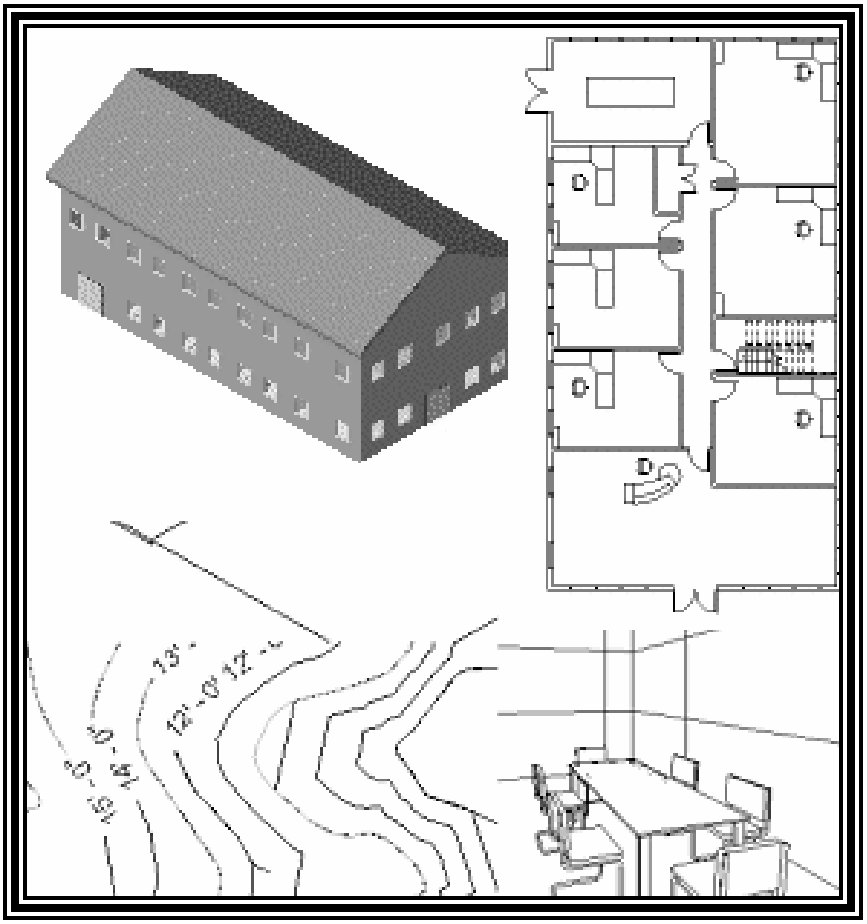
Autodesk Revit 9.0 Basics:

from the Ground Up



Elise Moss

SDC
PUBLICATIONS

Schroff Development Corporation

www.schroff.com
www.schroff-europe.com

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

Create Mass	Add Mass	Creates a solid shape
Place Mass	Place Mass	Places a mass group
Wall by Face	Wall by Face	Converts a face into a wall
Floor by Face	Floor by Face	Converts a face into a floor
Curtain System by Face	Curtain System by Face	Converts a face into a curtain wall.
Roof by Face	Roof by Face	Converts a face into a roof
Section	Section	Create a section of the model
Level	Level	Add a level

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

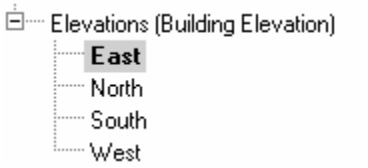
Drawing Name: default.rte
Estimated Time: 5 minutes

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.

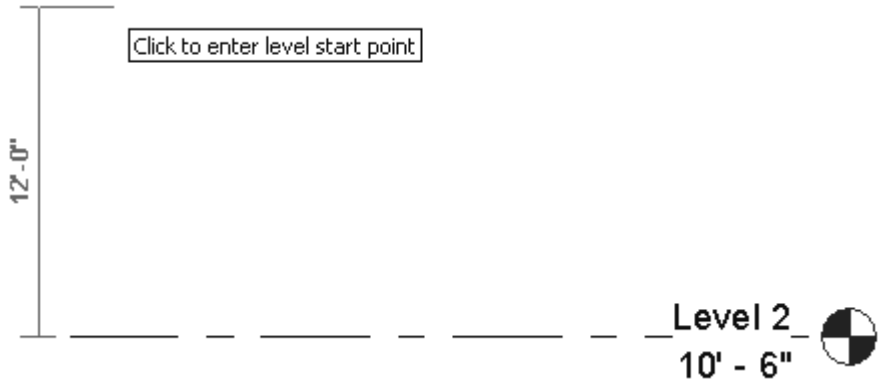
This activates the East view orientation.

3. 

Select the **Massing** button from the Design bar.

4. 

Select the **Level** tool. (This adds a floor elevation.)

