

# Revit Cookbook

by Bryan Bowers

Written January, 2012

Updated February, 2015

## Table of Contents

Outline – One Day Revit Workshop.....	2
Introduction.....	3
Program Interface and Workspace.....	3
Zooming / Viewing Model .....	4
Tool and Command Operation .....	4
File Naming Notes .....	4
Project Browser .....	5
Initial Notes on Functions and Tools .....	6
Datum Elements and Building Components.....	7
Building Components and Their Properties .....	7
Levels .....	8
Grids .....	11
Drawing and Editing Practice .....	12
Revit 2012 – Steps to Draw a Simple House.....	19
10 Revit Tips .....	40
Selecting Objects .....	41
Revit Review Questions.....	42
Dimensions .....	43
How to Create a Foundation Wall and Add Footings .....	48
How to create Soffits.....	53
How to Create a Sheet (for Printing) .....	58
Other Commands .....	62
Rendering .....	62
Seek .....	62
Sections .....	62
Layouts .....	63
Additional Learning Resources .....	64
Two Favorite Web Sites.....	64
Additional Web Sites .....	64
Dealer Led Training.....	64

## Outline – One Day Revit Workshop

Workshop is hosted by Technology Resource Center at Southeast Missouri State University

Instructor – Bryan Bowers, (573)651-2649 office or (573)450-2614 cell

### Introduction

- Program Interface and Workspace
- Zooming and Viewing
- Project Browser

### Datum Elements and Building Components

- Building Components and Properties
- Levels
- Grids

### Drawing and Editing Tools

#### Creating a Simple Model

- Creating walls and modifying wall styles
- Adding components – Doors, Windows and plumbing fixtures
- Creating a Roof and Ceiling
- Creating Various Views – Inside Elevation and 3D perspective

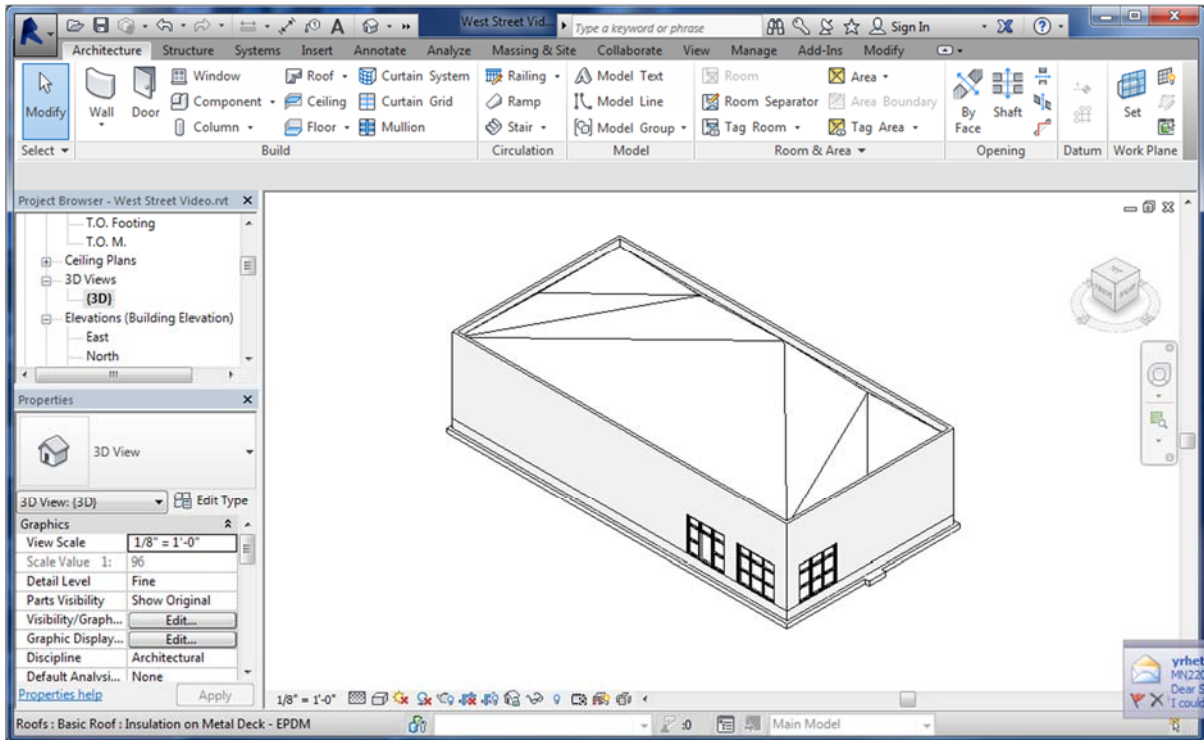
### Dimensioning

#### Additional Learning Resources

- Seek

### Layouts and Other View Commands

## Introduction



## Program Interface and Workspace

On the screen shot above identify the following:

- Application menu (letter R)
- Ribbons
- Tab Names
- Panels
- Options Bar
- Properties Palette
- Project Browser
- View Control Bar
- Scale Control

## Zooming / Viewing Model

- Mouse Wheel -Pan, Zoom, Orbit
- Compass
- Steering Wheel

## Tool and Command Operation

Revit will stay in a tool or command until you select another command. Pressing escape does not exit the command; it will usually restart the command. Most functions used will be on the home ribbon.

To select objects or components you will use the modify tool (I often call this the pick button).



## File Naming Notes

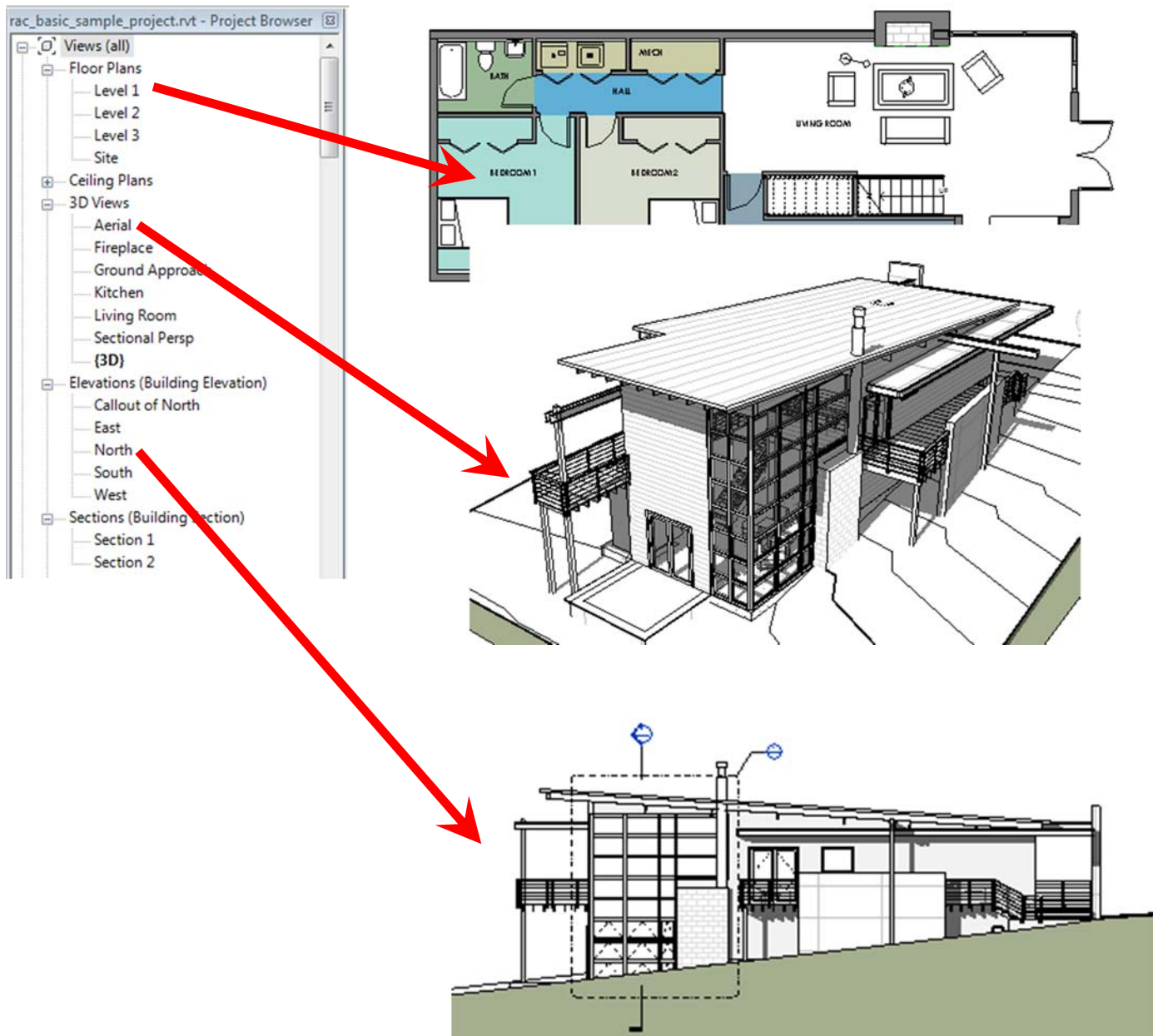
- Revit Projects have the extension RVT
- Revit templates have the extension RTE.

Templates are the starting points for projects. When starting a new Revit project you should always use a template.

- Backup files have the 001, 002, 003 within the name and so on. These are great if things go really bad, but in general you should never open them.

## Project Browser

In Revit we are creating a computer model of our building. Instead of drawing I like to think of a Revit project being more similar to building model cars from kits when I was a kid. The project browser is a key feature that list the different views of you model. In other words the model is built once, but we can have as many different views as we want. Below are some screen shots showing a portion of what we can see.



In addition to views the project browser has a Rendering section and Schedule section and a Sheets section. The Sheets are the link from the views to hard output of the plans.

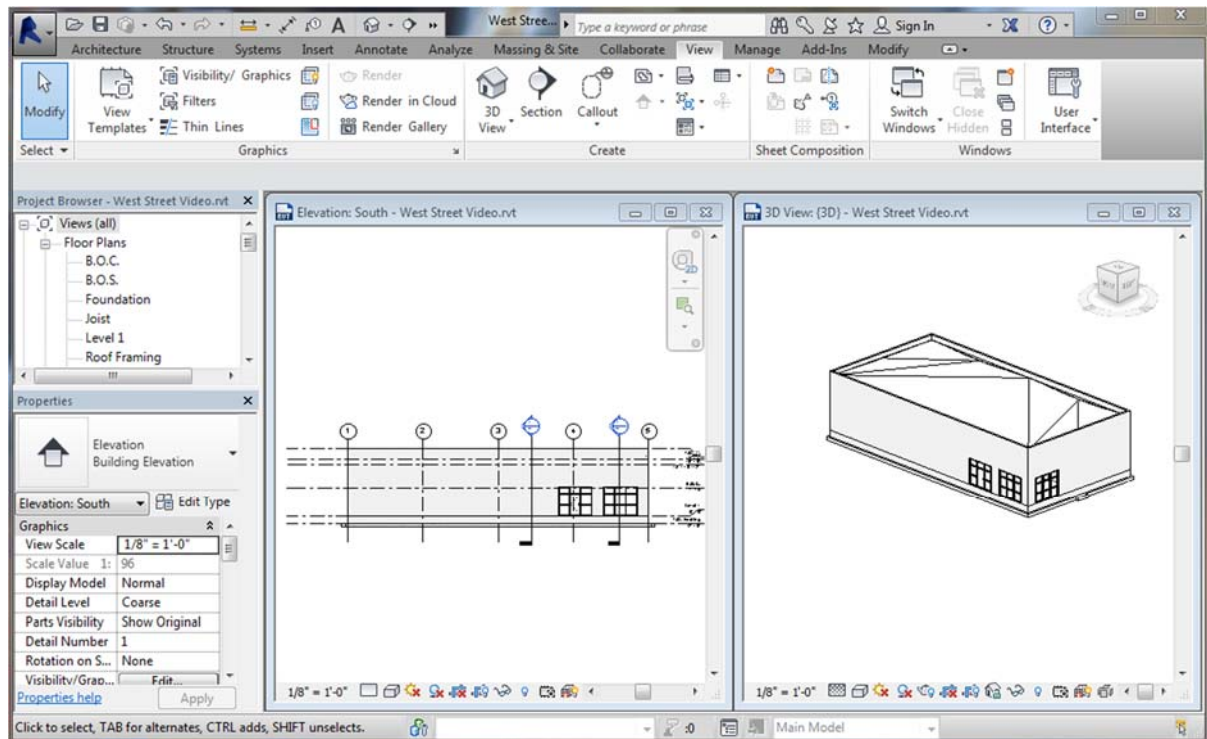
## Initial Notes on Functions and Tools

1. If the Project Browser is not shown, how would you turn on Project Browser?
2. Explain how you would temporarily hide objects in a view.
3. Explain how to unhide hidden objects.
4. Undo Command – Where is it located and what does it do?
5. Most commands will be located in the \_\_\_\_\_ Ribbon.
6. If I cannot find command I am looking for it is most likely in the \_\_\_\_\_ Ribbon.

## Datum Elements and Building Components

- Building Components
- Levels
- Grids

For this section open the project named West Street Video located in S:\bbowers\Revit Workshop.



Next open two windows. One showing the South Elevation and the other showing a 3D view. Your screen should look something like this:

## Building Components and Their Properties

We will look at various components and hide items to view different components for the building.

Once you have selected an item you can view its properties. In properties window you can select Edit Type to view its type properties and its structure makeup.



**Mini Exercise 1:** Select one of the exterior walls and answer the following questions:

What is the Base Constraint? \_\_\_\_\_

What is the Top Constraint? \_\_\_\_\_

How thick is the Wall? \_\_\_\_\_

What material is the wall made of? \_\_\_\_\_

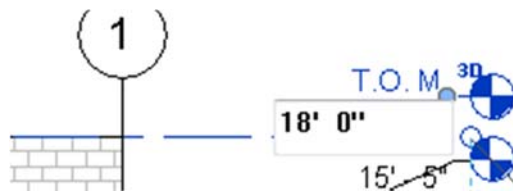
How did you find the answer to the last two questions? \_\_\_\_\_

## Levels

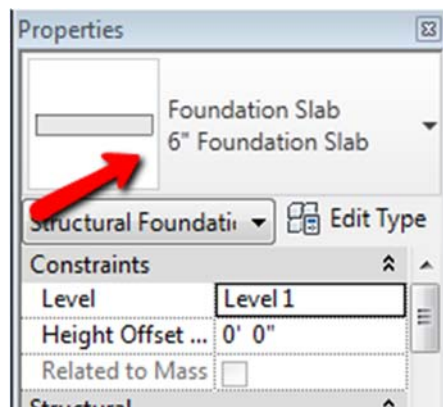
Levels control the vertical placement of components in the Model. Virtually every component you place in the project will be associated with a level.

**Mini Exercise 2:** Edit level height and view component relationships:

1. In the South Elevation view, click on the 18' (height) for the T.O.M. level and change it to 32' and press enter.



2. Note how wall heights change in both the elevation view and the 3D view
3. In the 3D view hide various components until you can see the concrete floor.
4. Select the floor. Your properties window should look similar to below, note the component.



5. Change the Height Offset to some silly number such as -6' and click Apply.

## Creating Levels

For the next exercise we will create some new levels. All functions and commands in Revit work very similar. This means that the steps we learn now will be very similar to commands that we use later on.

