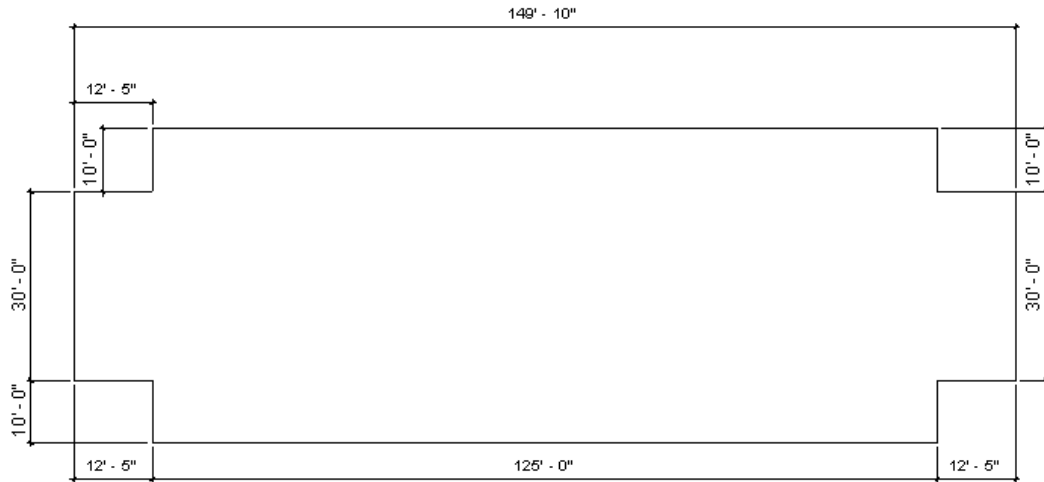
Set the Default Wall Type to:
Basic Wall: Foundation -12\"/>

Set the Default Floor Type to:
Floor: Generic -12\"/>

Set the Default Roof Type to:
Roof: Generic -12\"/>

Press **OK**.

10.




Create the shape shown.

11.

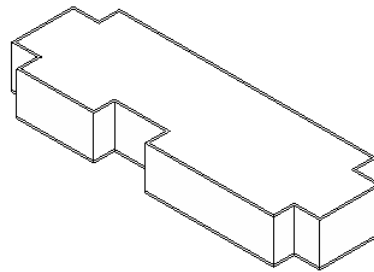
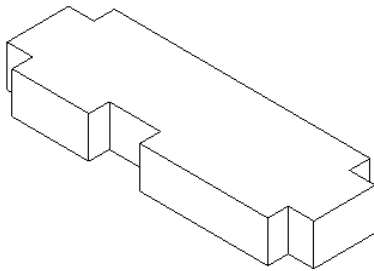
 Select **Finish Sketch**.

12.

 Select the **3D** view tool.

13.

Select the **Show Shell** tool.



14. Compare how the model appears depending on which is activated: Show Shell or Show Mass.

15. Save the file as *ex3-2.rvt*.

Exercise 3-3

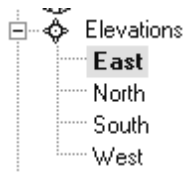
Modifying Mass Elements

Drawing Name: ex3-2.rvt
 Estimated Time: 5 minutes

This exercise reinforces the following skills:

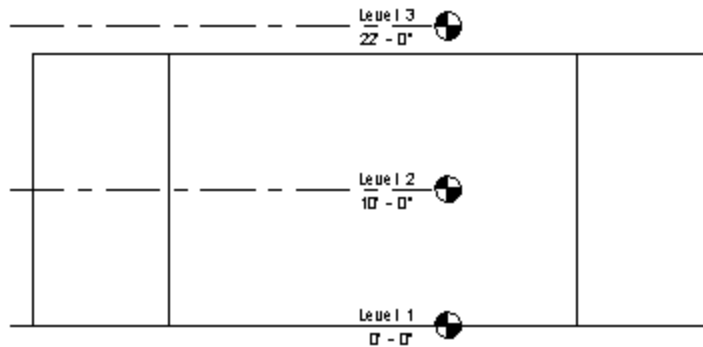
- Extrude
- Add Mass

1. Open *ex3-2.rvt*.


2.  Activate the **East** Elevation.



TIP: Pick on a mass element to activate the element's grips. You can use the grips to change the element's shape, size, and location.



We see that our building isn't really tall enough.