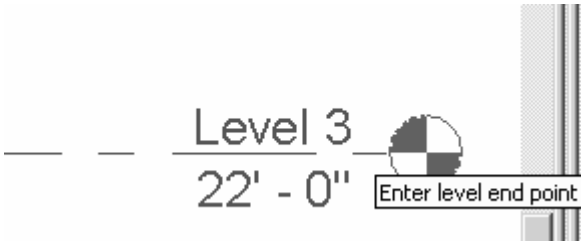


5. Move your mouse to set an elevation of **12′-0″**.
Pick to start the elevation line.

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.

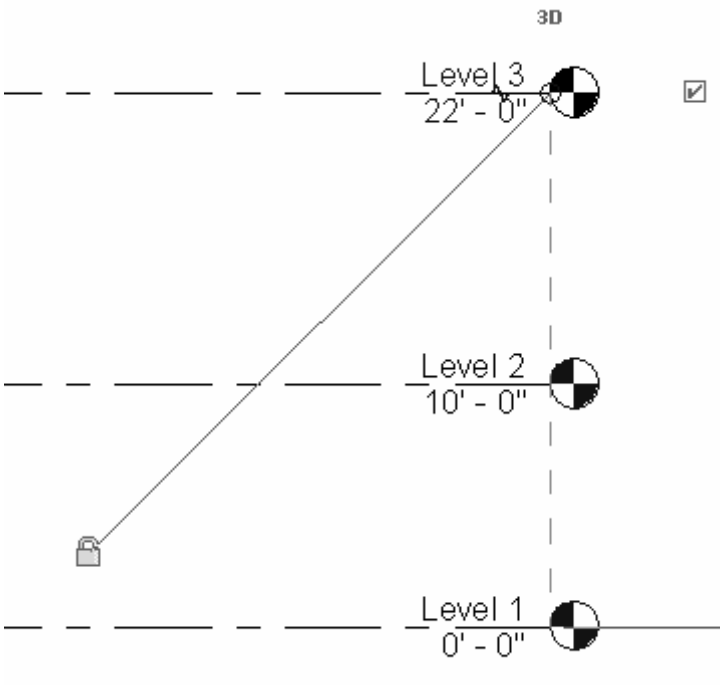
TIP: Double click on the blue elevation symbol to automatically switch to the floor plan view for that elevation.

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.

Right click and select **Cancel** twice to exit the Level command.



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

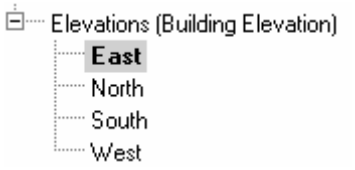
Adding Mass Elements

Drawing Name: ex3-1.rvt
Estimated Time: 10 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 **Create Mass** tool.

A warning dialog will appear to notify you that Show Mass mode has been activated, so you can see the mass element you define. If you do not want to see this dialog every time you create a mass when Show Mass mode is enabled, enable the Don't show this message again box.

Then press **OK**.

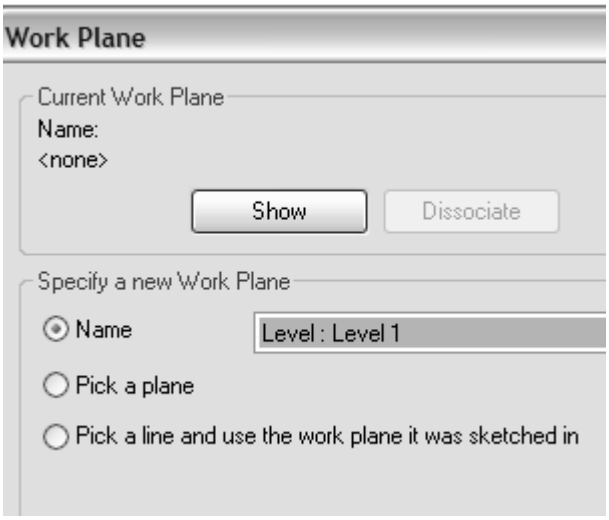
5. 

Enter **Level 1** in the Name field.

Press **OK**.

6. 

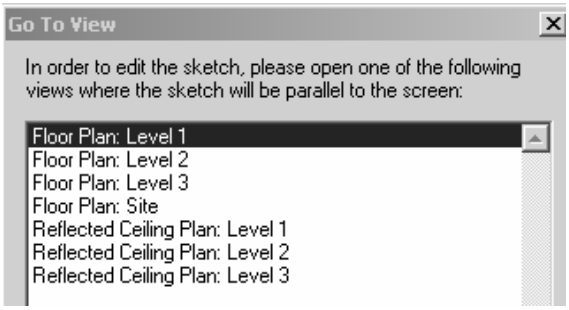
Select **Solid Form→Solid Extrusion**.

7. 

Enable **Name**.

Select **Level 1** from the drop-down list.

Press **OK**.

8. 