Additional note on Levels: In general, when we create a new level we are also creating a new floor plan view with the same name. For example, if we create a level named “2nd Floor” we will also have a Floor Plan View name “2nd Floor”.

Levels can be created by copying an existing level and renaming it or by drawing a new level. My preference is to draw a new level - the mini exercise below will create two new levels and show two methods to draw them.

### Mini Exercise 3: Create New Levels

#### Part 1 – Using the Line Tool

We will start the exercise in the South Elevation

1. Maximize the screen.

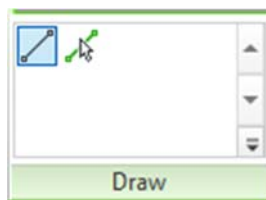


2. Click the Architecture tab and then pick on Level in the Datum



#### Side Note -- Key Revit Principal

As soon as we select the Level command the draw panel appears.



This is fundamental to how Revit works. The menus and interface will change based on the tool you are currently using. So when drawing Levels two choices exist:



Line - You will pick a starting and ending point for the level line.



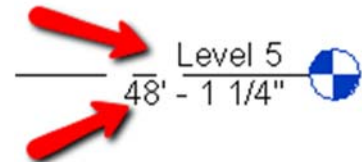
Pick Line – You will pick an existing level and Revit will mimic that level.

Later when we are drawing walls and other objects you will notice many more choices will be available in the Draw panel.

3. Pick the Line command in the Draw Panel



4. Draw the line from left to right above all other levels
5. Pick on level name to rename it and pick on level height to make it an even number



### Part 2 – Create a level with the pick tool

At this point you should still be in the level command if not you will need to pick it again.

1. Select the Pick tool in the Draw Panel



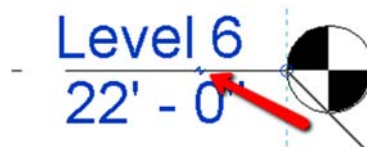
2. Set the Offset on the option bar to 10'



3. Pick on the highest level line (point should be slightly above line to get the offset to go up).  
A new level is now created

### Extra

- a. Have text and level mark appear on other side



- b. Adjust position of text for level

## Grids

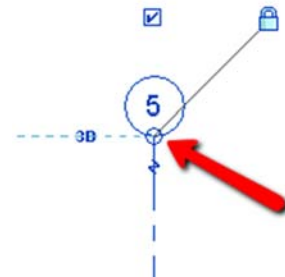
Grids (and Levels) are annotation elements. That means they are not part of your actual model, but model components can be referenced to them. A very good example of this is having a column placed at the intersection of grid lines, this column can be attached to the intersection. The Grid (and Level) consists of two main parts: The reference line and the header text. Using Grids is highly recommended for commercial buildings.

### Mini Exercise 4 – Working with Grids

#### Part 1 – Adjust label positions

Before starting double click on the “Level 1” Floor Plan in the Project Browser

1. Pick on one of the Grid lines
2. Pick and hold on the hollow circle, just below the label
3. Drag down the label.

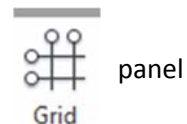


#### Part 2 – Move a Grid line

1. Pick on one of the interior grid lines
2. Use the arrow keys on the keyboard to change the position of the grid line. Notice how the column moves with the grid line, but the wall that was wrapped around the column does not move.

#### Part 3 – Create a new Grid Line

1. Select the Architecture tab, then pick the Grid tool in the Datum
2. Pick the Line tool and draw a grid line between 2 existing grid lines.
3. After picking the second point you can adjust the position of the grid line using temporary dimension.



Note: Typically the grid would be set up at start of project, so we are just experimenting to get a feel for the grid lines

## Drawing and Editing Practice

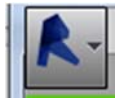
The following exercise will give us a better feel for the different drawing and editing tools. We will see different drawing options with the Wall command and then we use some of the modify commands to make adjustments.

### Drawing and Editing Exercise

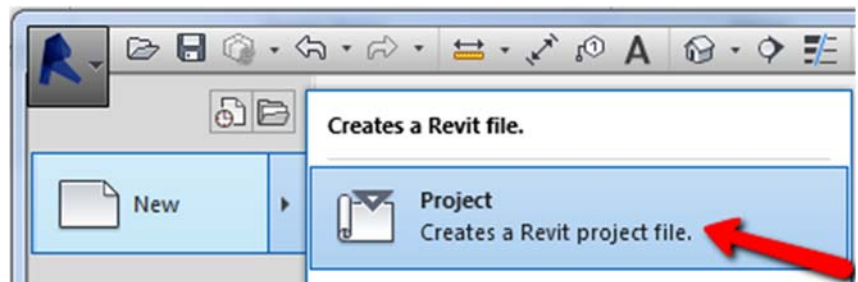
#### Part 1 – Draw Walls

First start a new project, using the default template. Then use the save button and using name it [your initials]Drawing Exercise

1. Go to the application menu



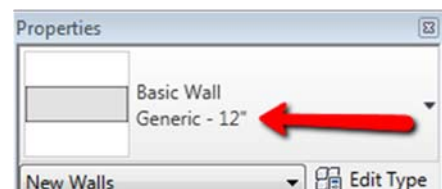
2. Select New and then select Project



3. In the New Project window select Browse and then pick on the default template
4. Go to the home ribbon and select Wall in the Build panel



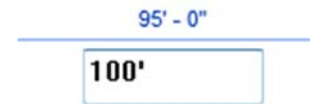
5. In the properties window select the wall type as Generic – 12"



6. Pick the Rectangle Tool in the Draw panel



7. On the screen drag out a rectangle, whose size is approximately 100' x70'. After clicking the second corner. Pick on the temporary dimension and change them to exactly 100' by 70' .

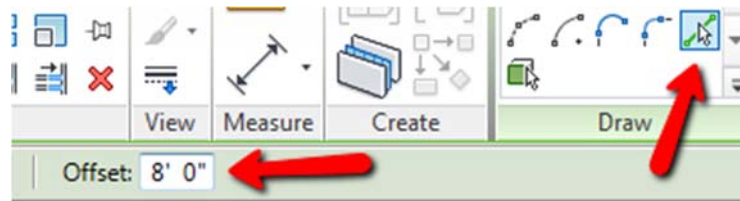


8. Select Wall in the Build panel and then select the Line tool in the Draw panel

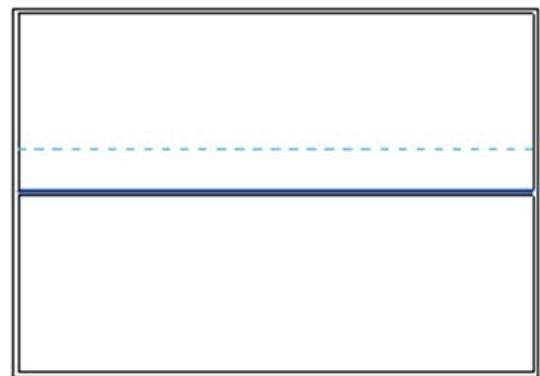


9. Draw a horizontal line through the midpoints of the two vertical lines

10. Select the Pick Lines tool and change the offset to 8'

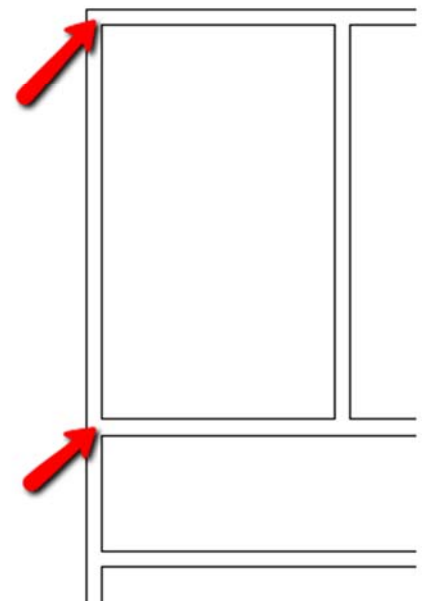


11. Place a wall 8' above the middle line. If doing correctly a dashed blue line will appear above the middle line.

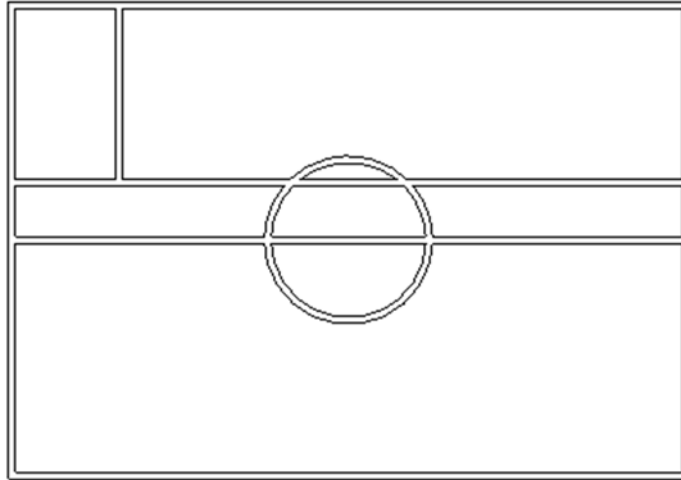


12. Now we will draw a line that is 16' from the West wall. **Select the Line tool** in the Draw panel. Change the offset distance to 16' on the Options bar. Now pick the centerline at points shown on adjacent figure.

Note: After you have picked the first point you should see the line being drawn to the right of the exterior wall. If it is not hit the space bar.

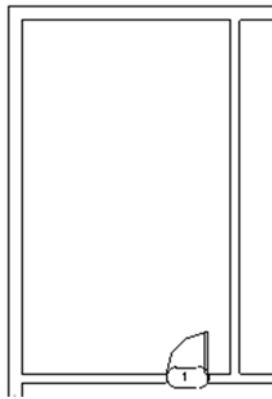


13. Select the Circle tool in the Draw panel. Pick the midpoint of the middle wall and draw a circular wall with a radius of 12'. After this your project should look something like the picture below:



14. Select the Door tool in the Build Panel. Select any type of Single door

15. Place the Door as shown

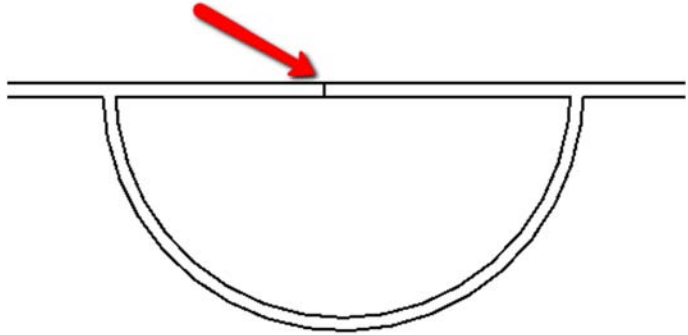



## Part 2 – Modify Tools – Editing Walls

1. Select the top of the circle and press the delete button.

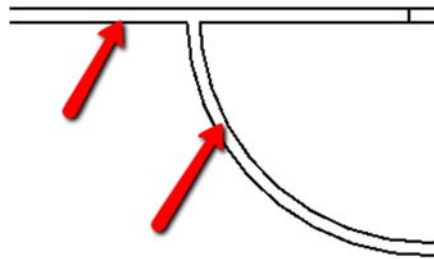
2. Pick the Modify ribbon. Select the Split Element tool 

3. Pick near the center of the circle.  
This will split the wall into 2 walls



4. Select the Trim / Extend to Corner tool 

5. Pick at points shown:



6. Repeat picking points on other side

After steps 5 and 6 your walls should look similar to the following:





### Part 3 – Offsetting Objects

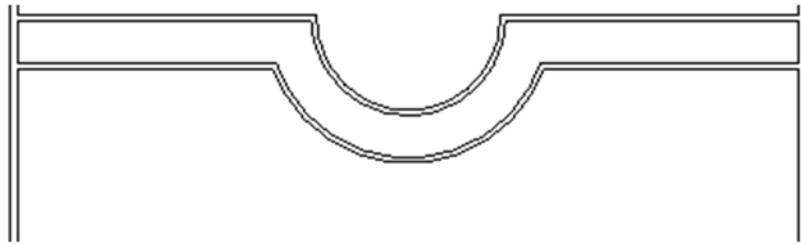
1. Select the Offset tool in the Modify panel



2. Change the Offset to 6' in the Options bar



3. Pick the middle wall and the semi-circle - Offset in a downward direction
4. Trim walls as needed using previous tools



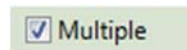
### Part 4 – Copying Objects

1. Select both the door and the interior vertical wall. Do this by selecting the Modify tool. Then pick on the wall. Then hold the Ctrl Key down and pick on the door.

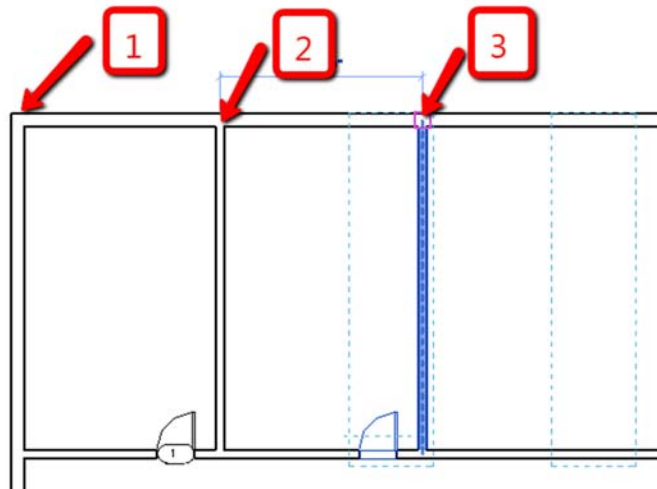
2. Select the Copy tool in the Modify Panel



3. Check on Multiple on the Option bar



- Click at point 1 (center of exterior wall) for the move start point



- Click at point 2 (center of interior wall) to indicate the move to point. Repeat from point 3 on to copy wall and door along the entire side.

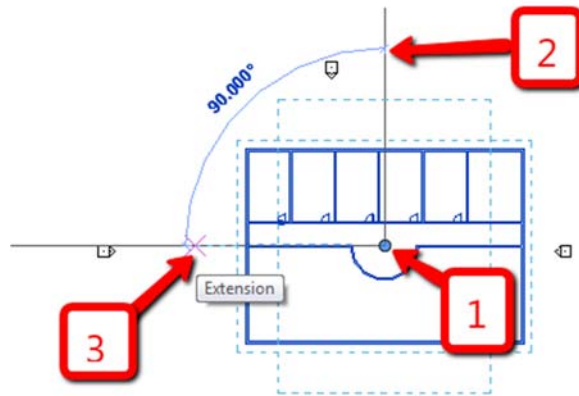
## Part 5 – Rotating Objects

- Select everything you have drawn – Pick on a point to top right of wall system drag mouse to bottom left over all objects, then release mouse.

