# REVIT TUTORIAL

FOR BEGINNERS

presented by

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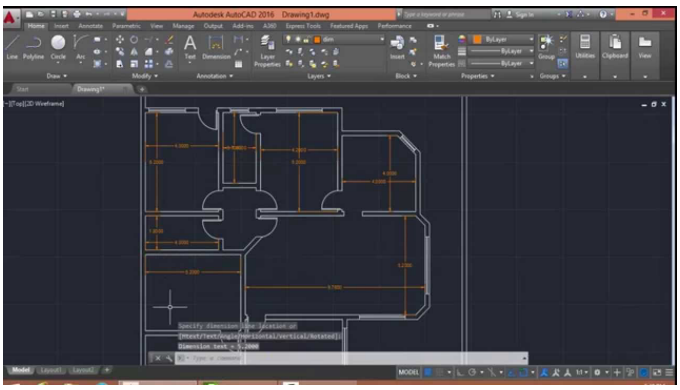
of

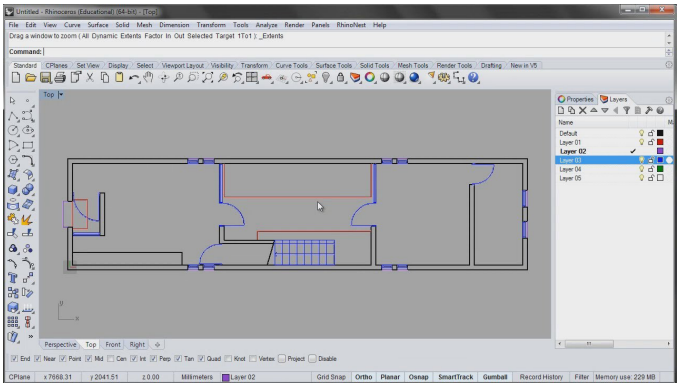
# Intro

Revit is a totally different software compared to the normal 3D softwares that you're used to seeing. It's a Building Information Model (BIM) software. This just means that unlike drawing lines or surfaces like you would in AutoCAD or Rhino, you are drawing/ creating actual material objects like walls, doors, or windows. I like to think of it as like playing Sims where your tools are actual components rather than just drawing tools. So if you played Sims before, you already know the logic of how Revit works. See images below...

AutoCAD



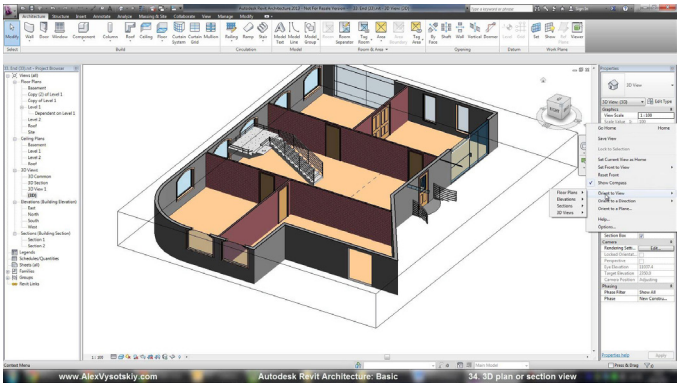
Rhino



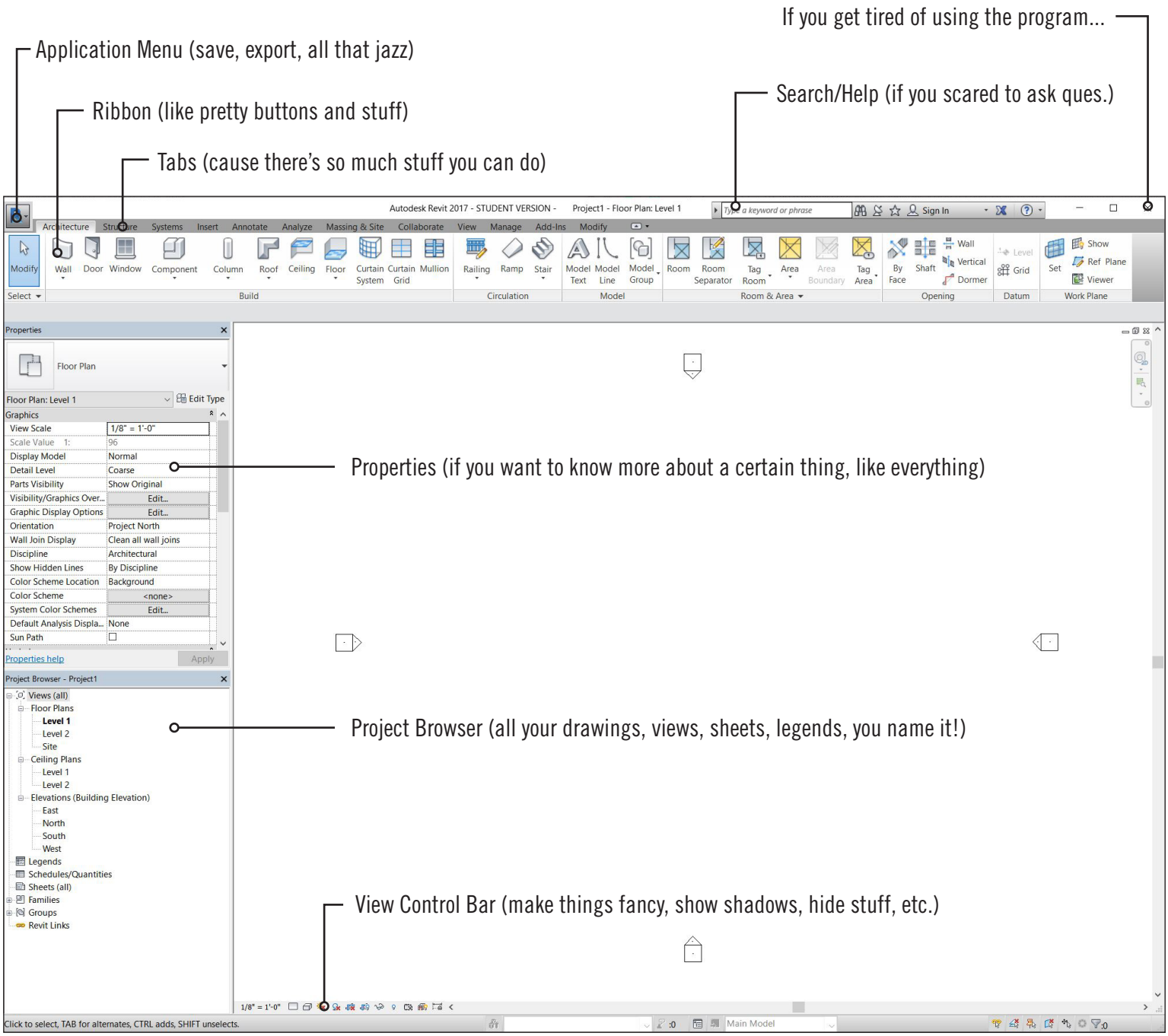
So cooool!

Sims Game

Revit



# User Interface



# Keyboard Shortcuts

Just some useful information that I learned along the way as I learn more about the program. This is a short list of the commands/tools I find useful to remember and has helped me learn the program a lot quicker.

**Annotate**

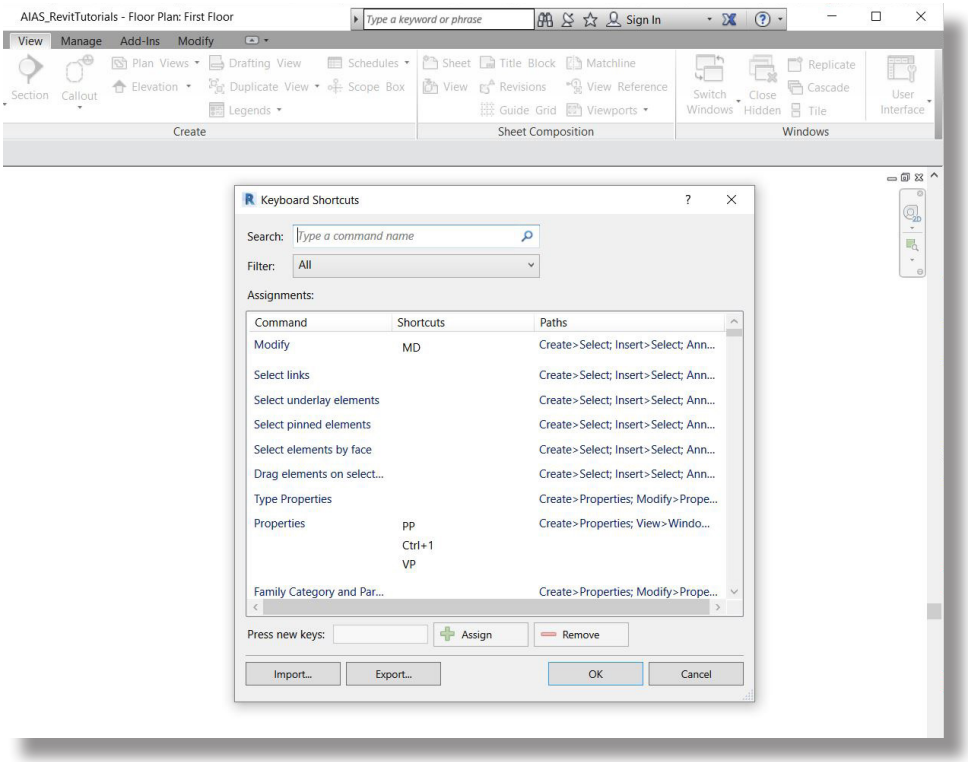
| | |
|---|---|
| DI | Aligned Dimension |
| DL | Detail Line |
| TX | Text |

**Architecture**

| | |
|---|---|
| DR | Door |
| RP | Reference Plane |
| WA | Wall |
| WN | Window |

**Modify**

| | |
|---|---|
| AL | Align |
| CO | Copy |
| CS | Create Similar |
| DM | Draw Mirror |
| MA | Match Properties |
| MM | Mirror (pick axis) |
| MV | Move |
| RE | Scale (resize) |
| RO | Rotate |
| SL | Split Line |
| TR | Trim/ Extend |
| TL | Thin Line |



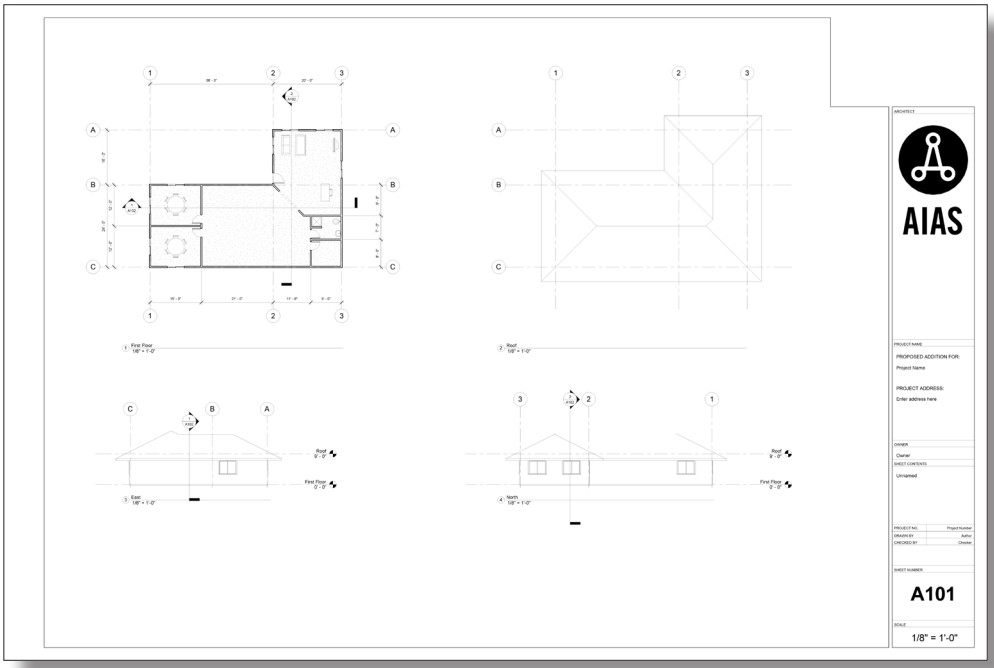

Of course there are a lot more. You can find a list of preset keyboard shortcuts on the **View** tab, on the **Windows** section, click on the **User Interface** button, then from the drop down list, click **Keyboard Shortcuts.** You can also create your own personal shortcuts!

*"If in doubt, right-click."*

# Agenda

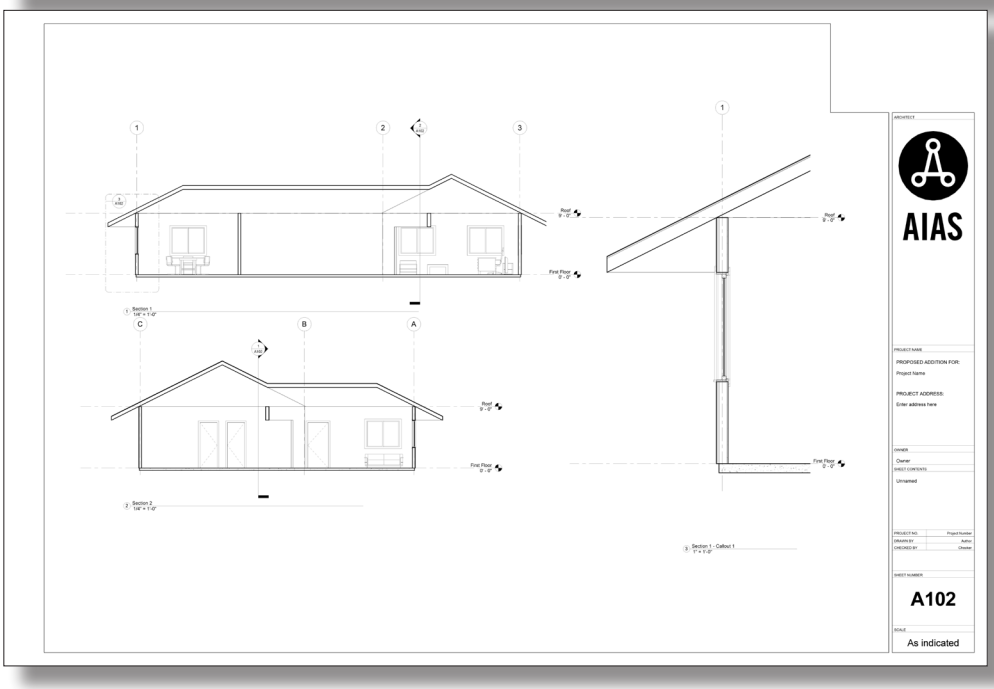
**Setting up the Drawing**
- Levels
- Sheets

**Basic Modeling**
- Setting up a grid
- Dimensioning
- Walls
  - Wall Assembly
    - Exterior
    - Interior
- Doors
  - Loading new doors
  - Customizing Size
- Windows
  - Loading new windows
  - Customizing Size
- Components
  - Loading new components
  - Hosts
- Floor
- Roof




**Annotation**
- Creating Sections
- Creating Details/ Callouts
- Creating Sheet Sets
- Organize drawings on a sheet

  etc.

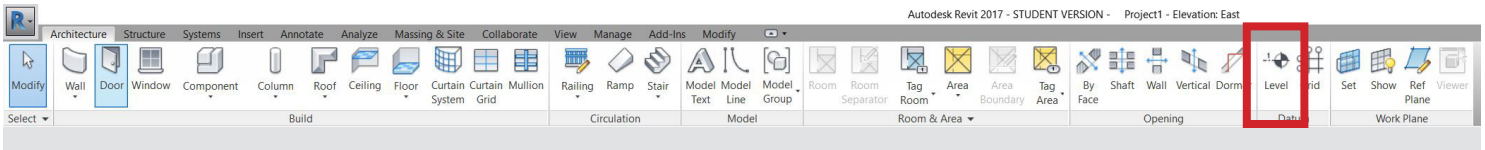



**Extras** (if get time)
- 3D Isometric View
  - Section Box
  - Visibility Options
- 3d Perspective
  - Shadows
  - Color
  - Rendering
- Exporting to Rhino
- Importing from Rhino
- Line work Graphics
- 3d Axon

# Levels

Let's start by setting up our Levels. Levels are a very important part in understanding Revit. They determine which objects are constrained to and helps organize objects in a 3D environment. Think of it as a working plane where you can assign objects to and use that level as it's base origin. For example, when you place a component like a chair or table, you can assign it to a level so you know how high it is in 3-dimensional space based on the level's height.

To create a level, you can go to your **Architecture** tab, under **datum**, and select **Levels**. Click from left to right and place it wherever. You can fine tune and adjust the placement after.

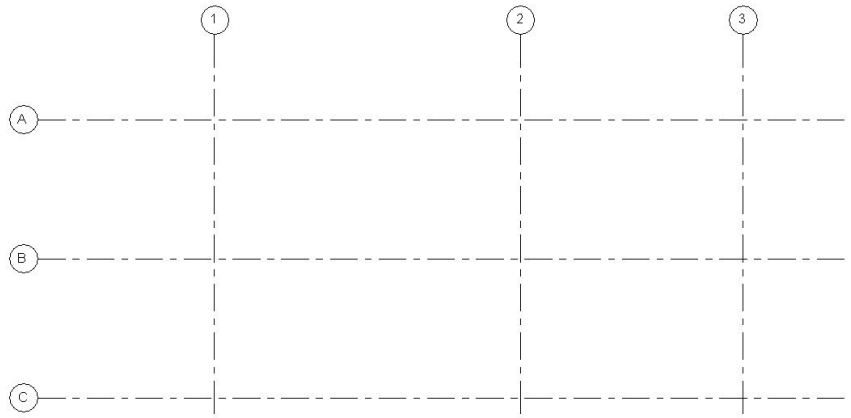



You can adjust the height of the level by click+hold and dragging it, using the move (MV) command, or by clicking slow double-clicking the height (This is not a sudden, traditional double-click. More like a click, pause, click again)

Change the level height to 9'-0".

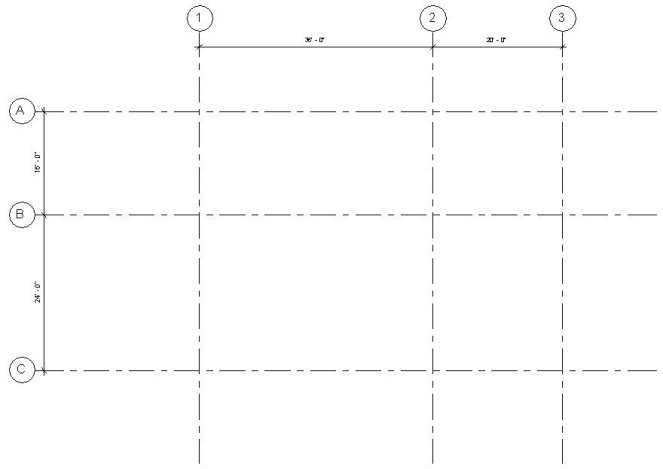
# Grids

Go to your floor plan view. We will now create a grid. To create a grid, you can go to your **Architecture** tab, under **datum**, and select **Grid**. Click a start and end point and place it wherever. Same principle as Levels, you can fine tune and adjust the placement after. Don't worry about accuracy. We can easily adjust that in our next step.




To create an accurate spacing between the grids, we can string dimension lines and adjust. Most of the time in Revit, you will be placing objects and components in random places then adjusting it after. Unlike the style in Rhino and Autocad, you pretty much have to be accurate when drawing line after line. In this case, we can "eyeball" placements and fine tune with accuracy using dimensions.

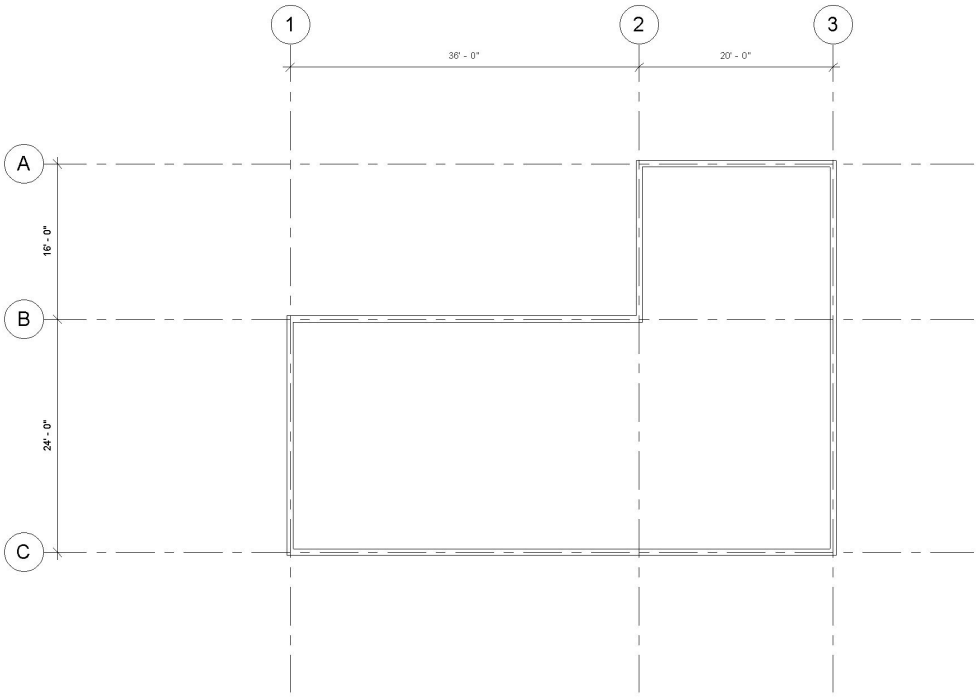
To activate the dimension string, type **DI.** String grids 1, 2 and 3 together & A, B and C together. Use the dimensions below.

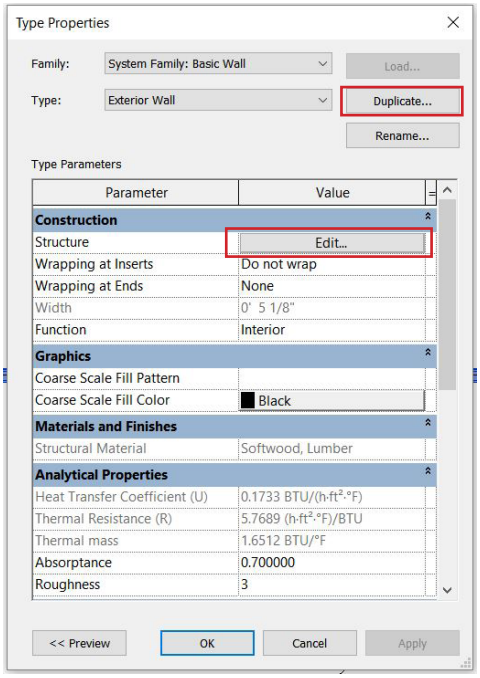



When fine tuning distances, click on the object you want to move (ex. grid line), then when you see the dimension turn blue, click on the dimension and input the desired distance you would want.

# Walls

You can create a wall by clicking on the Wall button on the ribbon or using the keyboard shortcut **WA.** Notice on the left, the properties box changes. This is the type of wall you are creating. Using the grid, create the exterior walls shown below.

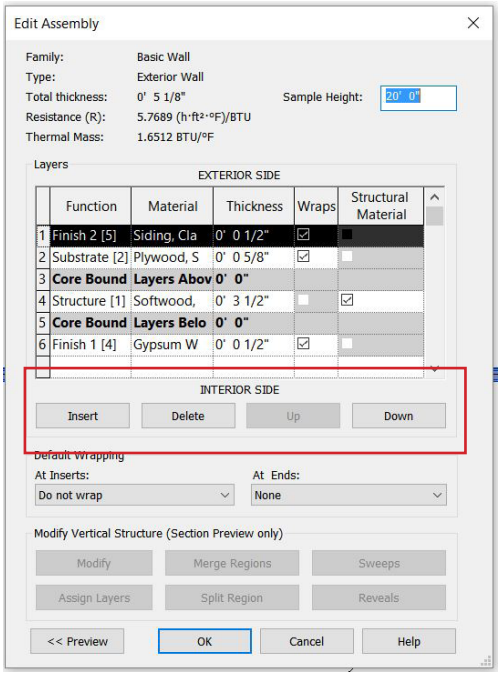


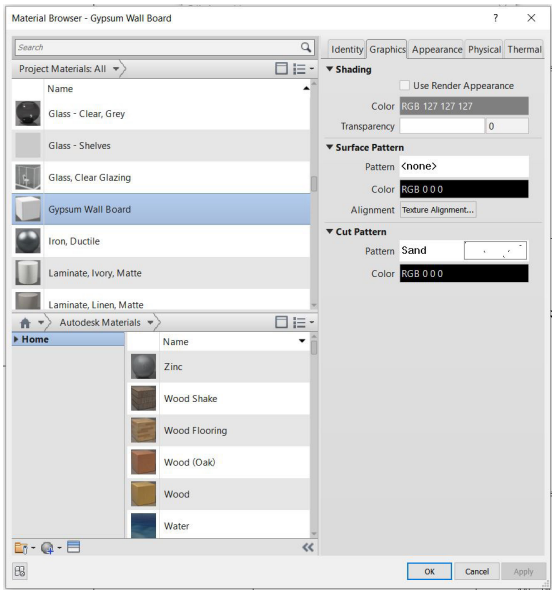




Notice on the left that the wall type is "Generic - 8". We can customize that and create our own wall assembly. To do this, click on a wall, any wall, and click **Edit Type** on the left in the **Properties** box.

Click on **Duplicate** and name your wall "**Exterior Wall**". Then, next to structure, click **Edit**.

A typical wall assembly is composed of different layers. This involves structure, substrate, finish, etc. **Insert** Layers and modify the elements to create a wall assembly similar to the right. You can highlight objects and move them **up** or **down** depending on the material.

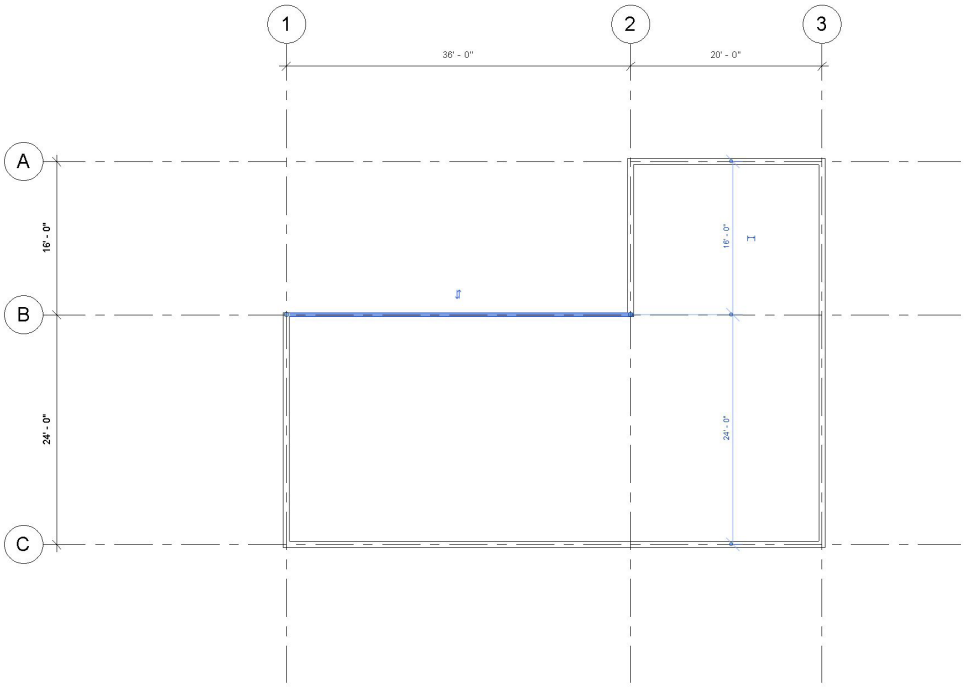




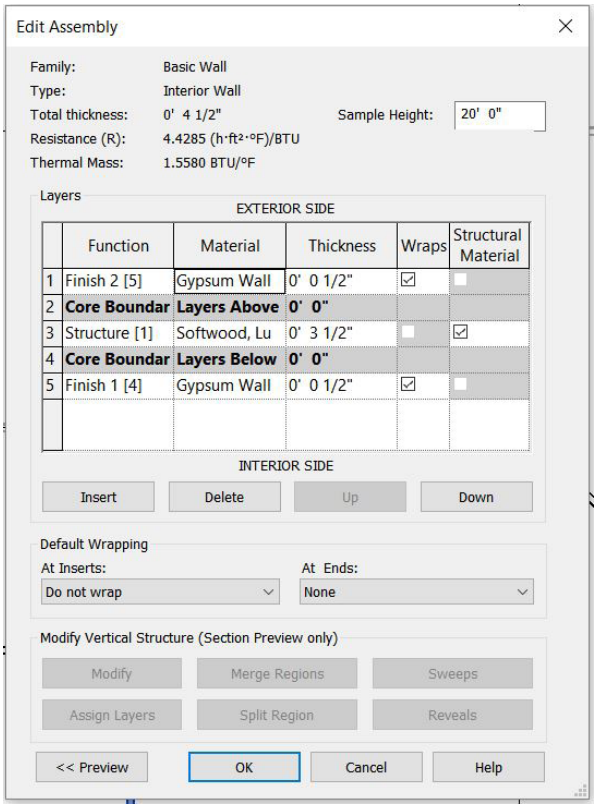

You can change the material of the layers by clicking on the name under the material column. As the **Material Browser** dialogue (left) window pops up, you can cycle through or search the materials list to assign it to your wall.

Note:
Materials are editable. You can play around with the colors and other settings, but before doing that, make sure you duplicate the material first so you don't override the settings or properties of that material.

Now that you changed the properties of one wall, select the other walls and switch them to **Exterior Wall**.
Tip: You can cycle through selections by pressing the **Tab** key on your keyboard.

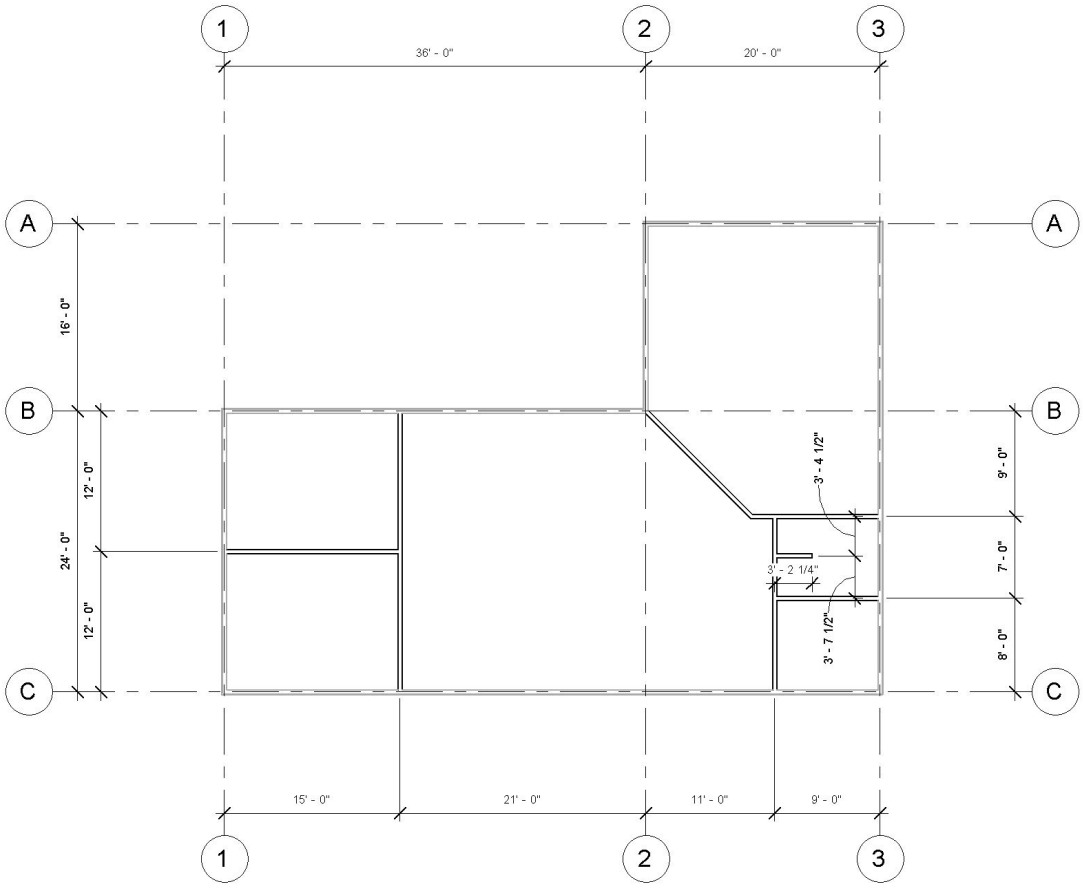


# Walls

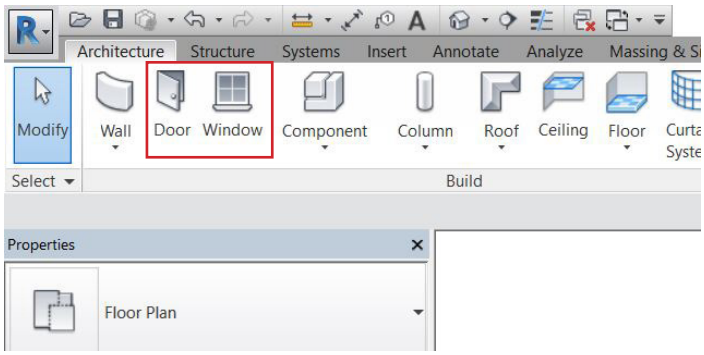



Using what you learned, create another wall assembly, name it "**Interior Walls**" and input the layers shown on the left.

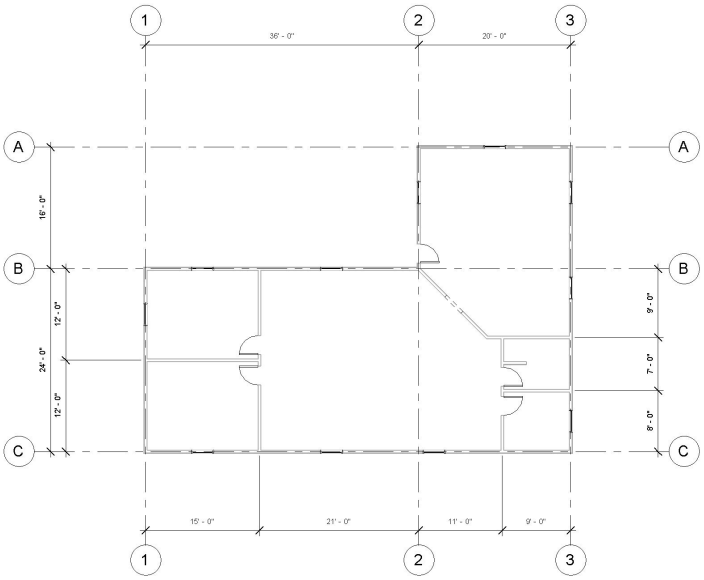
Now create the interior walls as shown below. Use the dimensions as references.

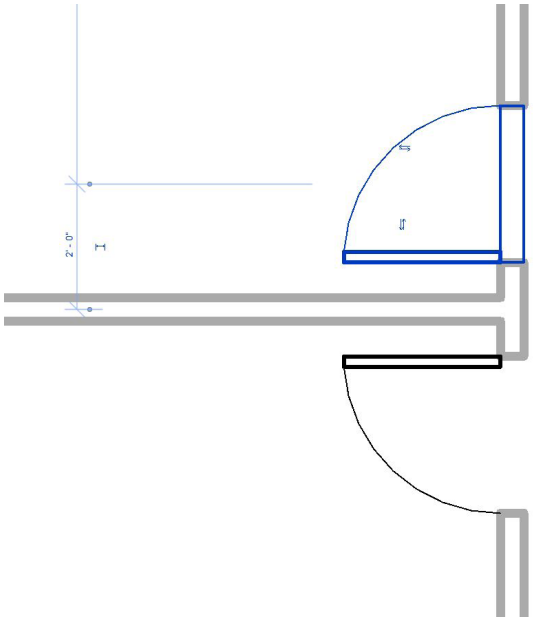


# Doors & Windows



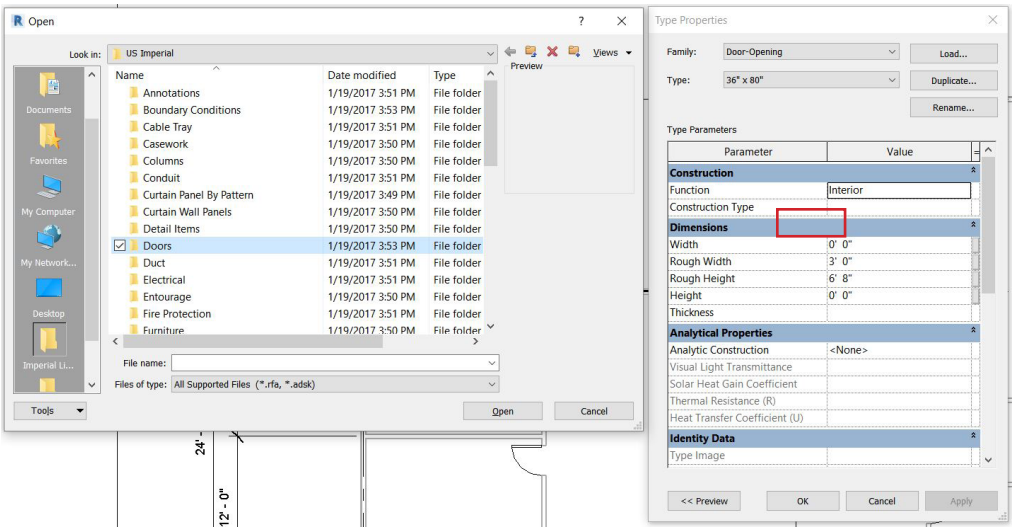

To create a door or window, you can find the **tool** button under the **Architecture Tab**. Or using keyboard shortcuts, **DR** for Door & **WN** for Window. Place doors and windows around your floor plan similar to the image below. You don't have to be accurate, just eyeball it for now.



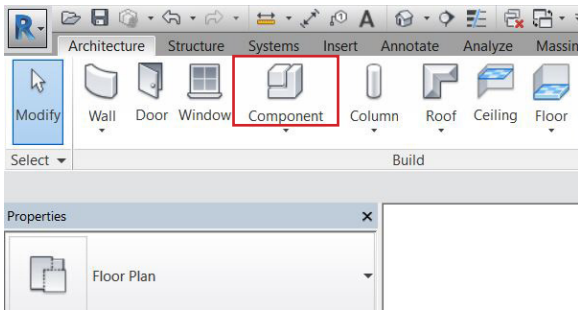




Doors and Windows can easily be adjusted differently. When clicking on it, the element will highlight blue, and a number of different options will pop up in a blue color. This means the object has been selected and can be edited. The image on the left shows that you can 'flip' the door vertically or horizontally by clicking the arrows, or by repositioning the placement by clicking the dimension. Really flexible.

Notice that the door opening on the diagonal wall is not an option when placing doors. That's because you have to load it from your library. To load from your library, activate the door tool and click **Edit Type.** In the dialogue box, click **Load** & open the **Doors** folder. Here, you can select which doors you would want to load onto your project. Remember, the more you choose, the bigger the file size, so choose wisely. In this case, load the **Door Opening** folder and load a door. Same goes for window, but load slider with trim.

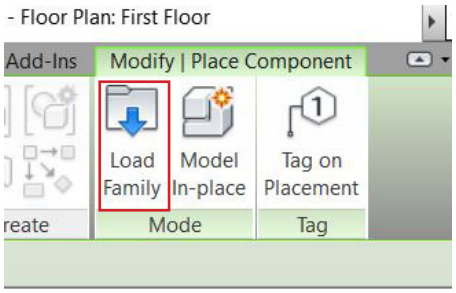


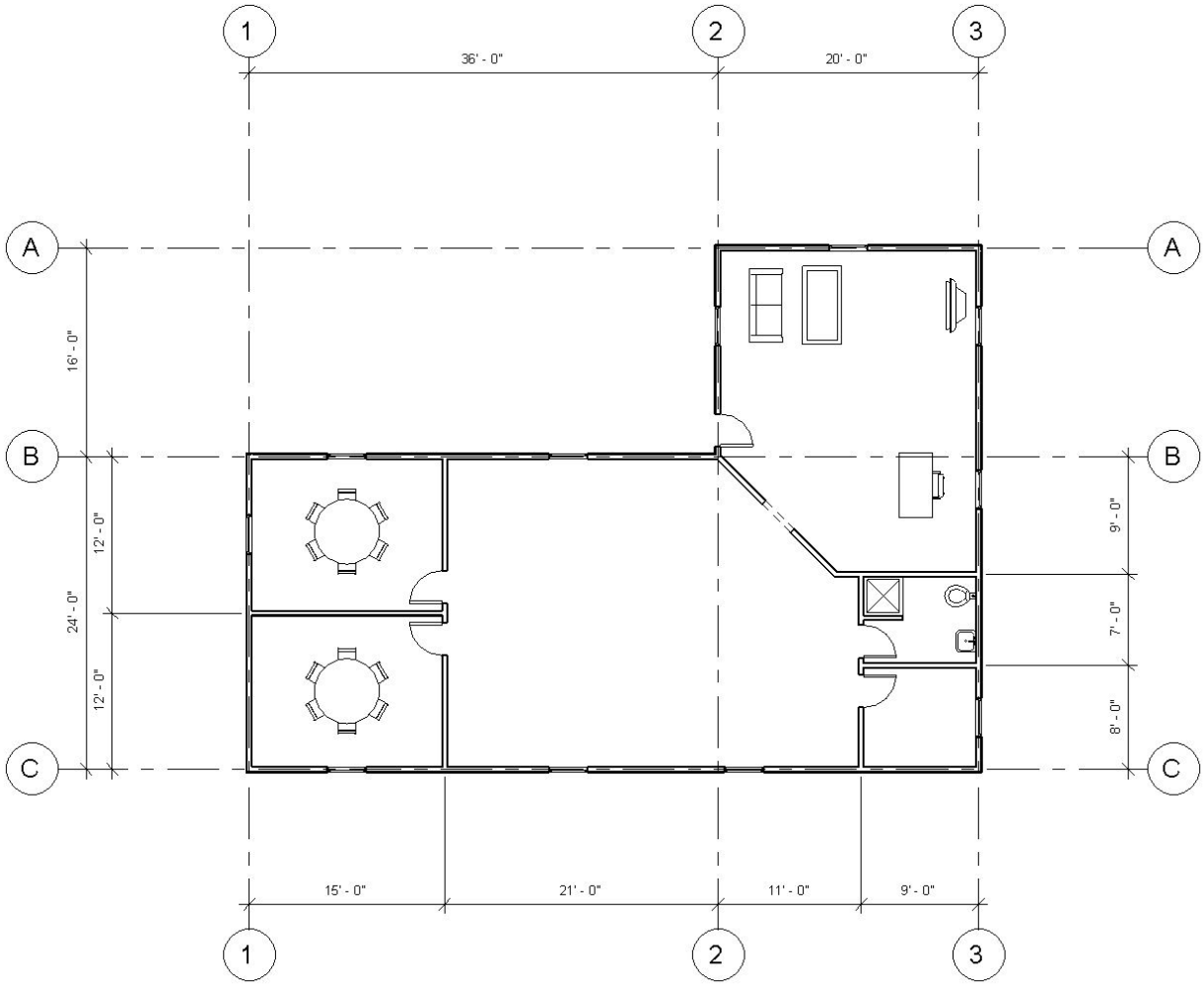
# Components



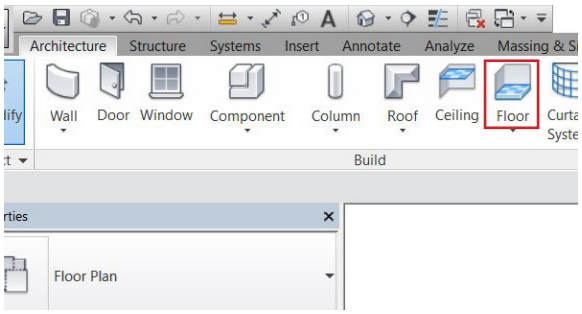

A component in Revit terms is a single entity "block" that was created on another file. In Revit, it's called a **family.** Creating families is another complex topic, so we will just use preset ones that came with your Revit Library. These elements have to be loaded into your Revit file, just like how doors and windows are. If you can't find specific components in the Revit library, you can always Google search free ones online and download them.

Click the **Component** button on the Ribbon under the **Architecture** tab. Once you click it, new buttons will appear on the left of the Ribbon under "**Modify | Place Component**". Click on **Load Family**, which will pop-up a new dialogue window. From your Revit Library folders, browse through the different folders and pick certain components you would like to load on to your Revit file. In this case, I picked families from the **Furniture** folder under the **Tables, Chairs, & Plumbing** sub-folders. Play around with it and furnish your floor plan! **Have fun**!



# Floor

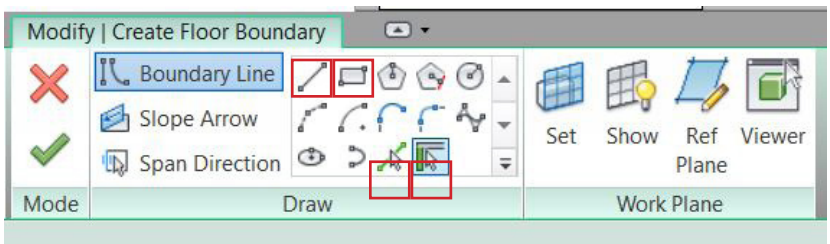


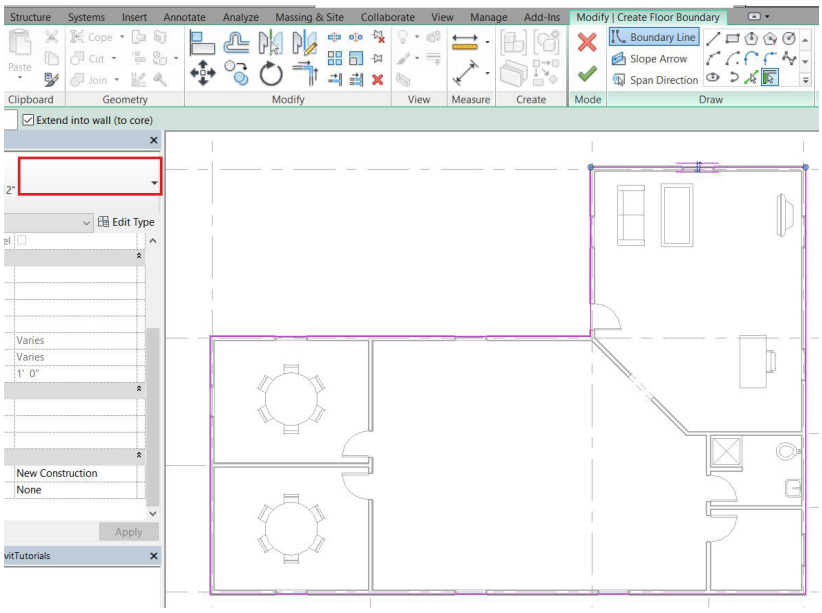

So you have your walls, doors, windows, and furniture, we now have to enclose your building with a floor and roof.

To create a floor, click on the Floor button on the Ribbon.

There are many ways to create a floor. You can either sketch your own boundary, pick lines to reference off of to build your boundary, or pick walls.

When creating a floor boundary, you have different options in creating your floor. I find myself using the **line, rectangle, pick line**, and **pick wall** tool most of the time. For this exercise, we will be using the pick wall tool to draw our boundary.

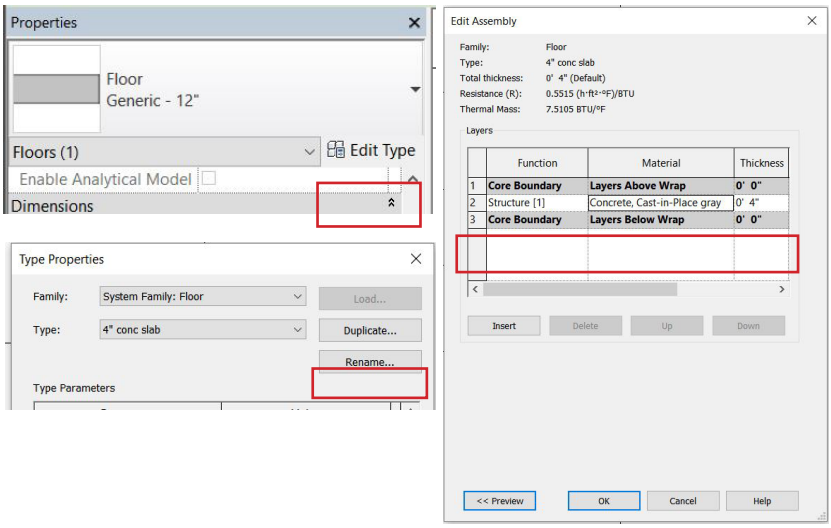



Before picking your lines, make sure **Extend into wall (to core)** is checked. This will create a boundary under the wall structure and flushed to the outer part of the light frame system. (the 3-1/2" thick layer). You will understand this more when creating your wall section detail.

Tip: Hover over a wall, use your **Tab** key to cycle through your selection and wait till all walls are highlighted. Once they're all highlighted, click and a magenta boundary will be created based on the walls that were picked.

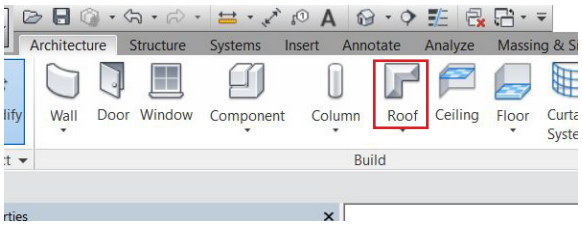
When done, click on the green check mark.




Let's modify the floor so it's a concrete slab. Using what you already know, click on **Edit Type**, **Duplicate**, and change the material and thickness to match the image on the left.

Your building is now sitting on a 4" concrete cast-in-place slab. #thumbsup

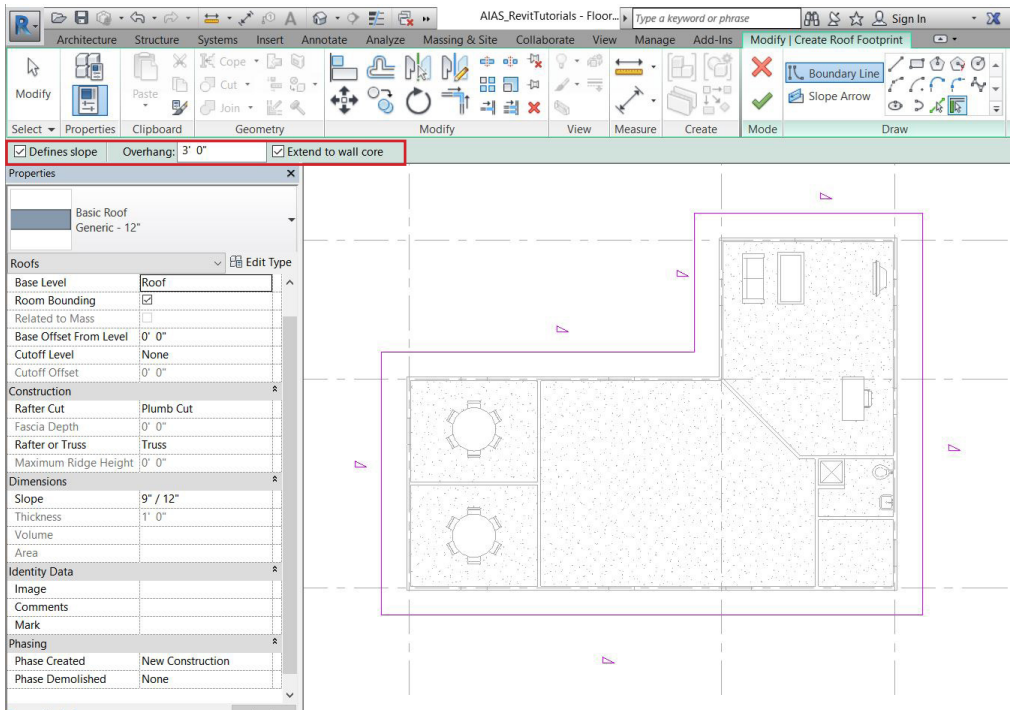
# Roof

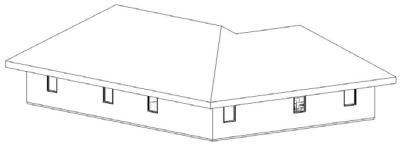


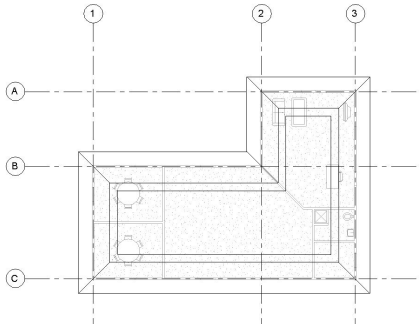

Creating a roof is very similar to creating a floor. The only difference is having the option to create an overhang and any roof slope. Other than that, the process of creating a boundary is the same. For this building, let's create a gable pitched roof.

On the project browser, go to your roof view.

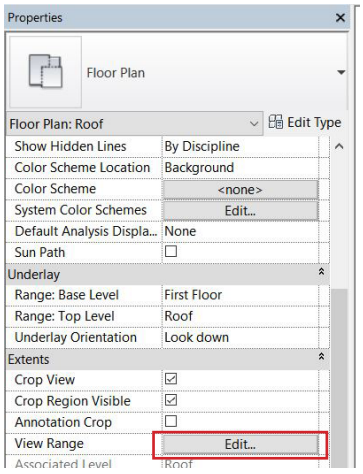
Using the pick wall tool with an overhang of 3'-0", Revit automatically generates the footprint of the roof. You will notice that there are triangles that are next to each line. This represents that there is a slope from that edge. This happened because we have Defines Slope checked on the upper left corner. Click the green arrow and let's see that Revit will give us with these options.

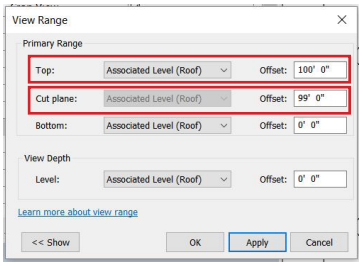




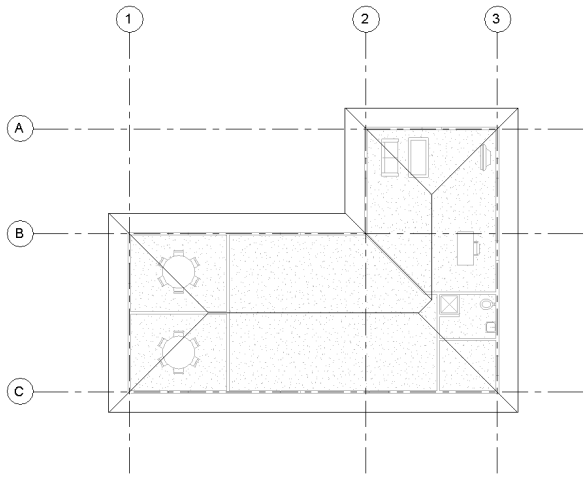

In the roof plan, you will see that the roof came out weird. It looks like the top half got cut off, but in the 3D view, your roof is actually okay. This is because Revit defaults to a cut plane of 4'-0". Remember when I told you levels were important? This is why. From the roof level, 4'-0" above that, the roof plan will only show whatever is below that 4'-0" cut plane. We can change this by adjusting our view range. In the **project browser**, click "**View Range**".




The concept of view range is the like setting a height limit of what you would like to see in your floor plan. In the view range options, we will adjust what the highest height we would like to see from the roof level. Since it's a roof plan, let's be dramatic and set our offset to 100'. Then set our cut plane at 99'. This is saying that from the roof level, we would like to see everything from 100' above and whatever is at 99', cut through. Of course nothing will show that it's being cut through, so this is a correct way of setting the view range. Click apply and see the changes.

# Roof

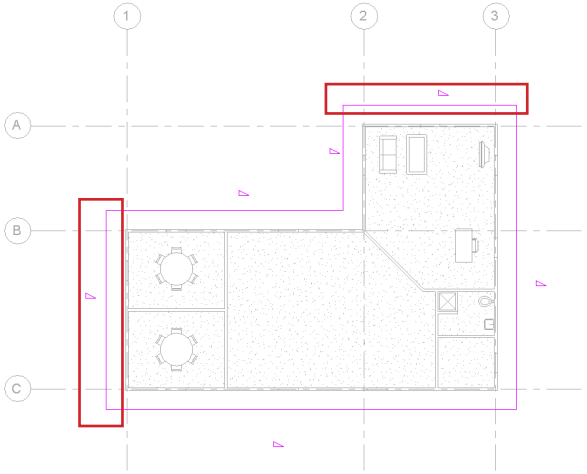



Yay! Now our roof looks like an actual roof! You will see that Revit automatically generates where the ridge lines are based on the boundaries you created. Cool yeah?

We're not done yet. We still have to create a gable pitched roof, not a hipped roof, which is what is showing on the left.

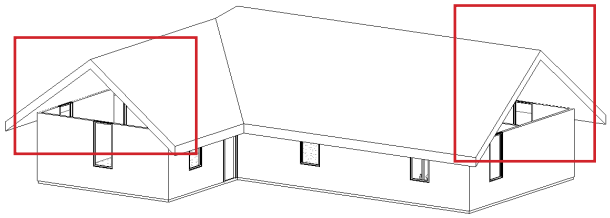
We can work with what we have now and edit it.

Click on the roof and click **Edit Footprint** at the top. This will bring you back to the roof editing mode.

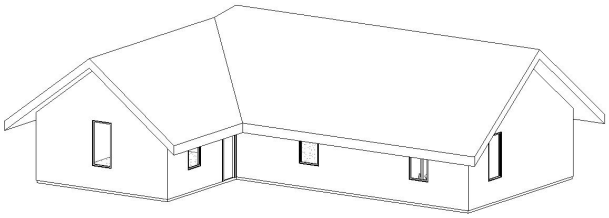



Click the two roof lines on the left & uncheck the Defines slop box. The triangles will disappear, which will eliminate the slop of that roof line.

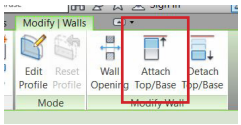
Click the green check mark on the top and see your results.



You got your roof, but look at that huge opening above your wall. No good...



Click those two walls, then above on the Ribbon bar, click **Attach Top/Base**.

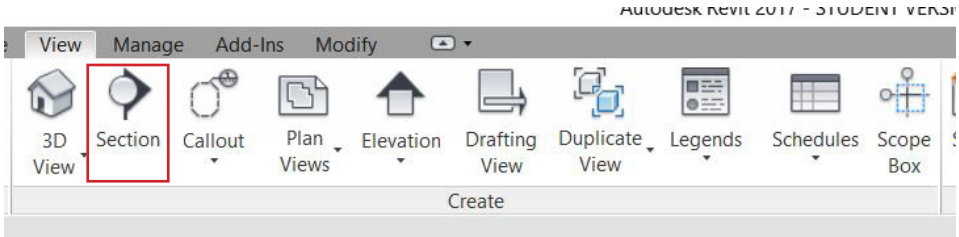


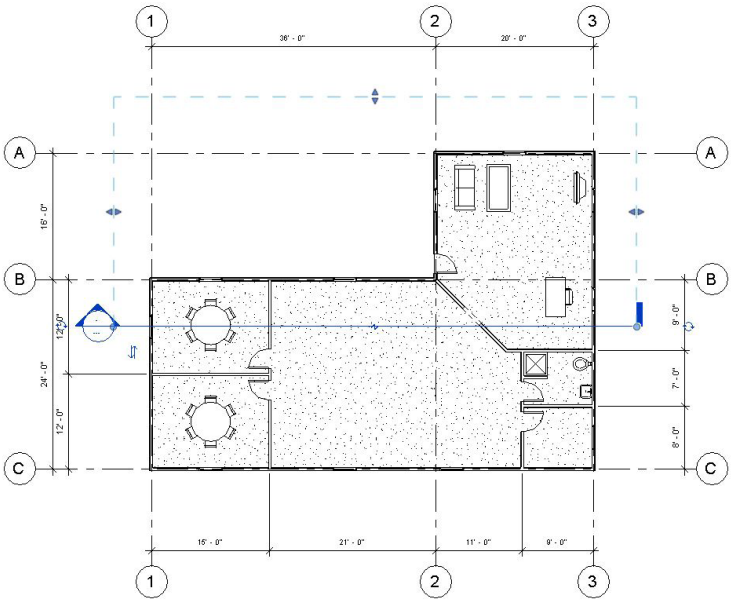

Tadao! You just modeled your (maybe) first ever Revit building. #thumbsup

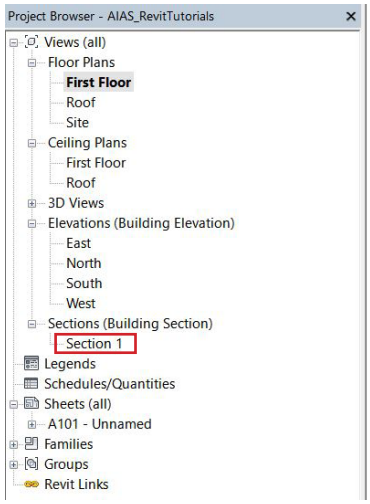
# Creating Sections

Now that you've got your building modeled, we can generate some detail views like sections.

Go back to your floor plan and under the View tab, click on Sections.



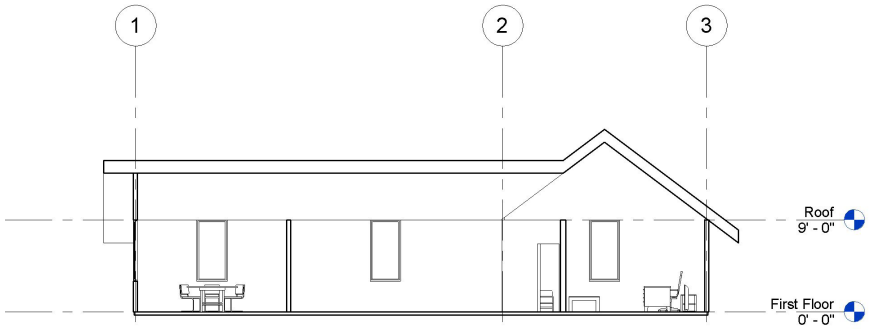



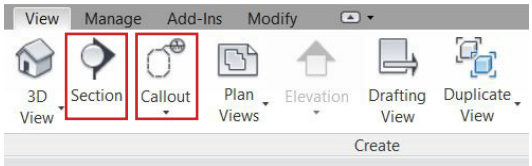



Pick a point anywhere from the left exterior of the building, click, then click anywhere on the right exterior of the building. This is telling revit what want to see in the Section view you're generating.

Once that's done, you will see a new view pop up in the project browser on the left side named Section 1. Double-click the view and see the results.

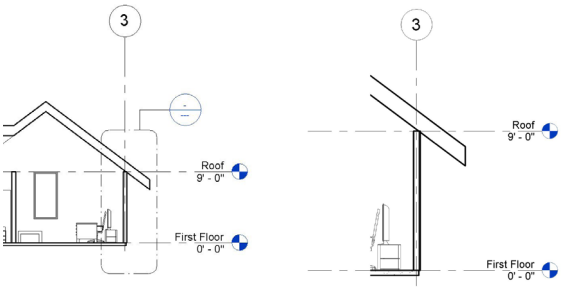
You can see that Revit automatically generated a Section view for you with correct line weights, heights, and levels.




From here, you can create call out views to generate wall section details. You can do that by clicking Callouts at the top and creating a boundary of what part you want to create a wall section from.

In the project browser, double-click on the newly generated callout view.

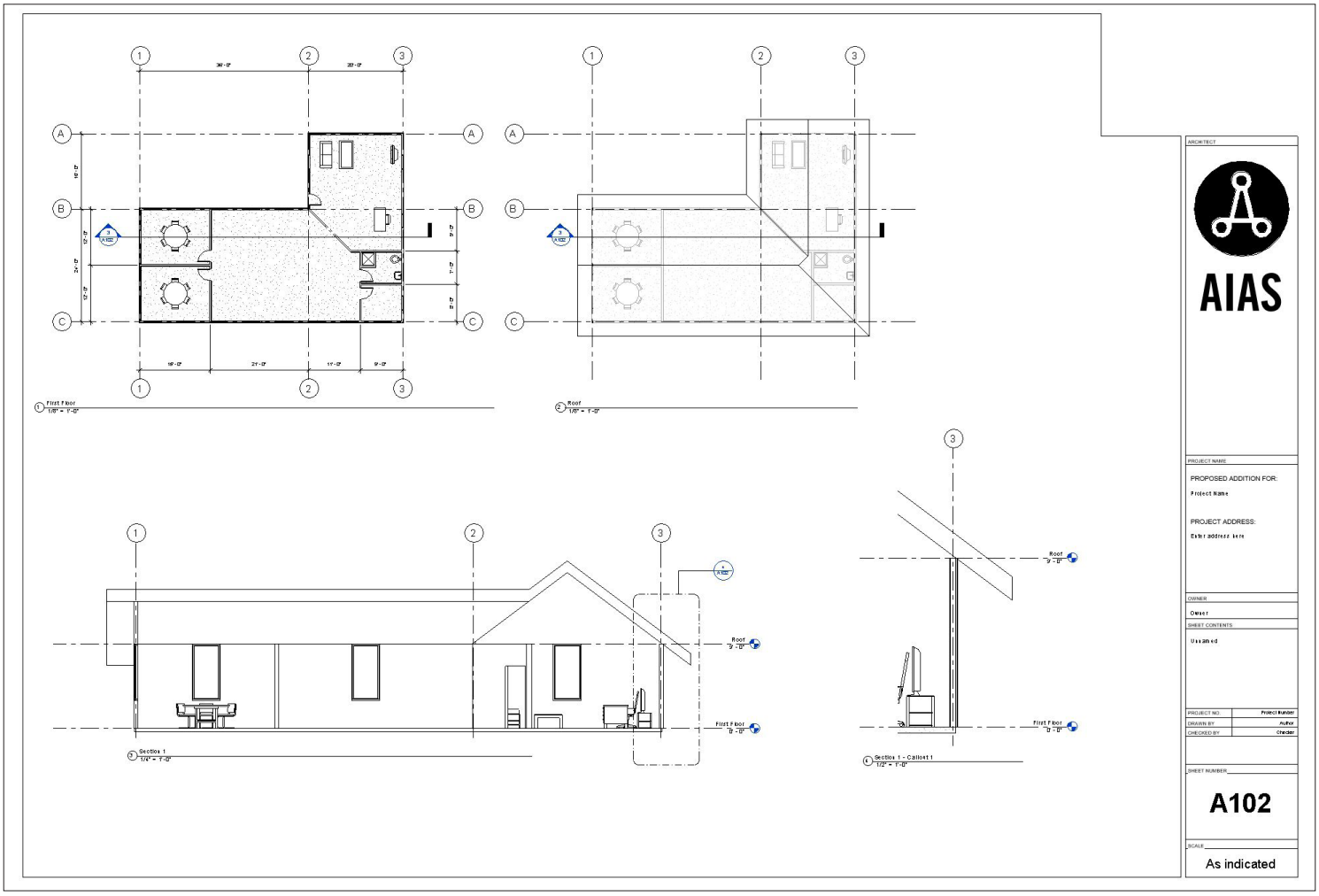


# Creating Sheets

Now that you created a good amount of drawings, let's create a sheet to organize our drawings.

In the project browser, right-click on **Sheets**, and click **New Sheets**. Next, click **Load...** and look for the titleblock in the tutorials package titled **aias titleblock 36x24.** When you are done, click okay. A new title block should appear on your screen.

To insert drawings, drag and drop the views from the Project browser and place them within the sheet. And there you have it, the basics of Revit!




If you have any questions or need help in the future, I'm always here to help. Just shoot me an email! Thanks!

-Kris J
kjugueta@hawaii.edu