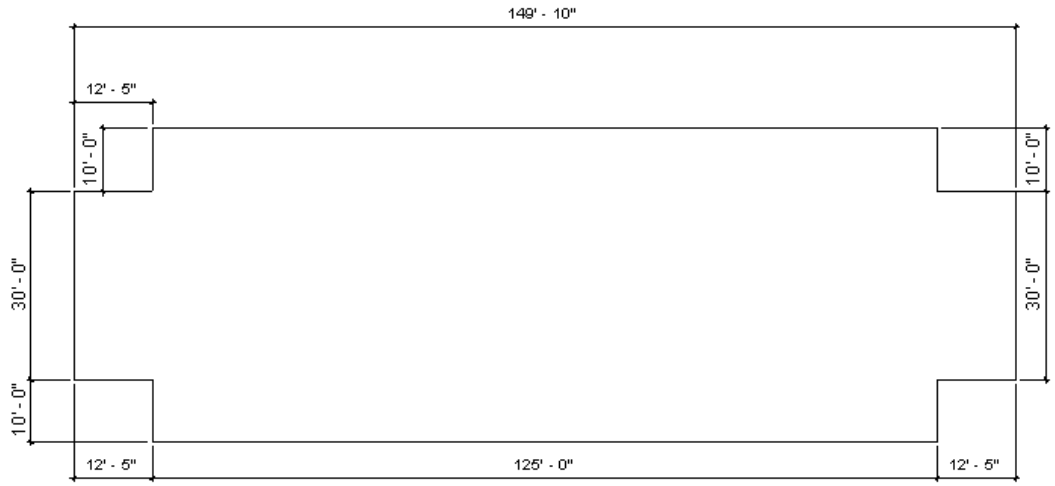
Highlight **Floor Plan: Level 1**.

Select **Open View**.

9. 

Enable **Chain** in the Options bar.
This allows you to draw lines without always having to pick the start point.

TIP: Object tracking will only work if the sketch objects are active and available in the current sketch. You can use **Pick** to copy entities into the current sketch.

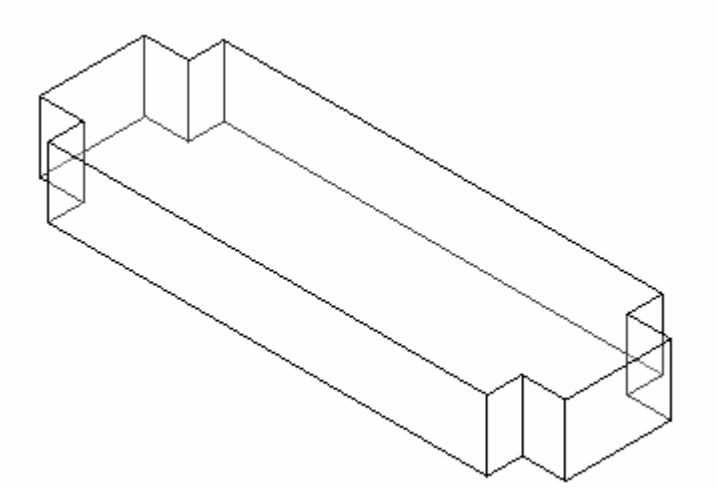
10. 

Create the shape shown.

11. Finish Sketch Select **Finish Sketch**.

12. Finish Mass Select **Finish Mass**.

13. Select the **3D** view tool.



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

Exercise 3-3

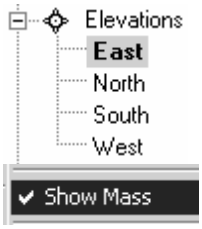
Modifying Mass Elements

Drawing Name: ex3-2.rvt
Estimated Time: 30 minutes

This exercise reinforces the following skills:

- Extrude
- Add Mass

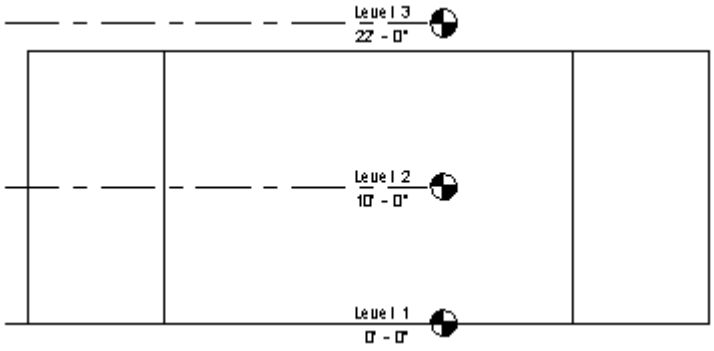
1. Open *ex3-2.rvt.*

2. 

Activate the **East** Elevation.

Go to **View**.
Enable **Show Mass** so that you can see your mass object if it is not visible.

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.



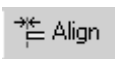
We see that our building isn't really tall enough.

3. 

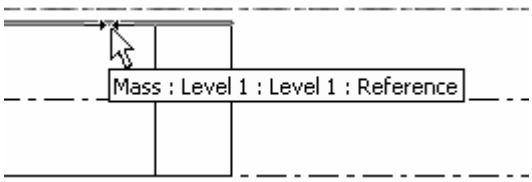
Highlight the mass in red.
Select **Edit**.

4. 