- Pick the Rotate tool in the Modify panel



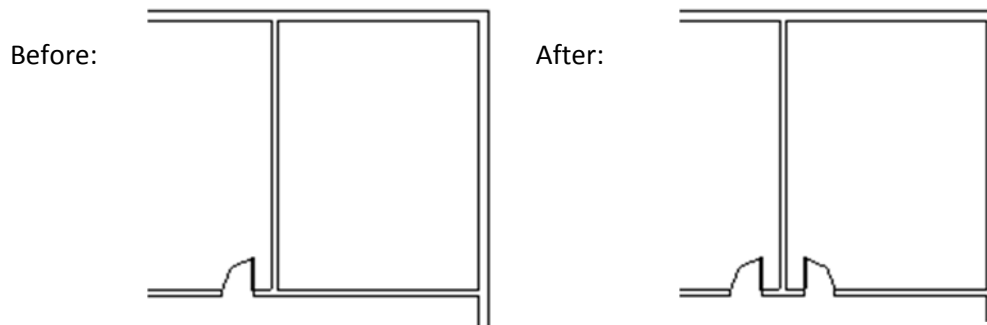
3. Pick a point near the center of the object (Point 1)



4. Pick a point directly above the center point (Point 2)
5. Pick a point to create the rotation angle (Point 3). Note instead of typing a 3<sup>rd</sup> point you can type a rotation angle.

#### Extra Practice:

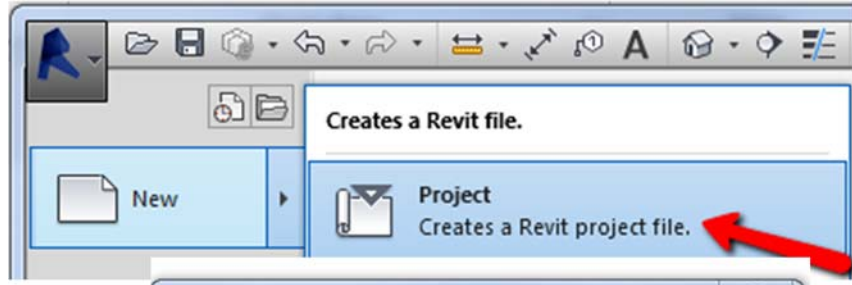
Try using the mirror command to end up with the following results



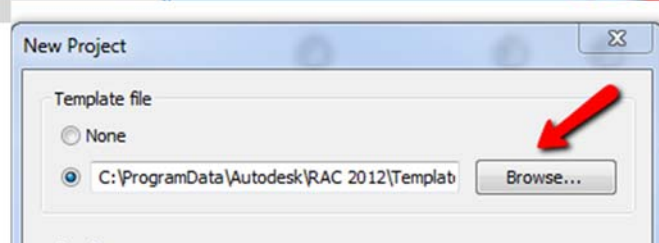
## Revit 2012 – Steps to Draw a Simple House

1. Start Revit, then start a new project. Use the **Residential-Default Template**


Select the application menu (letter R), then New, then Project



Select the Browse button and then select the Residential-Default Template




### Some notes:

- The styles for walls are known as “system components”. This is important because wall styles are stored in a project template. Thus if you do not have walls you are looking for you will need to get the correct project template before you can start.
- To enter a specified distance for a wall length drag cursor in direction you want to go, type in the number and press enter.
- When entering distances type the distance separated by spaces for the different units. For example 5'6-1/2" type 5 6 ½ and press enter.
- To remove or erase an object select it and hit the delete key. Click on  **Modify** to activate the modify mode.

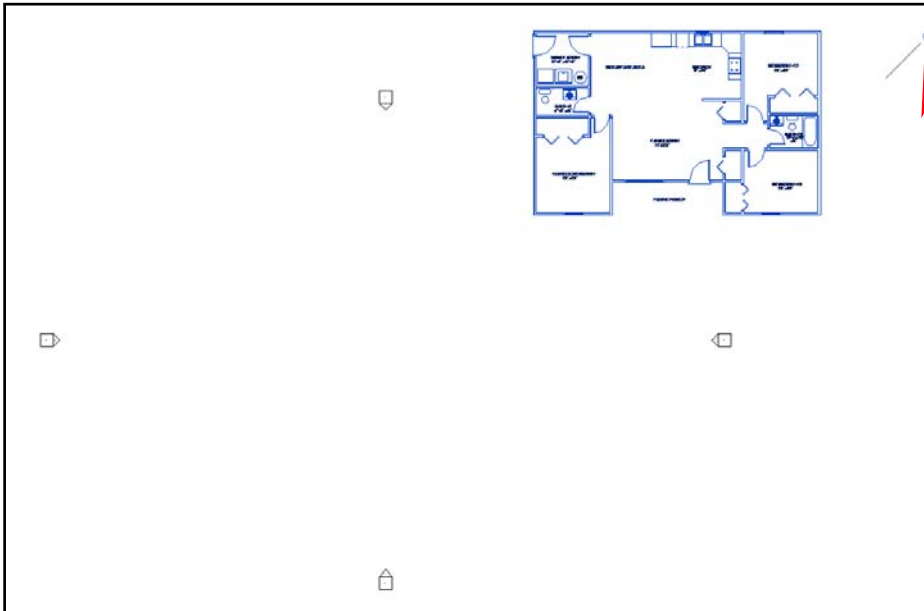
**Before getting too far use the Save Command to save your project. Name it [your initials]Mary Street**

The next pages contain general steps for drawing walls over an AutoCAD drawing.

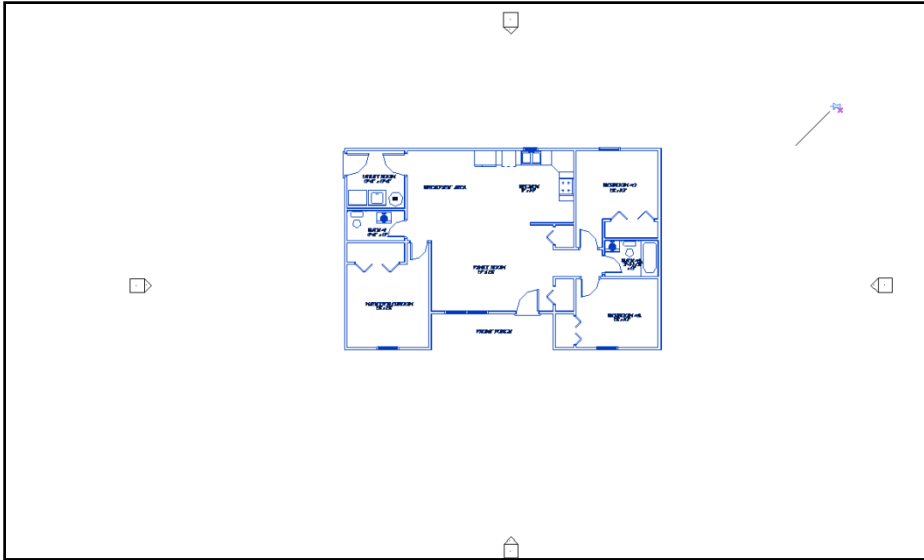
### Bring in AutoCAD drawing – Use to practice drawing walls

1. In the Insert tab>Import Panel, click  (Import CAD)
2. Browse to the instructor specified location and select Mary Street Lines  
(should be located in S:\BBOWERS\Shared\Revit Workshop)
3. Pick open in the Open CAD Formats dialog
4. Pick Close button on “Some Elements lost during import”

**EXERCISE NOTE:** *The inserted AUTO CAD drawing may not appear within the four elevation marks. You will have to zoom out and find the inserted drawing.*




1. Inserted auto cad drawing must be unpinned by clicking on the pin.

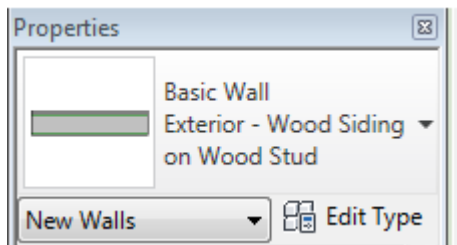


2. Unpin drawing and using the move tool place the drawing within the elevation marks.

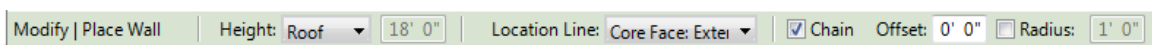
**Exercise Note:** For all the walls drawn below draw through the doors and windows. We will add these features in a later.

### Draw exterior walls

1. In the Architecture tab > Build, click  (Wall)
2. In the Properties dialog select “Exterior – Wood Siding on Wood Stud” as the basic wall style (see example below)



3. In the options bar change Height: to **Roof** and Location Line: to **Core Face: Exterior**



Hint: When drawing walls – they may appear on the wrong side of the AutoCAD walls. To change sides hit the space bar.

4. Now draw exterior walls as shown in the AutoCAD drawing. Zoom in as needed and pay attention to snaps while drawing walls. Also for now, draw wall lines through doors and windows. Doors and windows will be added later.

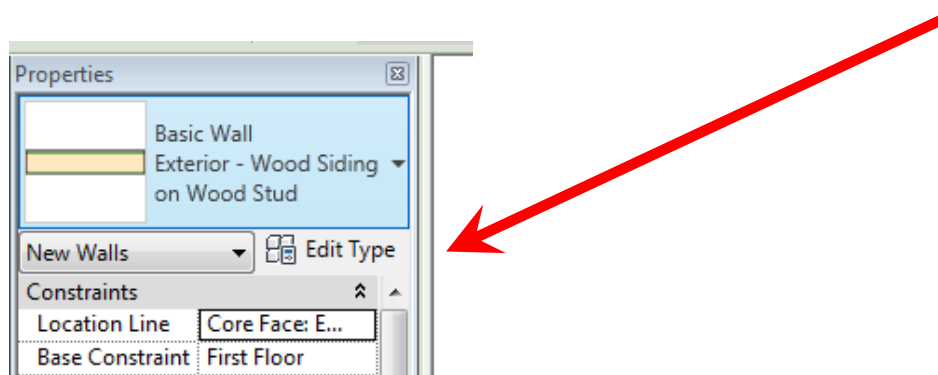
After Exterior walls are drawn we will draw the interior walls

### Draw interior walls

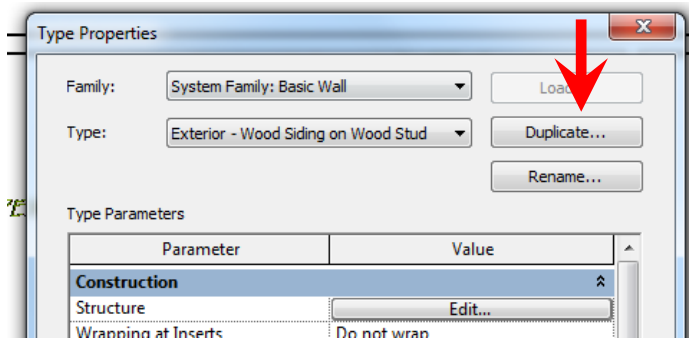
1. In the Properties dialog select Interior – 4 ½" Partition
2. In the options bar change Height: to **Roof** and Location Line: to **Finish Face: Interior**
3. Now draw interior walls as shown in the AutoCAD drawing. Zoom in as needed and pay attention to snaps while drawing walls. **Draw wall lines through doors and windows.** Doors and windows will be added later.

### Create an Exterior Wall Style

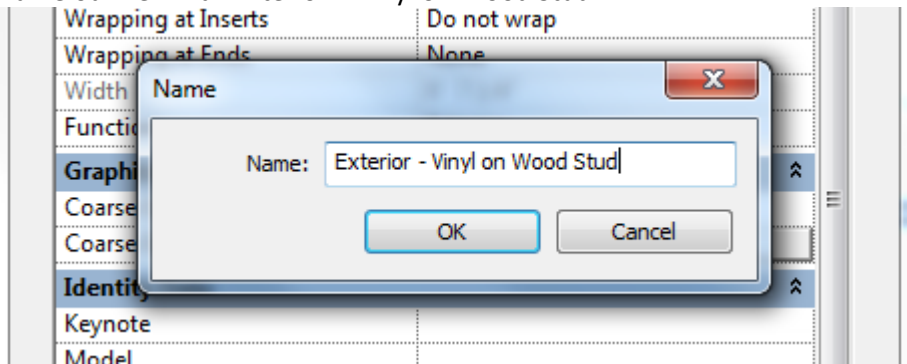
1. ON the Architecture tab, Click the modify control and select one of the exterior walls
2. In the properties dialog select edit type



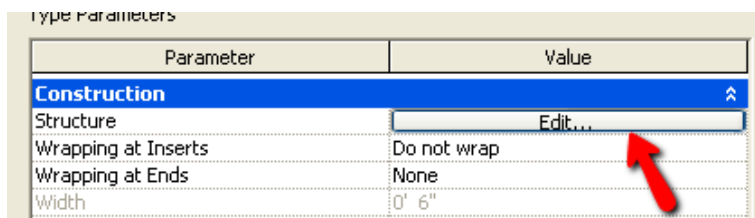
3. In the type properties pick the Duplicate button



4. Name our new wall Exterior – Vinyl on Wood Stud



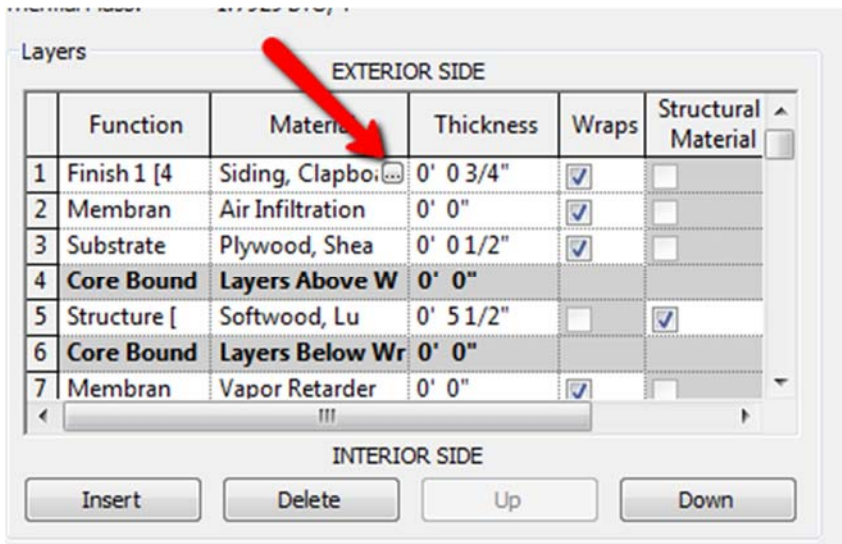
5. In the Type Properties pick the Edit Button to the right of Structure



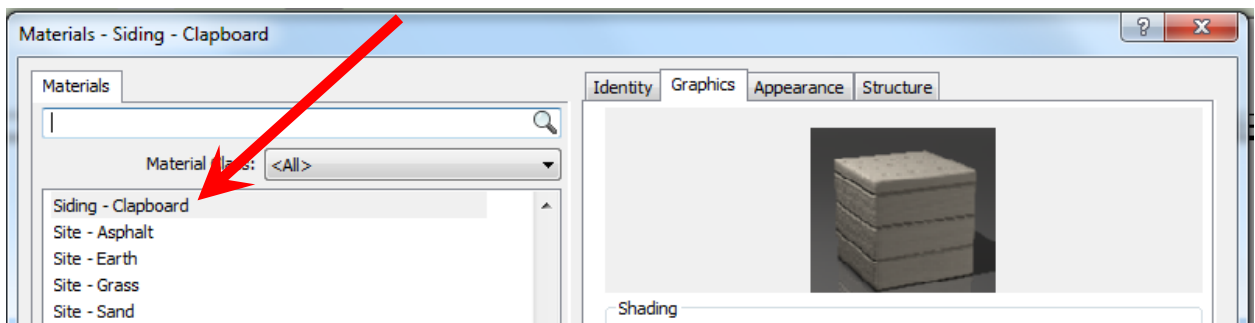
6. Match your settings to the settings shown below. Note you will need to create a material type called Siding – Vinyl.



