

BERN STAPLES

ON AUTODESK REVIT

NORTHLAKE CHRISTIAN SCHOOL

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The source code of this document may be found under a public GIT repository here: <http://www.github.com/hendenburg/onautodeskrevet>

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Contents

<i>Introduction</i>	7
<i>Chapter 1 - Creating Your House</i>	13
<i>Chapter 2 - Creating the Base of the House</i>	17
<i>Chapter 3 - Creating the Terrain</i>	21
<i>Chapter 4 - Creating Exterior Walls, Floors, and Roofs</i>	25
<i>Chapter 5 - Creating Interior Walls</i>	33
<i>Chapter 6 - Creating Doors and Windows</i>	37
<i>Chapter 7 - Creating a Curtain Wall, Connected Walls, and Entry Deck</i>	43
<i>Chapter 8 - Creating Stairs and Railings</i>	49
<i>Chapter 9 - Creating the Project Documentation</i>	53
<i>Bibliography</i>	55

List of Figures

1	The revit start page	8
2	A revit New file popup	8
3	A template file list	9
4	A revit default workspace	9
5	The revit top bar	10
6	The annotation bar	10
7	The massing and site bar	10
8	The view bar	11
9	The modify bar	11
10	The revit side bar	13
11	The revit elevations list	13
12	Clicked elevation lines	13
13	The revit options bar	14
14	Shortened elevation lines	14
15	The names of elevation lines	14
16	Revit object types	17
17	The foundation walls	18
18	Revit foundation and retaining walls	19
19	Initial topographic points	21
20	Second set of topographic points	22
21	Third topographic points	22
22	Building Pad Lines	23
23	Revit 3D Maneuvering Square	23
24	Revit 3D view after Topographic Creation	24
25	Entry level walls	26
26	Lower Level Walls	26
27	Exterior walls 3D view	27
28	Revit Roof Intersection	27
29	Finished Roof Lines	28
30	Revit Pick Walls Tool	28

31	Lower level floors	29	
32	Entry Level Floor Tools	29	
33	Entry Level final floors	30	
34	3D wall context menu	30	
35	The final 3d floor view	31	
36	Wall distance guide	33	
37	The lower level walls guide	34	
38	The split tool selected	34	
39	A completed hallway	35	
40	Entry Level interior walls	35	
41	The Revit Lower Level Exterior Door	37	
42	Entry Level Exterior Door	38	
43	The Balcony Door	38	
44	Upper Interior Doors	39	
45	Lower Level Interior Walls	40	
46	The Location of the Retaining Windows	40	
47	The Final Lower Level Windows	41	
48	The initial Entry Level Windows	41	
49	The Upper Windows Aligned	41	
50	Final Upper Window Arrangements	42	
51	The Revit Curtain Wall Segments Selected	43	
52	The Final Curtain Wall Arrangement	44	
53	The Finalized 3D Image of Curtain Walls	45	
54	All walls selected for attachment process	45	
55	The Recently Attached Walls	46	
56	A Correct Side Entry Deck	47	
57	A wall Added to the Entry Deck	47	
58	The Retracted Entry Deck	48	
59	An example of the replaced retracted section	48	
60	A Sloped Deck	48	
61	The placement of Stairs	49	
62	A Space in the Floor for Stair	49	
63	The railings of stairs selected	50	
64	The Entry Level Railing	50	
65	The Final Upper Railings	51	
66	Your Final Roof Footprint	52	

Introduction

The following guide and user manual utilizes Autodesk Revit, a BMI program which is used to create Architectural Visualizations ¹. The guide is based on Autodesk's own guide ²

¹ Autodesk. Revit. <http://www.autodesk.com/products/revit-family/overview>, 2016. Computer Software

² Autodesk. *Getting Started with Autodesk Revit Building*. Autodesk, 2006

Starting Revit

To start Revit, either find the program via its icon, or by searching for `Revit` by bringing up the search menu with the `Windows Key`

Getting adjusted to Revit

The Figure 1 represents an accurate representation of a Revit opening screen. When opening a Revit project file this screen is circumvented.

Starting your first project, and an introduction to Revit's interface

Let's antiquate ourselves with the introduction page. The introduction page is made up of two primary sections: `Projects` and `Families`. For the time being you can ignore the `Families` section, and focus only on the former.

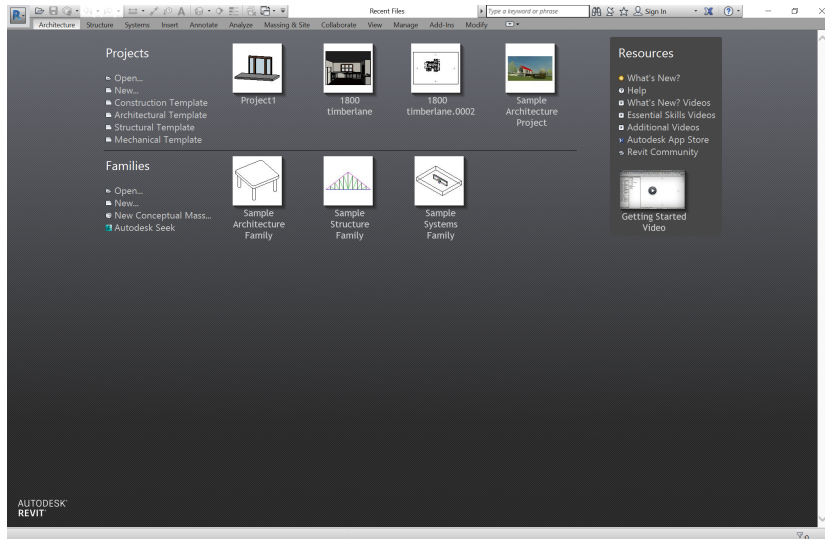


Figure 1: This figure shows the opening page when you open up the Revit Application.

There are three major parts to the Revit Application Main Page.

AMONG THE LINKS are: **Open...** which opens an already existing project, and **New...** which presents to you the process to create a new project, and various templates. The images and captions within the project section are existing projects that have been opened recently.

WE ARE GOING to start a new project. If you click on **New...** you should have a popup window like in Figure 2.

Once you click **Browse...** you should be taken to another popup. The popup, which is shown in figure 3 has a list of templates used in Revit Projects. The template you will want to you is called **default**. Once the template is selected click **Ok** and be off onto the project.

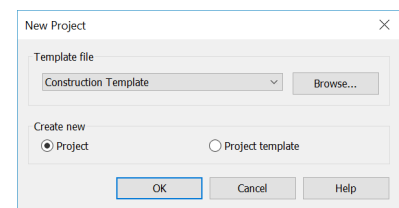


Figure 2: This is new file popup, you see this whenever you wish to create a new project. You will always be creating a Project, not a Project Template.

You will not be creating any files with the Construction Template

if you can't find it, the file path is:
ProgramData\Autodesk\RVT 2016\Templates\US Imperial\default

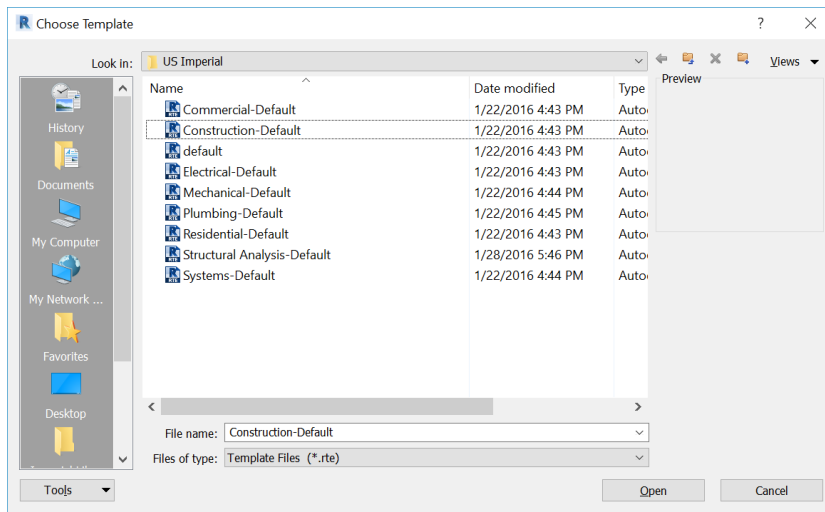


Figure 3: A list of the templates that will popup on your screen

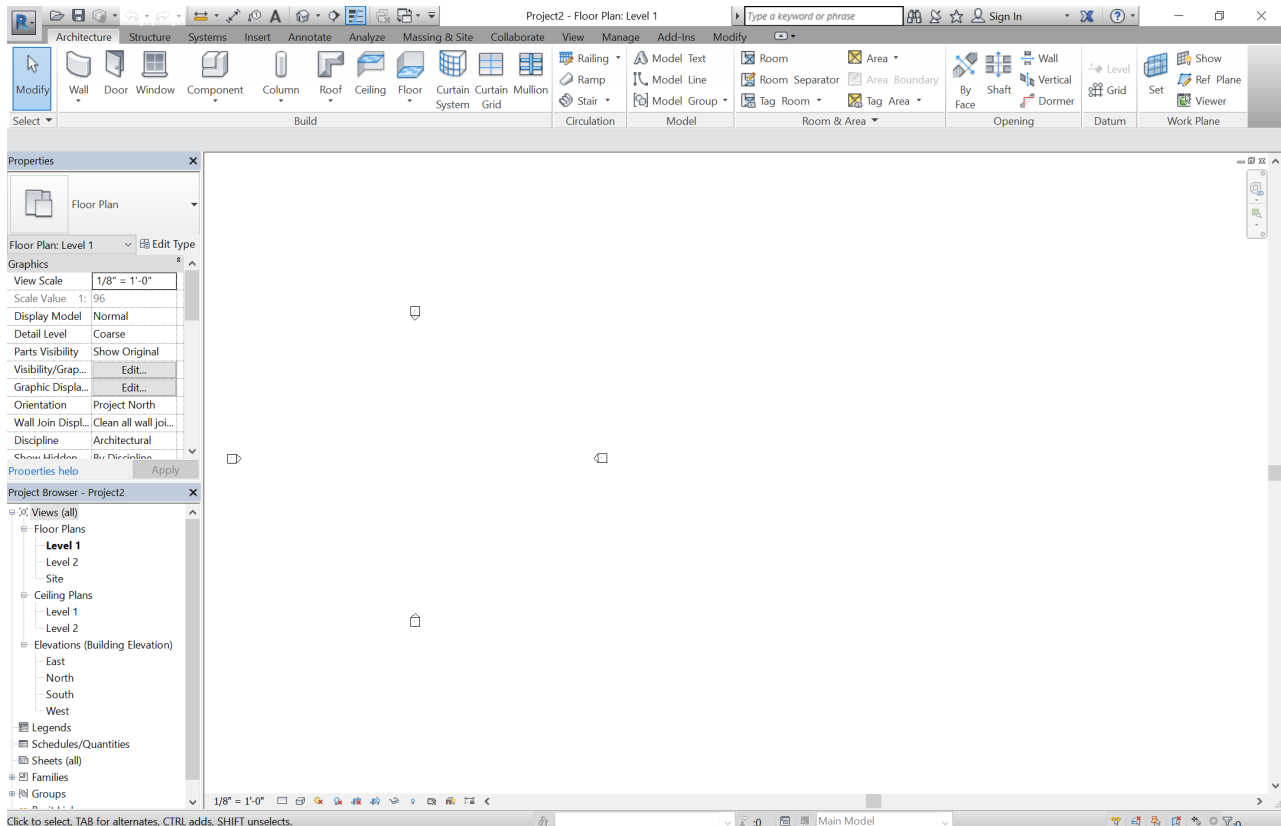


Figure 4: A full screen example of the Revit workspace. Composed of multiple ribbon banners, and views. The large whitespace is the plane on which you have your building

Elements of the Revit Interface

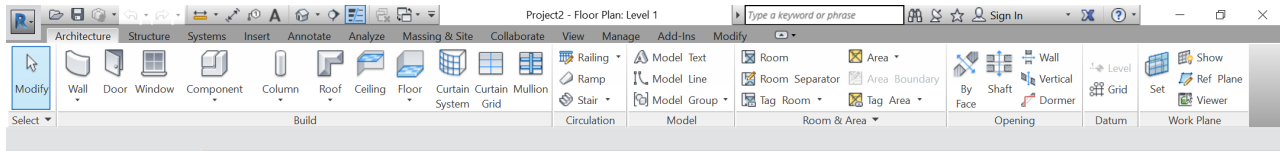


Figure 5: The revit top bar, at it's base.

In the figure 5 you can see what we will refer to as the **Top Bar**, this will be the location where all the tools of this program are located.

YOU CAN SEE icons for each tool, and above those is a line of tabs, called Ribbons, starting with **Architecture**, then **Structure**, **Systems**, etc. When you click one of the ribbon labels you are taken to a new section of tools.

As you create the house below, you will become familiar with all these tools; each tool is essential in the creation of a functioning model.

THE **ARCHITECTURE** TAB, which is show in Figure 5, contains the tools to create the basic formation of a house: the foundation, the floors, the walls, and the windows.

THE **ANNOTATE** TAB which is shown in the figure 6 contains the tools which you use to markup the project. These tools document your creation, while also making presentation easier. They can be used to determine the size of your model, the angels of you walls, the width of you house for a variety of reasons.

You won't be using the majority of these tabs, but it's smart to know what they do, along with the tools inside. See the Menu Tools sections reference for more. For the majority of this tutorial the only tabs will be: **Architecture**, **Annotate**, **Massing & Site**, **View**, and **Modify**

Beware: overuse of the **Massing & Site** **Toposurface**, and the **Massing & Site** **Site Component** tools can lead to your computer becoming slow and sluggish.

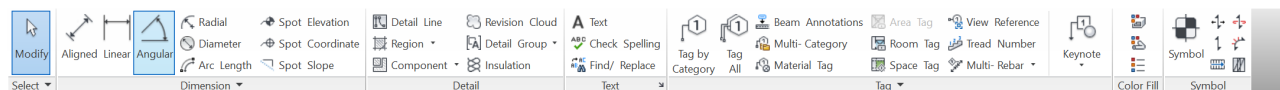


Figure 6: A picture of the **Annotation** bar in revit.

THE **MASSING & SITE** TAB, in figure 7 is used to model and map the terrain of your model.

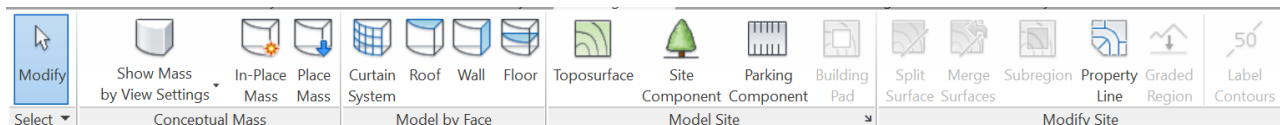


Figure 7: A picture of the **Massing & site** bar in revit.

THE **VIEW** TAB, shown in figure 8, contains essential tools for viewing and presenting your project. The **View > 3d View** tool will become vital for visualizing your house in the future.

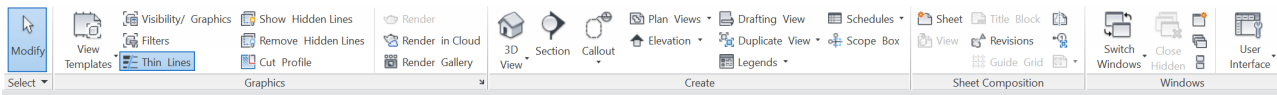


Figure 8: A picture of the **View** bar in revit.

THE **MODIFY** TAB, in figure 9, is different from the others. While the previous tabs were meant to interact with the building, this tab is primarily focused on interacting with the objects that make the building up. For instance, splitting a singular wall is done inside the modify tab.

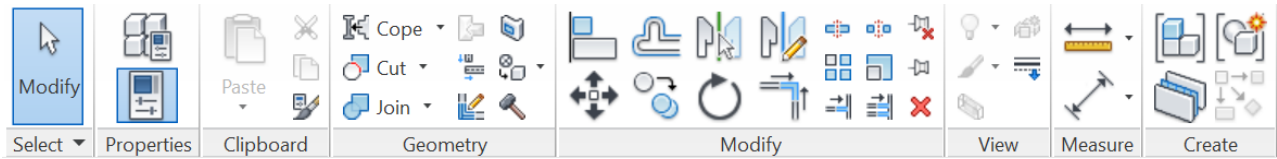


Figure 9: A picture of the **Modify** bar in revit.

Chapter 1 - Creating Your House

Figure ?? is a picture of what your house will look like.

ON THE RIGHT in figure 10, you can see the **Revit Sidebar**. This sidebar, which should be on the left hand of your revit window, is the detail window for everything you do. in the **Revit Sidebar** > **Properties** you can see the type of object, and the specifications for it. in the **Revit Sidebar** > **Project Browser** you can see a list of all the views and documents associated with your project.

Selecting and Creating Elevations

The following guide's purpose is to establish an understanding of altitudes and elevations in 3d architecture.

1. Within **Sidebar** > **Project Browser** > **Elevations** is the elevations list.
2. Refer to figure 11 and click on the **Sidebar** > **Project Browser** > **Elevations** > **South** button
3. You should see elevation lines in the main workspace. if you click along the line once, it will become like figure 12, you should click and drag the leftmost circle to the right until the line becomes shorter.
4. Each elevation has two main elements, the name and the altitude. Generally your foundation should be several feet under the ground.
5. You have two elevations currently: **Level 1** and **Level 2**
6. You can either use your scroll wheel too zoom into the elevations, or you can use the keybinding: **Ctrl** + **Z** + **F**
7. If you click on the text of **Level 1** where it says **0'-0"** it will allow the input of a new altitude
8. Click on the altitude of both **Level 1** and **Level 2** and change their altitudes

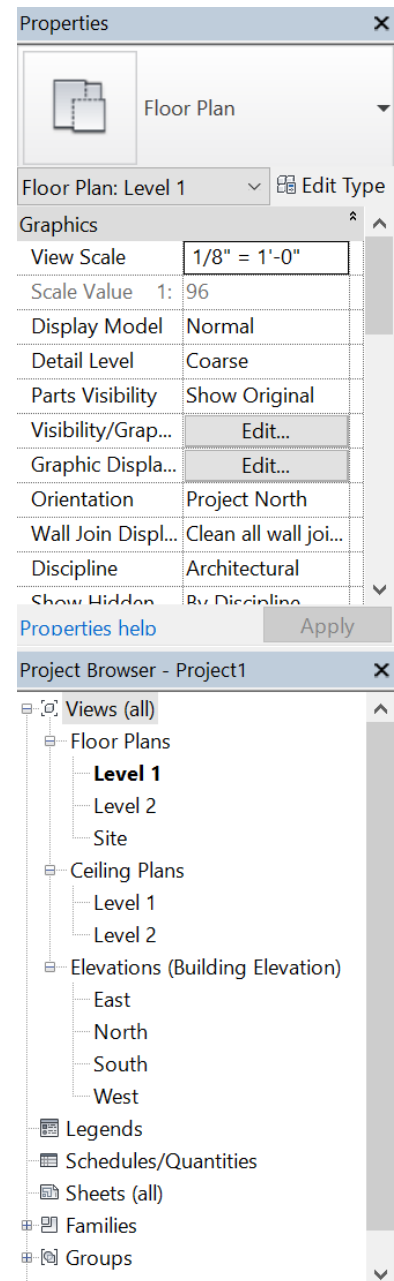


Figure 10: A picture of the **Revit Sidebar**

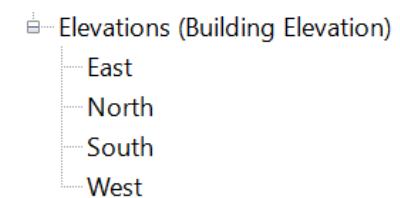


Figure 11: A view of the elevations: East, North, South, and West

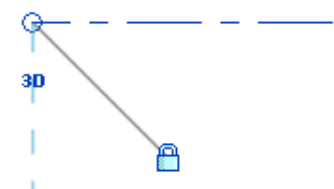
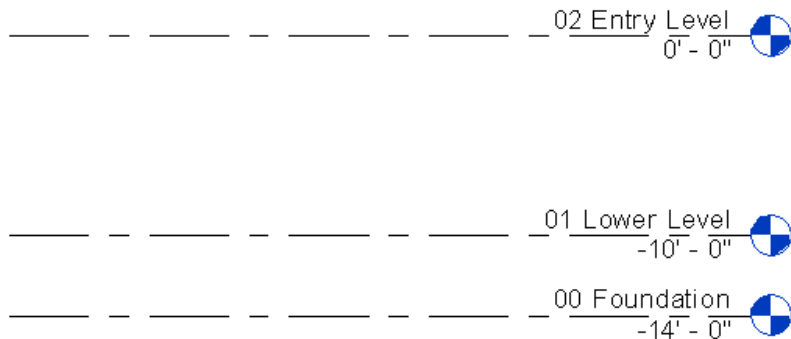


Figure 12: Elevation lines that have been clicked once

- For **Level 1** where the altitude should be **-14'0"**
- for **Level 0** where the altitude should be **10'0"**

Creating additional elevations

- If you right click on the uppermost elevation, **Level 2**, you should get a context menu, it should include the option: **Create Similar**. If you click on that option it should select the **Architecture > Level** tool which creates an annotation, but it also has the same selected options as the elevation you selected.
- If you look at Figure 13 you should see what is called the **Options Bar**, on it you can see multiple options: **Make Plan View** and **Offset:** which equals **0'0"**
- To create an elevation that is **10'** above **Level 1** Change the **Option Bar > Offset:** to equal **10'0"** while **Create Similar** is selected, and click from the leftmost point of **Level 2** and drag to the rightmost point. Reference figure 14



Make sure that your elevations look similar to this figure

- Use the same procedure as used to create **Level 3** to create another elevation at **10'0"**. To do this, make sure your **Options Bar > Offset:** is set to **10'** and create a similar elevation above **Level 3**
- Similar in method to changing a elevation's altitude is changing an elevation's name. For instance, click on **Level 1** where it says 'Level 1', so that it becomes a text box like when changing the altitude. Enter the following name: **00 Foundation**
 - Name the **Level 1** this: **00 Foundation**
 - Name the **Level 2** this: **01 Lower Level**

-4'0" generally is a good altitude to keep your foundation base, **Level 1** is the foundation for this house, for instance.

A context menu is what happens when you right click, the first option should be cancel, in this case, the option you're looking for should be the 10th down

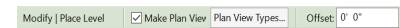


Figure 13: The options bar, which is mostly used to set chain settings and offsets

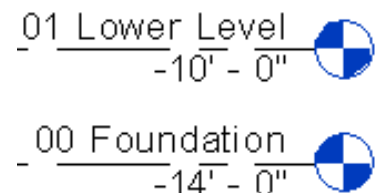
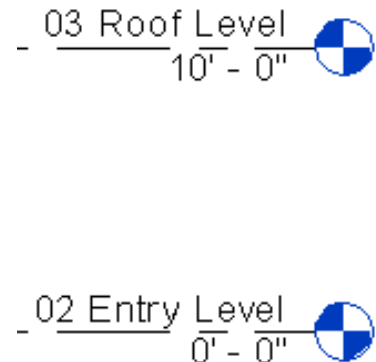


Figure 15: Make sure that your final elevations are named likewise

- Name the this:
- name the this:

Chapter 2 - Creating the Base of the House

The purpose of this guide is to instruct in the method of creating the foundation for the project.

Creating the Retaining Walls

- 1. Select this view Sidebar >> Project Browser >> Floor Plans >> 00 Foundation
- 2. Zoom into the lower right quadrant of the workspace
- 3. From there, select the following tool: Architecture >> Wall Tool. When you click on the screen with this tool selected you create points, just like on a graph you click or drag another point out to create a line, or a wall in this case.
- 4. If you remember the Sidebar for the interface explanation, there was Sidebar >> Properties, inside this is the options for the wall.

Settings	Basic Wall Retaining - 12" Concrete
Location Line	Wall Centerline
Base Constraint	00 Foundation
Base Offset	0'0"
Top Constraint	Up to 02 Entry Level
Top Offset	0'0"

- 5. Click to create a base point, a line should begin to follow your cursor. You can easily create a wall by pointing your cursor in a direction, and typing in the distance.
- 6. create a base point and move your cursor to the left: type 40'
- 7. If chain was selected in Option Bar >> Chain: then, you should just be able to move the cursor up and type in 22', otherwise click on your last created point and repeat the aforementioned steps
- 8. Repeat the same steps, moving your cursor right and typing: 40'

This is why we named our elevations the way we did in the previous chapter. Our floor plans are listed alphabetically in the Project Browser so when we have the numbers preceding the name, they are both descriptive, and correctly ordered.

It's good to make sure that your walls have the correct base and height. If the program does not let you select the correct height, while not perfect, another option is to choose unconnected for the Sidebar >> Properties >> Top Constraint and then select the altitude for the elevation point, for instance, the offset would be 10'0" for 02 Roof Level

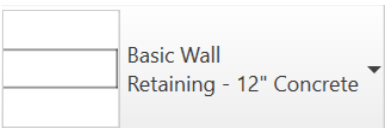


Figure 16: When selecting an object in Revit. There is, of course, different object types. The image in this figure is the Object Selector. For walls specifically, there are multiple types that we use. When referenced, the Object type can be explained as Sidebar >> Properties >> Object Selector >> Basic Wall Retaining - 12" Concrete or plainly as Basic Wall Retaining - 12" Concrete

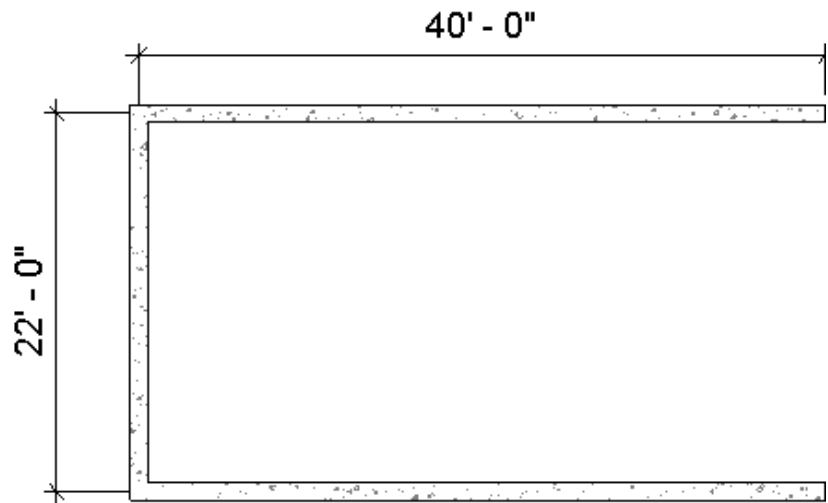


Figure 17: The foundation walls

[Revit retaining walls]This is what your walls should look like

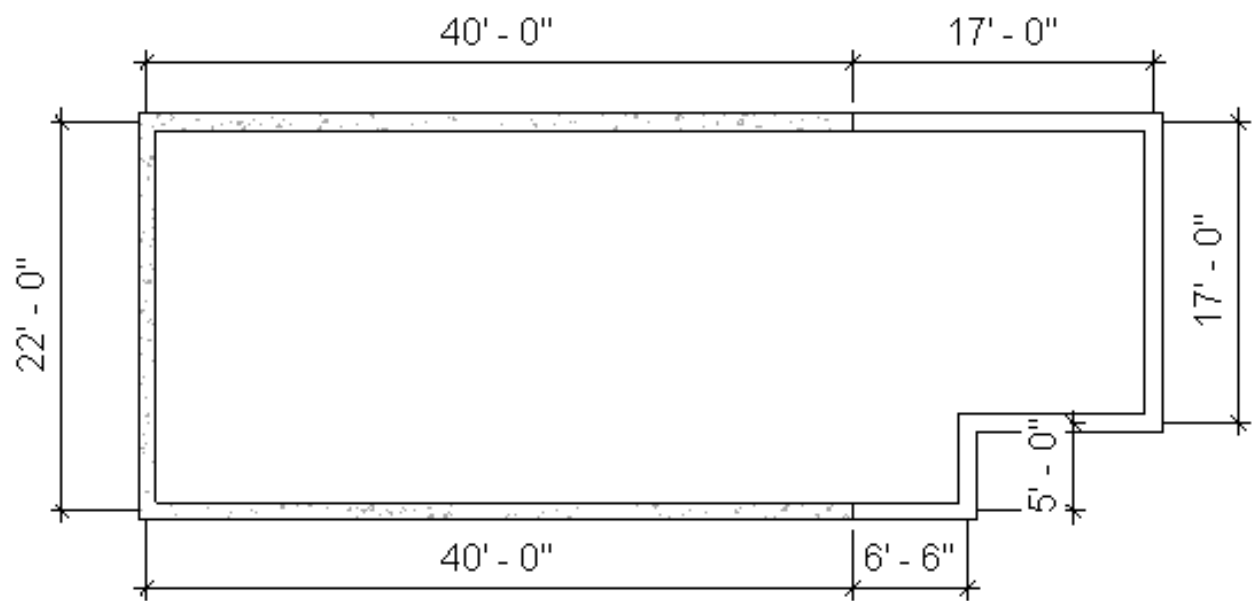
Creating your Foundation Walls

9. Select your retaining walls with the following options

Settings	Basic Wall Foundation - 12" Concrete
Location Line	Wall Centerline
Base Constraint	00 Foundation
Base Offset	0'0"
Top Constraint	Up to 01 Lower Level
Top Offset	0'0"

10. Create the walls on the outside
- (a) select the rightmost edge of the bottommost wall with the wall tool selected
 - (b) Move the cursor to the right: type 6'6"
 - (c) Move the cursor up: type 5'
 - (d) move the cursor right: type 10'6"
 - (e) meet the intersect where the topmost point of your wall becomes directly right of the rightmost point of the top wall.
 - (f) Complete the walls by moving to the left until you hit the top wall.

11. Figure 18 should be the final product of this level



Make sure your walls look like this

Figure 18: The final foundation walls

Chapter 3 - Creating the Terrain

The purpose of this guide is to introduce the basics of terrain creation in Revit. This should explain the basics of pads and terrain.

Adding a Toposurface

1. Go to the following view: **Sidebar** > **Project Browser** > **Floor Plans** > **Site**
2. Select the following tool: **Massing & Site** > **Toposurface**
3. Select the following options for **Options Bar** > **Elevation:** to **-0'6"**
4. Add points to the left side of the building, like the figure 19

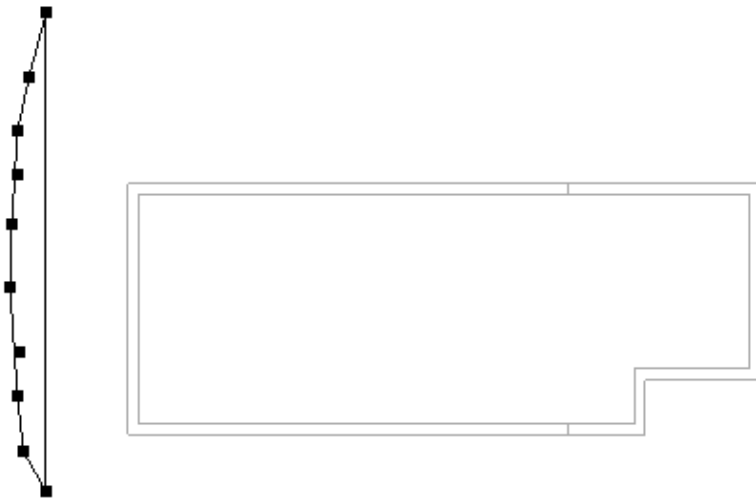


Figure 19: Initial topographic points

Work to make sure yours looks similar, not exact

5. Select the following options for **Options Bar** > **Elevation:** to **-10'**
6. Select the points as in the figure 20
7. Select the following options for **Options Bar** > **Elevation:** to **-11'**
8. Select the points as in the figure 21

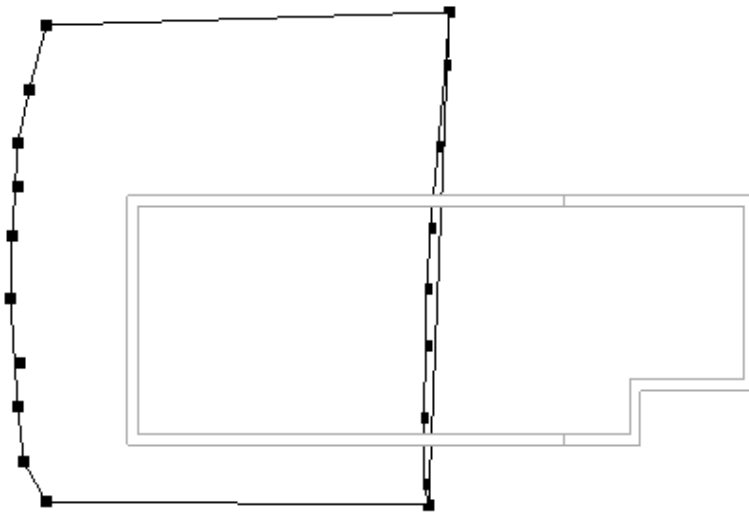


Figure 20: Second set of topographic points

Work to make sure yours looks similar, not exact

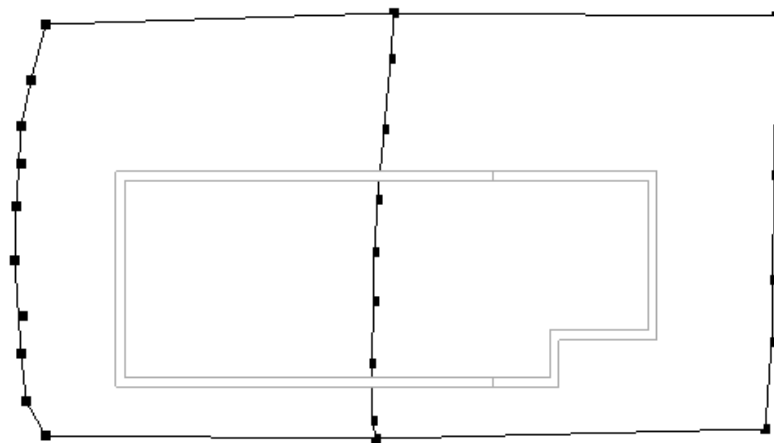
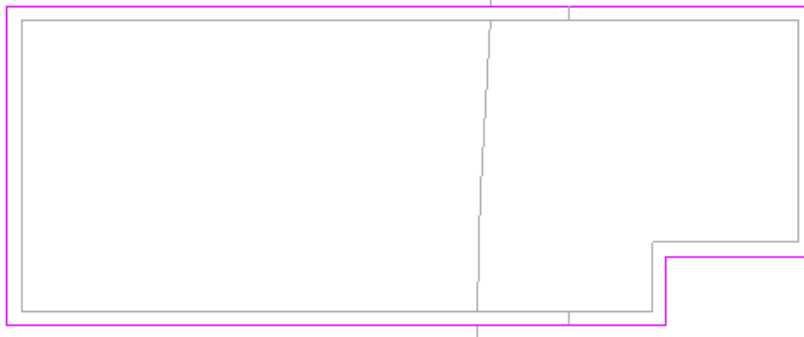


Figure 21: Third topographic points

Work to make sure yours looks similar, not exact

Setting up a Building Pad

9. Having finished the terrain surface by clicking the big green checkmark.
10. To create a building pad click on each of the walls with the **Massing & Site >> Building Pad** tool.
11. Click each wall, finally click the purple line with three parallel lines attached: click it until the purple lines are only on the exterior of the walls. Reference figure 22



Make sure your pad looks like this, it's not essential but recommended

Remember that it's best to avoid adding excessive amounts of topographic points, which may slow your computer.

Figure 22: When building a pad, it's essential that it covers the buildings base, but doesn't extend past it. The pads purpose is to place a solid foundation base, while making sure that the terrain does not enter the floors of your building, so it removes any terrain where it's at.

Creating a 3D view

12. Click on the tool **View >> 3d View**, it will create a new view called **Sidebar >> Project Browser >> 3d Views >> {3D}** right click on this view to rename it to something, I recommend **To Building**
13. select your renamed **3d View** and use the 3D maneuvering square to change the view. Reference Figure 23



Figure 23: Use the 3d viewcube to move around the 3D environment. If you grip the sides and corners with your mouse, you can drag it to change your view.

The proficient use of this is essential, so make sure you focus on it in later projects.

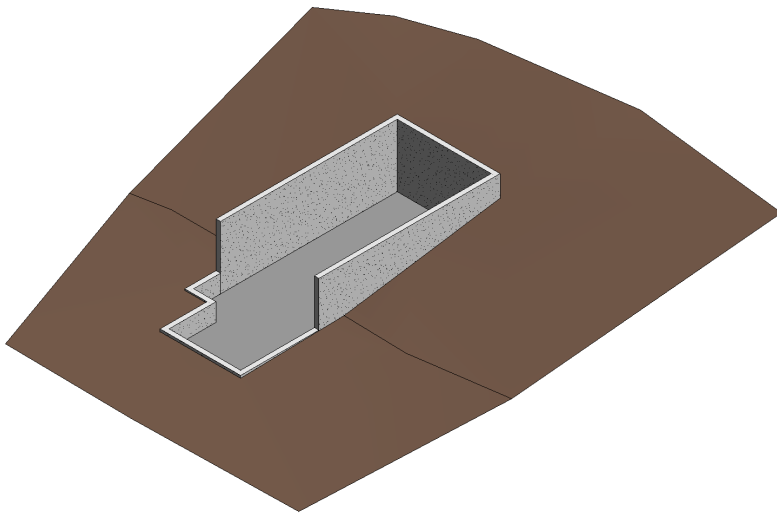


Figure 24: It's Important that everything looks realistic. When presenting your building, you want to an accurate representation of what it would look like. If you wish for further information, either ask your teacher, or reference any information on rendering

Make sure your 3D view looks rather similar to this, but it will vary from person to person

Chapter 4 - Creating Exterior Walls, Floors, and Roofs

The purpose of this guide is to continue on the education of wall creation. This also touches on the creation of wall retained floors, and non retained floors.

Creating Exterior walls

Add walls to the entry level

- go to the following view: Sidebar Project Browser Floor Plans 00 Entry Level
- Create the following walls with these options:

Settings	Generic - 6"
Location Line	Core Face Interior
Base Constraint	02 Entry Level
Base Offset	0'0"
Top Constraint	Up to 03 Roof Level
Top Offset	0'0"

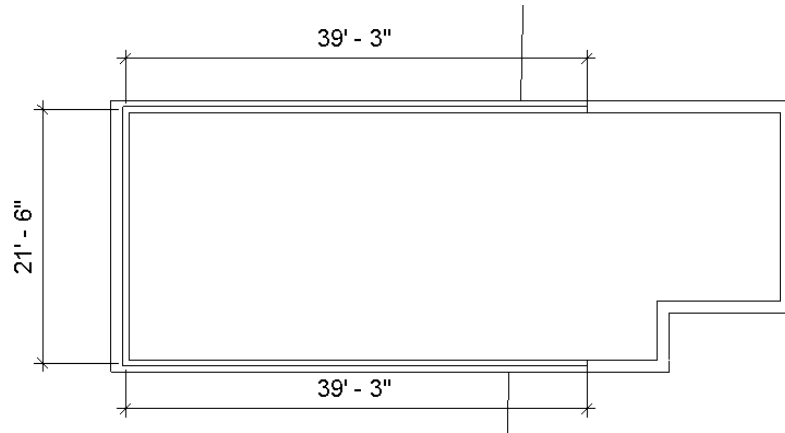
If you are having issues with seeing objects below the current view level, then change the following settings. While you have the view selected in the Sidebar Properties there is an option called View Range, if you go into that setting and change the View Depth Level: option to the appropriate level you wish to have your view depth to.

- beginning at the bottom right, trace the interior of the three existing retaining walls, the three rightmost walls, by selecting endpoints. Reference figure 25.

Add walls to the Lower level

- Open up the following: Sidebar Project Browser Floor Plans 01 Lower Level
- Use the following settings:

Settings	Generic - 6"
Location Line	Core Face Interior
Base Constraint	01 Lower Level Level
Base Offset	0'0"
Top Constraint	Up to 03 Roof Level
Top Offset	0'0"



Make sure your walls look like this, annotations excluded

6. Trace the interior of the Foundation walls, the 5 leftmost walls.
Reference figure 26

Figure 25: The walls along the retaining walls which reach the exterior walls are meant to border the interior of the retaining walls. By selecting **Core Face Interior** the walls are more easily aligned with the interior face of the walls.

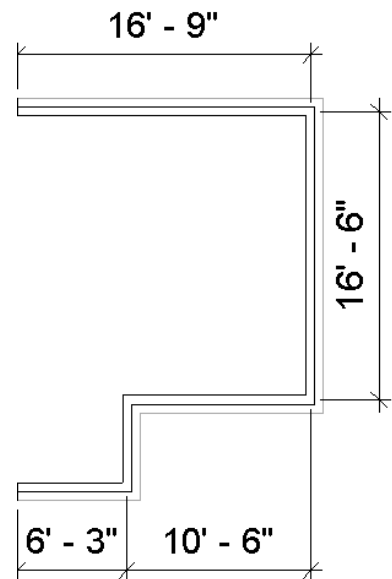
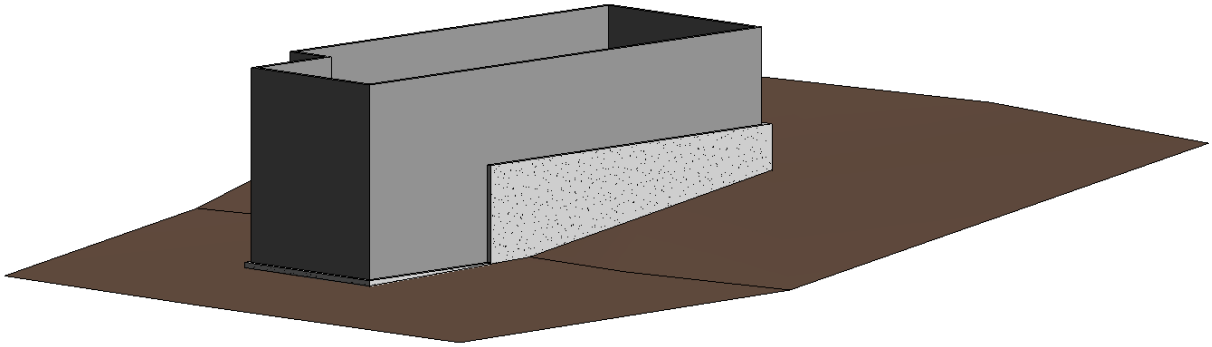


Figure 26: Lower Level Walls

Make sure your walls look like this, annotations excluded



Your 3D view should now look rather similar to this

Figure 27: This is the 3D view of the outer walls. If one of your walls is taller or shorter than the other, make sure that you have the correct height selected in your wall options.

Creating a Roof

7. Go to the following view: **Sidebar** > **Project Browser** > **Floor Plans** > **03 Roof Level**
8. the tool you should use is called: **Architecture** > **Build** > **Roof**
9. The Roof should have the following settings in **Sidebar** > **Properties**:

Settings	Basic Roof Generic - 12
Base offset	0'0"
Rafter Cut	Plumb Cut
Slope	1" / 12"

Draw a roof line

10. When you select the roof tool, you are brought to the modify tab, you will want to select the line tool, which is under **Modify | Create Roof Footprint** > **Draw** > **Line Tool**. Selecting that tool allows you to create a roof in the same way as a wall, except to create a roof, you must create a closed perimeter with your lines to define the roof.
11. Make sure the option: **Options Bar** > **Chain:** is not checkmarked, this means that when you click to create two points, it automatically starts to make the next points.
12. Make sure the option: **Options Bar** > **Defines Slope:** is checkmarked. This means that the future slope that you have will be based on this side of the roof.

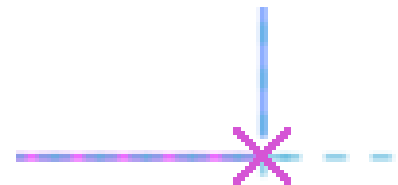


Figure 28: when you push a line past a wall's end, it will give you guides in relation to other objects in the project. So for this one, you will want to click only when it gives you guide lines that reach to the rightmost wall.

13. Trace the southernmost walls past the end, where it becomes parallel with the endpoints of the rightmost wall. The intersection should look like Figure 28

Draw an offset roof line

14. As you did when creating an elevation line, to create a roof line that is offset from the roof, you will want to select an offset.
15. Select the option for your wall line: **Options Bar** >> **Offset:** should equal **-3'0"** as well as make sure that **Options Bar** >> **Defines Slope:** is not checked for the remaining lines.
16. On your workspace, click on the last point you made and travel upward until you hit the top edge of the leftmost wall.
17. Travel to the left until you hit the rightmost part of the to wall.
18. Travel down until your last line is perpendicular with your first.
19. Make your **Options Bar** >> **Offset:** to be **0'** and connect the lines together, reference Figure 29 for an idea of what the finished product should be

Be sure when creating any object with an offset that the result is indeed offset from the initial line that you placed. Failing to realize this and fix the error just means more work for you.



Figure 29: Your finished roof lines should be a singular line with define slope right against the southern wall. the rest of the lines should be offset **3'0"** all along the wall

Make sure that your roof looks exactly like this, or at least similar

Creating Floors

Creating Lower Level Floors

20. Open up the view: **Side Bar** >> **Project Browser** >> **Floor Plans** >> **01 Lower Level**
21. Select the **Architecture** >> **Floors** tool, which you use to make floors, unsurprisingly

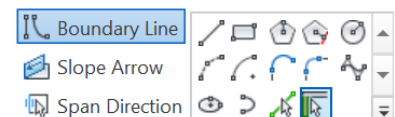


Figure 30: The tool you are using to create a floor is specifically made to fill a room or a certain amount of rooms by selecting the boundaries of the floor based on the surrounding walls.

Make sure you are using the tool with the surrounding marquee

22. The default tool selected should be sufficient, make sure you have the right tool selected, it's the **Modify | Create Floor Boundary** **Draw** **Pick Walls** tool, check figure 30
23. Click all the walls in ???. This should be the same method as creating the building pad, except make sure that the lines are all interior rather than exterior.

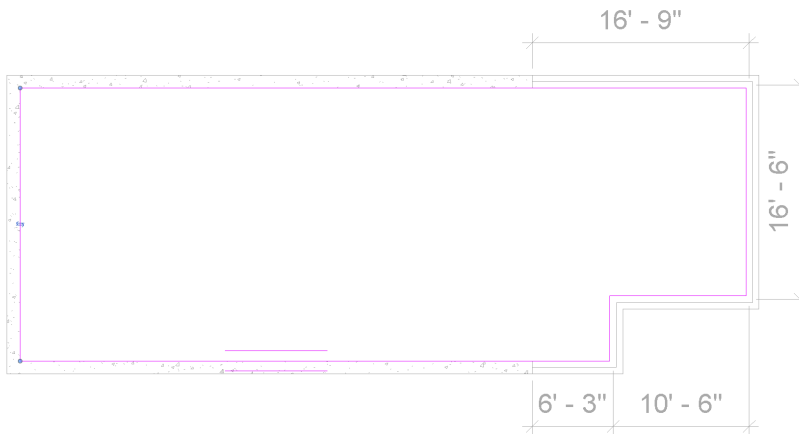


Figure 31: This should be the lower level floors, which are represented by the purple line. Make sure that the purple line is only on the interior

Make sure yours looks exactly like this, or similar.

24. Say no to all popups after creating the floor, for the time being, you do not need to worry about those

The popups are in regards to the wall's geometry that you attach too. You will most likely never need to worry about that.

Creating the Entry Level Walls

25. The creation of the **01 Entry Level** walls is a bit more hands on.
26. Navigate to **Side Bar** **Project Browser** **Floor Plans** **01 Entry Level**.
27. Instead of the tool you were using before, select the **Line Tool**
28. Make sure that **Options Bar** **Chain:** is selected
29. From the top right place a point to create the flooring
30. Use the following method to create the Entry Level floors
 - (a) Move to the right and type: **36'**
 - (b) Move down and type: **16'6"**
 - (c) Move to the right and type: **25'**
 - (d) Move down and type: **4'6"**
 - (e) Then move your cursor to the bottom left of the model and complete the sketch

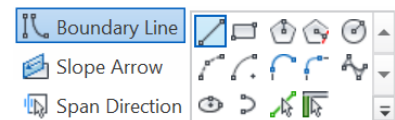
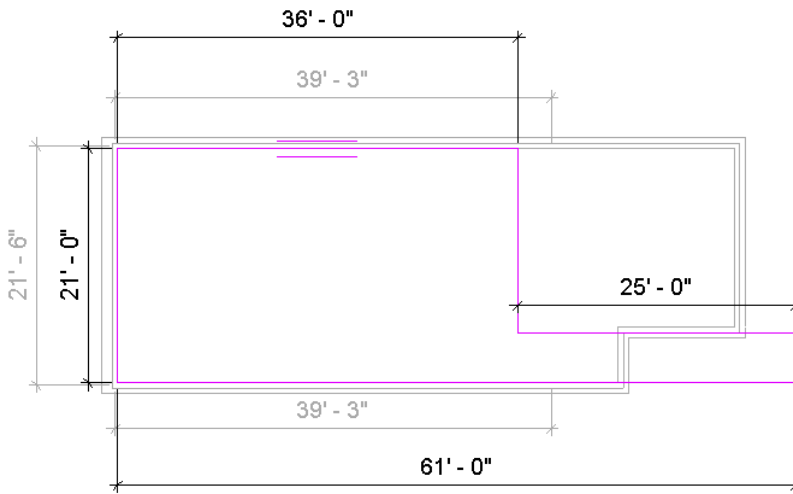


Figure 32: Entry Level Floor Tools
Make sure you are using this tool, not the previous one.



Your Floor should look, exactly like, or similar to this.

31. Once you have done this, you may finish the floorplan by clicking the large green checkmark

Viewing Your Floors in 3d

32. Select the view:

Side Bar > Project Browser > 3D Views > [What you named your primary 3D View]

33. Now, using your 3D view wheel, position your building so the front-right corner is at the forefront, this should be the default position

34. , Right click the wall on the right: click on the context menu that comes up. Use the following options: Context Menu > Hide in View > By Element

35. Reference the Figure 35, for a final look at what your 3d view should look like

Figure 33: The flooring for the Entry Level is essential. The fact that it doesn't fully cover that level is for the creation of a single atrium for the living room. As you get further you will see how the windows and stairs coincide with this design.

Like before, any alert dialogs that pop up on the screen are not relevant to you, and should be either ignored or, if particularly concerning, consult your instructor.

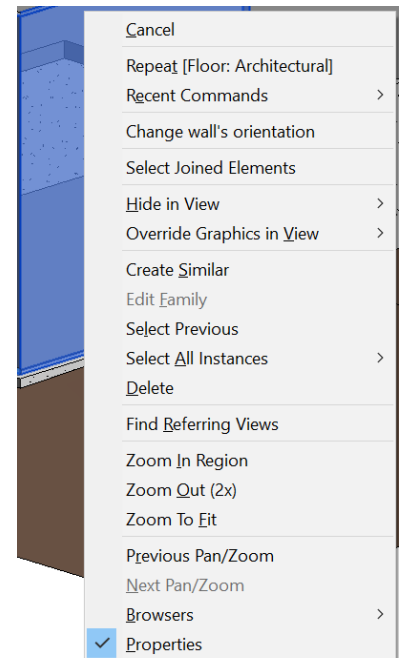


Figure 34: What pops up here should be the caption menu when right clicking a wall.

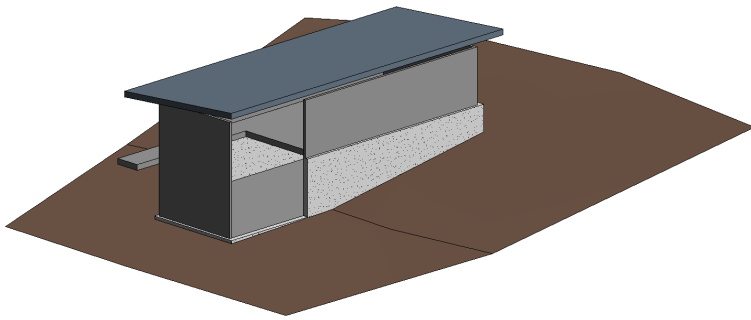


Figure 35: The final 3d floor view

Your view should look similar to this, excluding view point discrepancies.

Chapter 5 - Creating Interior Walls

In this guide you will continue on your education of wall creation. This time in the perview of interior walls.

Creating Lower Level Interior Walls

- 1. Open up the following view:

Side Bar > Project Browser > Floor Plans > 01 Lower Level
- 2. Use the following options for your wall properties

Settings	Generic - 6"
Location Line	Wall Centerline
Base Constraint	01 Lower Level Level
Base Offset	0'0"
Top Constraint	Up to 02 Entry Level
Top Offset	0'0"

- 3. Add walls:
 - (a) Beginning at the far left wall, move your cursor until the guide states that you are 20'0" away from the right corner wall. Look at the figure 36 to determine how it should look when you click.
 - (b) Create a wall perpendicular to that point, and bring it down until it reaches the far wall.
 - (c) At this point, refer to the figure 37 to continue the walls on this level. It is not essential that your walls are exactly the same.

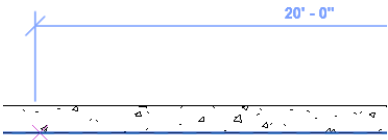


Figure 36: Wall distance guide
It should look like this when you click

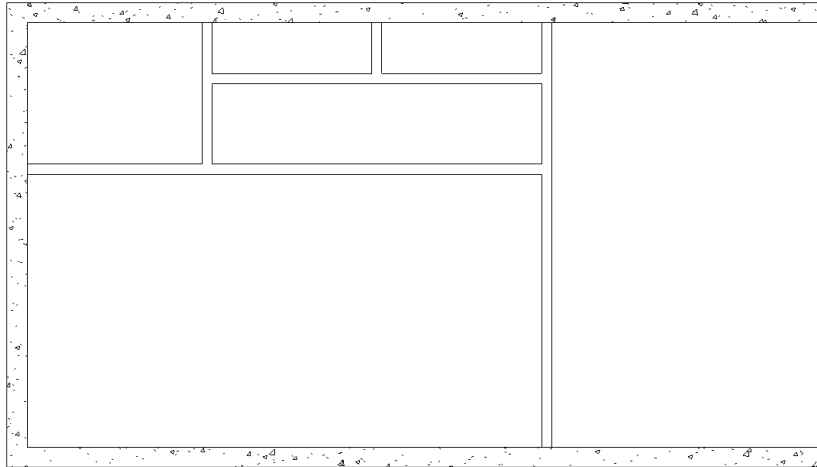


Figure 37: The lower level walls guide

Your walls should look similar, but not exactly like this. All of this can be changed later of course

- (d) You should use the **Modify | Place Walls > Modify > Split Element** tool to split a point in the far right interior wall, to create a hallway.
- (e) Select both end of the now split wall, to create the hallway.
Check figure 39

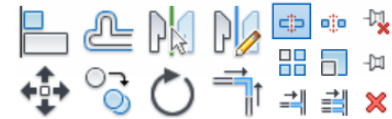


Figure 38: The split tool selected

Creating the Entry Level Walls

4. In this section, you're going to take charge on the construction of the Entry Level walls, following a figure. This should be on view: **Side Bar > Project Browser > Floor Plans > 02 Entry Level**, and using the following options:

Settings	Generic - 6"
Location Line	Wall Centerline
Base Constraint	02 Entry Level
Base Offset	0'0"
Top Constraint	Up to 03 Roof Level
Top Offset	0'0"

5. In the figure 40 you should be creating the walls that are not halftone, meaning the walls that are the darker shade.
6. When you are done creating the walls, if you wish to remove the ability to see the lowerlevel walls while on that level, use this option while the white background is clicked: **Side Bar > Properties > View Level > View Depth > Level:** and change the option to **Associated Level**

Advanced: When you are creating your Entry Level walls, if you have trouble seeing because you are seeing the lower level walls at fulltone, do this: To select multiple walls for an options hold down the **Ctrl** key and click the lowerlevel walls that you want to be halftone. When those are selected, rightclick on one of them, and click **Context Menu > Override Graphics in View > Element**, a popup should come onto your screen. in the top right corner of that popup is a checkbox that says **Halftone:** if you check that and click apply, then it will be halftone

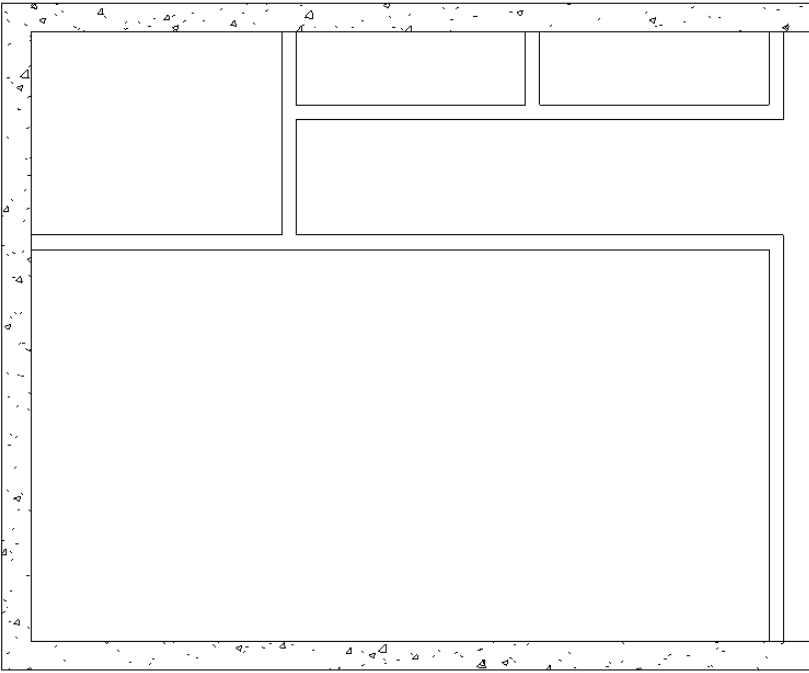
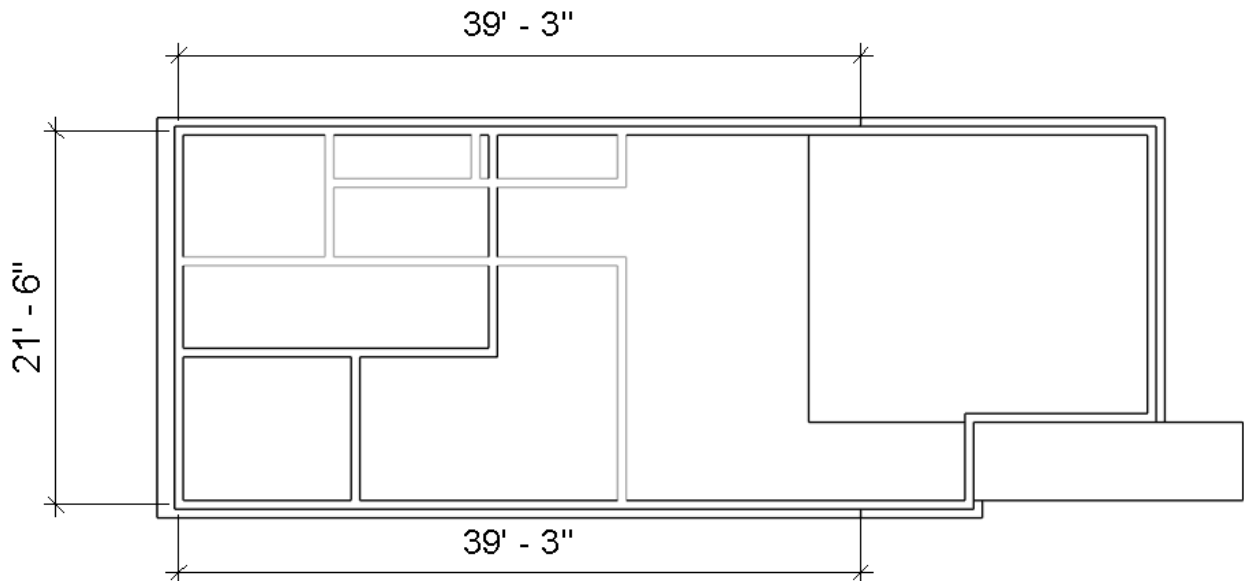


Figure 39: A completed hallway

Your hallway should look very similar, if not exact to this



You can change these up however you want, but make sure they have similar composition

Figure 40: Entry Level interior walls

Chapter 6 - Creating Doors and Windows

In this particular section, you will be guided into adding Doors and Windows, which also doubles as a guide to the initial selection of objects

Adding Exterior Doors

1. Go to the view level: Side Bar Project Browser Floor Plans 01 Lower Level

Adding Objects from a Library

2. Have the door tool selected, which is: Architecture Build Door
3. Inside the Modify bar is the following option: Modify | Place Door
Mode Load Family When you click on that, a popup with an object directory comes up
4. Go into the following directory to find the required object: Doors > Double-Glass.rfa. If you are unable to find it, you can substitute it with any other available model.
5. A table should come up, this allows you to load in select objects in that door group, or all of them. Just click on the first cell of the table, which is 68"x80" and click OK

The Tool: Model In-Place, which is adjacent to Load Family Allows you to create your own furniture right into the workspace. It is an advanced tool, but if you continue along the Revit path, you may come across that tool later

Assume that our document root of this example is: C:\Program Data\Autodesk\Revit 2016\Libraries\US Imperial

Creating the Lower Level Exterior Door

6. After clicking OK, you should have the door selected. Place it on the bottom of the rightmost wall. When placing a door, the orientation that the door swings, is dependant on which side of the wall your mouse is closest to. You're going to want your mouse nearest to the right side of the wall. This will cause the door to swing out into the exterior. When referring to a doors orientation, we will refer to as an exterior or interior swing. If the door is inside, then the exterior is merely swinging outside the room that it is being placed.

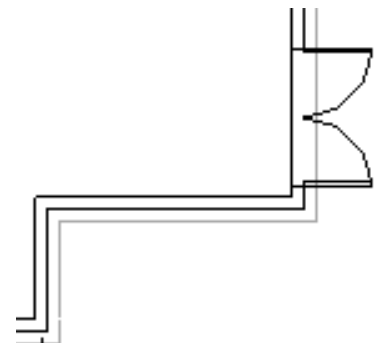


Figure 41: The Revit Lower Level Exterior Door

Your door should look similar to this, though the location doesn't have to be exact, it should be around the same area.

7. We can refer to this door in the same way as walls we placed earlier, using the following options table, as well as choosing different doors like choosing different walls

Settings	Door-Double-Glass 68"x80"
Sill Height	0'0"
Head Height	6'8"

Creating the Entry Level Exterior Door

8. Using the same door settings as before go to view: Side Bar
Project Browser Floor Plans 02 Entry Level
9. Prepare to place the door on the topmost retaining wall. Only place it when the guide lines show that you are 7'0" away from the right edge of the retaining wall, reference Figure 42
10. Load in an object like before, the directory is: Doors Residential Door-Interior-Single-Full Glass-Wood.rfa. Select only the seventh cell down in the table and click OK
11. Using that door, place a door with an interior swing on the balcony. Refer to Figure 43

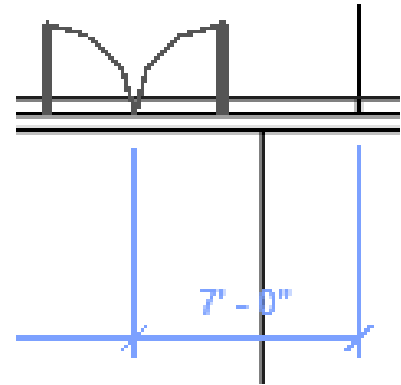


Figure 42: Your door should be placed only when you see the 7'0" guide marker next to your door. This represents the distance to the end of the Retaining Wall. Remember that there is a difference between your Retaining and Foundation Walls, your retaining walls are meant to Retain Terrain.

Your door should look like this



Figure 43: The Balcony Door
Your door should look like this

Adding Interior Doors

12. Stay on the Floor Plan that you're currently on.
13. Use the following door settings:

Settings	Single-Flush 30"x80"
Sill Height	0'0"
Head Height	6'8"

Entry Level Interior Doors

14. There should be three identifiable rooms on the Entry Level: A Medium Sized Bedroom, A Closet, and Everything else.
15. Click on the Medium Size Bedroom on it's bottom right edge. Put an interior facing door near the right edge of the bottommost wall of that room.

16. On the left side of that wall is the adjacent wall which the **Medium Size Bedroom** shares with the **Closet**. Place an exterior facing door on the closets topmost wall
17. Refer to Figure 44 for an idea of what this means

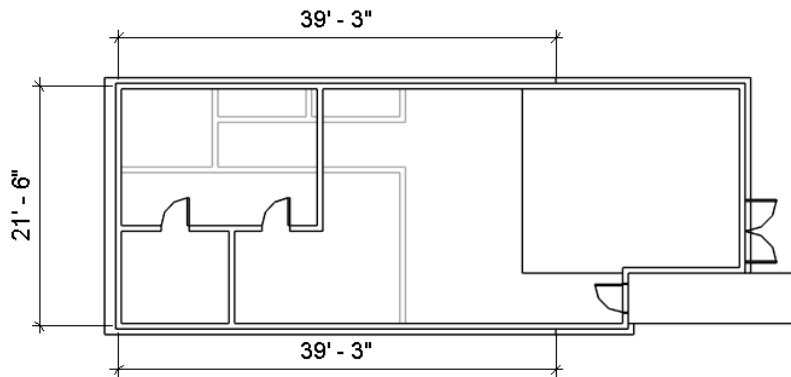


Figure 44: The Upper Interiors doors access these two rooms, you can see the door connecting the **Medium Size Bedroom** and **Everything Else** is interior because it's facing into the wall you're attaching it to. The closet door is exterior because it's facing away from the main room it's connecting. In an effort to stay away from pedantry, it's best to look at the following figure and then reference the guide for specific details. You'll get a hang of it

Lower Level Interior Doors

18. You should use the same door settings as the previous sub-section
19. You should identify Five unique rooms: the **Master Bedroom**, the smaller **Closet 1**, the larger **Closet 2**, The room which is larger than the closets, yet smaller than the Master Bed, the **Bathroom**, and finally **Everything Else**:
 - Place a door on the **Closet 1** connecting to **Everything Else**, exterior facing
 - Place a door on the **Closet 2** connecting to **Everything Else**, exterior facing.
 - Place a door on the **Bathroom** connecting to **Everything Else**, interior facing
 - Place a door on the **Master Bedroom** connecting to **Everything Else**, interior facing.
20. Reference Figure 45

You can safely assume that the main room is the first listed. So when it's exterior facing, we mean the exterior of the main room.

Adding Windows

Lower Level Windows

21. Open up this view: **Side Bar** > **Project Browser** > **Elevations** > **South**

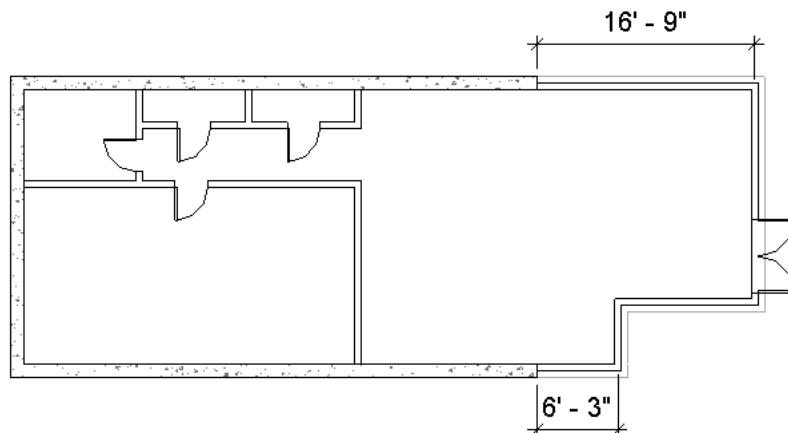


Figure 45: Lower Level Interior Walls

*In this case, your doors do not have to look exactly like mine, although the orientation has to be correct. Look at the listing and see how the exterior and interior facing coincides with the picture. The leniency you have is, for instance, changing where you have the door of the **Master Bedroom**.*

22. Select the following tool; **Architecture > Build > Window**

23. Use the following properties:

Settings	Fixed 36"x48"
Sill Height	3'0"
Head Height	7'0"

24. With the window selected, place it along the retaining wall, like in the Figure 46

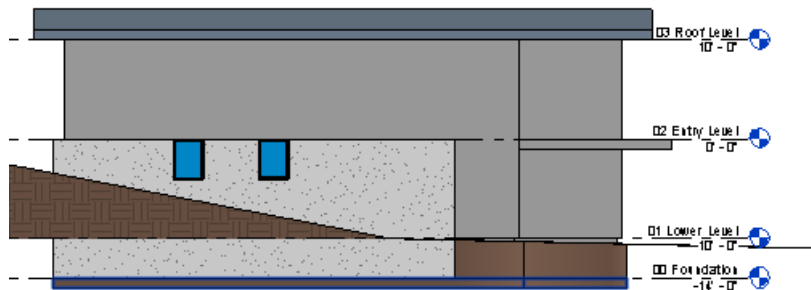


Figure 46: The Location of the Retaining Windows

25. Now go into the view: **Side Bar > Project Browser > Floor Plans > 01 Lower Level**

26. If you do not see the windows in this view, go into these settings with the background selected: inside **Side Bar** > **Properties** > **Extents** > **View Range** > **Primary Range** > **Cut Plane** > **Offset:** and set the number inside as **6'0"**
27. Now you can properly move the windows. Select the right window and move it until it is **2'6"** from the right interior walls, and move the left window until it is **9'6"** from the leftmost wall. Reference figure 47

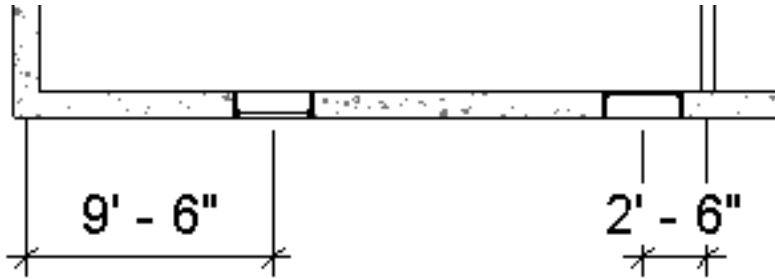


Figure 47: The Final Lower Level Windows

Your windows should look like this, annotations excluded

Entry Level Windows

28. You can use the same windows settings as in the previous section
29. Go to view: **Side Bar** > **Project Browser** > **Floor Plans** > **02 Entry Level**
30. Place three windows on the leftmost wall of the **Medium Size Bedroom** reference Figure 48
31. Select the following tool: **Annotate** > **Dimension** > **Aligned**
32. Click on the items in this order: The topmost wall, the middle of the first window, the middle of the second window, the middle of the third window, and the room's bottommost wall. Reference Figure 49
33. Click on the line which holds the alignment numbers, to the left of all the numbers should be a little symbol. It says **EQ** with a line through it.
34. Click on the little **EQ**. All your windows should become equal in distance, and the numbers should change to EQ. Check figure 50

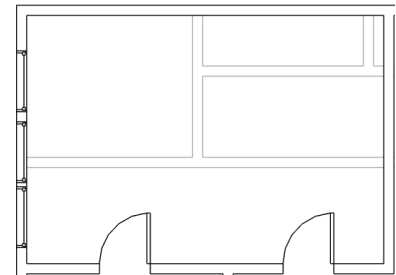


Figure 48: The initial Entry Level Windows

Do not be worried if they are staggered, that will be dealt with

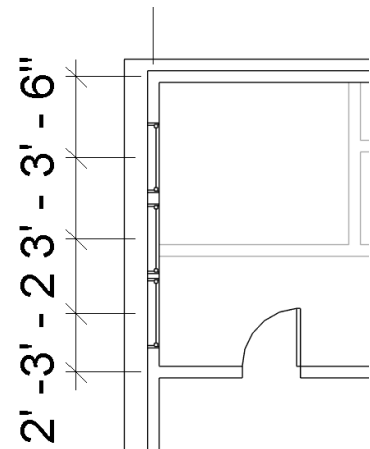


Figure 49: The Upper Windows Aligned

Your windows should look like this with the alignment tool properly applied, they should not have changed yet.

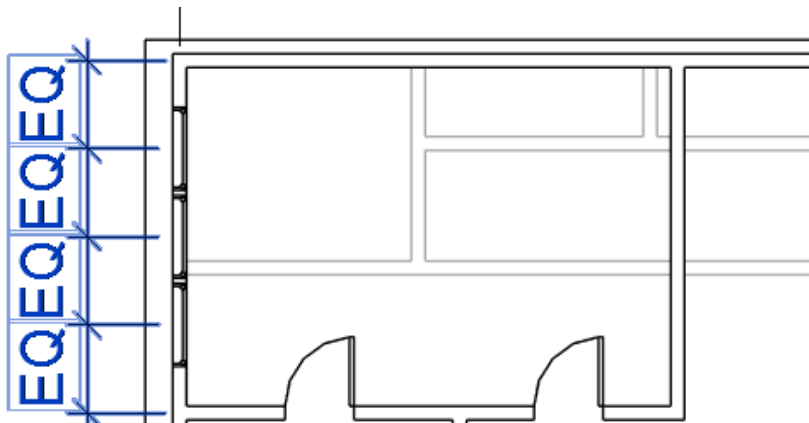


Figure 50: Final Upper Window Arrangements

Your windows should look similar to this

Chapter 7 - Creating a Curtain Wall, Connected Walls, and Entry Deck

In this section of the guide, you will be learning how to create new wall types, connecting walls to the roof, and creating an entry level deck.

Creating a Curtain Wall

- 1. Open up to view: Side Bar Project Browser Floor Plans 01 Lower Level
- 2. Using the Modify Modify Split Element tool from when creating a hallway, split a point above the 01 Lower Level Exterior Door.
- 3. Using the Ctrl + Click combination your learned earlier, select the segment that you seperated from the wall, and the topmost Generic 6" wall segment.
- 4. With the segments selected, go into properties and give it the following:

Settings	Curtain Wall Storefront
Location Line	Wall Centerline
Base Constraint	01 Lower Level
Base Offset	0'0"
Top Constraint	Up to 03 Roof Level
Top Offset	0'0"

- 5. Refer to [Figure 52](#)

Creating a Unique Curtain Wall Type

- 6. Below the sections which allows you to change object types is the Edit Type Button. If you click it, it gives you a more advanced version of the Object Options

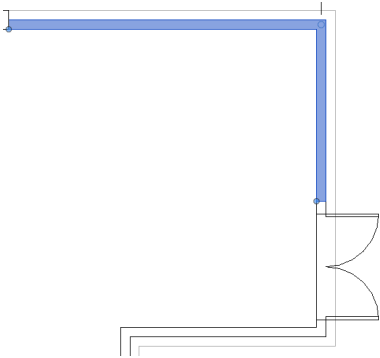


Figure 51: These are the segments you should have split, and selected for the creation of the curtain walls.

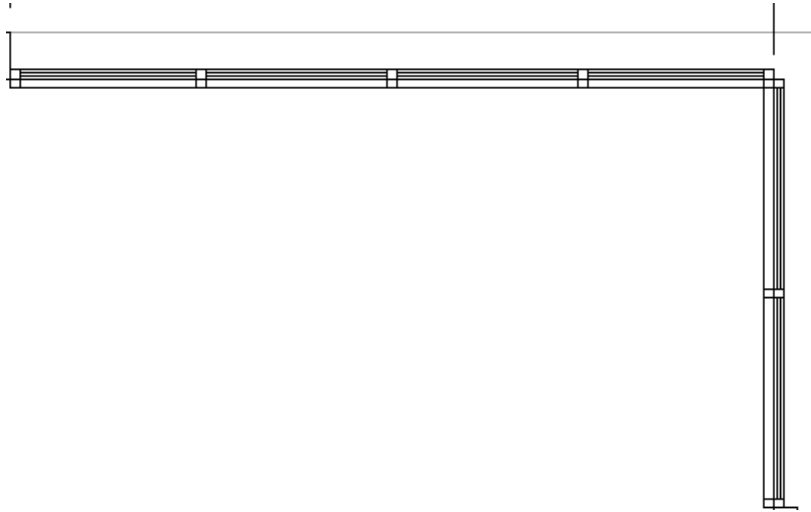


Figure 52: The Final Curtain Wall Arrangement

7. Click **Side Bar** > **Properties** > **Edit Type**
8. Inside, click the **Duplicate...** Button. The name should be this:
House 4x4
9. Change the following options to this:

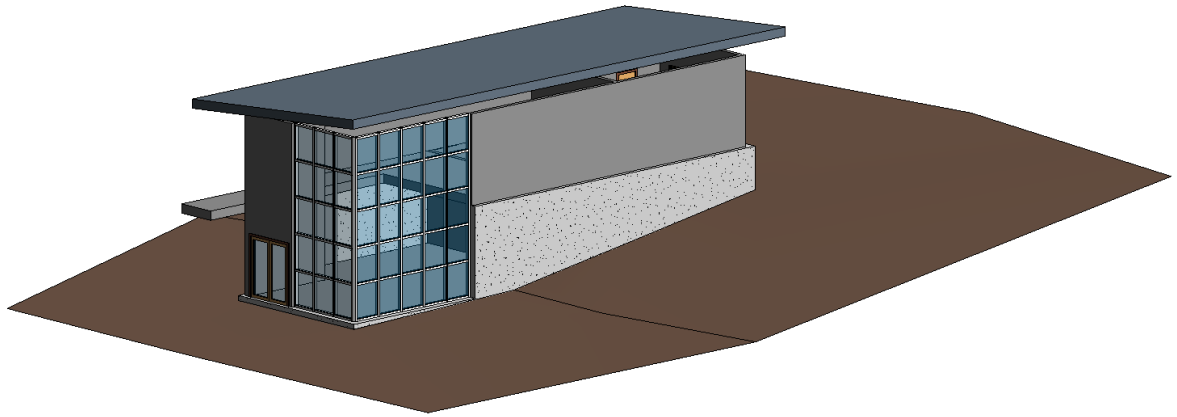
<i>Vertical Grid</i>	
Spacing	4'0"
<i>Horizontal Grid</i>	
Spacing	4'0"

10. Click **OK**
11. Go into the 3D view and admire your work.

Attaching Walls to the Roof

12. If not given proper instruction, attaching walls to the roof may be challenging, but is actually one of the most simple exercises in Revit
13. while in 3D view, **Ctrl** + **Click** each exterior wall, excluding the Retaining walls.
14. Reference Figure ??
15. Then click on the tool: **Modify | Walls** > **Modify Wall** > **Attach Top/Base**, and with all the walls still selected, click on the roof.

If your walls are not visible in 3D view, click on the little Lightbulb at the bottom of the screen. Your screen should go purple and you will be able to see it. Right click the missing wall, and in the context menu, select **Unhide in View** > **Element** and click the Lightbulb again



Yours should look rather similar to this

Figure 53: The Finalized 3D Image of Curtain Walls

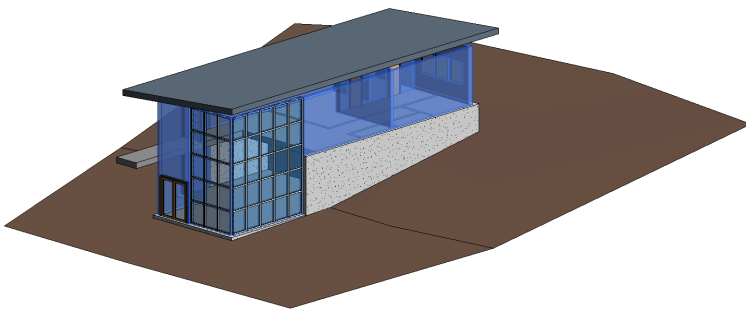
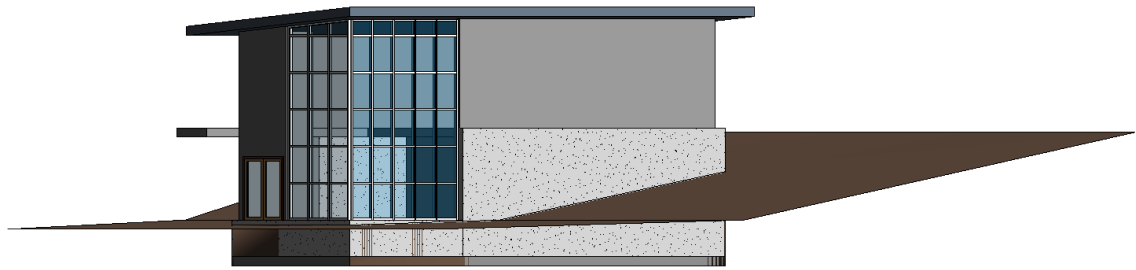


Figure 54: Here all the walls are selected through **Ctrl** + **Click**ing.

*Notice! Use the gap between the walls and the roof to select the interior walls as well. If you click elsewhere and your selection disappears, right click, and a context menu will appear, select: **Select Previous**. **Shift** + **Click**ing also will remove a wall from your selection*

16. Any alerts that show up, which may be on the bottom right of your screen, ignore, unless it says **Delete Elements** in regards to the Curtain Wall Mullions, then click that option, if you have any concerns, reference a Instructor or Friend
17. Now admire your attached walls and Curtain wall in the 3D view for a moment. Pat yourself on the back, you've made it further than most, but you're not done yet.



Note that the side door is missing in these past 3D visualizations, this is to keep the focus on the walls, and not the door.

Figure 55: The Recently Attached Walls

Creating the Entry Deck

Creating the Initial Deck

18. Open the view: **Side Bar** > **Project Browser** > **Floor Plans** > **02 Entry Level**
19. select the following tool: **Architecture** > **Build** > **Floor**
20. Create a new floor right outside the topmost wall. Pick a point close to where the top corner is of the current floor. When you choose that point, move up **11'0"**
21. Then, at the leftmost corner of the topmost wall, make a point and move up **3'6"**
22. Now connect the two points, reference figure 56
23. If satisfied, click done, say no to any popups after finishing.

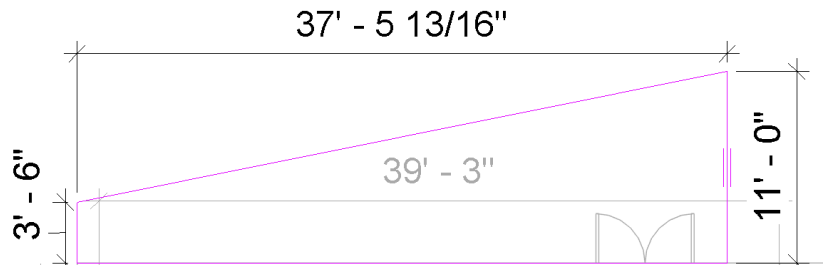


Figure 56: A Correct Side Entry Deck

Yours should look very close to this. If not, then correct, or reference Instructor or friend

Adding a Wall to the Entry Deck

24. In the same view, select a wall with these settings:

Settings	Basic Wall Retaining - 12" Concrete
Location Line	Core Face Interior
Base Constraint	00 Foundation
Base Offset	0'0"
Top Constraint	Up to 03 Roof Level
Top Offset	0'0"

25. Take the wall with those settings and drag a wall diagonal against the hypotenuse of the deck. Reference Figure 57

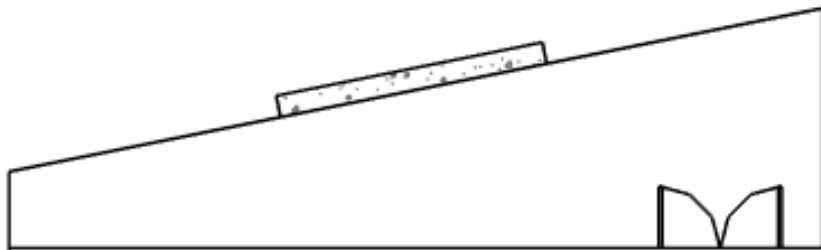


Figure 57: A wall Added to the Entry Deck

Make sure your wall looks like this

Shortening the Deck

26. Click on the deck and click **Modify | Floors >> Mode >> Edit Boundary**
27. Drag the leftmost line with your cursor until it is approximately $\frac{1}{3}$ past the leftmost edge of the wall
28. Finish, it goes without saying to say no to any popups

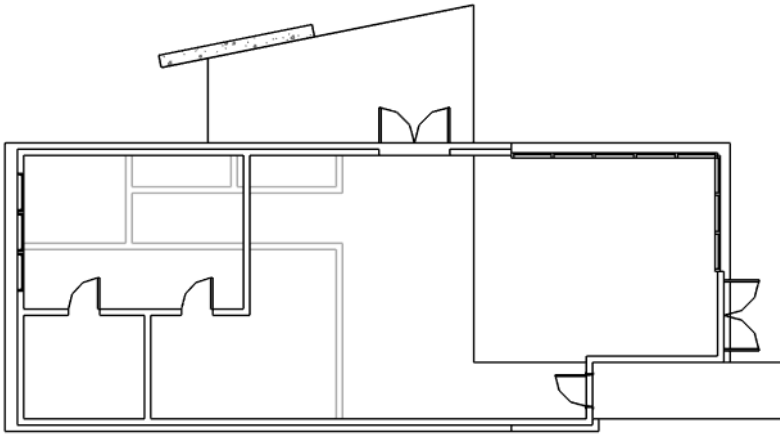


Figure 58: The Retracted Entry Deck

Make sure yours looks rather similar to this

Adding a Sloped Floor

29. select the **Architecture** > **Build** > **Floor Tool**
30. Create another, separate floor, where the retracted section once was.
31. While still in creation mode select the following tool:
Modify | Create Floor Boundary > **Draw** > **Slope Arrow**
32. Draw a **Slope Arrow** pointing to the right, completely perpendicular to the leftmost line
33. Click on the slope arrow and give it the following settings:

Specify	Height at Tail
Height Offset at Tail	-1'

34. Click finish and say no to any popups. Go into the view: **Side Bar** > **Project Browser** > **Elevations** > **North**

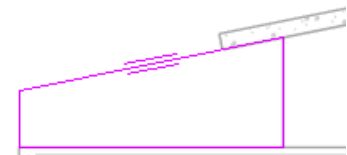


Figure 59: An example of the replaced retracted section

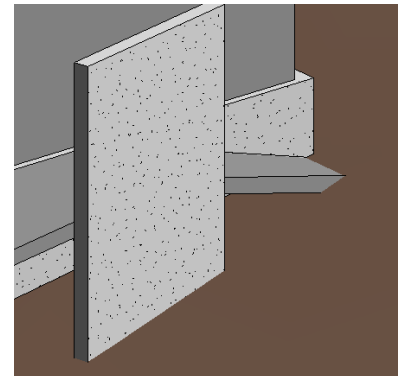


Figure 60: Go into a 3d view and edit the slope in the footprint until it reaches the ground. This picture is at **-5'** height offset

Chapter 8 - Creating Stairs and Railings

In this section of the guide you will complete the interior of the house. You will learn more about objects by placing Stairs and Railings

Creating Stairs

1. Enter the view: **Side Bar** > **Project Browser** > **Floor Plans** > **01 Lower Level**
2. Select the tool: **Architecture** > **Circulation** > **Stair**
3. Use the default stare options, use your current experience to determine whether this is sufficient for your use
4. Click and pull until you have created all 18 risers, with an arrow pointing towards the left
5. Click finish Sketch
6. Use your cursor to move the stairs into a position similar to Figure 61

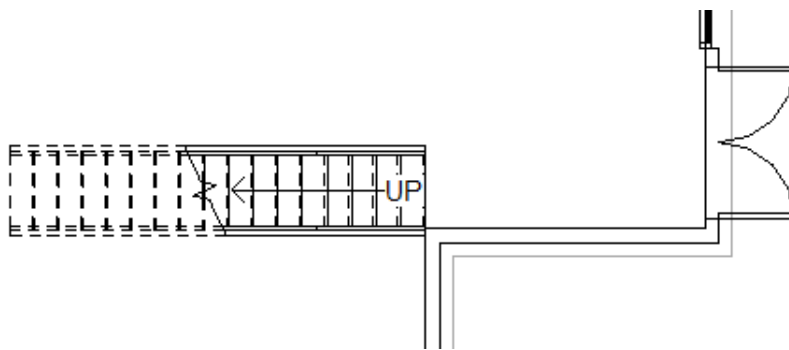


Figure 61: The placement of Stairs

7. Move to view: **Side Bar** > **Project Browser** > **Floor Plans** > **02 Entry Level**
8. editing the main floor's footprint, provide a space for the stairs to enter. Reference Figure 62

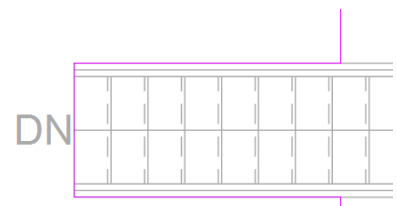


Figure 62: A Space in the Floor for Stair
It's okay if your floor is not as clean cut as this one, it is only your first time, but do you best.

9. Go into 3D mode once done, and select the railing like in figure 63

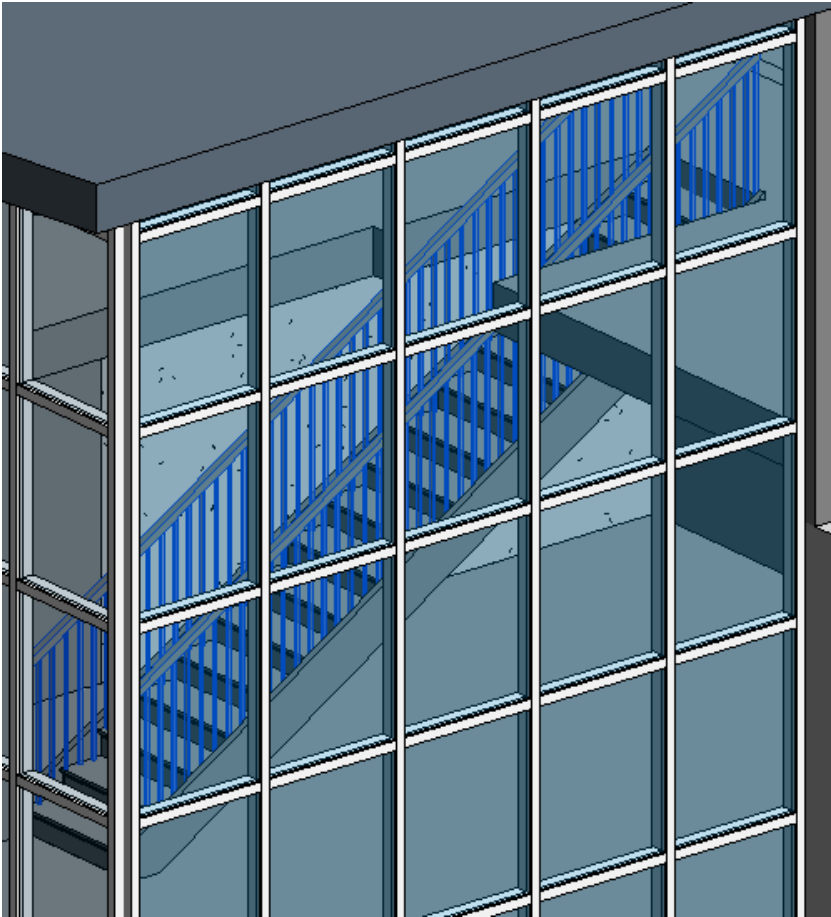


Figure 63: The railings of stairs selected

You can click through curtain walls to select objects.

10. Change the railing type to: Railing Guardrail - Pipe

Creating Railing

11. Go to the Side Bar Project Browser Floor Plans 02 Entry Level view
12. Select the tool: Architecture Circulation Railing
13. In your options, set: Options Bar Offset: to the setting 0'4"
14. Add railings to the Entry Deck. Reference Figure 64
15. Your Railing options should be:

Settings	Railing Handrail - Pipe
Base Level	02 Entry Level

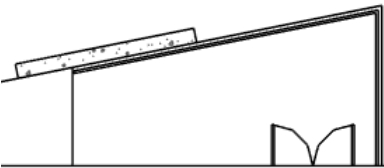


Figure 64: The Entry Level Railing
Your Railing should look like this. You can stop the railing when you reach the side wall, but i suggest that you keep the railing until you reach the endpoint of the first floor segment

16. Do the same, except with the Floor that borders between the Curtain Walls, and the Stairs. Along with the side of the stairs. Use your own judgment, but also Reference the figure ?? *Because of the location of railing, I suggest negating to Offset: to -0'4"*
17. Do the same, except for the Balcony. Make sure not to go through any walls

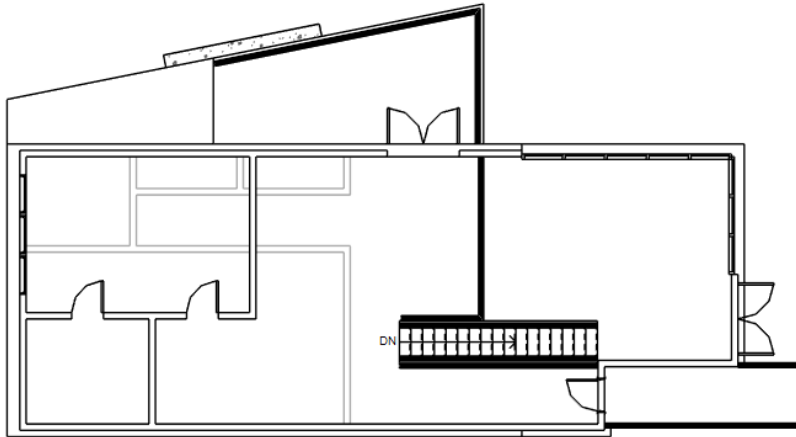


Figure 65: Your final Railings should look like this. Look for the solid Black Lines.

Creating The Roof Eave

18. Go to the view: Side Bar Project Browser Floor Plans 03 Roof Level
19. Using what you have learned. Edit the footprint of the roof.
20. using the Split tool, extend the roof like in the Figure 66

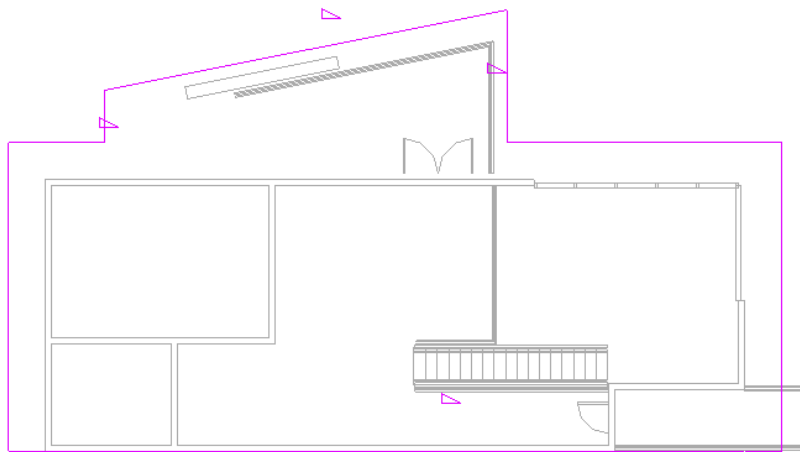


Figure 66: Your Final Roof Footprint

Chapter 9 - Creating the Project Documentation

Bibliography

Autodesk. *Getting Started with Autodesk Revit Building*. Autodesk, 2006.

Autodesk. Revit. <http://www.autodesk.com/products/revit-family/overview>, 2016. Computer Software.