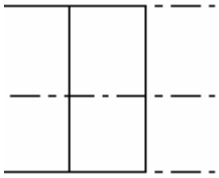
Make sure that **Modify** is enabled.

5. 

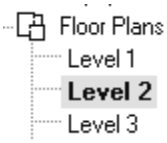
Select the **Align** tool.

6. 

Select the top level line (Level 3) then select the top of the extrusion.

7. 

The top of the extrusion extends to the level 3.

8. 

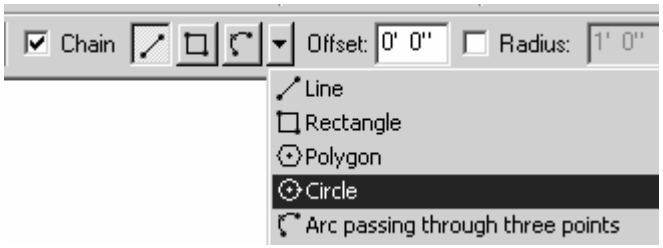
Activate **Level 2** under Floor Plans**.**

9. 

Select **Solid Form→Solid Extrusion**.

10. 

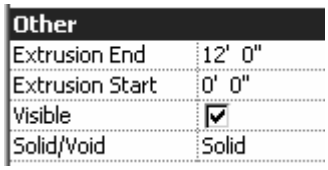
Enable **Lines** mode.

11. 

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

12. 

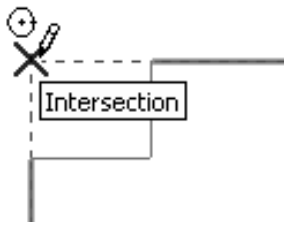
Select **Extrusion Properties**.

13. 

Other	
Extrusion End	12' 0"
Extrusion Start	0' 0"
Visible	☑
Solid/Void	Solid

Set the Extrusion End to **12′-0″**.

Press **OK**.

14. 

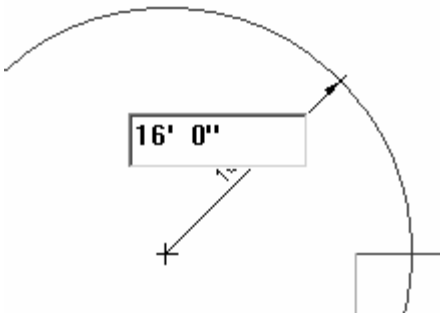
You can use object tracking to locate the intersection between the two corners.

To activate object tracking, enable the **Pick** tool.  Then select the two lines you want to align with.

Then enable the **Draw** tool.

When you see the large X and the tooltip says Intersection, you will have located the intersection.

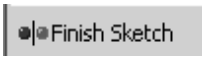
Pick to locate the center of the circle at the intersection.

15. 

Enter a radius of **16′-0″**.

When you selected the two lines, you copied those lines into the current sketch. You need to delete those two lines or you will get a warning error when you try to exit the sketch.

16. Select the two copied lines.
Right click and select **Delete**.

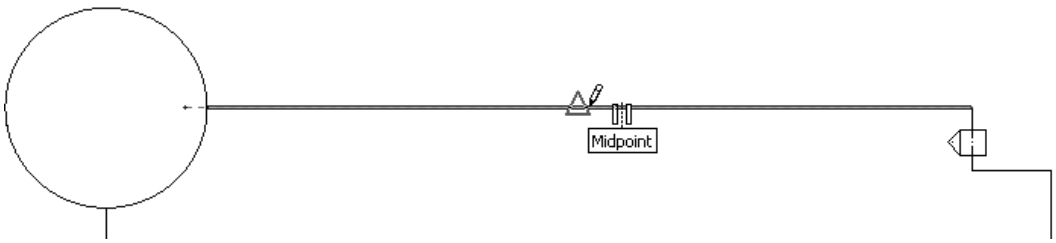
17. 

Select **Finish Sketch**.

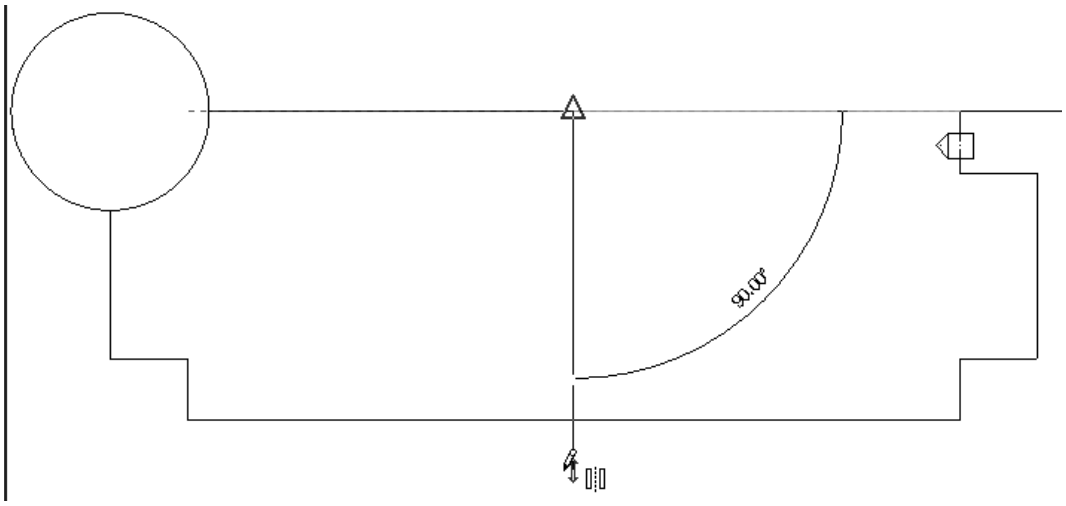
18. 
Verify that the circle is still highlighted.
Select the **Mirror** tool from the Options bar.