3.  Make sure that **Modify** is enabled.

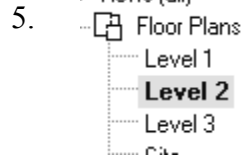
4.

Parameter	Value
Extrusion End	22'
Extrusion start	0' 0"

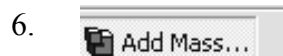
 Select the extrusion. Right click and select **Properties**. Change the Extrusion End to **22'**. Press **OK**.



TIP: Instead of using Properties, use the **ALIGN** tool (just click Align, then pick the level, then the top of the mass. Then lock the mass to the level. If you change the height of the level, the mass automatically adjusts with the level. Parametric power!!!



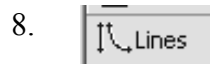
Activate **Level 2**.



Select **Add Mass**.



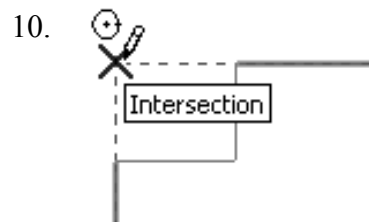
Select **Extrude** and **OK**.



Enable **Lines** mode.

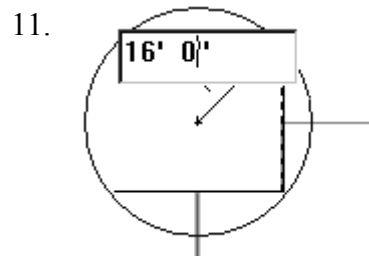


Select the **Circle** tool from the Options bar.



You can use object tracking to locate the intersection between the two corners.

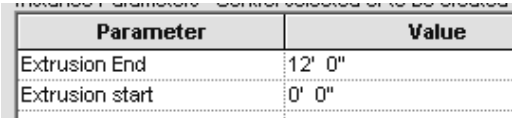
When you see the large X and the tooltip says Intersection, you will have located the intersection. Pick to locate the center of the circle at the intersection.




Enter a radius of **16'-0"**.


12.  Select **Finish Sketch**.

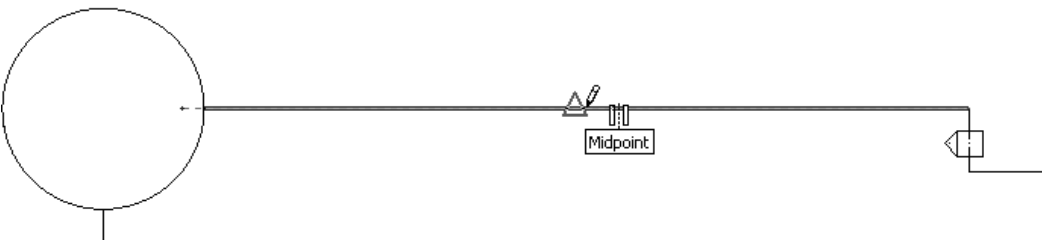
13.  Select the Circle.
 Right click and select **Properties**.

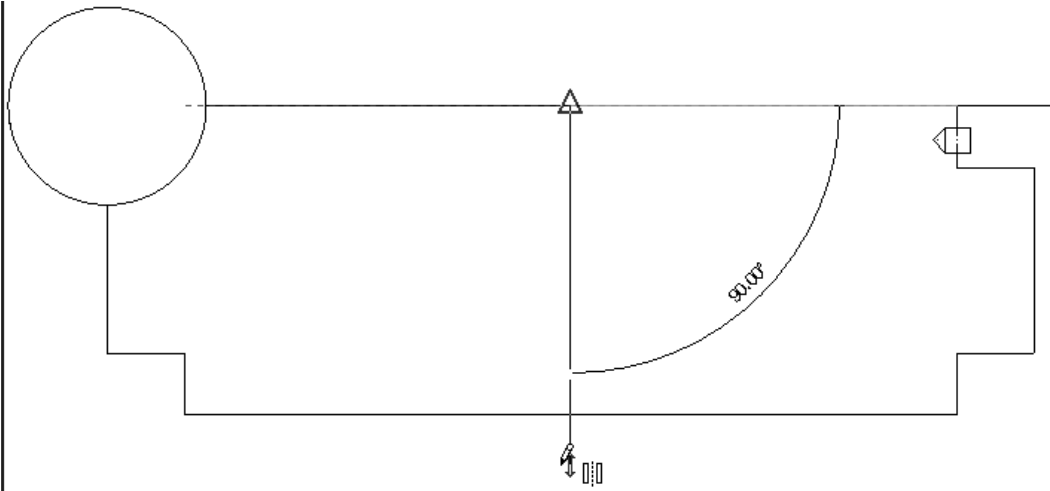
14.  Set the Extrusion End to **12'-0"**.