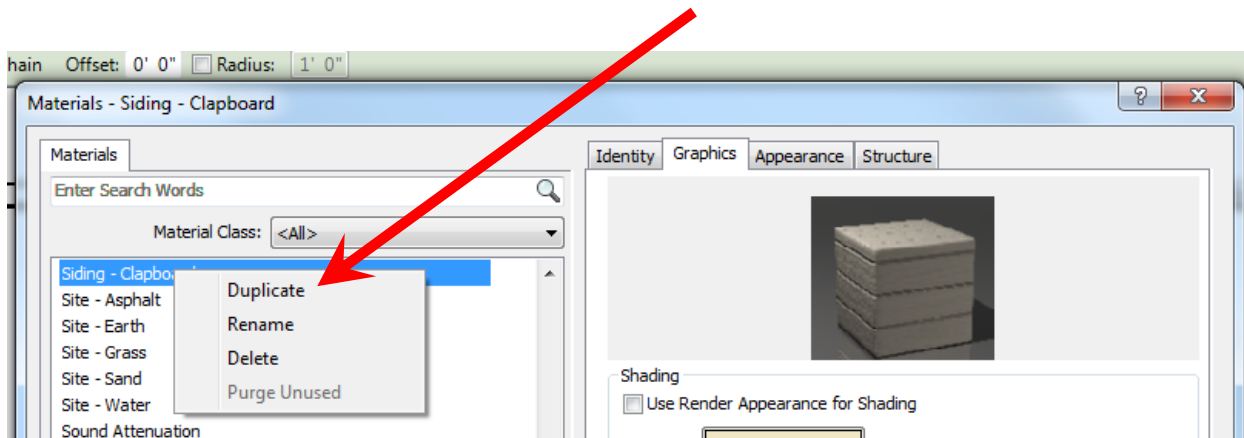
7. Select this button



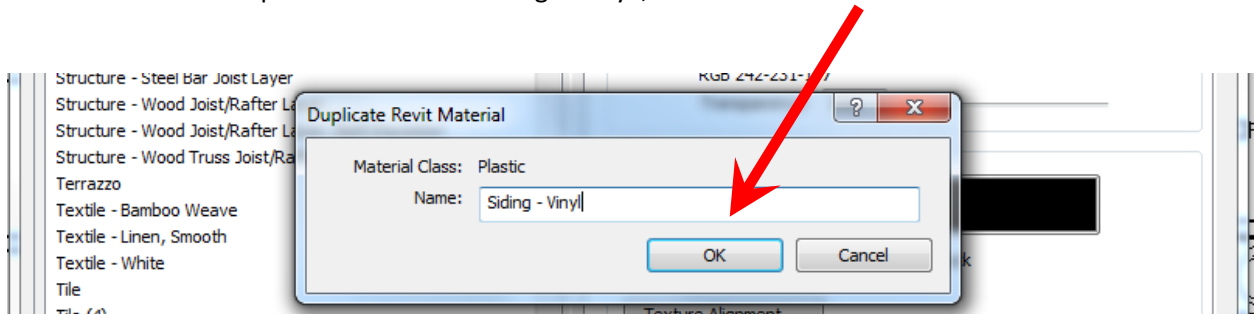
8. Select Siding – Clapboard



9. Right Click on "Siding – Clapboard" and select Duplicate



10. Name the Duplicate Material - Siding – Vinyl , Click on OK

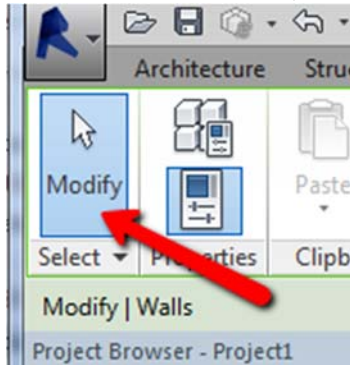


In the edit assembly dialog match the settings shown here. Note that the Thickness of the Structure (1) is 3 1/2" and the membrane layer next to the Gypsum wall has been deleted.

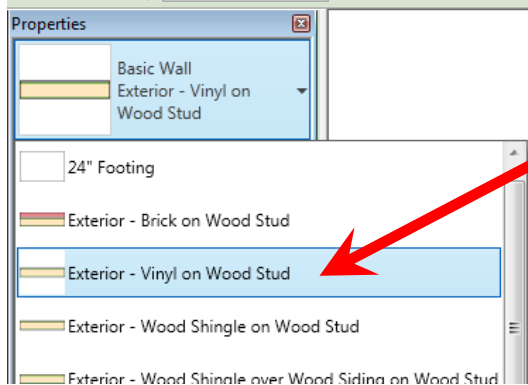
Layers					
EXTERIOR SIDE					
	Function	Material	Thickness	Wraps	Structural Material
1	Finish 1 [4]	Siding - Vinyl	0' 0 1/2"	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Membran	Air Infiltration	0' 0"	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	Substrate [	Plywood, Sheat	0' 0 1/2"	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	Core Bounda	Layers Above Wr	0' 0"		
5	Structure [	Softwood, Lum	0' 3 1/2"	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Core Bounda	Layers Below Wr	0' 0"		
7	Finish 2 [5]	Gypsum Wall B	0' 0 1/2"	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## Change exterior wall styles


1. ON the Architecture tab, Click the modify control.

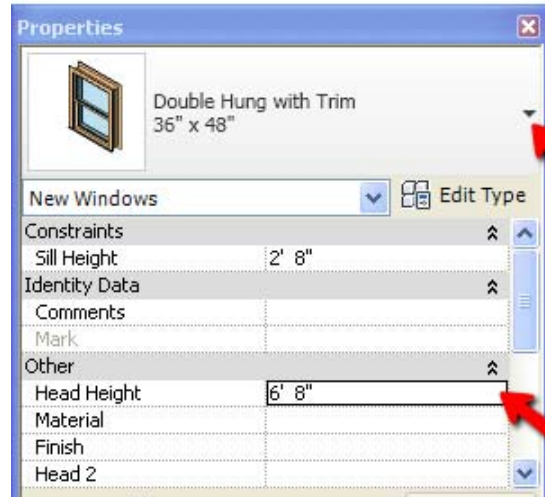


2. Select all exterior walls (hold the control key down to select multiple walls).
3. In the properties dialog select the Wall style you just created as the new wall type.




## Insert Windows

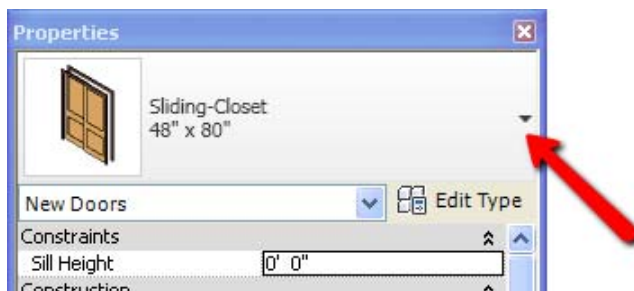
1. In the Architecture tab>Build, click  (Window)
2. In the Properties Dialog – Pick drop down arrow and select “Double Hung 36” x 48”
3. Change the Head Height to 6’ 8”



4. Insert this window for all windows shown on the AutoCAD floor plan. One window for each bedroom, double window in living room and one window above kitchen sink



## Insert Closet Doors

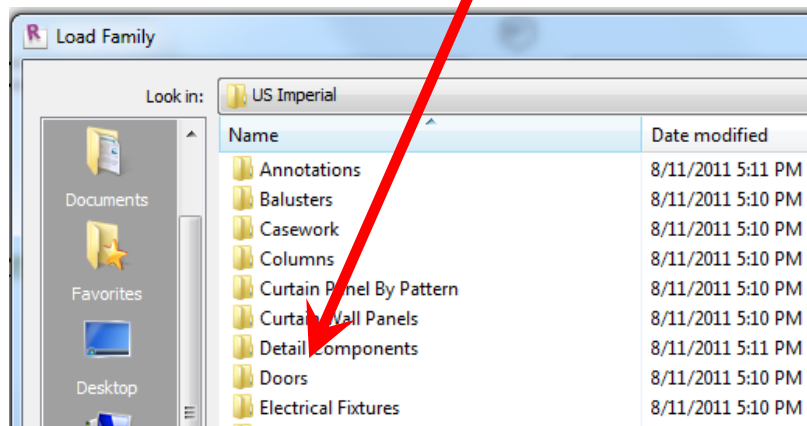
1. In the Architecture tab>Build, click  (Door)
2. In the Properties Dialog – Pick drop down arrow and select **Sliding-Closet 48” x 80”**
3. Insert Closet Doors for Bedroom 2 and Entry Closet



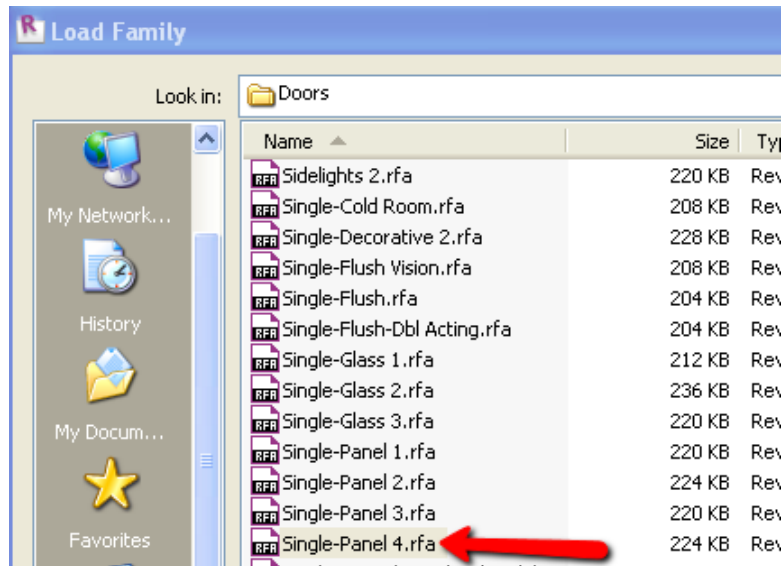
4. In the Properties Dialog – Pick drop down arrow and select **Sliding- Closet 72" x 80"**
5. Insert Closet Doors for Master Bedroom and Bedroom #3

#### Load 6 panel door and insert remaining doors

1. In the Architecture tab>Build, click  (Door)
2. In the Architecture tab>Mode, click  (Load Family)
3. In the Load Families Menu select Doors



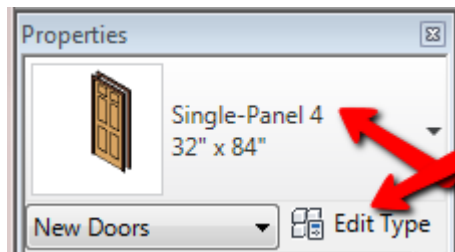
4. In Load Family Dialog select Doors > Single-Panel 4.rfa



5. Pick the Open button

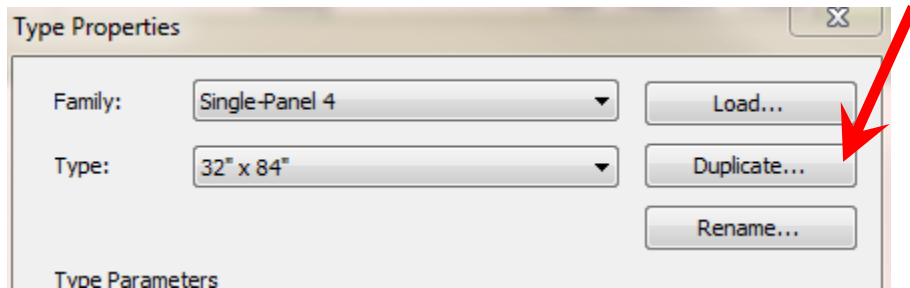
The typical size door we will be using is 32" x 80". As luck would have it there is no such door. Use following steps to create this door size.

1. In the Properties – Pick drop down arrow and select **Single-Panel 4 32" x 84"**

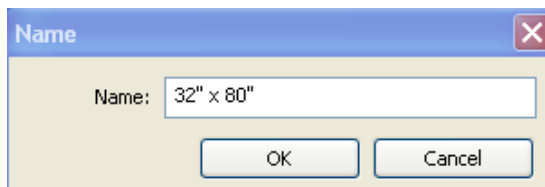


2. In the Properties Dialog – Pick the Edit Type button

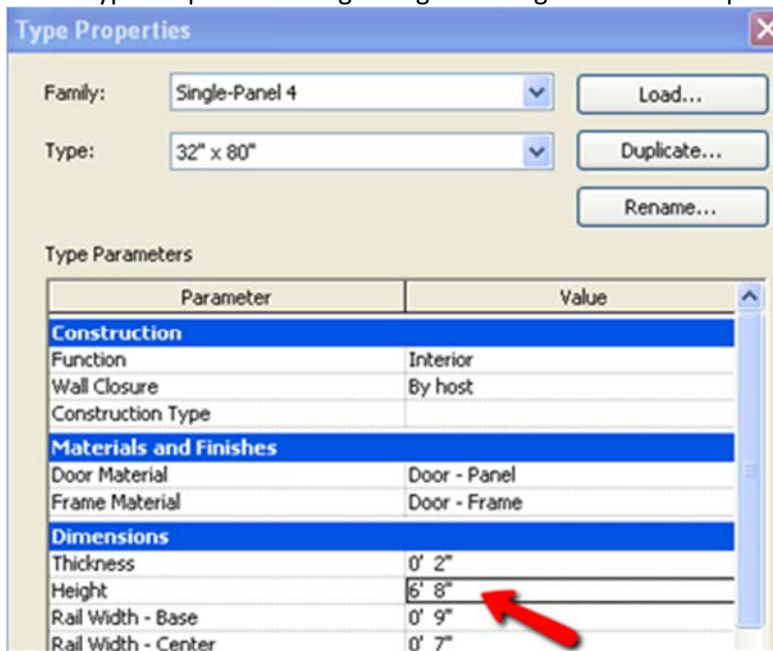
3. In the Type Properties Dialog – Pick the Duplicate Button



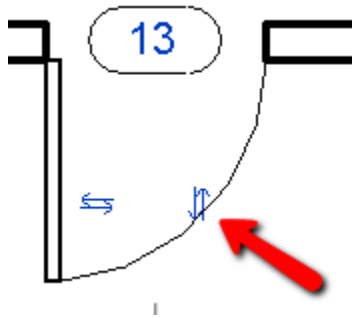
4. In the Name Dialog – type in **32" x 80"** and pick the OK button



5. In the Type Properties Dialog change the height to 6' 8" and pick the OK button




6. Insert doors as shown on AutoCAD floor plan. Most doors will use the size just created. For exterior doors use 36" x 80". For furnace closet use 30" x 80"

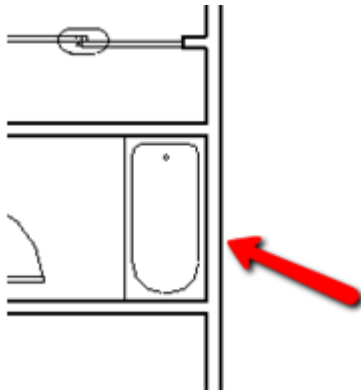



7. While inserting doors use the flip arrow to change the door orientation

**NOTE: After doors are inserted erase the AutoCAD underlayment**

#### Components Exercise – Begin inserting components


1. In the Architecture tab>Build, click  (Component)
2. In the Properties dialog select "Tub-Rectangular-3D"
3. Pick exterior wall in bathroom