19. 

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

20. 

Locate the midpoint of the small horizontal line and pick.

21. 

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

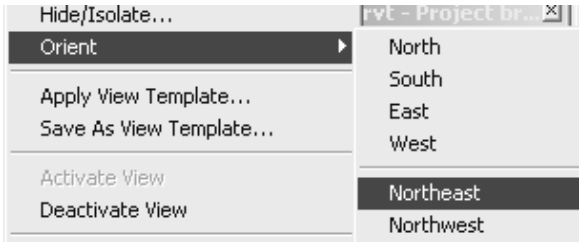
22. 

Select **Finish Mass**.

If the mass object disappears, it simply means you have to re-enable the Show Mass option under View.

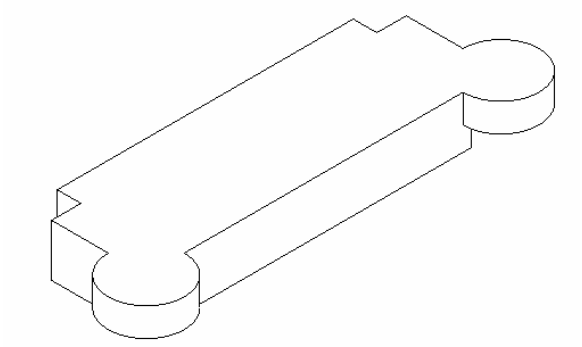
23. 

Activate the **3D** view.

24. 

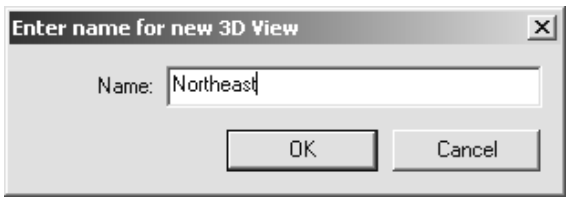
Go to **View→Orient→Northeast**.

The view changes.



25. 

Go to **View→Orient→Save View**.

26. 

Enter **Northeast** for the name of the view.

Press **OK**.

27. 

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

28. 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

Creating Wall by Face

Drawing Name: ex3-3.rvt
Estimated Time: 10 minutes

This exercise reinforces the following skills:

- Wall by Face
- Trim
- Show Mass

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

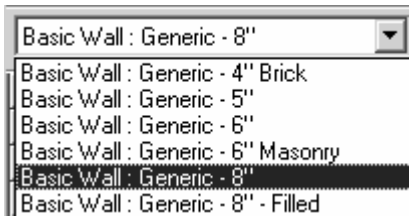
1. Open *ex3-3.rvt*.

2. 

Activate the **Northeast** view under 3D Views.

3. 

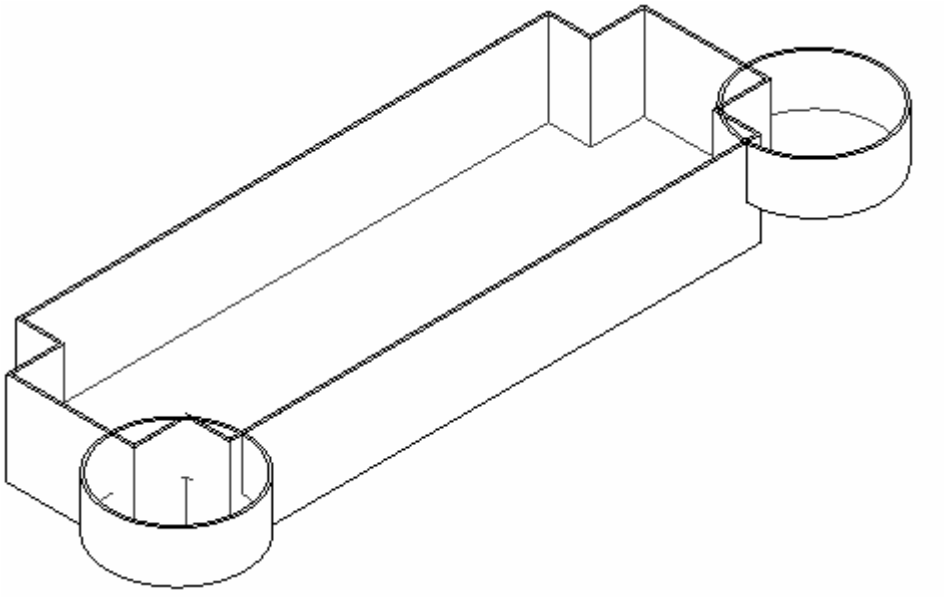
Select **Wall by Face**.