Parameter	Value
Extrusion End	12' 0"
Extrusion start	0' 0"

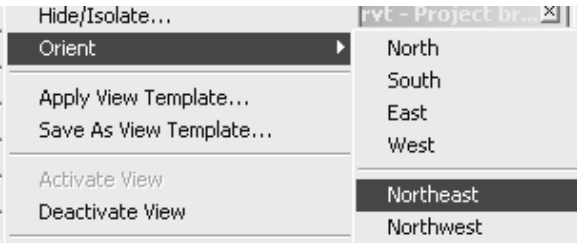
15.  Verify that the circle is still highlighted.
 Select the **Mirror** tool from the Options bar.

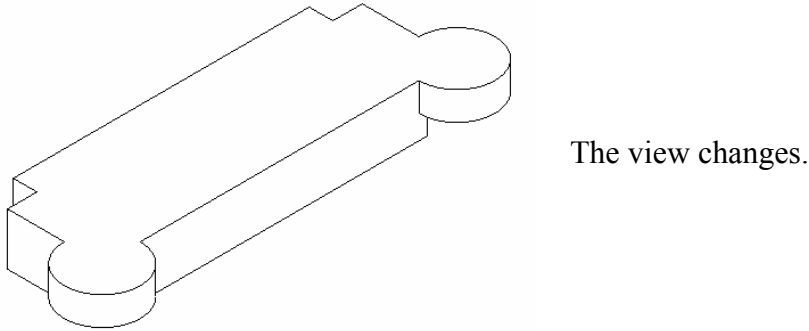
16.  Enable **Draw** and **Copy** from the Options bar.

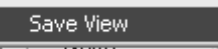
17.  Locate the midpoint of the small horizontal line and pick.

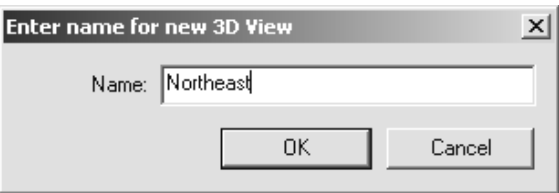
18.  Bring your mouse down in the Vertical direction and pick for the second point of the mirror axis.


19.  Activate the **3D** view.

20.  Go to **View→Orient→Northeast**.



21.  Go to **View→Orient→Save View**.

22.  Enter **Northeast** for the name of the view.
Press **OK**.

23.  The **Northeast** view is now listed in the Project browser.

24. Save the file as *ex3-3.rvt*.

 **TIP:** You can only use the **View→Orient** menu to activate 3D views when you are already in 3D view mode.

Exercise 3-4

Adding Doors and Windows

Drawing Name: ex3-3.rvt
 Estimated Time: 5 minutes

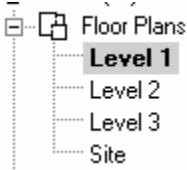
This exercise reinforces the following skills:

- Basics
- Door
- Load from Library
- Window
- Array
- Move Copies

You can add doors and windows to your conceptual model to make it easier to visualize.

1. Open *ex3-3.rvt*.


2.  Verify that the Massing bar is active on the Design bar. Select **Show Shell** to convert to walls, floors, and roof.

3.  Activate the **Level 1** view under Floor Plans.

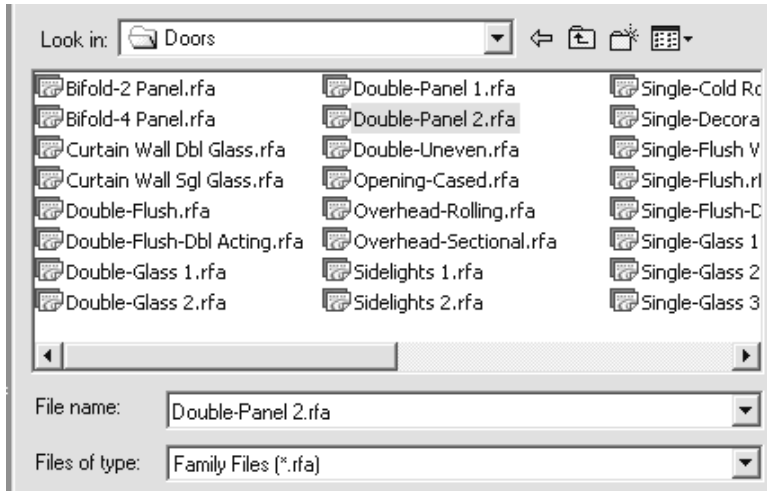
4.  Activate **Basics** from the Design bar.