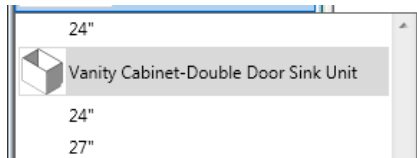
4. You may need to hit space bar to switch direction of the tub
5. In the Architecture tab>Build, click  (Component )



6. Find **Toilet Domestic-3D** and insert

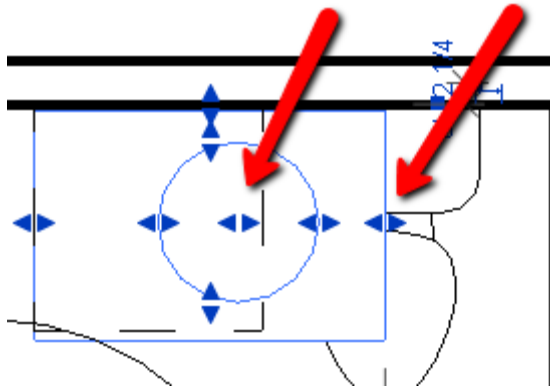
7. In the Architecture tab>Build, click  (Component)

8. Find a **Vanity Cabinet – Double Door Sink Unit** that will fit and insert.



9. For the vanity you will need to insert a **vanity counter top w Round Sink Hole 24\"** Depth

10. Using on screen controls adjust the size of the vanity counter and location of sink cutout.  
(dimensions can be changes with properties also)



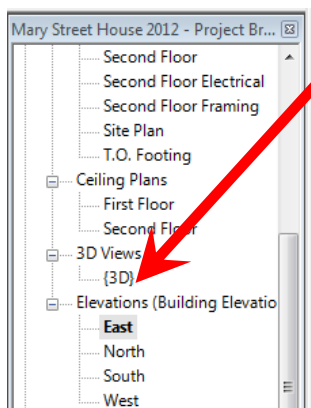
11. Insert “ **Sink-Vanity Round 19 x19”**

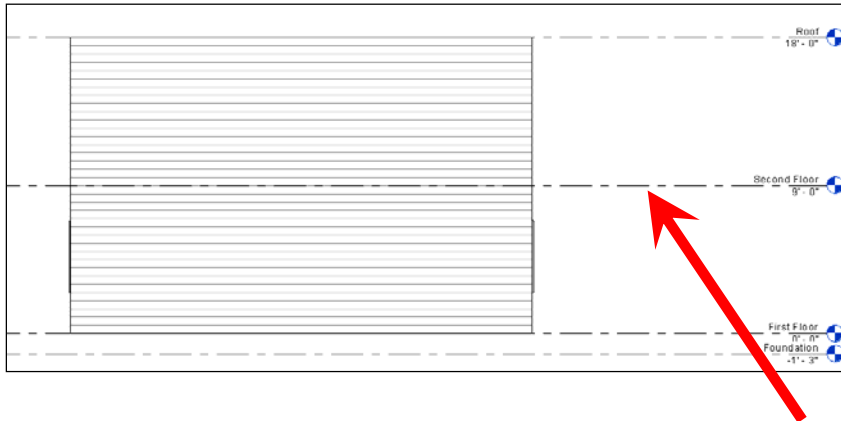
## Quick look at elevations and Levels

1. In the Project Browser Double click on the North Elevations and notice the level lines.



2. Now double click on the East elevation.



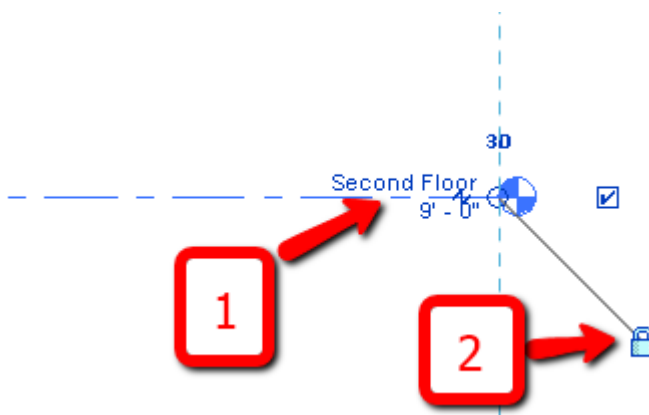


Notice the level lines are exactly the same as the North Elevations

*These levels are a very powerful tool. They allow you to set levels for your model that can be used consistently throughout the project.*

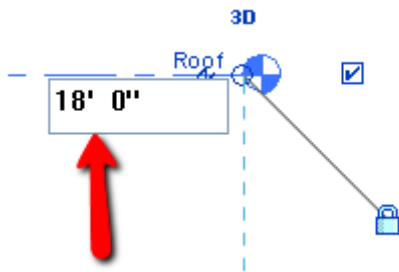
#### Exercise – Adjust and change levels

1. Pick on the level line at a location just below the text “Second Floor”



2. Right mouse click and select delete, or hit the delete key
3. A dialog box will appear stating View Second floor will be deleted. Pick OK
4. Pick on the Roof Level line



- Then click on the number 18'. This should then appear as a dialog where you can edit the number.

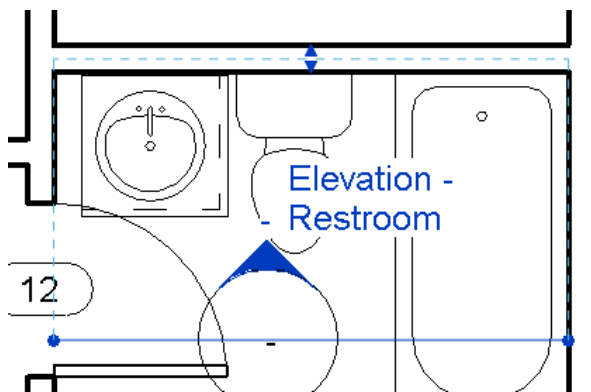


- Change 18' 0" to 8'3" and press enter

*All walls should now automatically adjust to the lower level.  
If not will need to review wall properties and adjust settings*

### Exercise - Create an Inside Elevation

- Open the First Floor view (should be in already – if not select First Floor in Project Browser).
- In the View tab>Create panel, expand  (Elevation) and click  Elevation
- Set the Elevation Type to Interior Elevation and the scale to  $\frac{1}{4}" = 1'$ . These settings are located on the Properties dialog and the options bar.
- Place the elevation marker inside the full bathroom
- Select the Elevation Mark. Four check boxes will appear check the box to North of elevation circle and uncheck any and all others.
- Pick on the text for the elevation and a horizontal line and dashed box will appear. Drag box so just restroom area is inside box (See below).

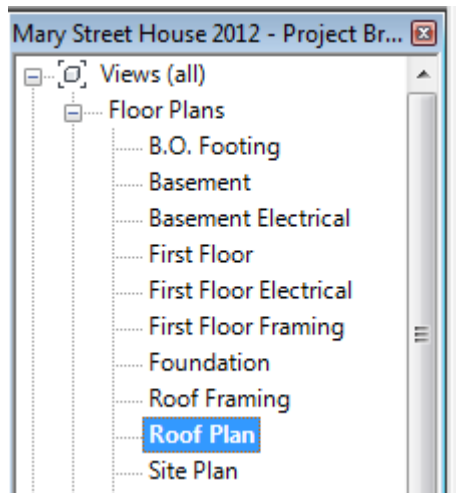


7. In the project browser dialog, scroll down to Elevations (Interior Elevations). Select the elevation that you just created and rename it to Elevation – Restroom
8. Double click on the elevation in the project browser to view the inside elevation

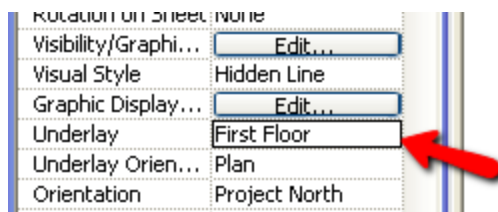
Note: What you are viewing here is “live”. For example make a change to the counter top here and the change will appear in all views of the model.

### Exercise – Create a Roof

1. In the Project Browser double click on the Roof Plan view located in the Floor Plans section



2. In the Properties Dialog, for Underlay select First Floor Click Apply



3. In the Architecture tab>Build expand




(Roof) and click

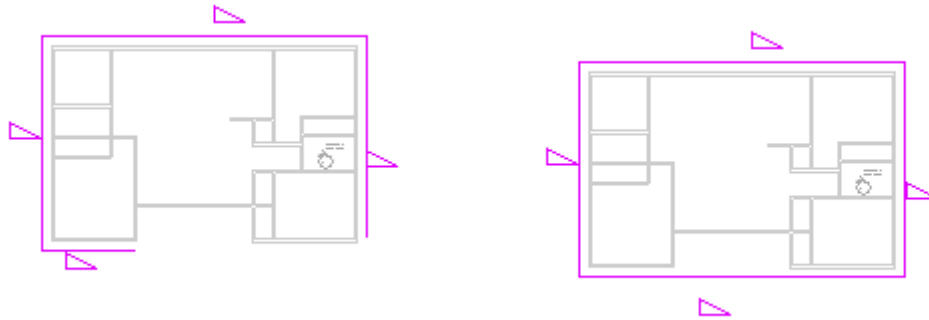



Roof by Footprint

4. Pick East Exterior wall; Pick North Exterior wall; Pick West Exterior wall; Pick on wing on South Exterior wall

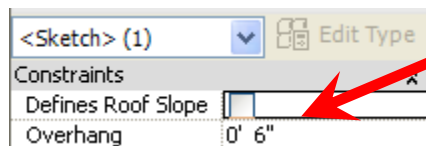
5. In the Modify | Create Roof Footprint tab>Modify click  (Trim extent to corner)

6. Pick on the South and East Wall. This should extend roof edge lines so meet. (Refer below for before and after pictures)



7. Click on  (Modify), hold control key down and select the east and west roof lines (future gable ends).

8. In the Properties dialog Uncheck Defines Roof Slope and change the overhang to 6".



9. Select the North and South roof lines

10. In the properties dialog change the slope to 4"/ 12"

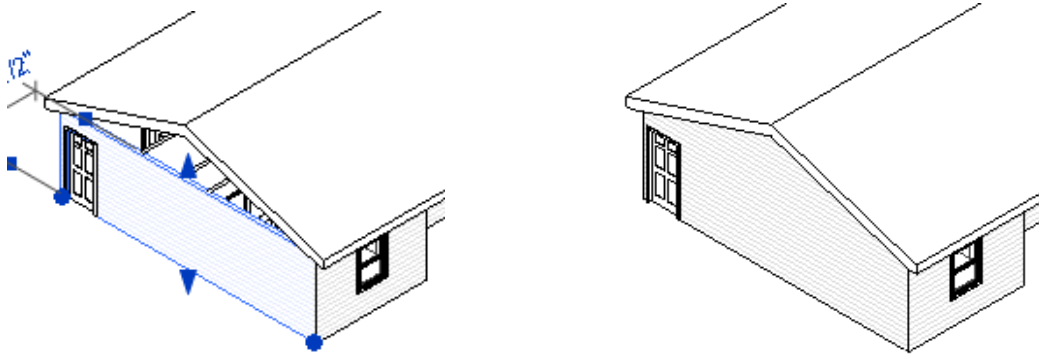
11. In the Modify | Create Roof Footprint tab>Mode click  (Check)

12. In the Project Browser double click on the 3D view. Orient a view so you can see a gable end of the house

13. Select the end wall



14. In the Modify | Walls tab>Modify Wall click  (Attach Top/Base)

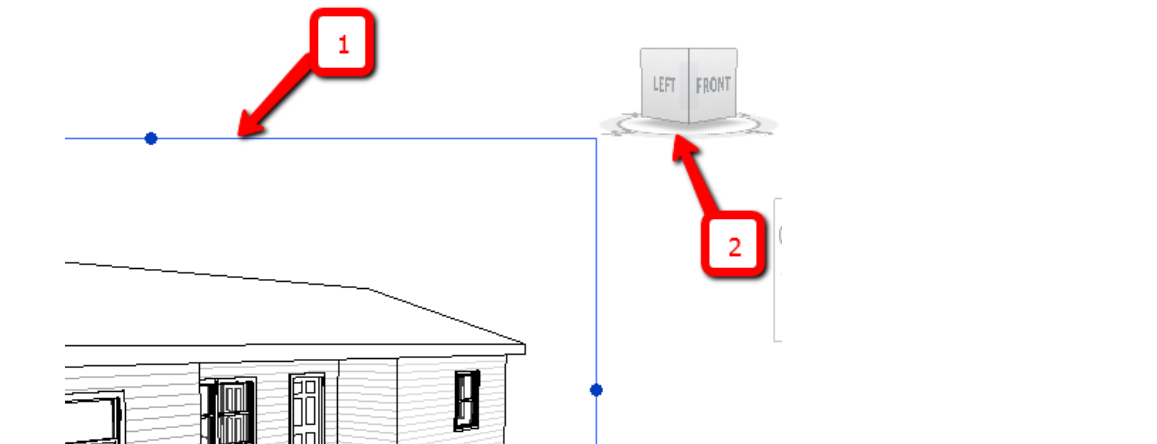
15. Select the roof. Before and after picture below.




16. Repeat steps for other gable end

### Exercise – Create perspective view


1. In the Project Browser, open the First Floor Plan
2. In the View tab>Create panel expand  (3D View) and click  (Camera)
3. Place the camera to the bottom left of the house (imagine you are at the street) and pick the focal as the front door.
4. In the Project Browser change the name from **3D View 1** to **3D Front Perspective**
5. Make adjustments to view by adjusting size of box(1) and twisting view cube (2)



6. At bottom of screen click  (Visual Style) then select  Realistic

- Can also make adjustment in the Properties dialog or by going back to First Floor Plan selecting camera and editing properties.
- If camera is not visible right click on 3D Front Perspective in the project browser and select show camera.

### Exercise – Create Ceiling

1. In the Project Browser, Ceiling Plans open the First Floor Plan
2. In the Architecture tab>Build, click  (Ceiling)

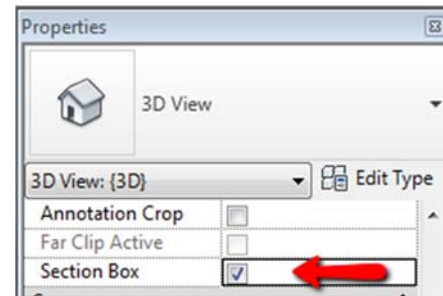
Move cursor to the inside of a room, the room boundary will be highlighted in red. Click on the left mouse button to create the ceiling



## 10 Revit Tips

### 1. The Section Box

Select on a 3D view. In the properties dialog, scroll down and check on Section Box then pick Apply.



### Numbers and Dimensions

- When entering numbers if no feet (') or inch (") symbol is given Revit assumes the number is feet. Also when enter numbers you can skip the symbols and use spaces. For example, if I wanted to enter 10' 6-1/2" I would type it in as follows: **10 6 1/2**
- When drawing a wall you can drag the wall in the direction you want and then type the exact length of wall desired.
- Temporary dimension give you some control on locations of components. Permanent dimensions (shown later) give you awesome control.
  - When you select a component a temporary dimension will show up. You can pick on the number and change to a desired value to change the components location.
  - Also you can pick on the solid circles on the extension lines to control the extension line position.