4. 

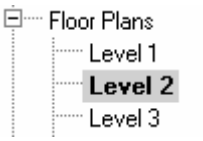
In the Options bar, you can set the wall type.

Set the Default Wall Type to:
Basic Wall: Generic- 8″.

5. 
Enable **Pick Faces** in the Option bar.

6. 

Select each wall and cylinder.
The cylinder will be halved by the walls, so you will have to select each half.

7. 

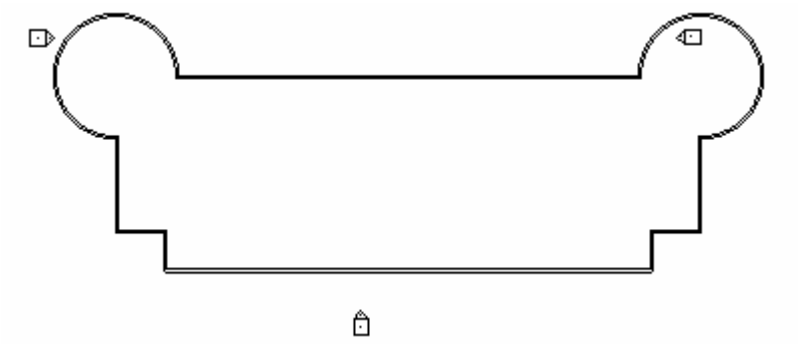
Activate **Level 2** under Floor Plans.

8. 

Select the **Trim** tool.

9. Note that you have some instructions in the lower left of the screen to assist you.

10. Disable **View→Show Mass** so you only see the walls.



11. Trim the walls as shown.
When you trim, select the elements you want to keep.

12. Save as *ex3-4.rvt*.

Exercise 3-5

Adding Doors and Windows

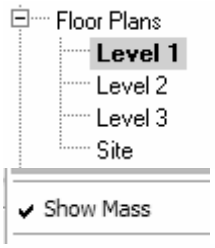
Drawing Name: ex3-4.rvt
Estimated Time: 5 minutes

This exercise reinforces the following skills:

- Basics
- Door
- Load from Library
- Window
- Array
- Mirror
- Shading

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

1. Open *ex3-4.rvt*.

2. 

Activate **Level 1** under Floor Plans.

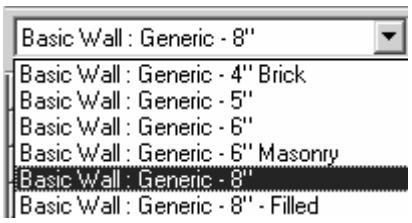
Re-enable Show Mass.

3. 
You don't see the cylinders because they were placed on Level 2.

We need to add a couple of the walls for the first level.

4. 

Select **Wall by Face**.

5. 

In the Options bar, you can set the wall type.

Set the Default Wall Type to:
Basic Wall: Generic- 8″.

6. 
Enable **Pick Faces** in the Option bar.

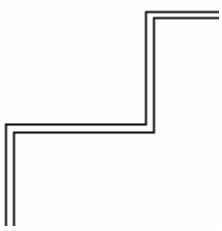
7.  Select the four walls indicated.

8. 

Disable **Show Mass** under View, so you only see the walls.

9. 

Use the **Trim** tool to join the walls.

10.  Simply select the two walls you want to join and they will automatically extend and join.

11.  Level 1 should appear like this.

12. 

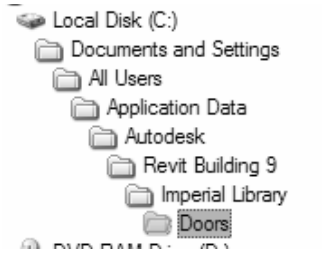
Activate **Basics** from the Design bar.

13. 

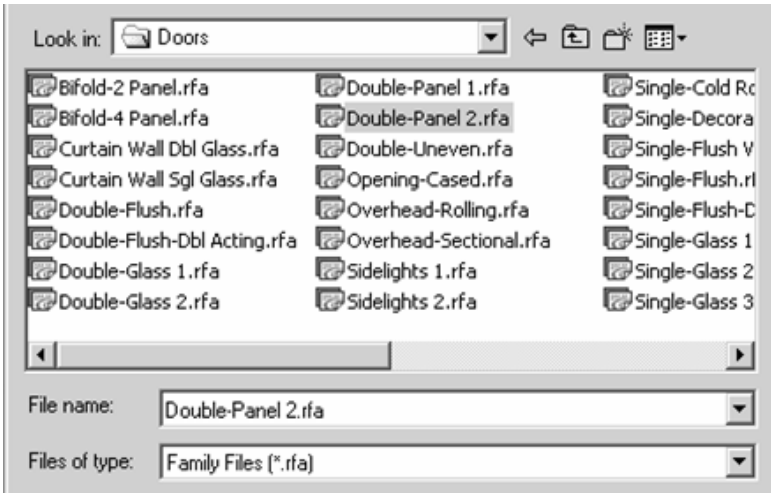
Press the **Door** tool.