5.  Press the **Door** tool.

6.  Press **Load from Library** from the Options toolbar.

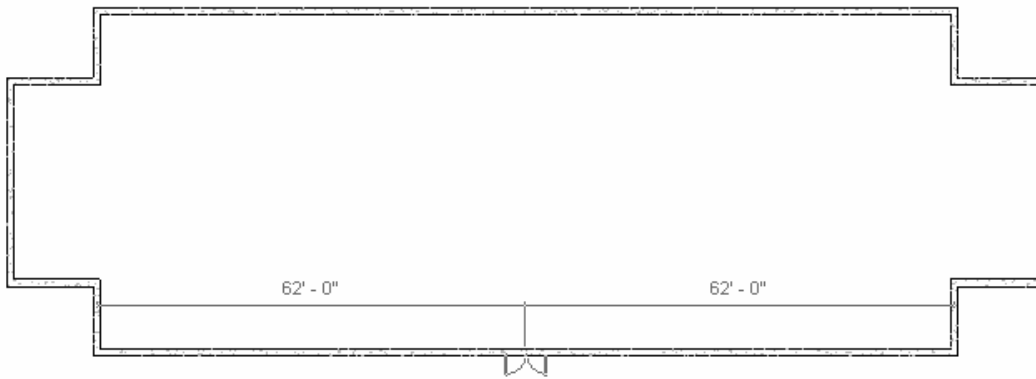
7.  Browse to the **Doors** folder.

8.



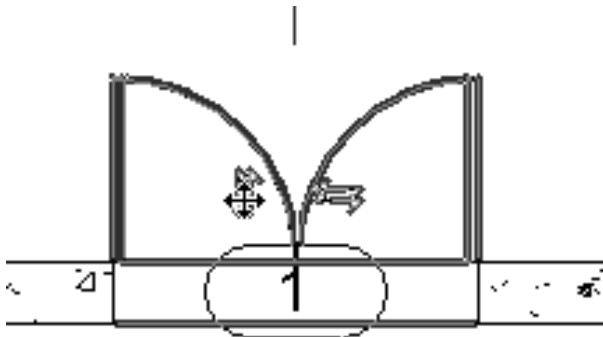
Locate the *Double-Panel 2.rfa* file.

Press **Open**.



9. Place the door so it is centered on the wall as shown.

10.



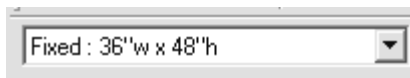
You can flip the door by picking on it then pick on the vertical arrows.

11.



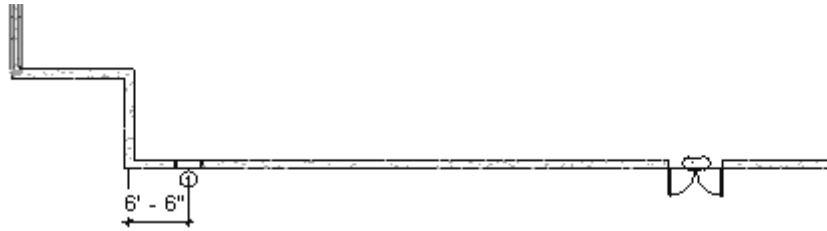
Pick the **Window** tool.

12.



Select **Fixed: 36" w × 48" h** from the drop-down list.

13.

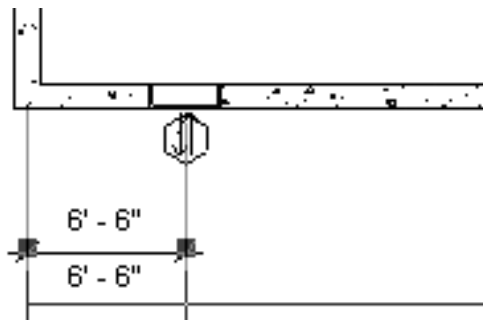


Place the window **6'-6"** from the inner left wall.

Dimensions in Revit work differently. Revit uses *temporary* dimensions and *permanent* dimensions. Permanent dimensions are the parametric dimensions attached to each object. You can modify these dimensions by clicking on the object. Temporary dimensions are the dimensions you place using the Dimension tool or typing 'DI'. The dimension values of temporary dimensions can only be modified by changing the permanent dimensions.

If you want to define the position of an object using a dimension that doesn't appear when you pick the object, you can apply a temporary dimension using the Dimension tool. This will add a permanent dimension to the object that can then be used to position the object.

14.



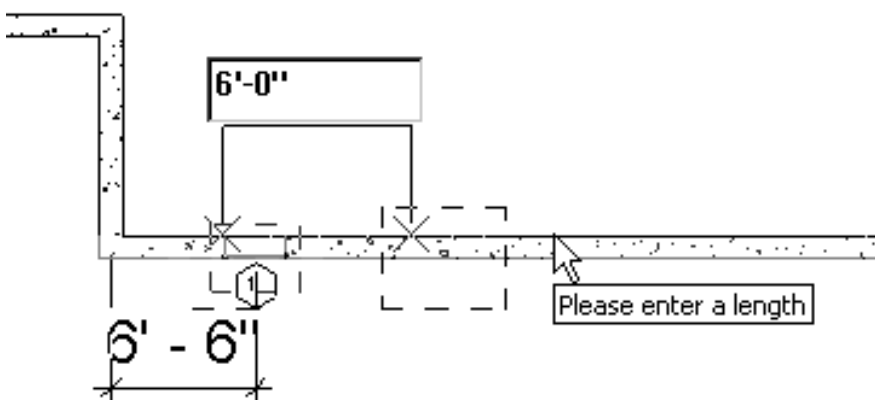
Pick the window so it highlights in red.

15.



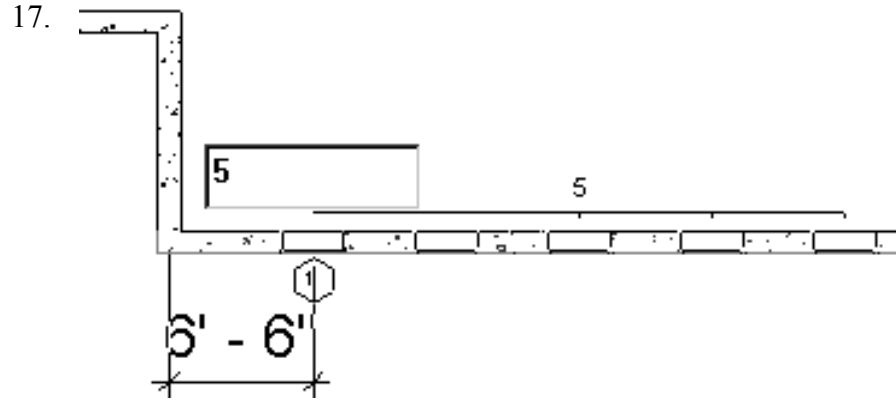
Select the **Array** tool.

16.



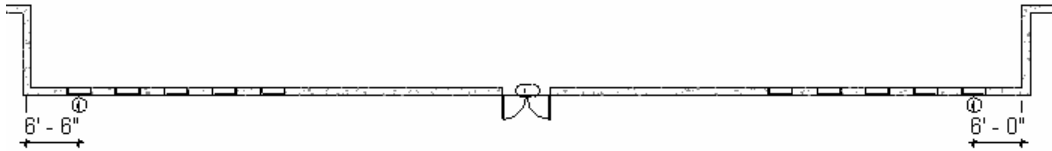
Set the array quantity to **5**.

Set the distance for the array to **6'-0"**.




You should see a preview of the array.

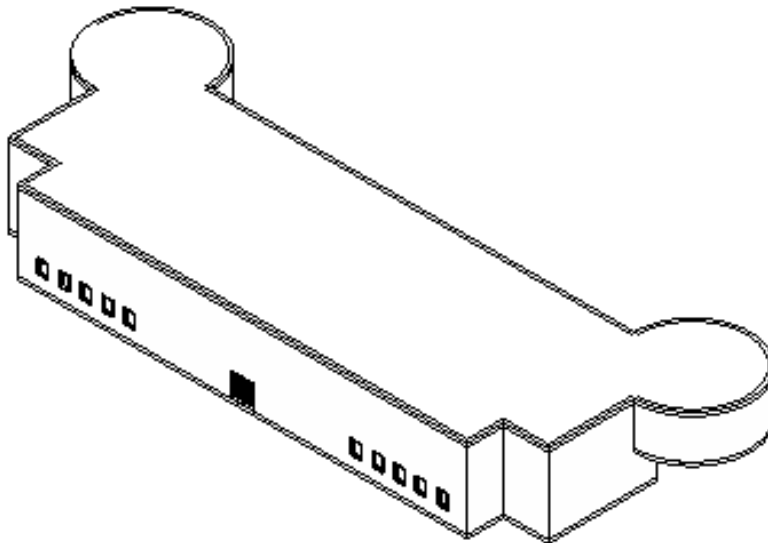
Press **ENTER** to accept.



18. Use the **Mirror** tool to mirror the windows to the other side of the wall opposite the door.

19.  Switch to a **3D View**.

20.  **Show Shell** Activate **Show Shell**.

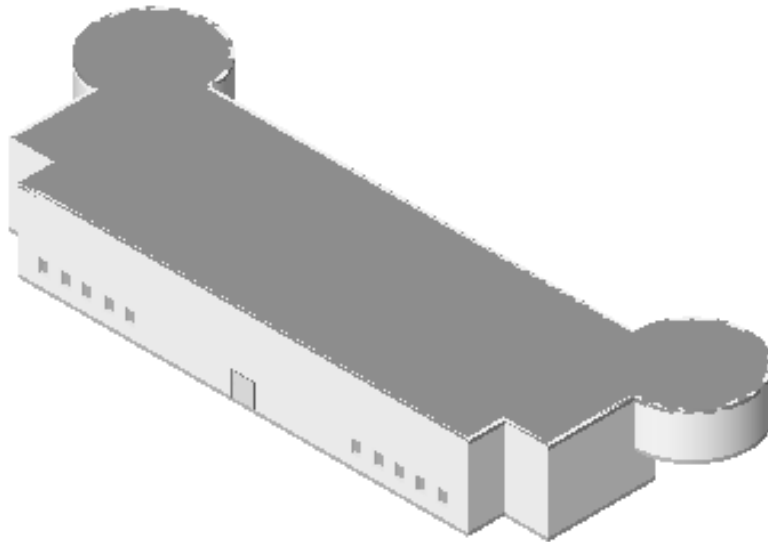


21.  Right click in the graphics window and select **View Properties**.

22.

Crop Region Visible	<input checked="" type="checkbox"/>
Visibility	Edit...
Model Graphics Style	Shading
Detail Level	Medium

Set the Model Graphics Style to **Shading**.




We have created a conceptual model that we can show a client in very little time.

23. Save the file as *ex3-4.rvt*.

Exercise 3-5 **Creating a Cost Report**

Drawing Name: ex3-4.rvt
Estimated Time: 5 minutes

This exercise reinforces the following skills:

- View
 - Cost Report
1. Open or continue working on *ex3-4.rvt*.
 2.  Go to **View Menu**→**New**→**Cost Report**.

Preliminary Cost Report

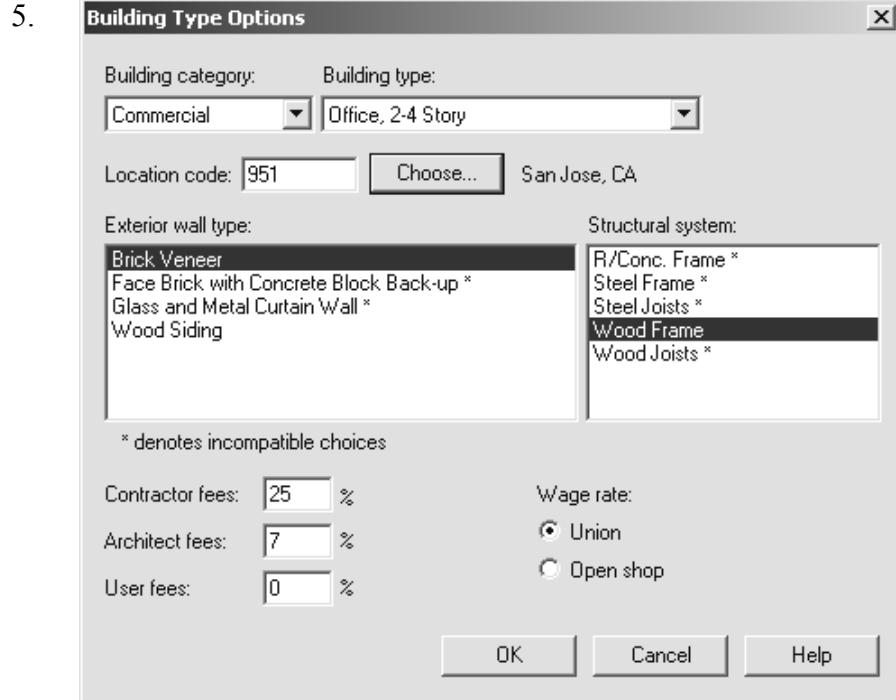


RSMeans
CMDGROUP



3. A window opens.

4. Select **Building Type**.



Set the Building Category to Commercial.

Set the Building type to Office, 2-4 Story.

Set the Location Code to 951.

You can also select the 'Choose' button and select San Jose, CA from the list.

Set the Exterior wall type to Brick Veneer.

Set the structural system to Wood Frame.

Set Contractor fees to 25%.

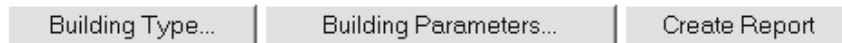
Set Architect fees to 7%.

Set User fees to 0%.

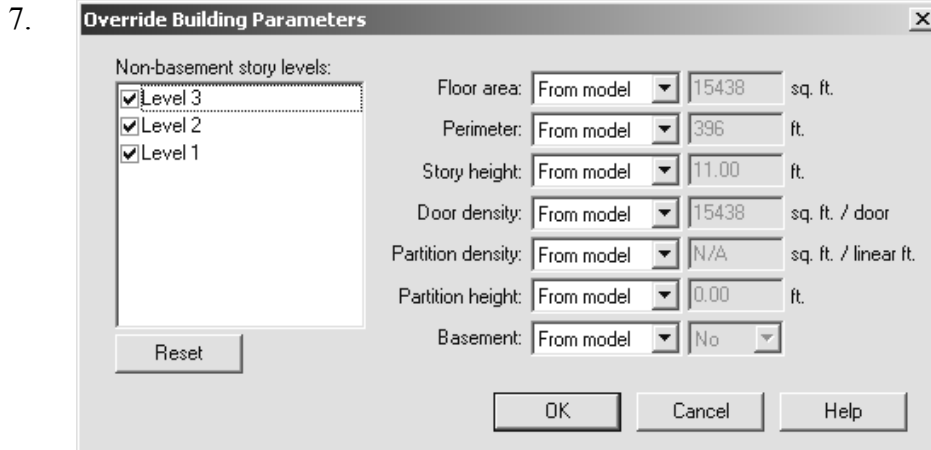
Set Wage rate to Union.

Press 'OK'.

6. **Preliminary Cost Report**



Select **Building Parameters**.



Note that Revit has already determined the square footage based on your conceptual model.

Press **OK**.

8. Preliminary Cost Report




Select **Create Report**.

Building type: Office, 2-4 Story	
Exterior wall type: Brick Veneer	Structural system: Wood Frame
First three digits of zip code: 951	Location: San Jose, CA
Data release: 2001Revit	Wage rate: Union
Stories: 3	Door density: 15438 sq. ft. / door
Floor area: 15438 sq. ft.	Partition density: N/A
Perimeter: 396 ft.	Partition height: 0.00 ft.
Story height: 11.00 ft.	Basement: No

Costs are derived from a building model with basic components. Scope differences and local market conditions can cause costs to vary significantly. Cost information is provided by RSMean CostWorks based on the input values shown above.

You will see a report that can then be printed out and provided to your customer.

Being able to create this sort of report early on in a project is a great feature in Revit.

9.  You can see the Preliminary Cost Report in the Project Browser.

10. Save as *ex3-5.rvt*.

**TIP:** Using the Mouse in Revit**If you use an IntelliMouse:**

1.	Go to your Windows Control Panel.
2.	Add the <i>Revit.EXE</i> to the exclusions list
3.	Make sure the middle button is set to 'Middle Button' and not Universal Scroll.
	To rotate realtime in Revit instead of pressing F8 or the eye icon, try pressing the wheel button + the shift key.

If you have a 5 button Mouse:

Make use of the two side buttons to enhance productivity.

Assign **Properties** to the left button.

Assign **Project Browser** to the right button.