Note: There is a setting controlling where temporary extension lines show up, but where temporary dimensions end up is somewhat arbitrary.

### The Space Bar

- When inserting doors use the space bar to flip the hand of the door.
- When drawing walls use the space bar to control what side of the wall you are drawing.
- When inserting components such as a tub use the space bar to rotate the orientation of the component.

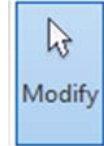
### Arrow Keys \*\*\*\*\* (All the asterisks are to indicate that this is the best tip)

- Select an object or a line. Then use the arrow keys on the keyboard to adjust location.

9. \_\_\_\_\_

10. \_\_\_\_\_

## Selecting Objects

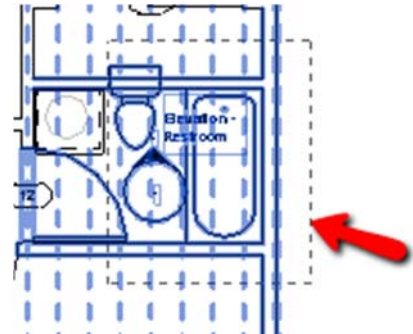


For all methods shown below you will be using the Modify tool

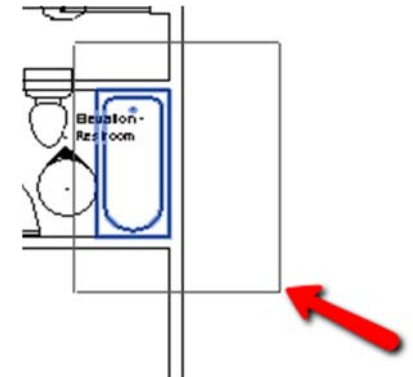
1. Simply pick on the desired object
2. To pick multiple objects you can hold the control key down and continue to accumulate object
3. If you want to un-pick an object hold the shift key down and re-pick the selected object
4. To un-pick objects - Double click where nothing exist (pick on white space)

### Windows

5. Crossing Window: Pick on white space, hold the mouse button down and drag to the left. Notice how the window appears dashed. This is a crossing window. Anything partly inside the window will be selected



6. Window: Pick on white space, hold the mouse down and drag to the right. Notice that the window appears solid. This is a window. Only objects that are completely in the window will be selected .

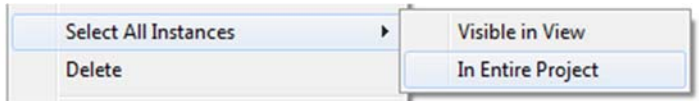


### Tab Key

7. To select all walls that are connected (a wall chain) pick one wall, then press the tab key until all wall are highlighted then hit the pick button again.
8. When many objects are on top of each other: Pick one object. Then press the tab key to highlight a different item. Continue to press the tab key until the desired object is highlighted. When the desired object is highlighted press the pick button again.

## Filtering

9. Select one object. Right mouse click.  
Pick “Select All Instances” to select multiple similar objects.



## Revit Review Questions

1. True or False – Revit Projects are backwards compatible with previous versions of software.
2. How do you display properties window if it is not visible?
3. How do you display the project browser window if it is not visible?
4. How can you close extra windows?
5. How and where do you set the scale for a Revit View
6. How and where do you set the detail level
7. Best way to control heights of walls is?
8. True or False – Doors are components and can be loaded into any project
9. True or False – Windows are components and can be loaded into any project
10. True or False – Walls are components and can be loaded into any project

## Dimensions

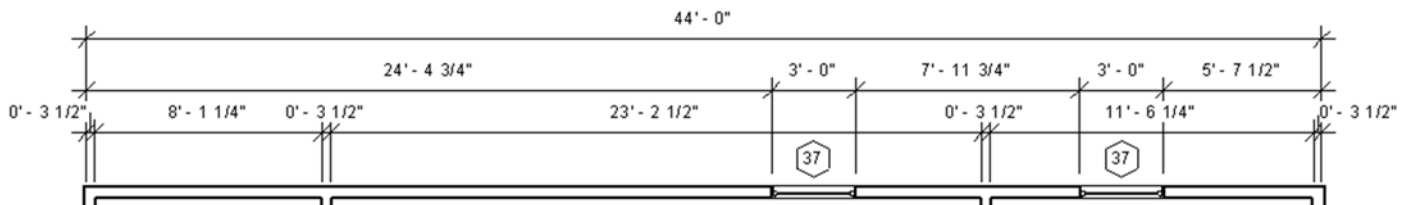
Dimensioning is very powerful in Revit. Below we will walk through a short exercise showing the basics for dimensioning. When working with dimensions in Revit it is important to remember that they are parametric. This means that the dimension text must match the length of the object you are dimensioning. Saying another way – to change the dimension text we must change the underlying dimension.

Tools for dimension are located on the Annotate Ribbon. Whenever possible I try to use the Aligned tool for dimensioning.



### Mini Exercise 1 – Create Dimensions for North Wall

For this exercise we will use the Mary Street project. If not already open you can find it in S:\bbowers\shared\Revit Workshop. When you are finished your dimensions should look similar to picture below:

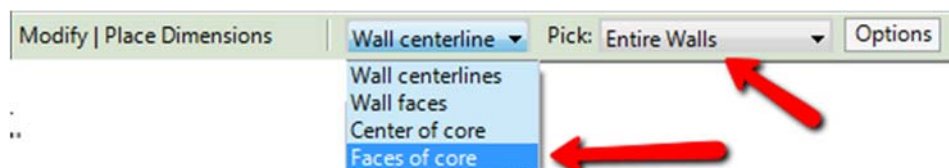


1. Activate the First Floor View (can double click on First Floor in the Project browser).
2. Adjust or zoom on view so you can see the entire North wall
3. Select the Annotate tab

4. Pick on the Aligned tool

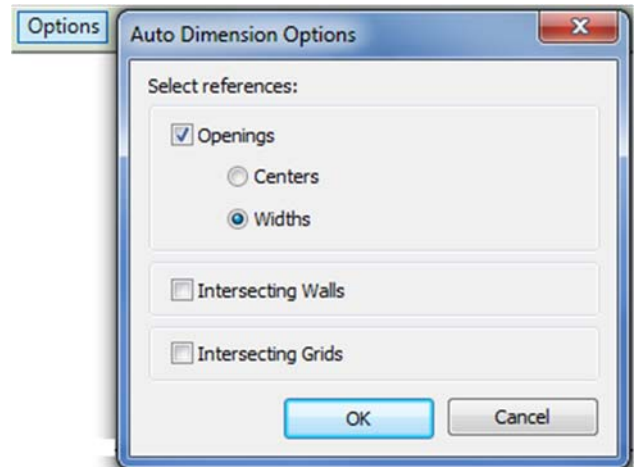


5. On the options bar select “Faces of core” and “Entire Walls”



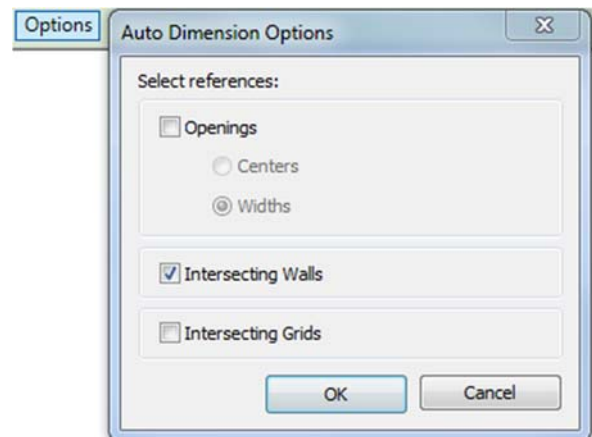
- Now select the North wall of the structure and drag dimension line up (refer to previous picture)

- Pick the Options button on the Option Bar. Then check on Openings and Widths. Pick OK.



- Again select the North wall of the structure and drag dimension line up

- Pick on the Options button on the Options Bar. Check off Openings and click on Intersecting Walls. Pick OK.

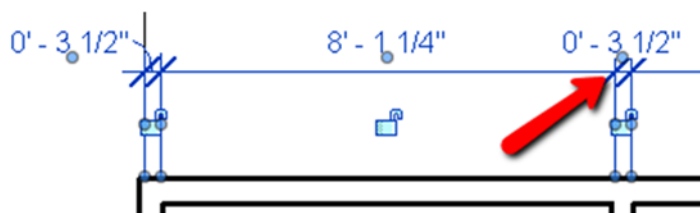


- Again select the North wall of the structure and drag dimension line up

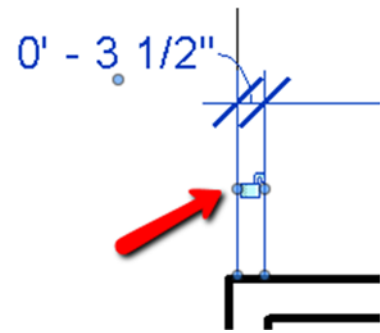
### Dimension Tips

Once you have created a dimension you can click on the dimension to get several editing options:

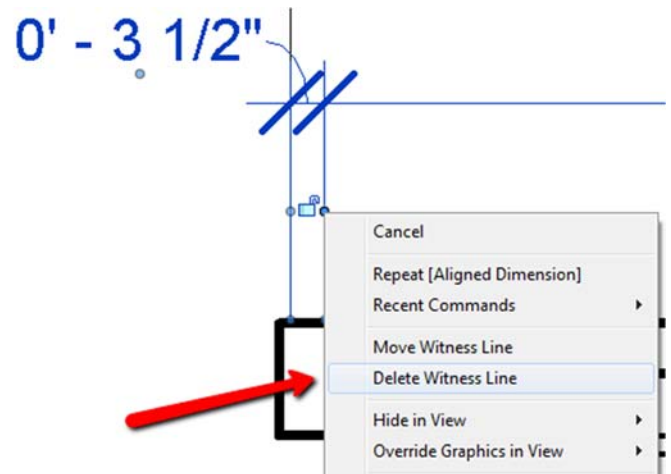
- You can pick and drag on the circle below the text to change the position of the text



- You can pick on the circle in the middle of the extension line to toggle its position from face of core to center of core to other face of core.



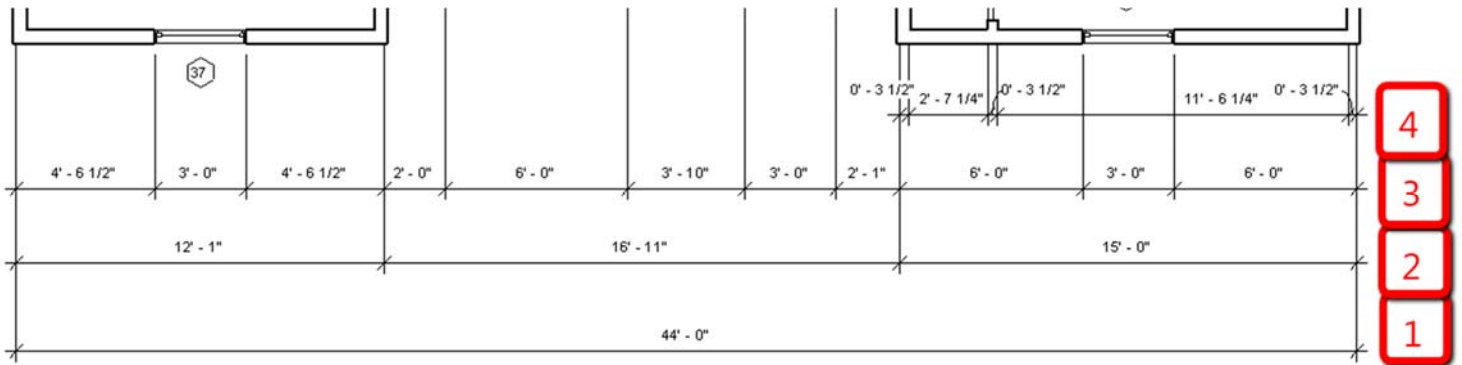
- You can right click on circle in middle of the extension line for additional editing options. For example if you want to get rid of an extension line and a corresponding dimension you can “Delete Witness Line”



- You can click the pad lock to “lock” the dimension and the corresponding object

## Extra Practice

Dimensions the South wall. Try to match the picture below:



### Hints:

Row 1: On the options bar change the pick to "Individual Reference" and then pick the two outside corners



Row 2: On options bar change to "Center of core", Pick -- "Entire Wall" and no Options selected. After you have created the dimensions move the extension lines so they are line up with the exterior core dimension from row 1

Row 3: Do similar to Row 2, but change the Options to include dimensioning to openings

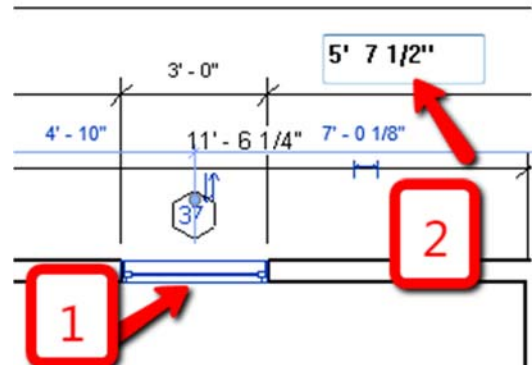
## Using Dimensions as an Editing Tool

Dimensions can be used as an extremely powerful editing tool. Changing the value of the text of the dimension changes the underlying length that is dimensioned. Doing this takes a bit of Revit gymnastics. The next mini exercise will walk us through these edits that can be made.

### Mini Exercise 2 – Using Dimensions to Edit

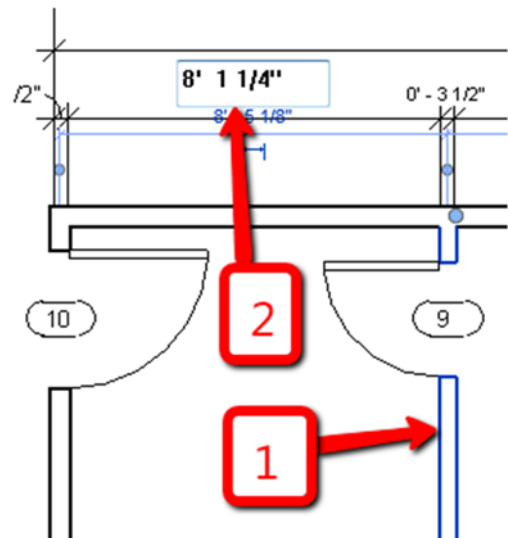
#### Part 1 – Changing a Window Location

1. Select one of the windows on the North wall
2. Select directly on the dimension text
3. Type in the new value for the dimension text



#### Part 2 – Changing a Wall Location

1. Select the wall you would like to move
2. Select a text of a dimension that is perpendicular to this wall
3. Type in a new value for the dimension text





## How to Create a Foundation Wall and Add Footings

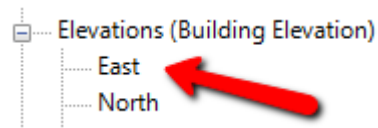
The steps below will create foundation walls under an already created wood frame walls.

The general steps are to:

1. Review levels and set a level for the bottom of foundation
2. Go to new view and display underlay of already created walls
3. Create foundation wall type
4. Draw walls.
5. Add Footing

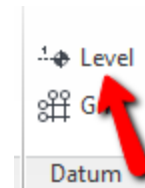
### *Step 1 – Review Levels and set a level for bottom or foundation*

1. In the project browser double click on one of the Elevations.



2. Any levels that are below the first floor level should be deleted (unless being used for some reason). To delete a level pick on the dashed line and press the delete key.

In the Architecture ribbon pick on the Level tool.



3. Draw the new level from left to right below the First Floor level. The end points you select should line up with the endpoints of the First Floor level.

4. After you have drawn the level pick on the elevation number and change it to the desired elevation. For my example it will be -2'.

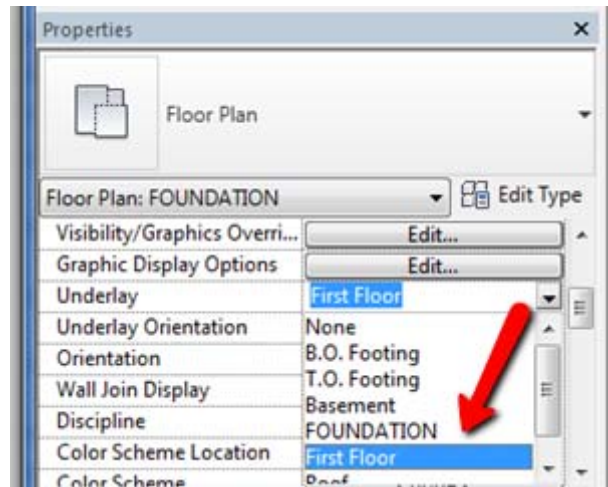


5. Pick on the Level Name and rename it to "Foundation"

### Step 2 – Go to new view and display underlay of already created walls

1. In the project browser double click on one of the Foundation View located under the Floor Plans section.

2. In the Properties window “Floor Plan” should be displayed. Click on the down arrow to the right of Underlay. Then select “First Floor” (or the level that displays your walls). Note: If Underlay is not shown you will need to scroll down the dialog box.



in

### Step 3 – Create a foundation wall type

1. On the Architecture Ribbon pick the Wall tool.

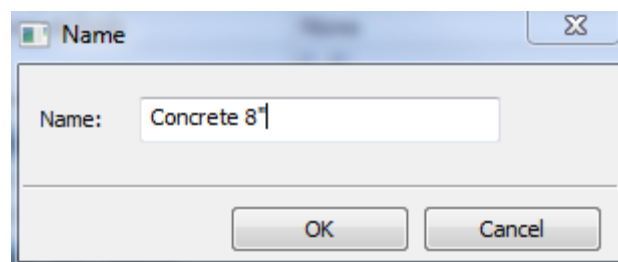
2. In the Properties window scroll down and select the “Generic-8” wall type .



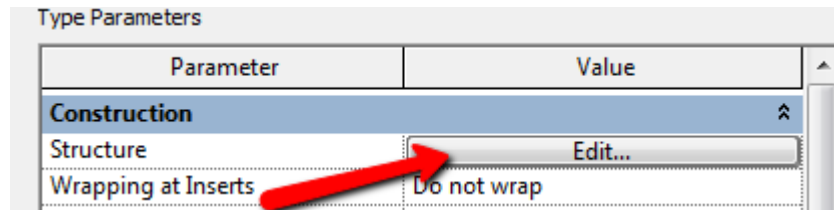
3. Pick the Edit Type button.

4. Pick the Duplicate... Button.

5. In the Name Dialog. Type in a new name. I used Concrete 8”.



6. In the Type Properties window pick the Edit button to the right of Structure.

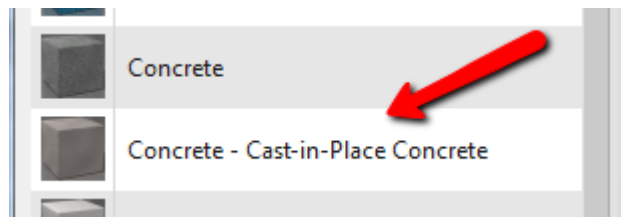


7. In the Edit Assembly window pick on the 3 dots button on line 2 of the window.

The screenshot shows the 'Edit Assembly' window with a table. The third row is highlighted, and a red arrow points to the '3 dots' button next to the 'Layers Below' value.

	Function	Material	Thickness
1	Core Boundar	Layers Above	0' 0"
2	Structure [1]	<By Categor...	0' 8"
3	Core Boundar	Layers Below	0' 0"

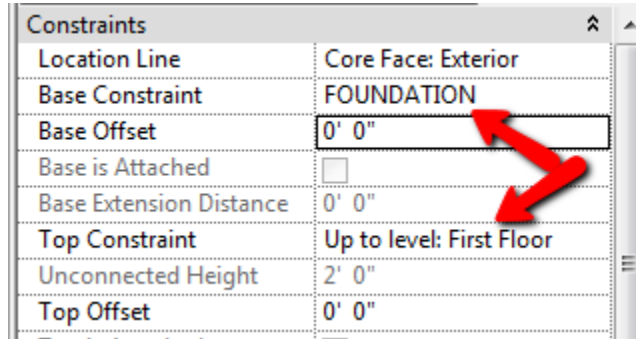
8. In the Material Browser select Concrete – Cast-in-Place Concrete



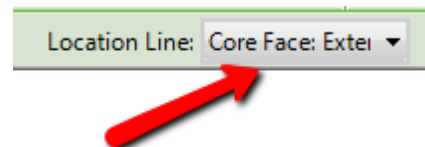
9. Pick OK 3 times to get out of all windows

#### Step 4 - Draw Walls

1. In the properties dialog verify that the Base Constraint is set to "Foundation" and Top Constraint is set to "First Floor". Note if your level names are different than mine the above names will be different



2. On the Options Bar verify that the Location Line is set to Core Face Exterior.

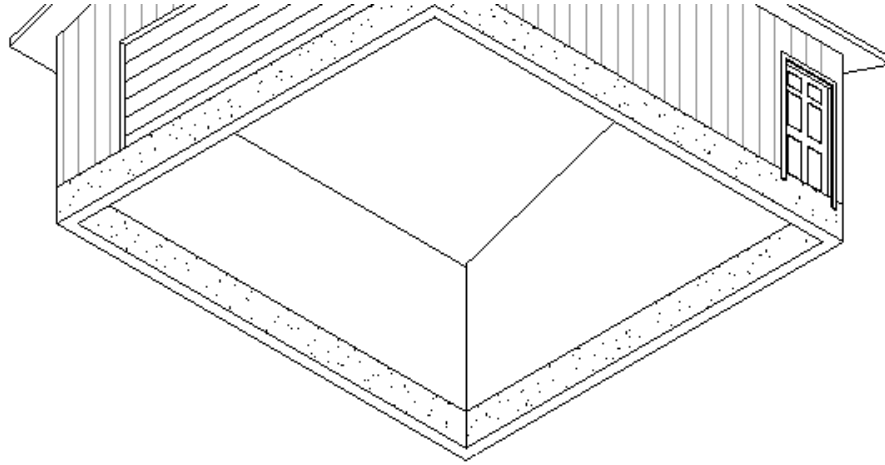


3. Draw Your Walls! Verify the exterior of the foundation wall lines up with the exterior of you wood frame walls.

#### Step 5 - Add Your Footing

1. In the Project Browser double click on the 3D view. Review and make sure the foundation wall looks correct.

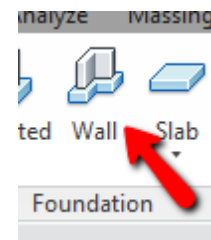
2. Adjust your view so you are looking from the bottom into the building.



3. In the Structure Ribbon Select the Wall (Foundation) tool .

4. For the Foundation type select Bearing Footing – 36 x 12

5. Pick Edit Type and the Pick Duplicate.



6. In the Name Window give it the Name Bearing Footing – 24" 12" and pick OK

7. Under dimension change the width to 2' 0" .

Dimensions	
Width	2' 0"
Foundation Thickness	1' 0"
Default End Extension Length	0' 0"

8. Now use in the point pick on the bottom of each foundation wall and a footing will be drawn.

## How to create Soffits

The Soffit is the underside part of the roof that overhangs a building. Soffits can be flat or slope along gable ends they will typically have the same slope as the roof.

Revit will allow you to create both types. To create a soffit you will select the soffit tool, then draw a rectangular area that you want the soffit for and then pick the green check mark. Please note that when creating soffits it generally works best to create them one at a time.

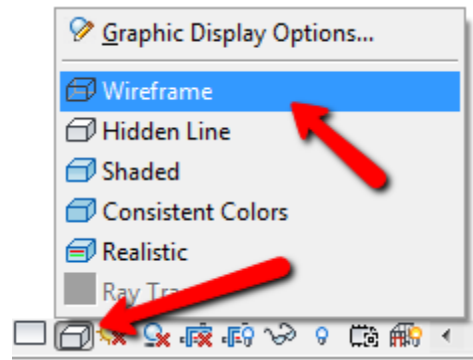
For the steps below I will create one flat soffit and one sloped soffit along a gable end. The screenshots will correspond to the Residential Garage Model, but steps should work for most any house.

### Step 1 – Set up to create soffits

1. In the project browser double click on the roof plan
2. Now you should see the top view of the roof.
3. If you do not see the walls underneath do the following:



- a. Click on the fourth icon from bottom of view area
- b. Click on Wireframe option..

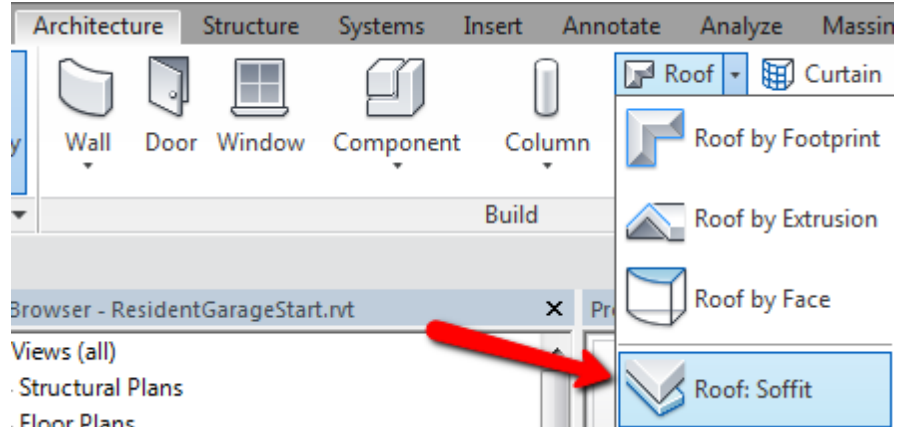


left at the

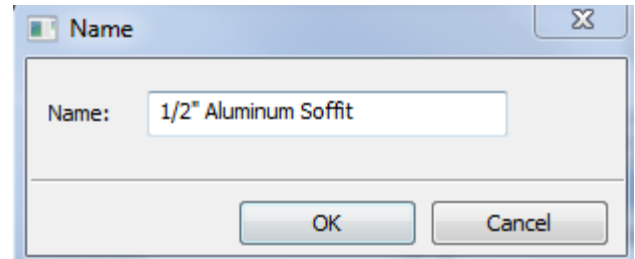
Wall should now be visible. If some or all the walls are still not showing up the wall most likely need to be attached to the roof.

## Step 2 – Set up soffit type

1. On the Build panel of the Architecture Ribbon pick the drop down arrow next to Roof, Then pick Roof: Soffit





2. In the Properties dialog pick Edit Type. Then pick Duplicate.

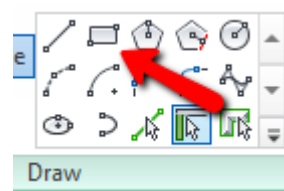


3. For the new name enter ½" Aluminum Soffit. Then Pick Ok.
4. Pick the Edit.... button on the Structure line.
5. Change the material to Metal – Aluminum and the thickness to ½"
6. Pick OK (twice) to exit the dialog boxes

### Step 3 – Draw Flat Soffit

Notice how everything is grayed out and there is a large  and . These are your indications that you are in sketch mode. Normal command and tools will not work until you click on one of these marks.

1. Pick on the Rectangle Draw tool .

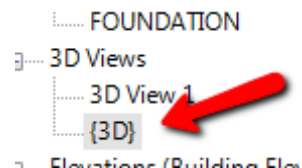


2. Now create a rectangle from the outside corner (1) to a point intersecting the edge of roof and the outside face of the wall (2)



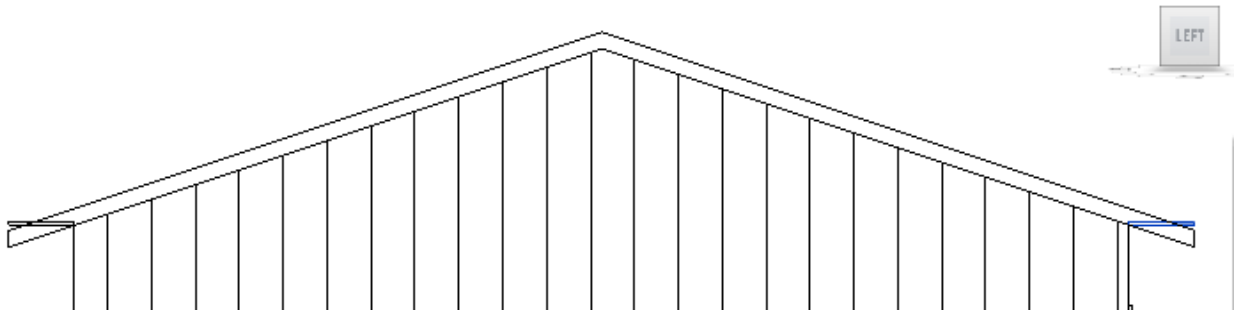
3. Pick the green check mark.
4. Repeat the above steps for the opposite side. Start by picking the Soffit Tool again.

5. In the Project Browser double click on the 3D view



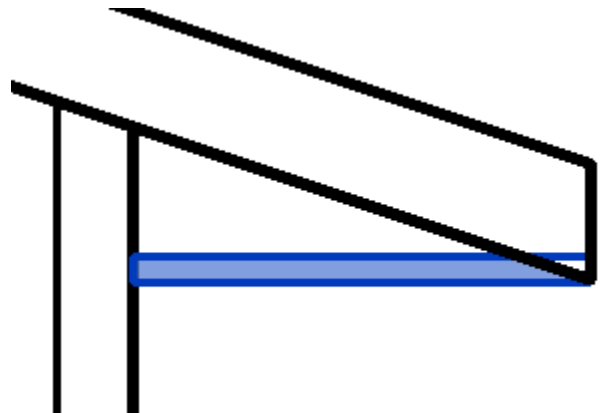


6. Arrange the 3D view so you are looking a Gabel End.



Notice how the Soffits are too high

7. Hold your Ctrl key down and pick on both Soffits (Both Soffits should of turned blue).



8. Use your down arrow key on the key board to move the Soffits down. The bottom of the Soffits should line up with the bottom of the roof

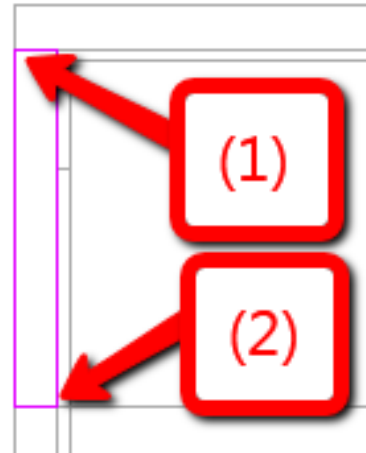
#### Step 4 – Draw Gable End Soffit

1. In the Project Browser double click on the Roof Plan

2. Select the Roof: Soffit tools

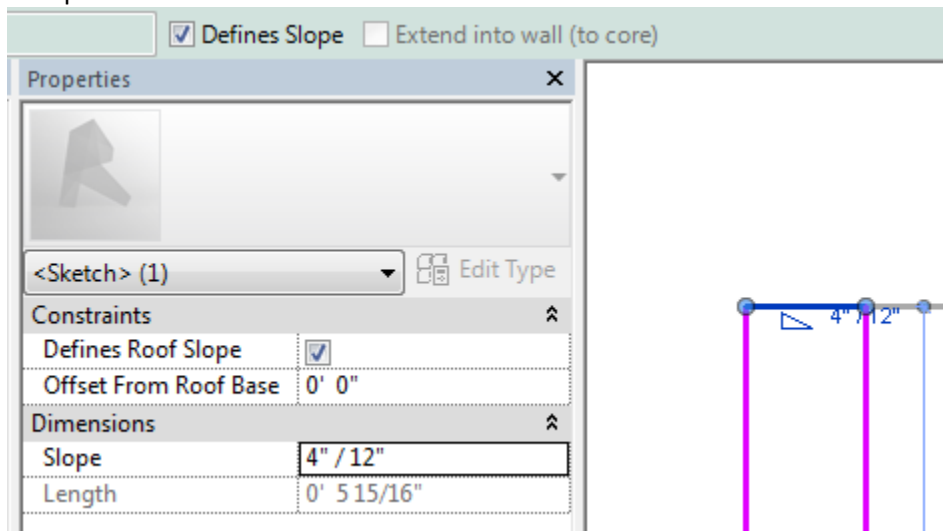
3. Pick on the Rectangle Draw tool

4. Draw the Soffit from Point (1) and point (2) shown on the screen shot.



5. Pick the Modify tool

6. Pick on the short outside line. Check the Define Slope box and set the slope to match the roof pitch.



Pick on the green check mark

## How to Create a Sheet (for Printing)

The steps below will create a sheet to plot out a floor plan out in Revit. The steps will walk through creating a 22x34 to be plotted out at 11x17. While steps these steps are specific the general process can be used to create any sheet.

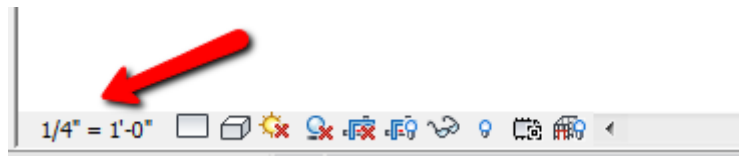
The general steps are to:

1. Verify scale and crop view
2. Delete sheet if already using view
3. Create new sheet
4. Set up to plot

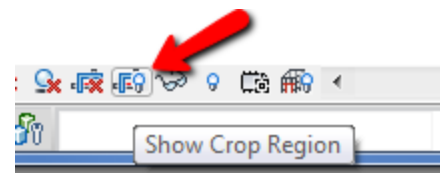
### Step 1 - Verify scale and crop view

1. Open the view that you want placed on the sheet. For specific example select the Level 2 View

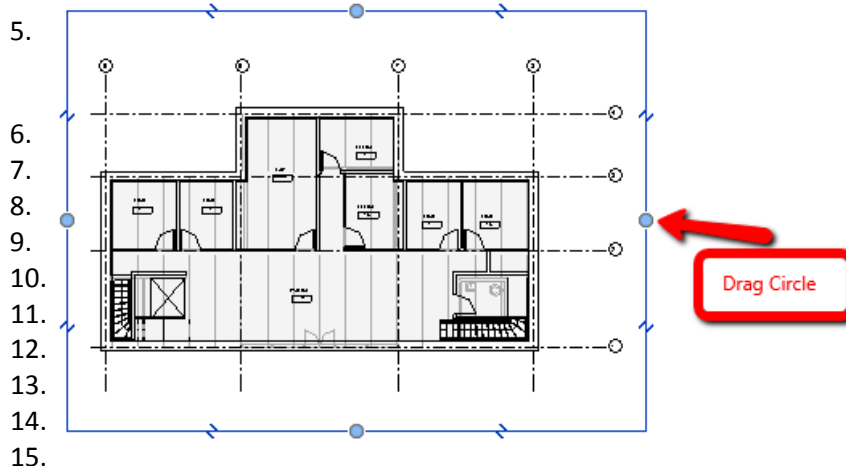
2. Set the scale to the intended plot scale. Try  $\frac{1}{4}" = 1'$



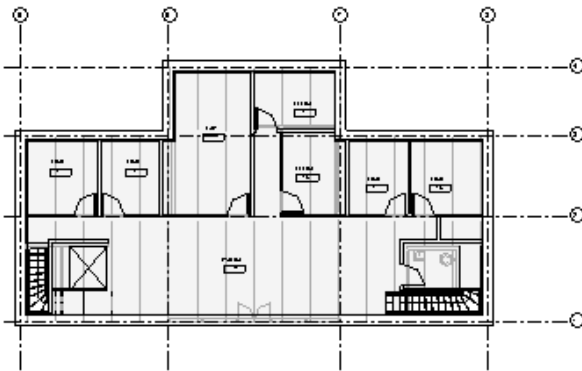
3. On the view control bar (bottom of sheet) pick the show crop region button.



4. This will place a rectangle around the items in your view. Pick on the rectangle. Drag the blue circle in so that the rectangle only shows your floor plan, grid lines and the dimensions. (Refer to screen shot below)



5. In the view control bar (bottom of the screen) toggle the “Crop View” button and the “Hide Crop Region” button. Note these toggle so one may already be set the correct way. The view should end showing only what you want to plot with the crop region box not shown.



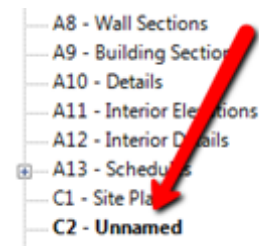
### *Step 2 - Delete sheet if already using view*

In Revit a view can only be used in one sheet. If the view you want to print is already used in a sheet you will need to delete that sheet.

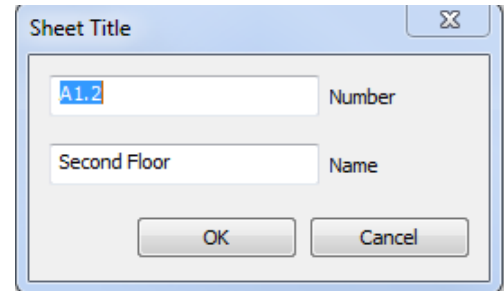
7. In the project browser go to the sheet section review all sheets if your view is already in use (Level 2 for my example).
8. Select (left click) on the sheet in the project browser.
9. Then right click and select delete

### *Step 3 – Create a new sheet*

1. In the project browser select (left click) on the Sheets section
2. Right click and select “New Sheet ...”
3. If the sheet you want to use in not loaded select the load button
4. For the CM322 class go to S:\bbowes\shared\cm322 and select “SEMO22x34.rfa”
5. In the New Sheet dialog box verify the desired sheet is highlighted and pick “OK”. At this point the blank sheet should appear in the window and the “Sheet Name” should bold under the Sheets category



6. Select on the “Sheet Name”, right click and pick “Rename...”.



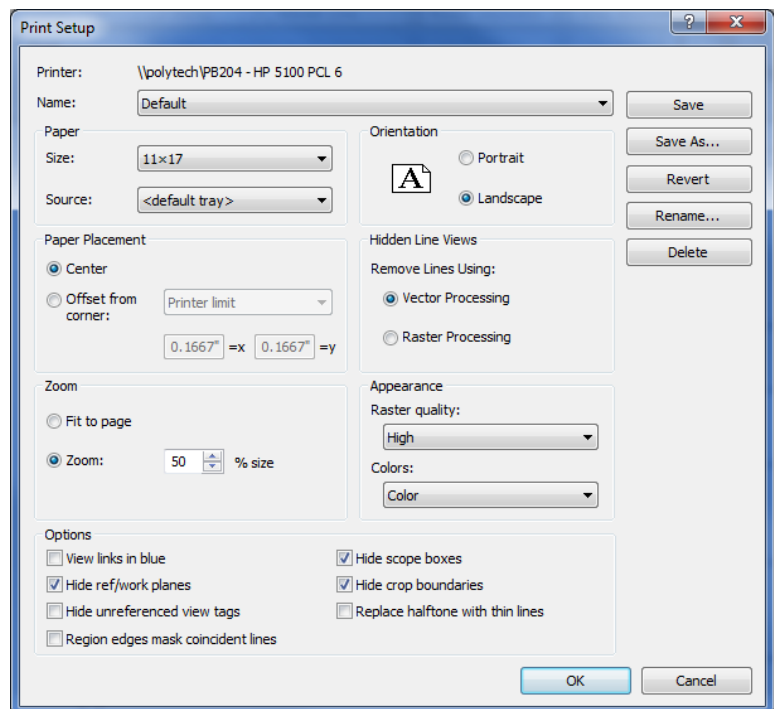
7. Select on the “Sheet Name” right click and and pick “Add View...”.
8. From the Views dialog pick the desired view. For my example it is “Floor Plan: Level 2” and the pick the “Add View to Sheet” button
9. Position the drag box within you sheet border. Adjust as need

#### Step 4 – Set up to plot

1. In the application menu pick Print the pick Print again.



2. Select the name of Printer. (For CM322 this will be PB204 – HP 5100 PCL6)
3. In the Print dialog pick the “Setup...” button.
4. In the Print Setup dialog set the paper size to 11x17. Zoom to 50% (for CM322 half size sheets. Most others will set zoom size to 100% and Center for Paper Placement. Pick OK.



5. In the print dialog pick the “Preview” button to test if plot settings are correct.
6. After this you are ready to print. Yee Ha!

## Other Commands

### Rendering

In a 3D view at the bottom of the screen will be the teapot icon which is the rendering dialog

### Seek

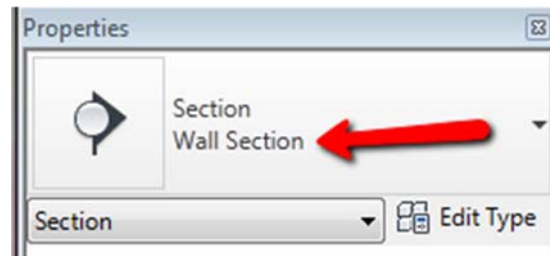
On the insert tab. Can be used to search for components

### Sections

For exercise below we will use the West Street Video Project

#### Mini Exercise 1 – Cut a Wall Section

1. Open the “Level 1” Floor Plan View
2. Select the View Ribbon. Pick on the Section tool in the Create panel
3. Verify that properties is set to “Wall Section”



4. Draw a section line through an exterior wall
5. Double click on the section bubble. This will take you directly to a section view

#### Extra Practice:

Use annotation tools to dress up the section and label it.

## Layouts

Layouts are used to get hard copy from the model to paper. In general, one layout will correspond to one sheet and one view will be displayed on that one sheet.

### Mini Exercise 2 – Create a Layout Sheet

#### Part 1 – Add View

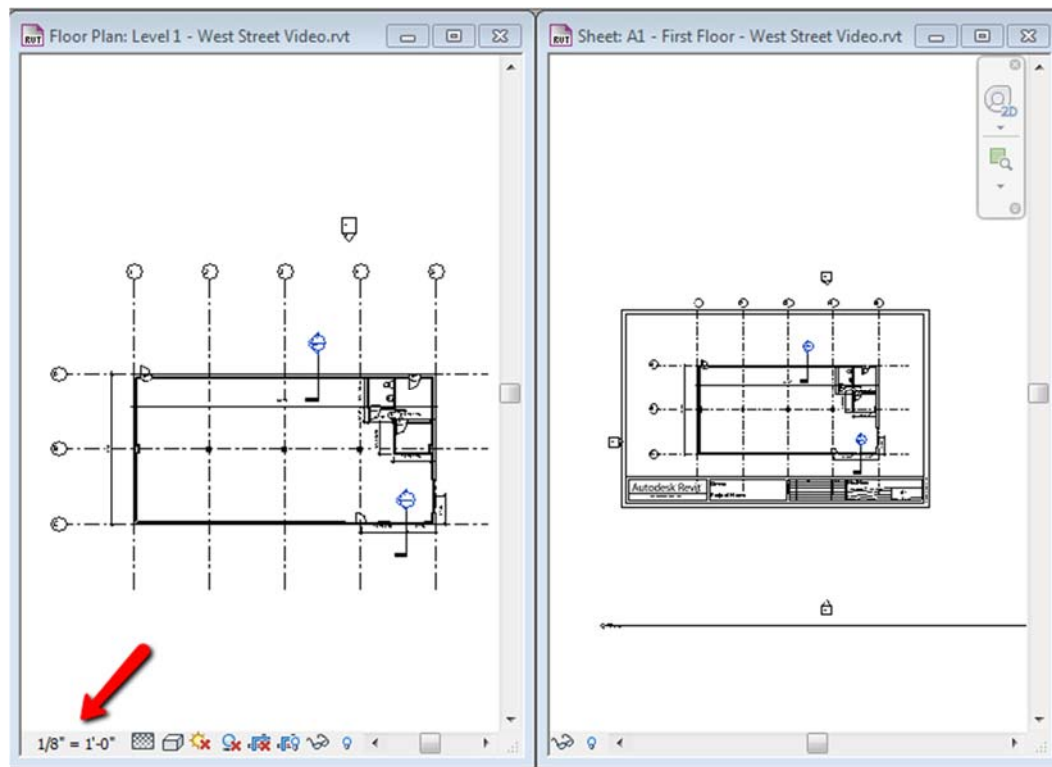
1. In the Project Browser scroll down to the Sheet Section. Double click on A1 – First Floor.

Note: The exercise has already been set up so a blank 11x17 sheet is on this layout tab

2. In the Project Browser scroll back up to the Views – Floor Plan section
3. Pick on Level 1, hold the mouse button down and drag the view to the sheet. When over the top of the sheet let go of the mouse button.

#### Part 2 – Experiment with Scale

1. Set up windows so you can see both the Sheet – A1 – First Floor and the Level 1 View at the same time. See below:



2. Currently the scale is set to 1/8" = 1'. Experiment by setting different scales.



## Additional Learning Resources

### Two Favorite Web Sites

#### Videos

<http://revitrocks.blogspot.com/2010/01/revit-parametric-house-magic.html>

This guy has put together 100s of videos. They can be purchased and they seem well worth the price. I have learned a lot just watching the free ones.

#### Revit City

<http://www.revitcity.com/index.php>

Has very good online discussions and have found many answers to questions on this site.

Search tip go to Google type in what you are searching for then add /site:revitcity.com. This will tell Google to search on a specific site. I use this all the time not just for Revit or Revit City.

**Example search: Revit drawing a Soffit /site:revitcity.com**

### Additional Web Sites

<http://www.augi.com/home/default.asp>

<http://forums.autodesk.com/t5/Autodesk-Revit/ct-p/2003>

<http://revitclinic.typepad.com/>

<http://www.revitcity.com/index.php>

<http://www.revitzone.com/>

<http://www.cadtutor.net/>

<http://www.youtube.com/> -- search for Revit + topic of interest (keyword CADClip has some very good videos)

### Dealer Led Training

The folks that sell the software can also provide training. Here is the dealer that sold us the software: <http://www.mwcad.com/>

Here is a link to their training schedule: <http://www.mwcad.com/trainingschedule.php>