14. 

Press **Load** from the Options toolbar.

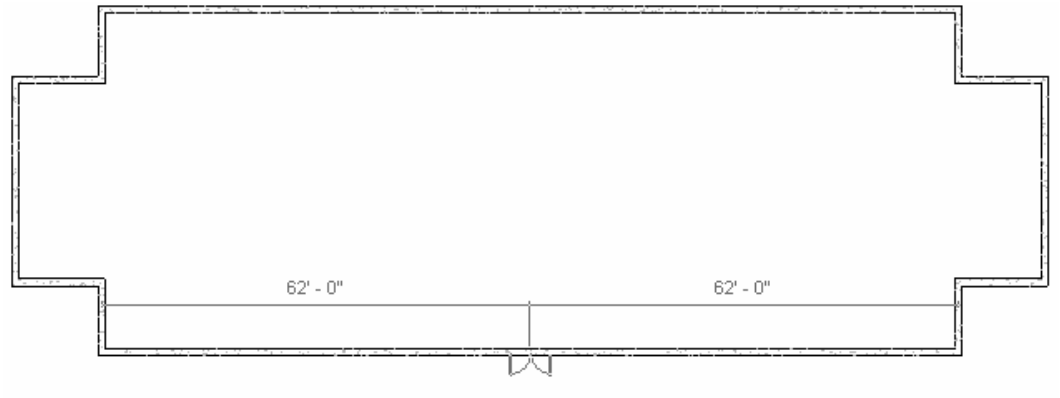
15. 

Browse to the **Doors** folder.

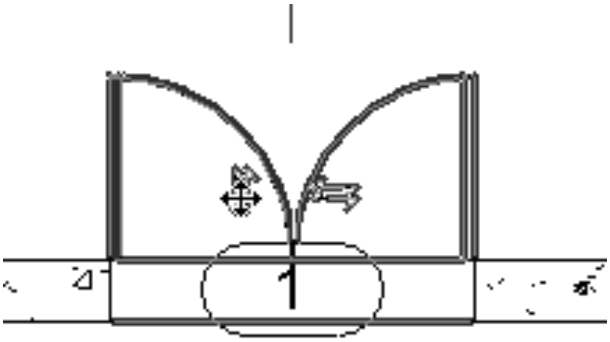
16. 

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

Press **Open**.



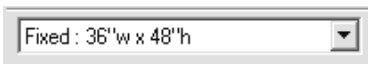
17. Place the door so it is centered on the wall as shown.

18. 

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

19. 

Pick the **Window** tool.

20. 

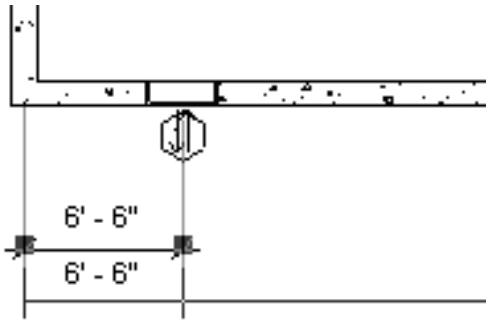
Select **Fixed: 36″w × 48″ h** from the drop-down list.

21. 

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.

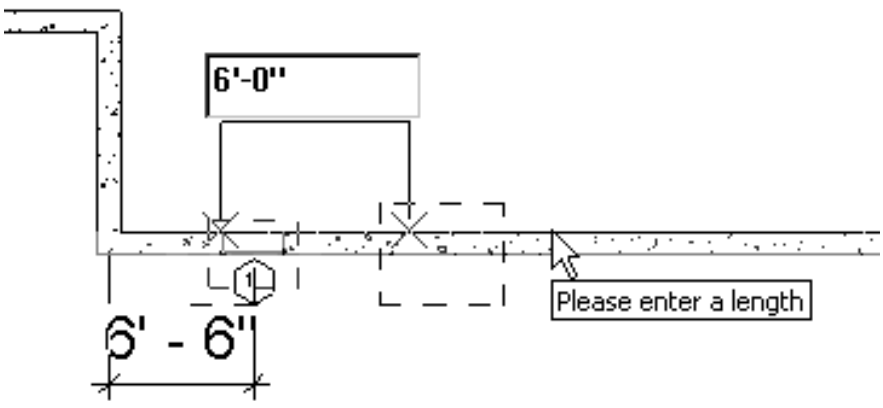
If you want to define the position of an object using a dimension that doesn't appear when you pick the object, you can apply a temporary dimension using the Dimension tool. This will add a permanent dimension to the object that can then be used to position the object.

22. 

Pick the window so it highlights in red.

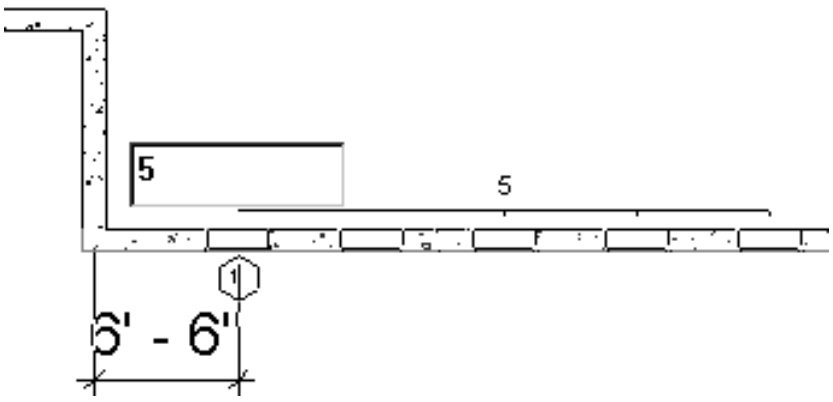
23. 

Select the **Array** tool.

24. 

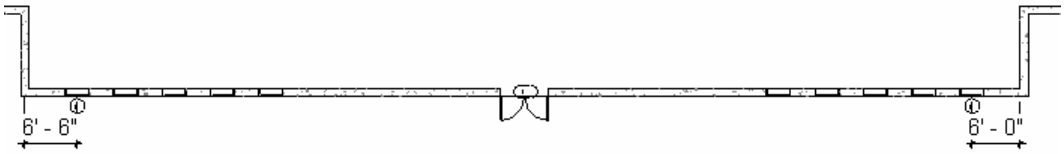
Set the array quantity to **5**.

Set the distance for the array to **6′-0″**.

25. 

You should see a preview of the array.

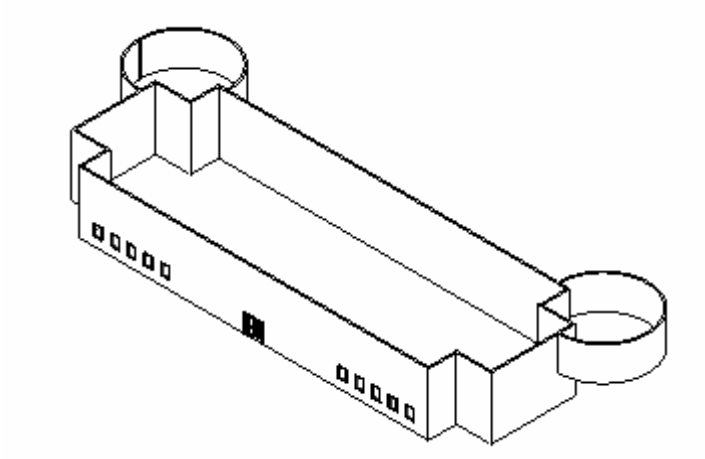
Press **ENTER** to accept.

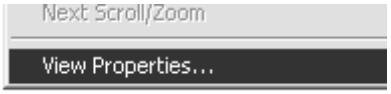
26. 

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

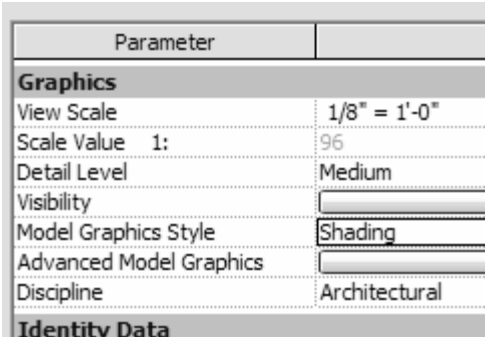
27. 

Switch to a **3D** View.
Disable **Show Mass** under View.

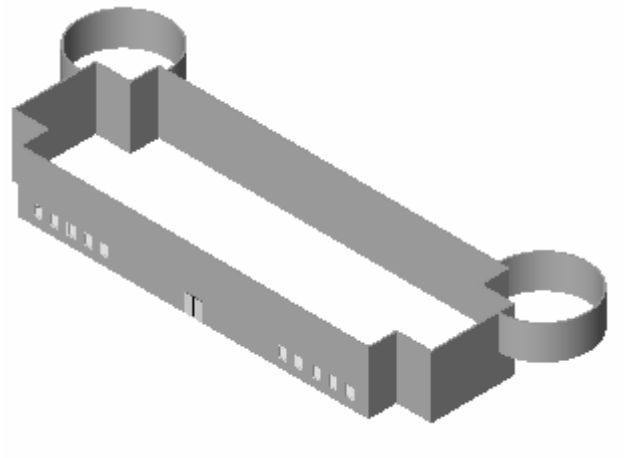


28. 

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

29. 

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



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

30. Save the file 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 *Revit.EXE* to the exclusions list
3.	Make sure the middle button is set to 'Middle Button' and not Universal Scroll.
	To rotate real-time 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.

NOTES: