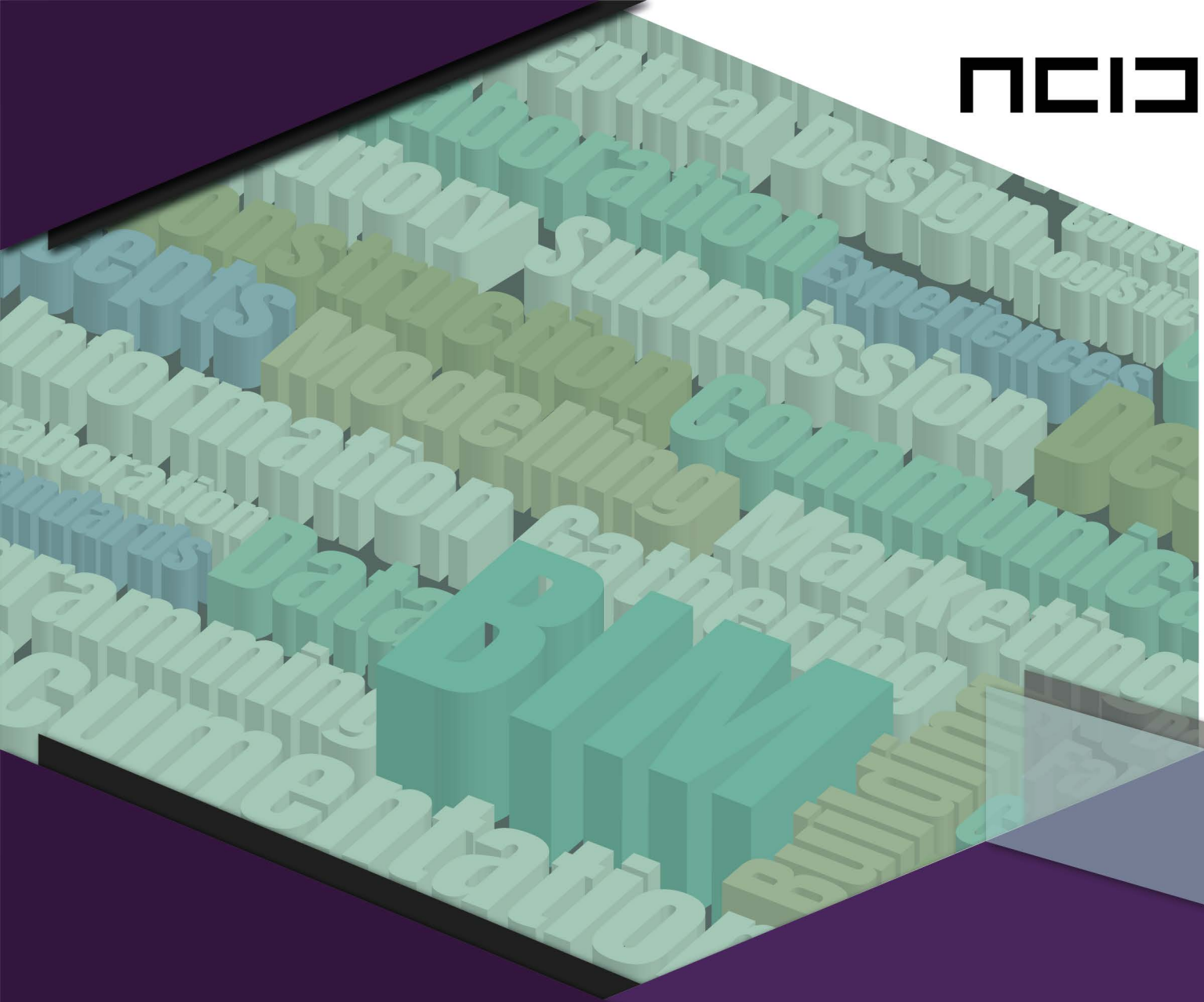


BUILDING INFORMATION MODELLING

Training Materials

MEP (Revit)

Advanced Construction Information Development Ltd.

Contents

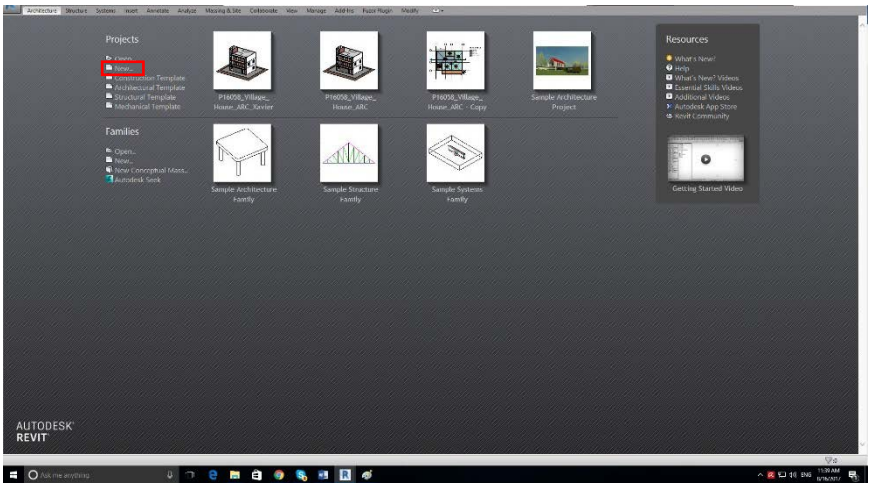
1. Starting a Revit Project

1.1 Starting a project using Revit templates

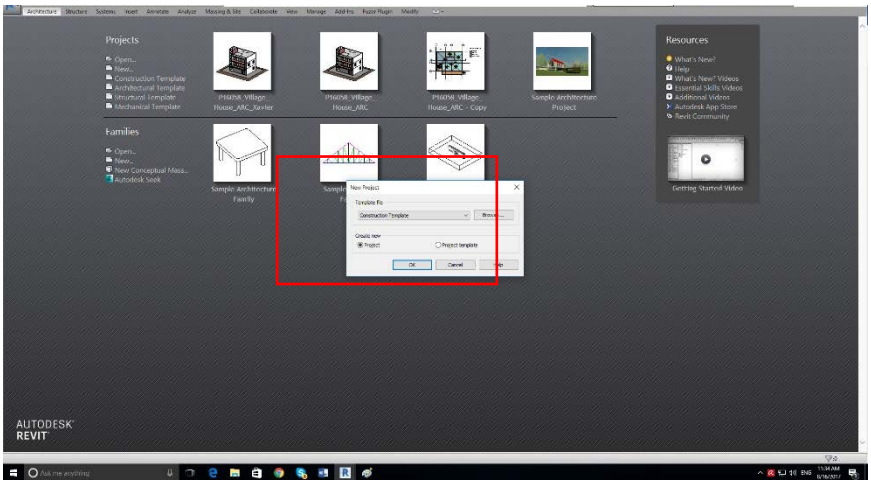
There's good chance that your company has a predefined template, as long as the template is in mechanical discipline, it would be suitable for this tutorial…

1st way to access New Project Dialog:

1. Click **New** on the file screen.

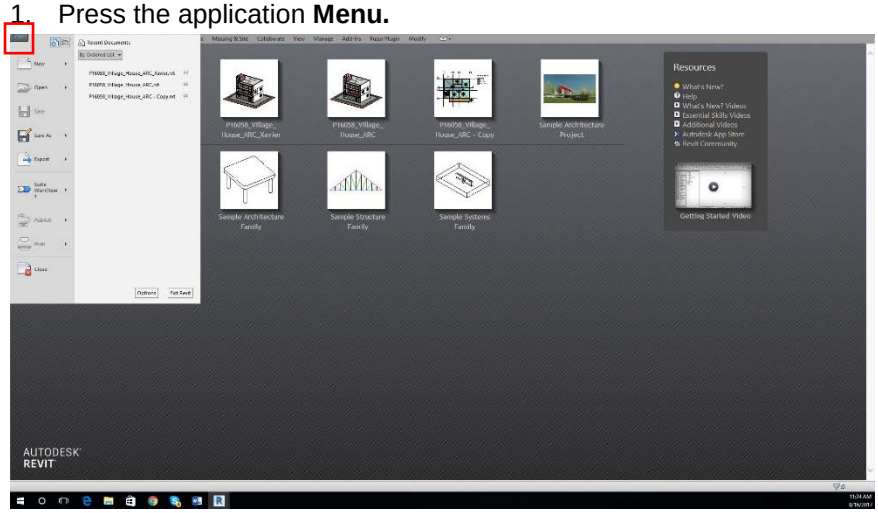


2. The **New Project Dialog** will appear.

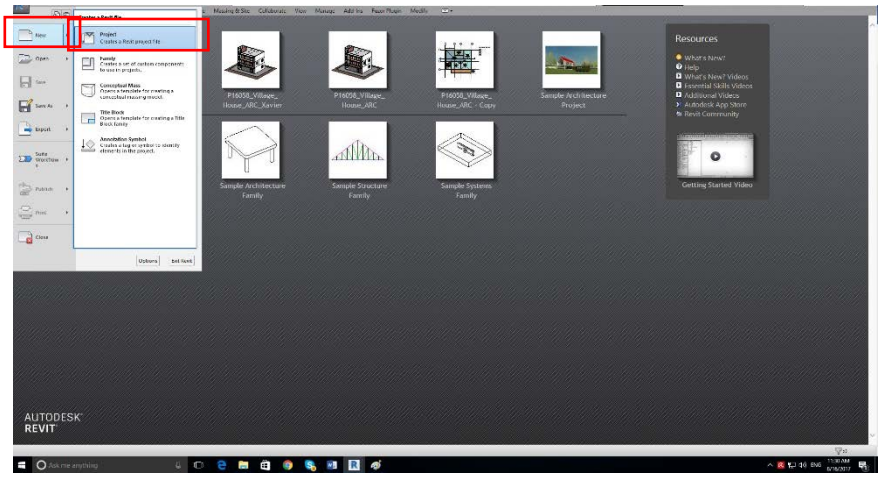


2nd way to access New Project Dialog:

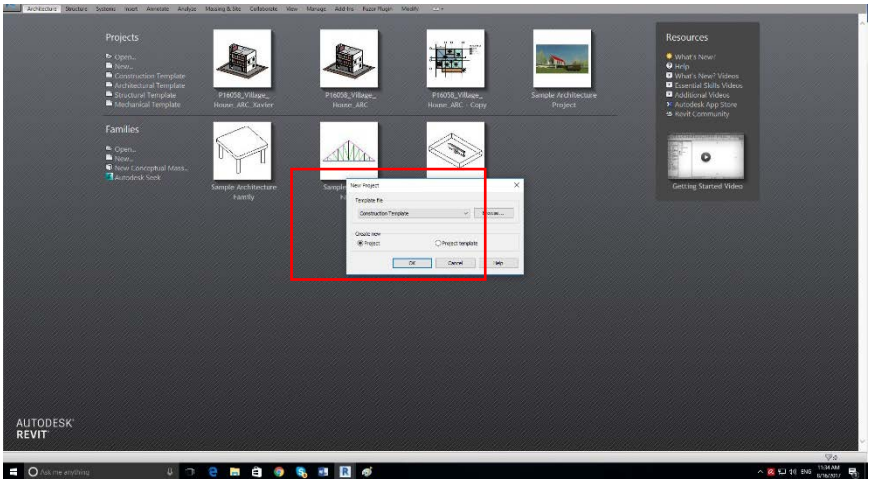
1. Press the application **Menu.**



2. Select **New** command and choose **New Project.**



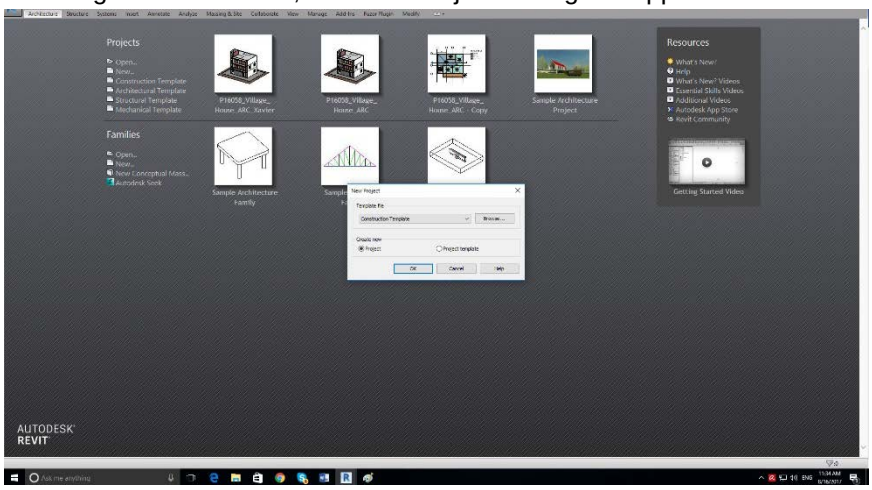
3. The **New Project Dialog** will appear.



3rd way to access New Project Dialog:

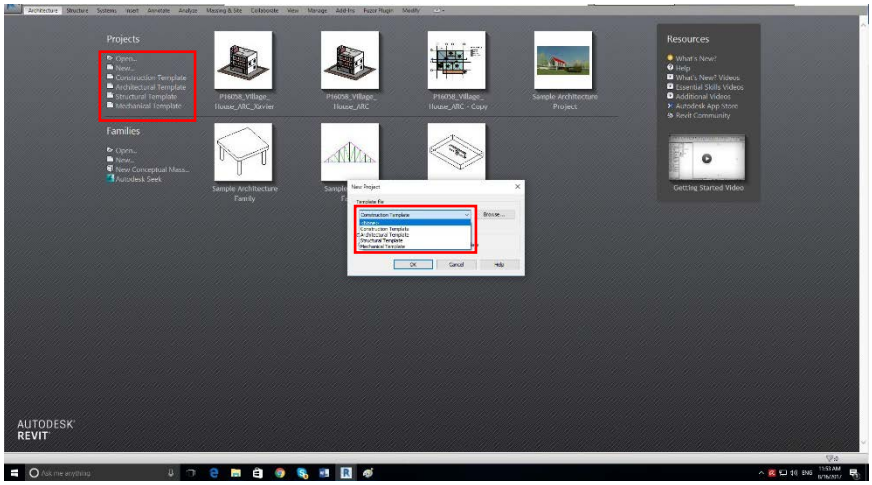
Using combination of hot keys. As interface will change depending on undergoing task, this combination offers a easy acess to New Porject Dialog.

Pressing **“Ctrl”** and **“N”**, the New Project Dialog will appear.

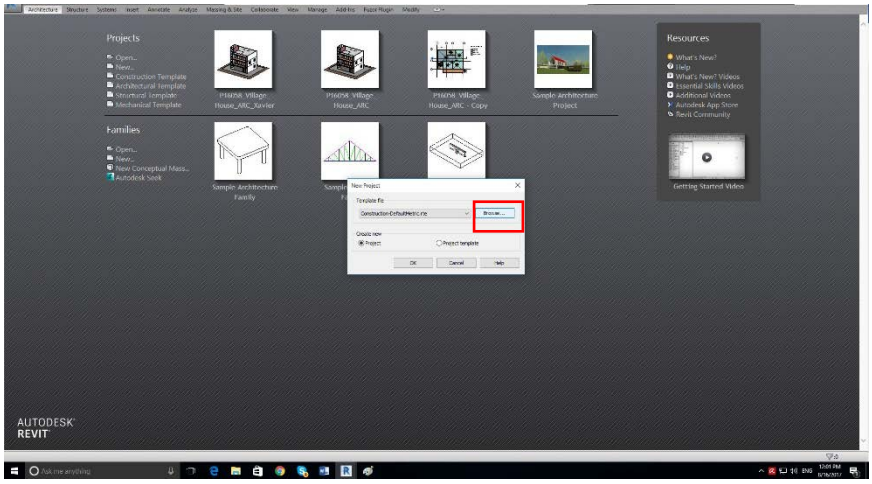


Open Autodesk pre-defined Template:

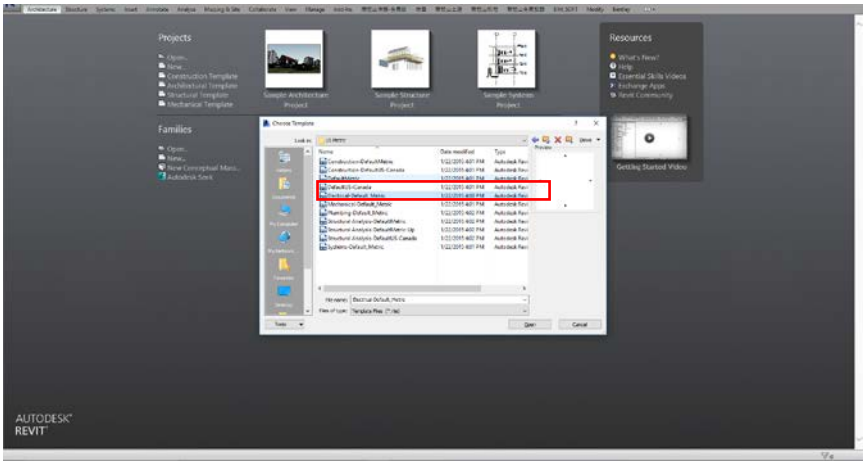
1. The list can be found on the **File Screen** and **New File Dialog**.



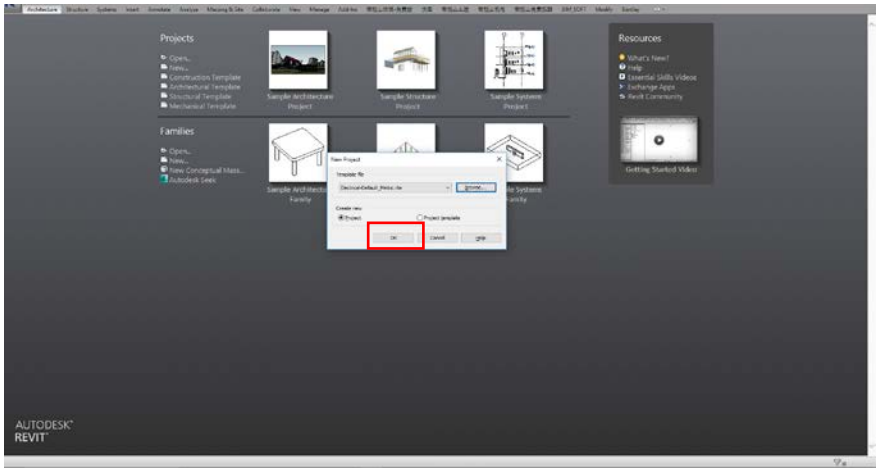
2. Click the **Browse** button.



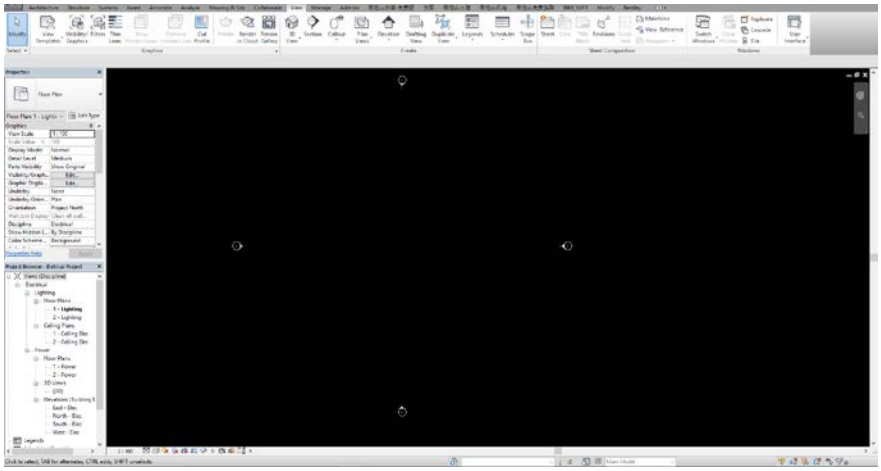
3. Click **Electrical-Default Metric,** then **Open.**



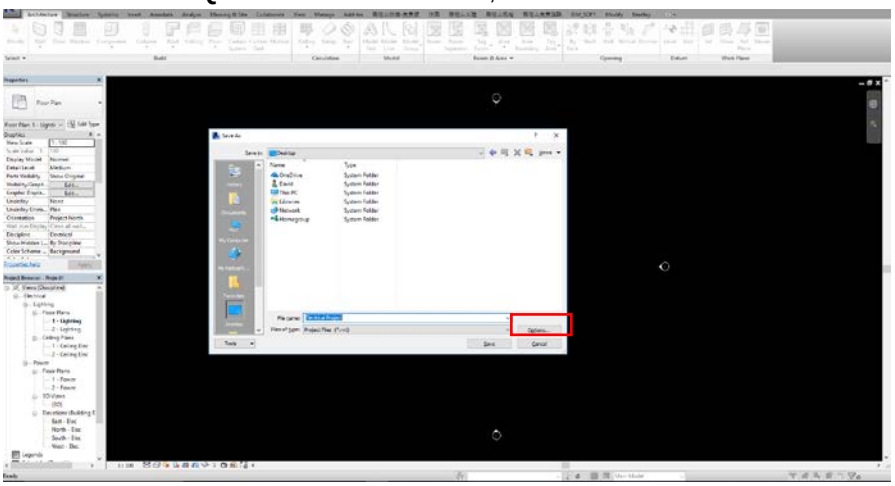
4. Press the **OK** button.



5. A **New Project File** is created.



6. Hover over your mouse cursor to upper-left of your screen, noted that these small buttons consist of our **Quick Access Tool Bar**, then click **Save.**

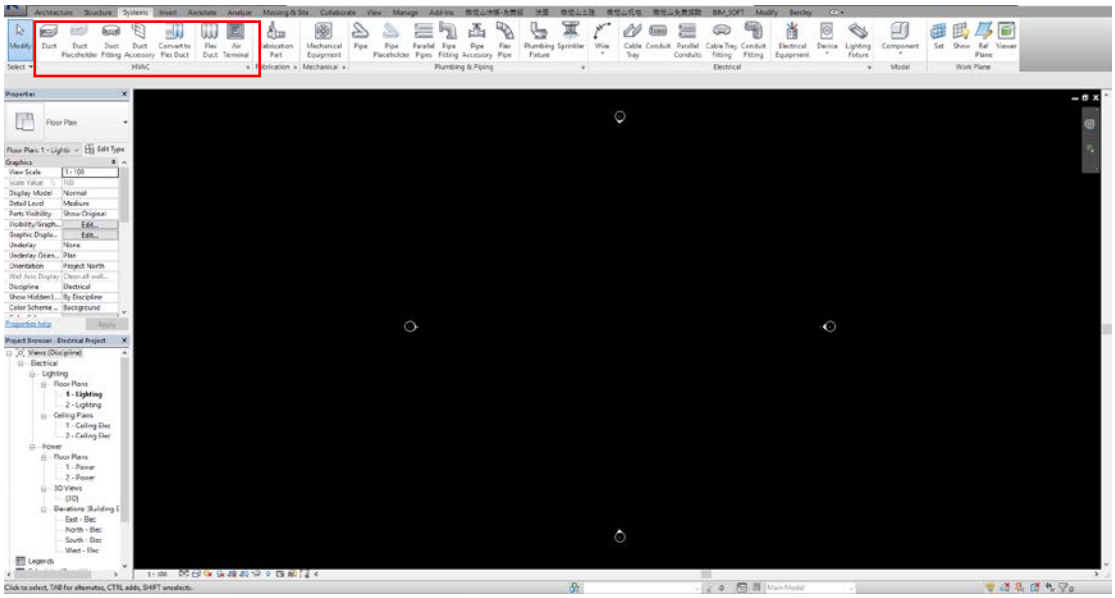


Click **“Options”,** change **Maimum backups to 1** to avoid unecessary backup files piling up. Name your Project and save.

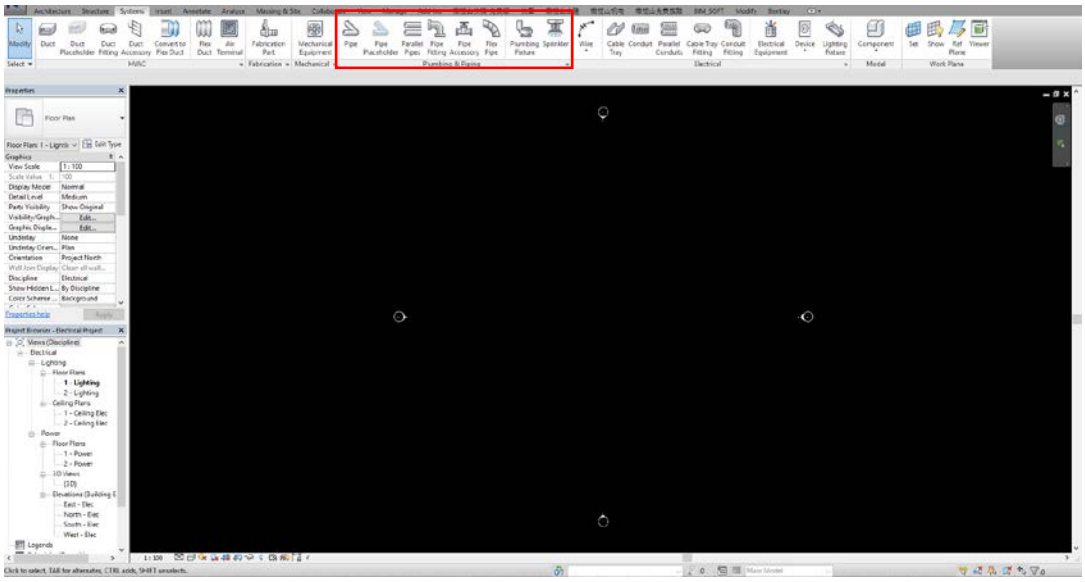
1.2 Touring the user interface

Right below the **Quick Access Tool Bar**, select the **System** tab which contains series of MEP panels:

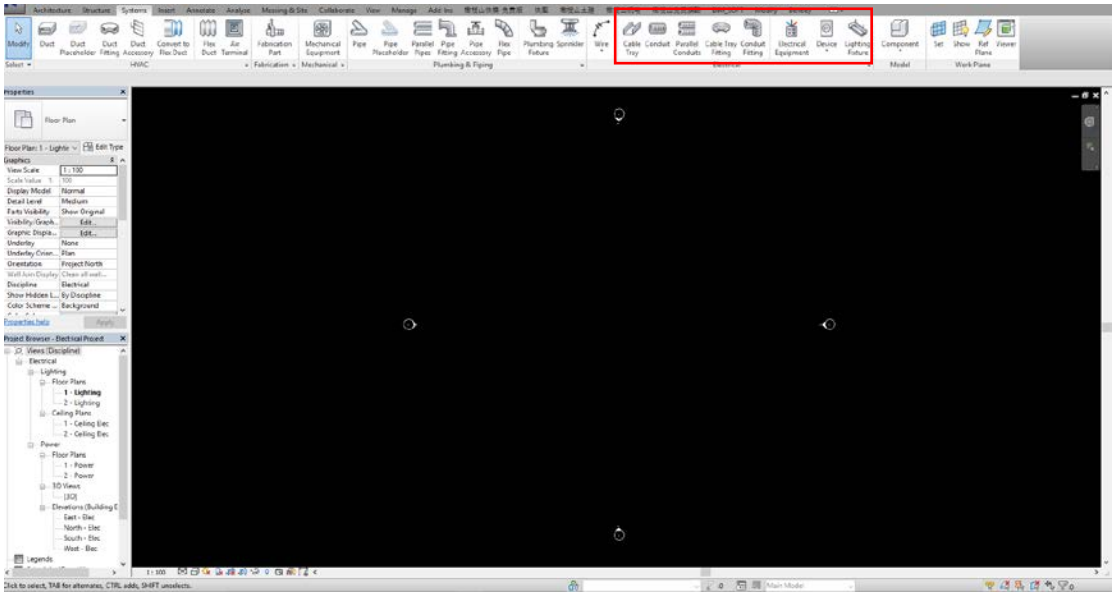
1. HVAC panel.



2. Plumbing & Piping panel.

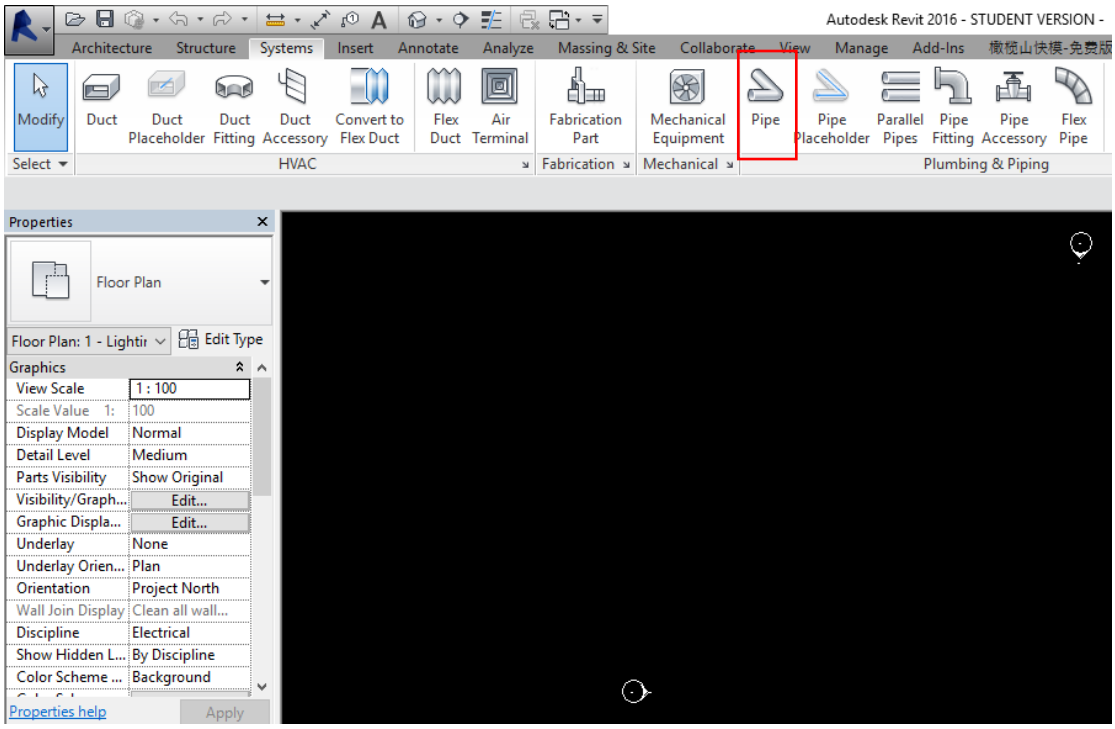


3. Electrical panel.



1.3 Introduction to Properties Window

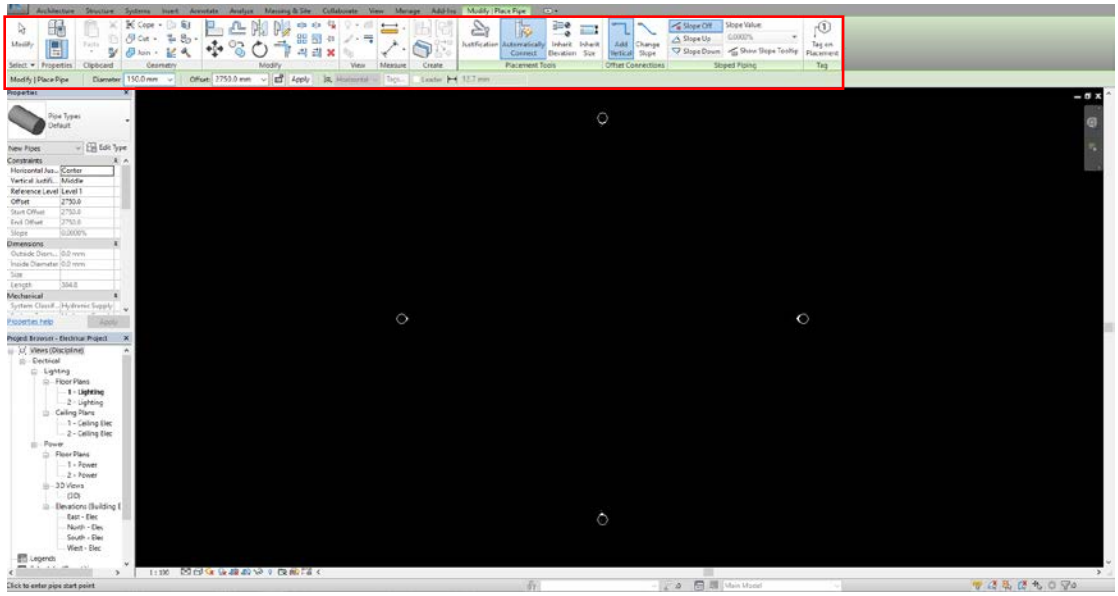
1 Click the Pipe icon in Plumbing & Piping Panel.



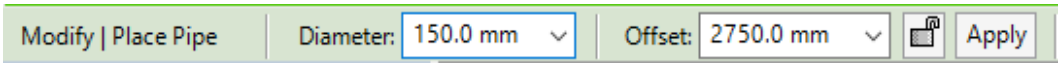
Notice that Revit is an interface sensitive software, it will bring us to a new interface which aims to aid us utilizing that command.

What happens when we start a command is more icons will show up to help us utilize its specifical functionality.

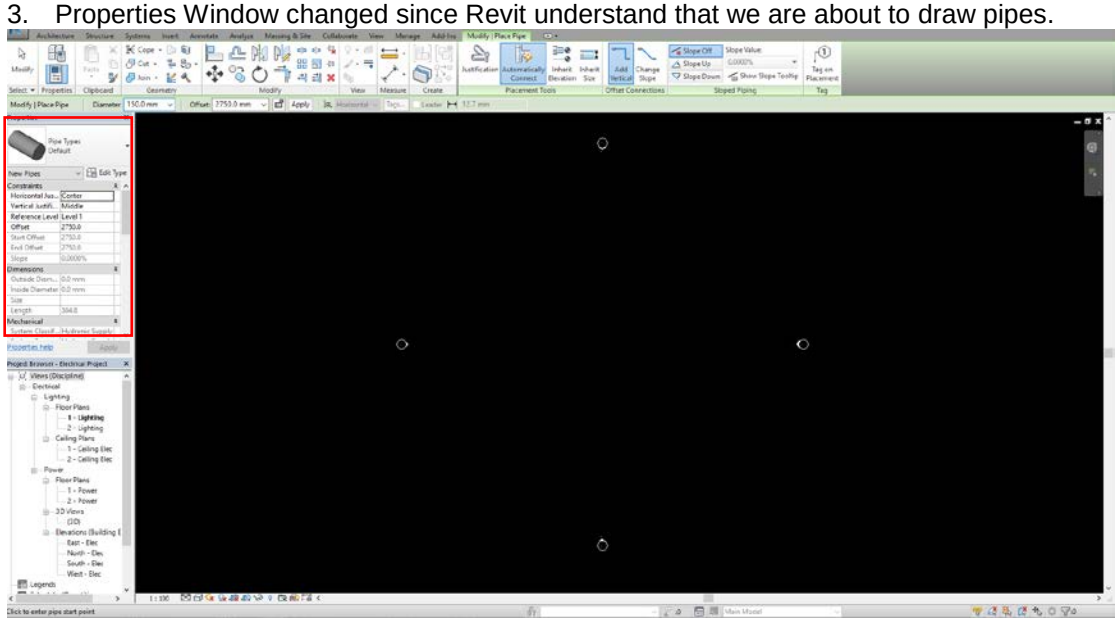
1. More icons show up.



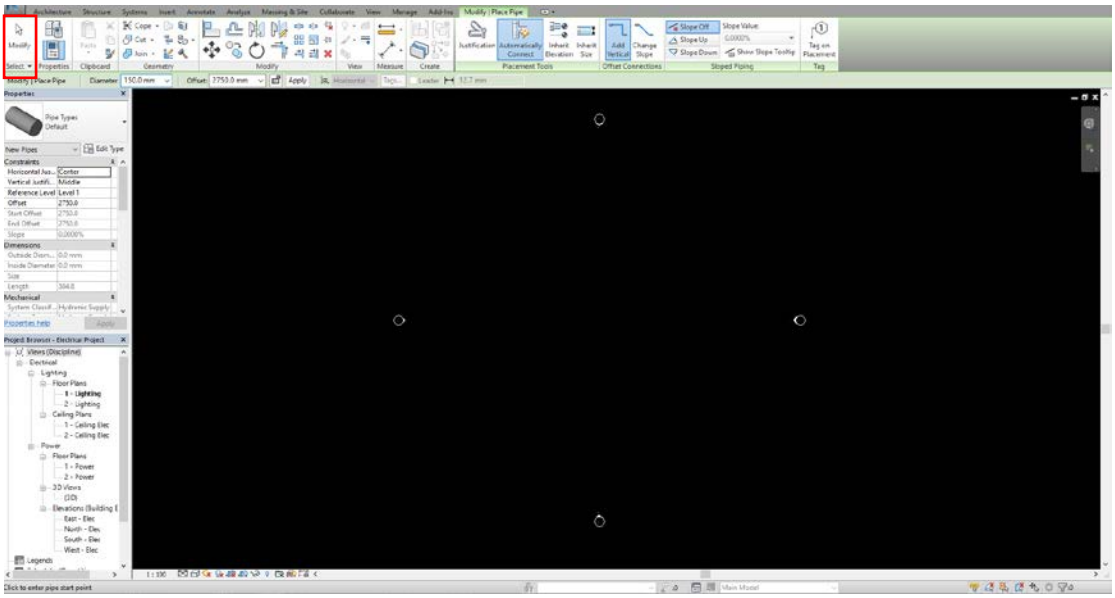
2. Setting proper diameter and offset from ground level for the pipe, now for simplicity, I'll leave it as default.

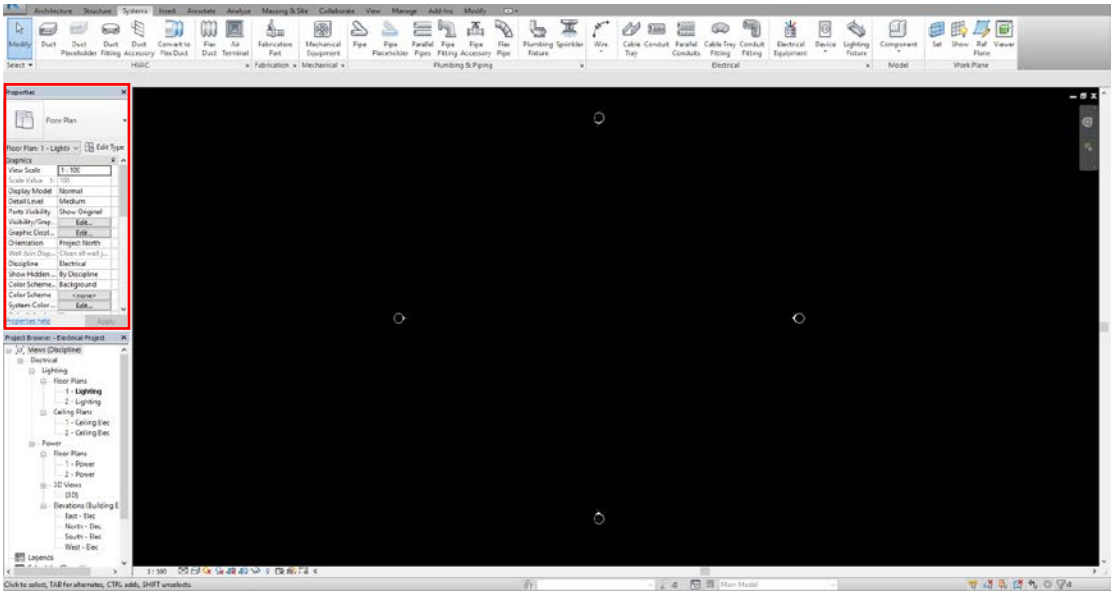


3. Properties Window changed since Revit understand that we are about to draw pipes.



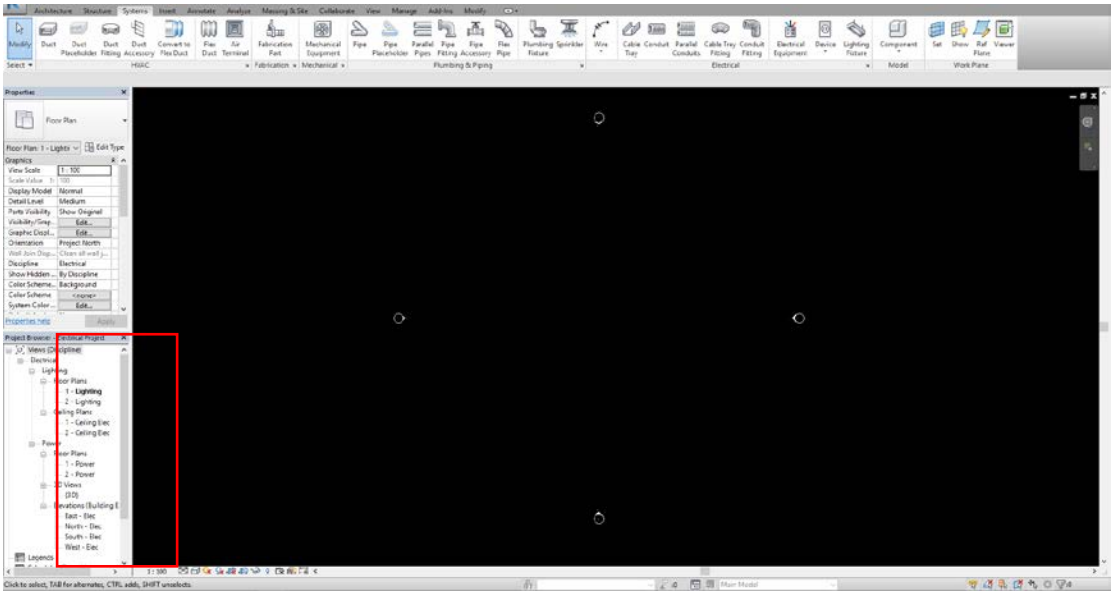
4. Clicking **Exit** on keyboard or **Modify** command with your mouse brings us back to where we were. Now the active object is floor plan instead of pipe.



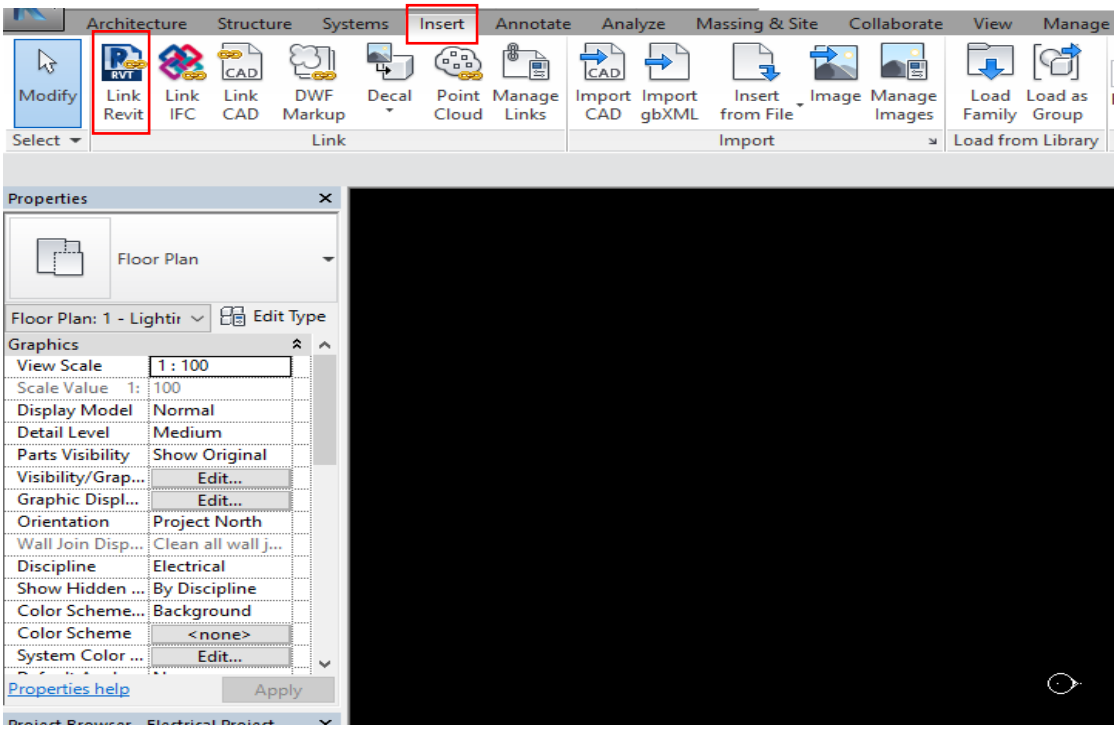


Navigate yourselt in views.

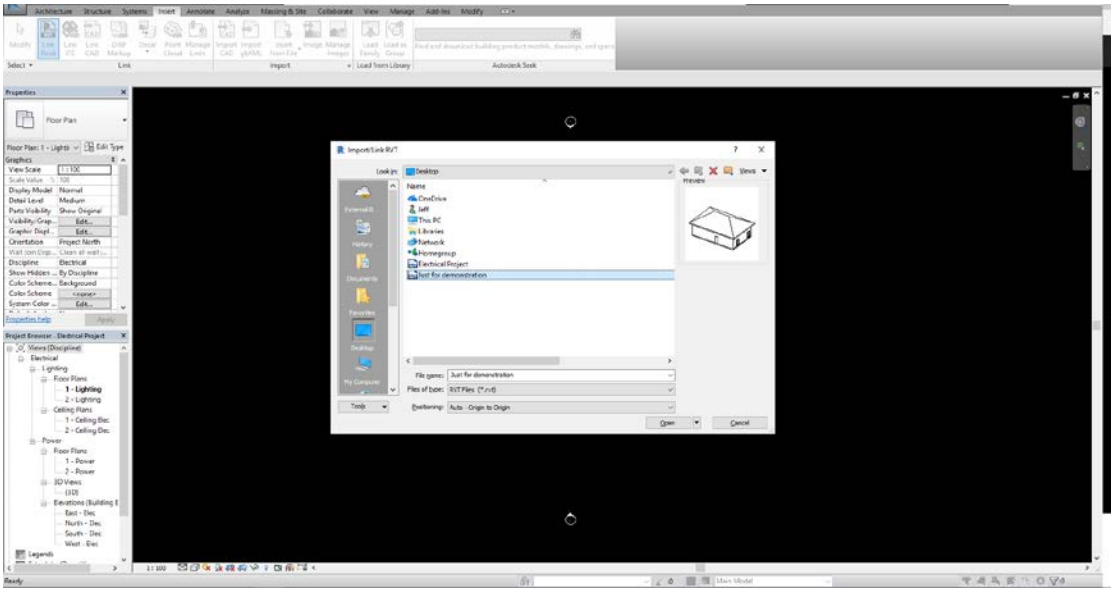
1. Below the Properties Window is Project Brower which includes views of our projects.



2. Now go to insert tab, select Link Model.

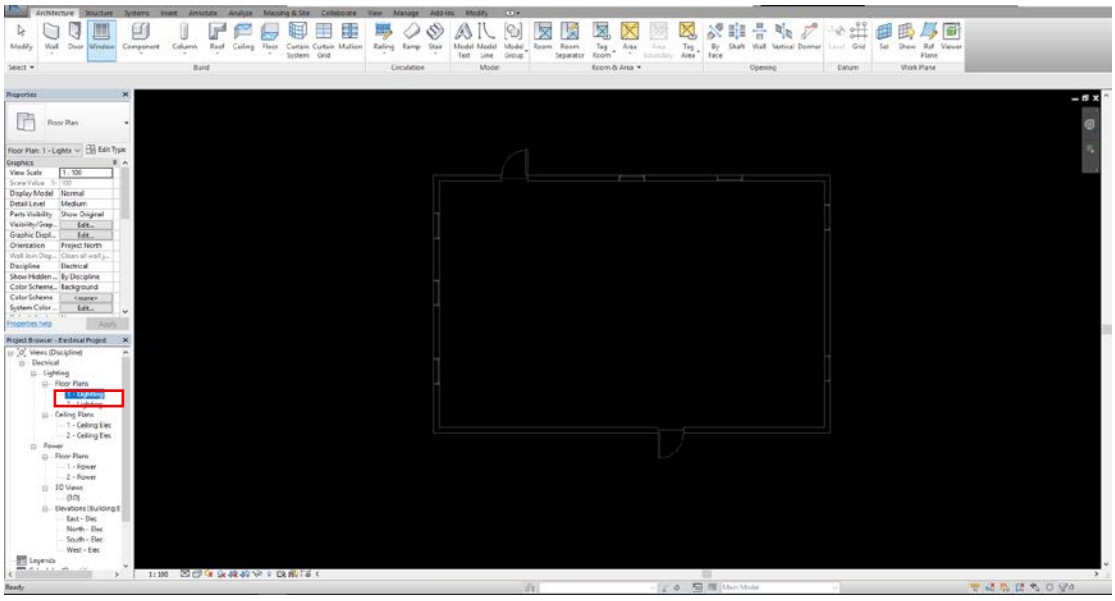


Link the architectural file you want, click open.

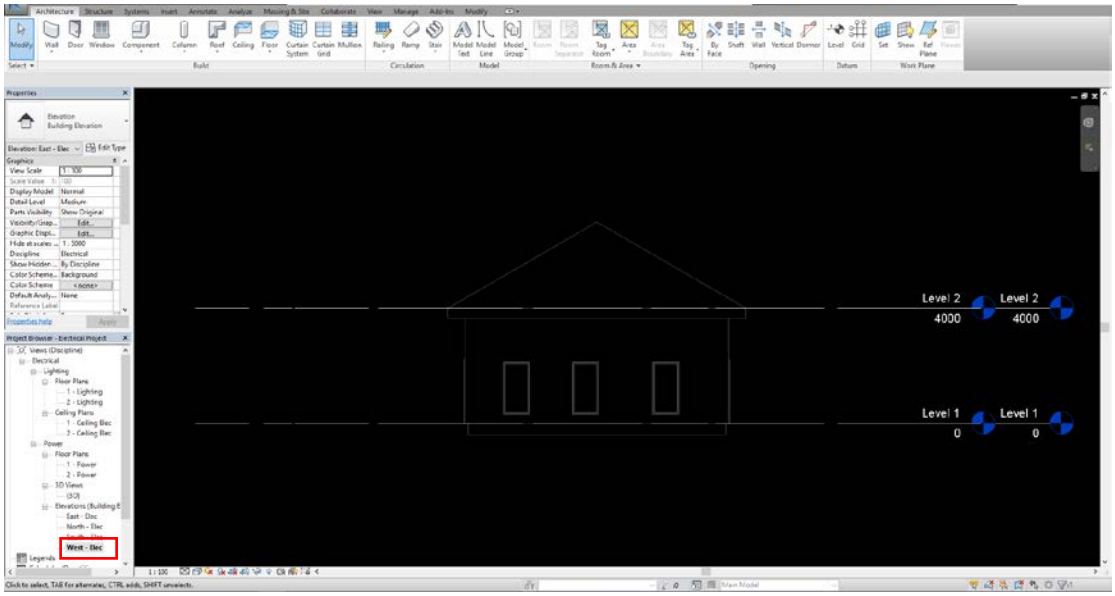


3.To change whichever views you desire, double clicking views in Project Browser, for instance, **South-Elec** will bring you to the south elevation of your model.

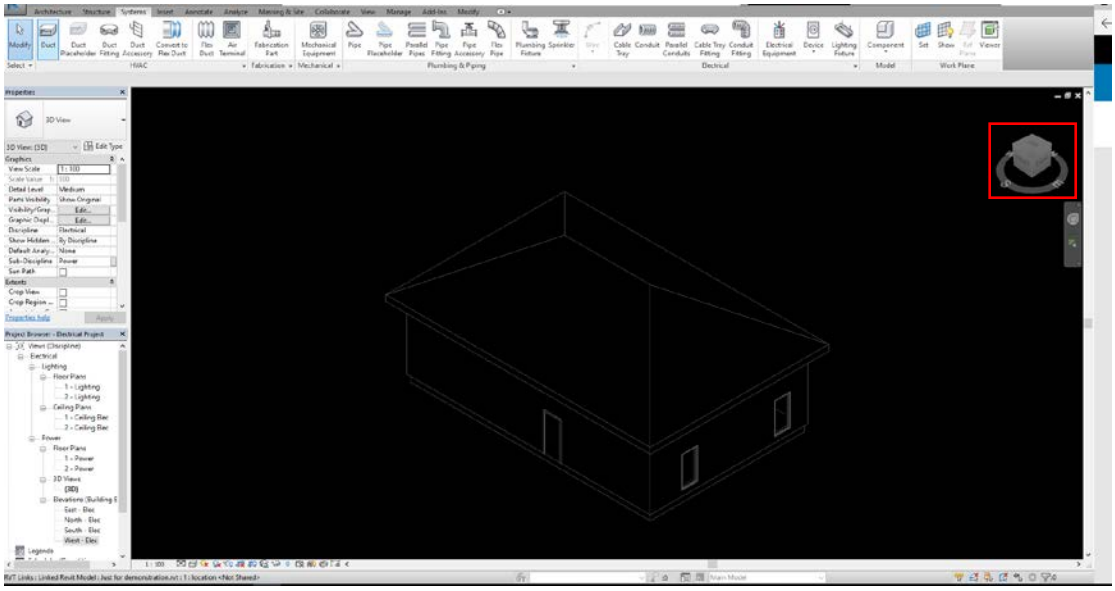
1- Lighting view currently.



Switch to West-Elec.

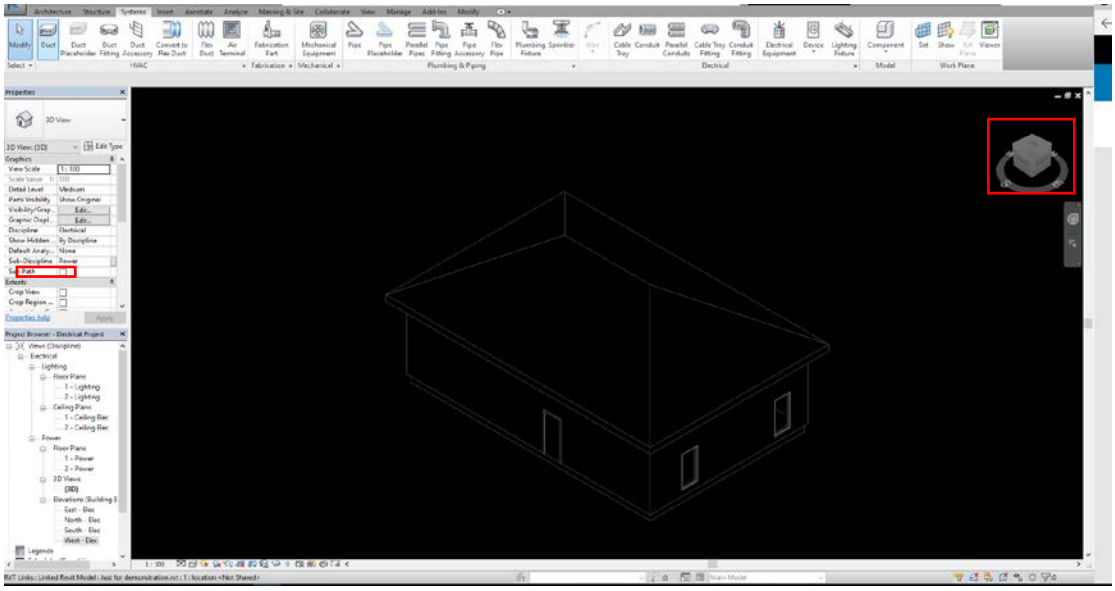


4.Hover over to Quick Access Tool Bar, a house-like icon called Default 3D view will bring us to the 3D view of the model.

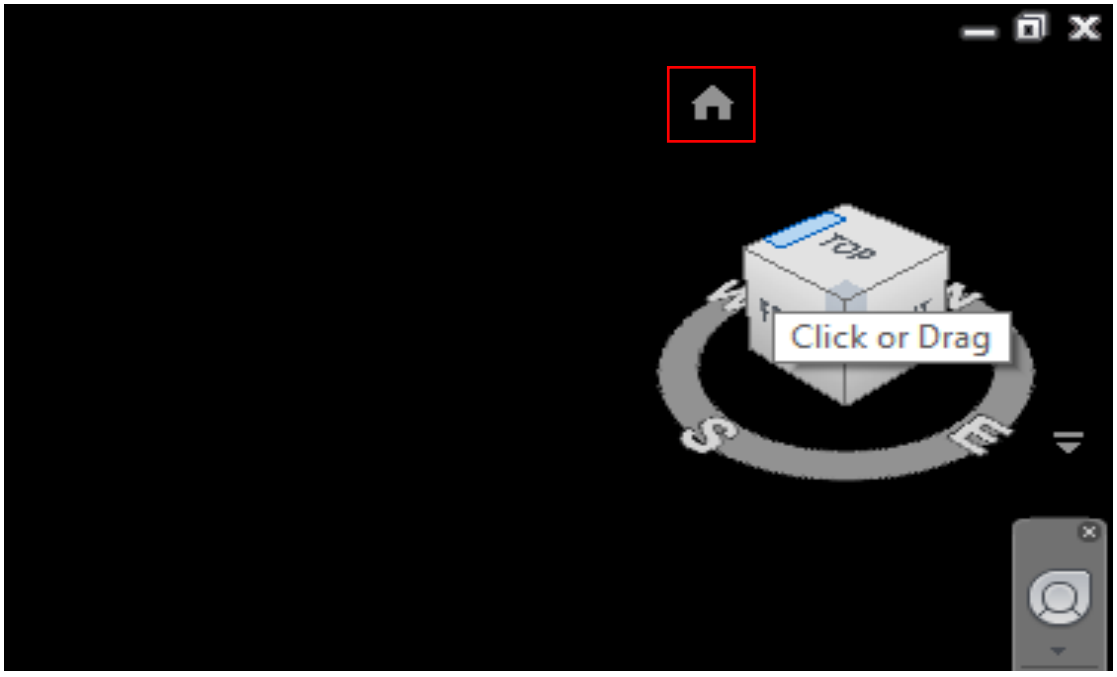


Any changes will be updated simeoustantly on every single view.

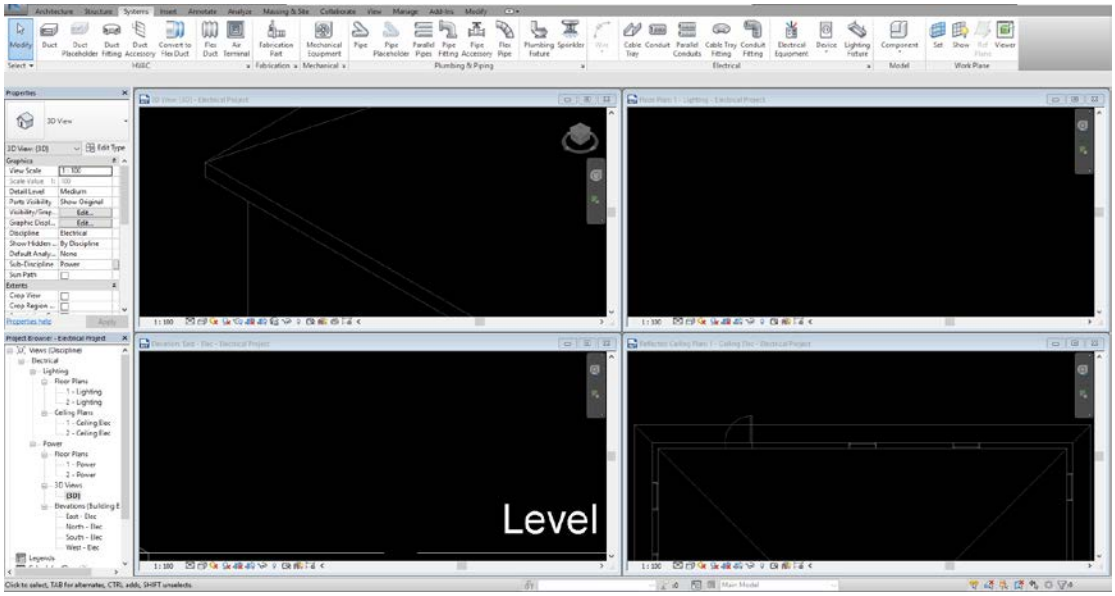
5. At upper-right corner of 3D view, there's a box called view cube, clicking tags or corners on the cube will bring you associated views, or just press on cube then drag to any specific view you want.



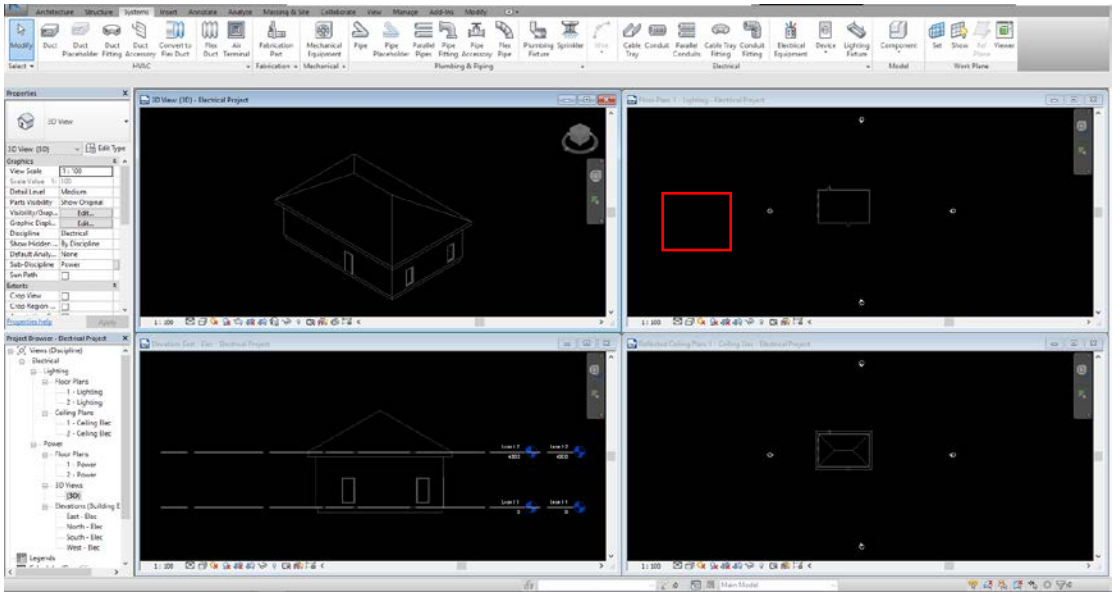
Home icon will show you entire model in 3D view, feel free to use it once you are lost in a complex model.



6. To pan in any 2D or 3D views, holding down your mouse wheel then moving to any directions you wish to.
7. Wheeling mouse wheel towards you will zoom out your view, oppositely will zoom in your view.
8. W + T keyboard short cut will tile your recent open views.

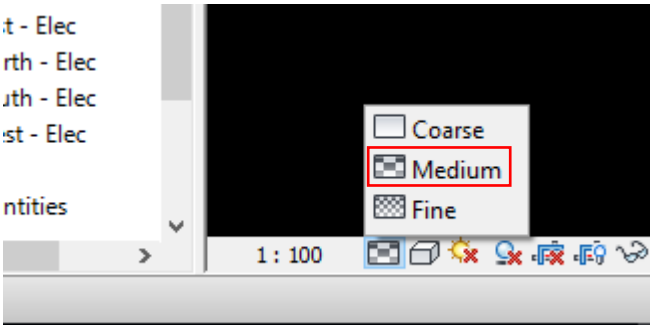


Z + A (stands for “Zoom All”) will zoom all views currently opened.

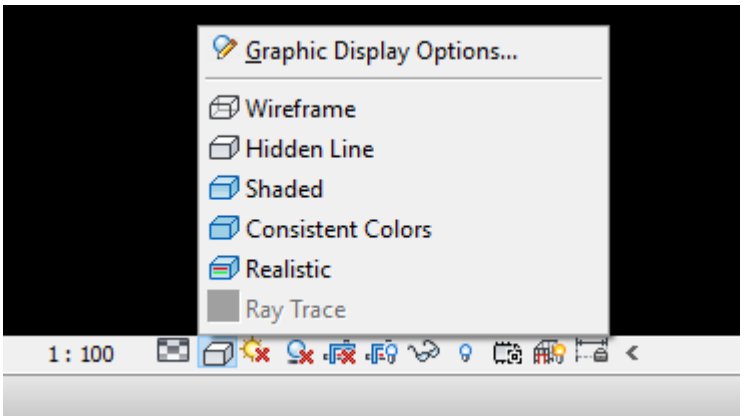


1. Bottom left of each view is the view control tool bar, it contains the scale of your view, detail level, etc.

Among three of detailed levels, medium is the one we will use frequently.



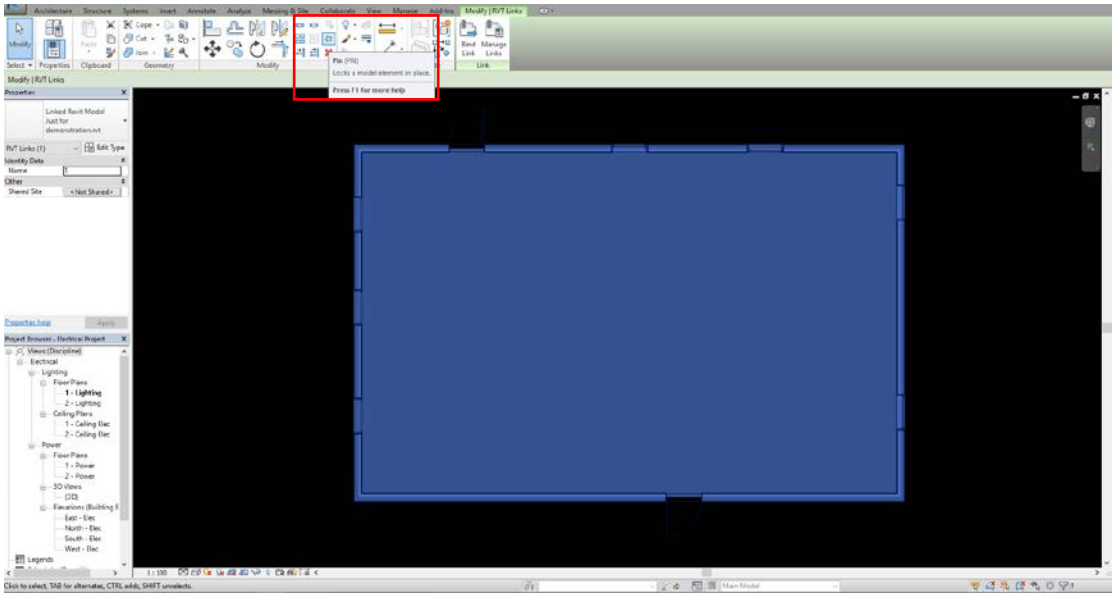
Also, depends on how much you wish to see, Visual Style option will come in handy in your work.



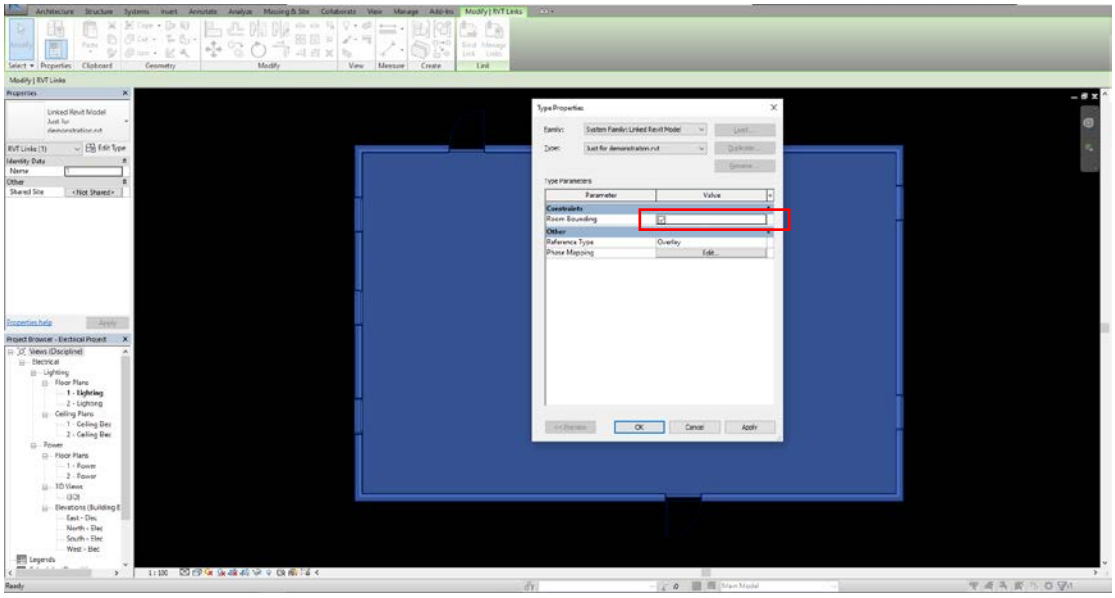
1.4 Linking other models

Linking models for your MEP work will always be your first step.

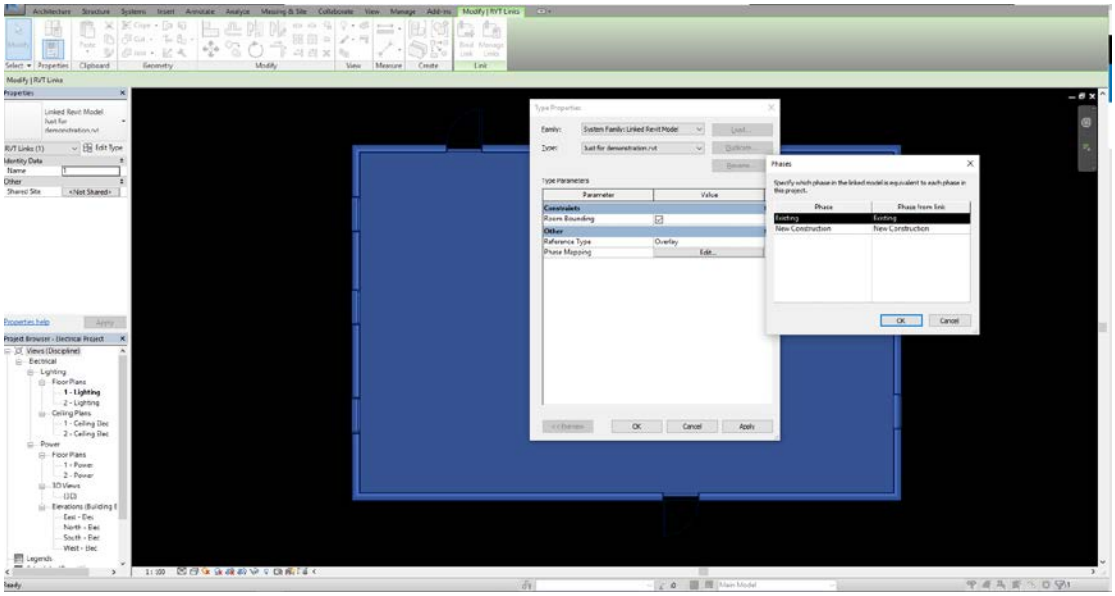
1. Once you linked your architectrual file, select entire model then pin it.



2. Click Edit Type in properties window, turn on Room Bounding.

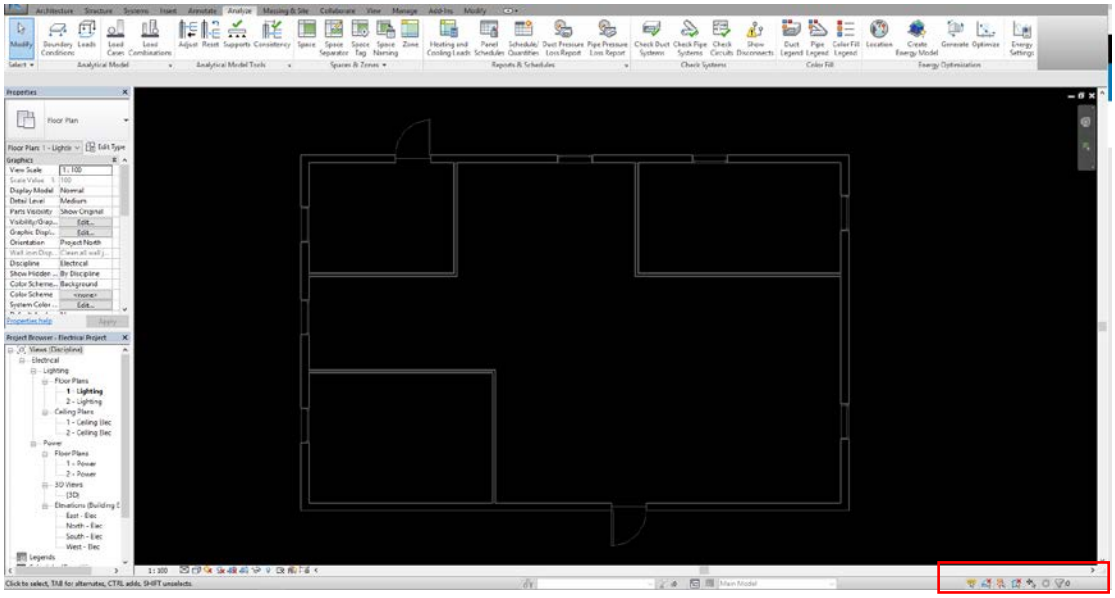


3. Hit Ok, then hit apply.



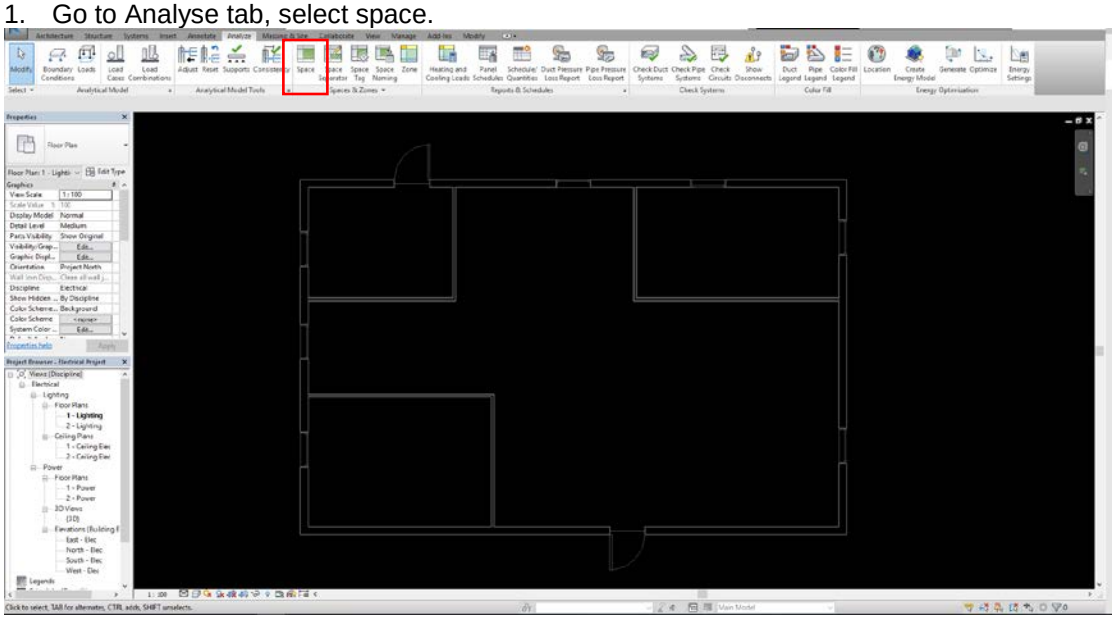
Repeat the same process, linking structrual file for your MEP work.

Notice that pinned objects cannot be moved, furtherly, if you click the following icon, pinned objects will no long even be selected.

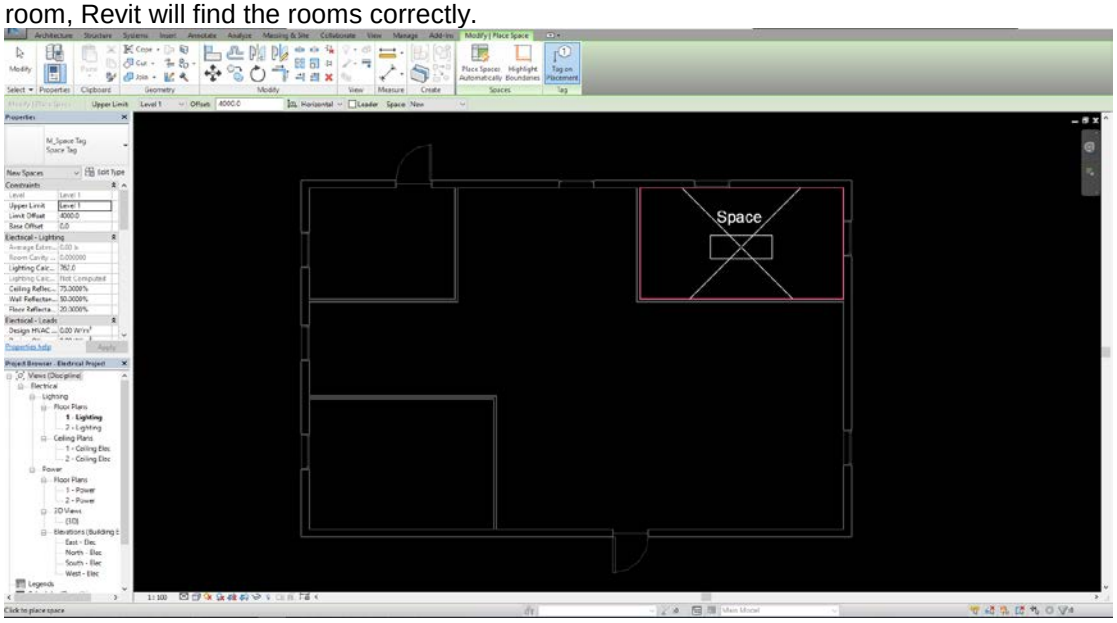


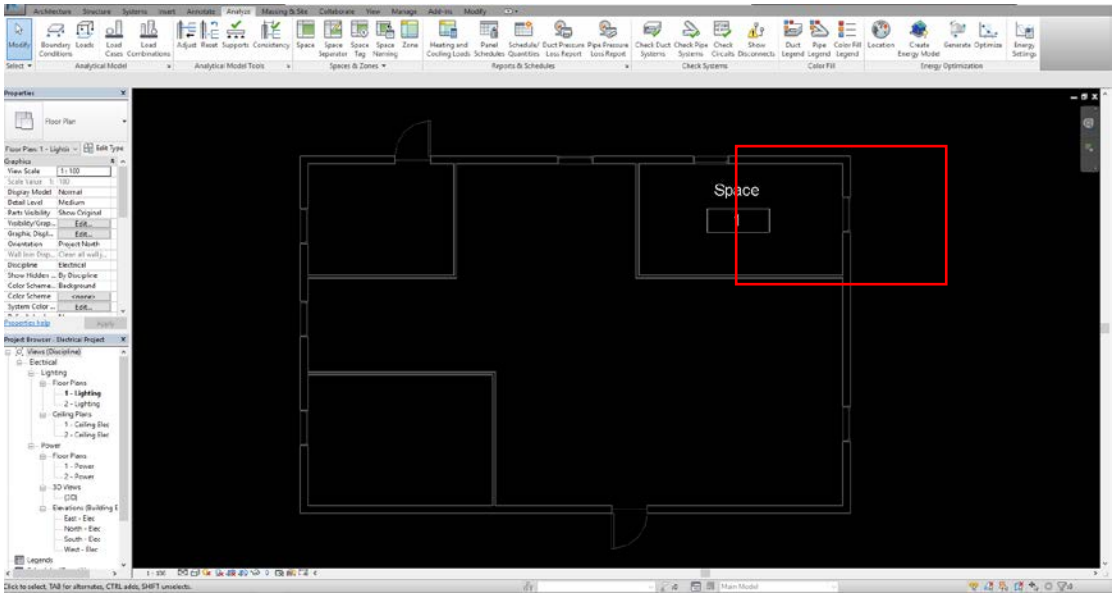
Adding space to the model.

1. Go to Analyse tab, select space.

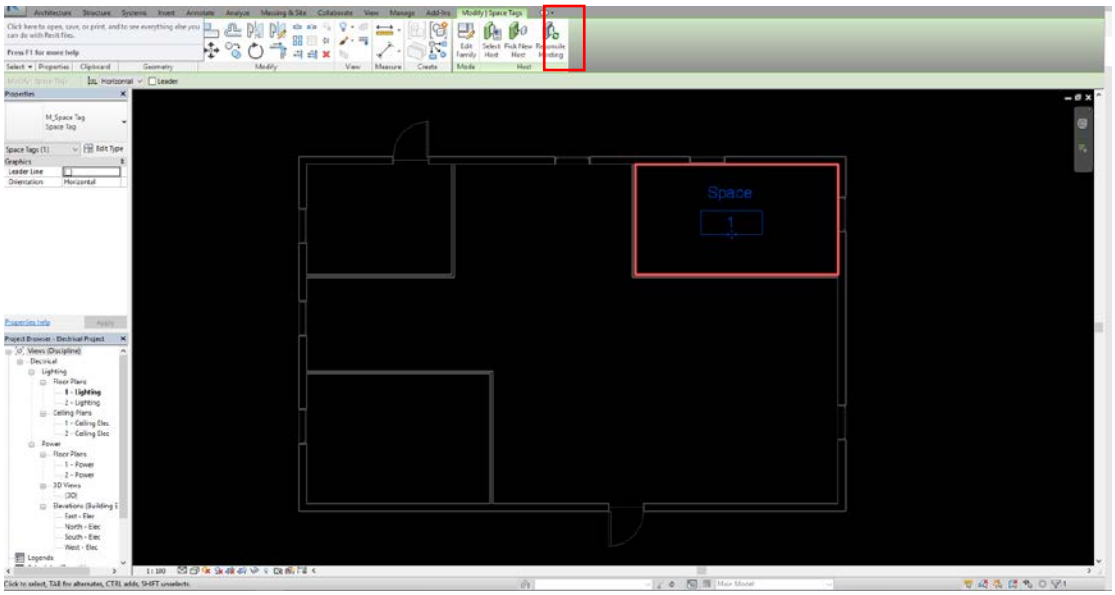


2. As the result of checking Room Bounding, when you hover mouse cursor to targeted room, Revit will find the rooms correctly.

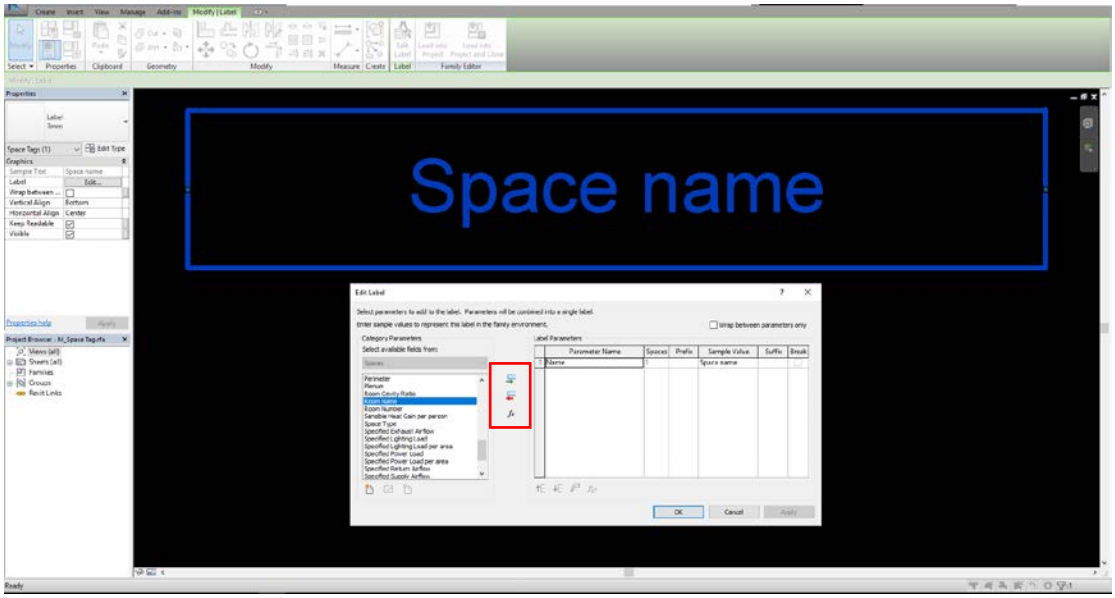




3. Customize space name tag. With the name tag selected, click on edit family.

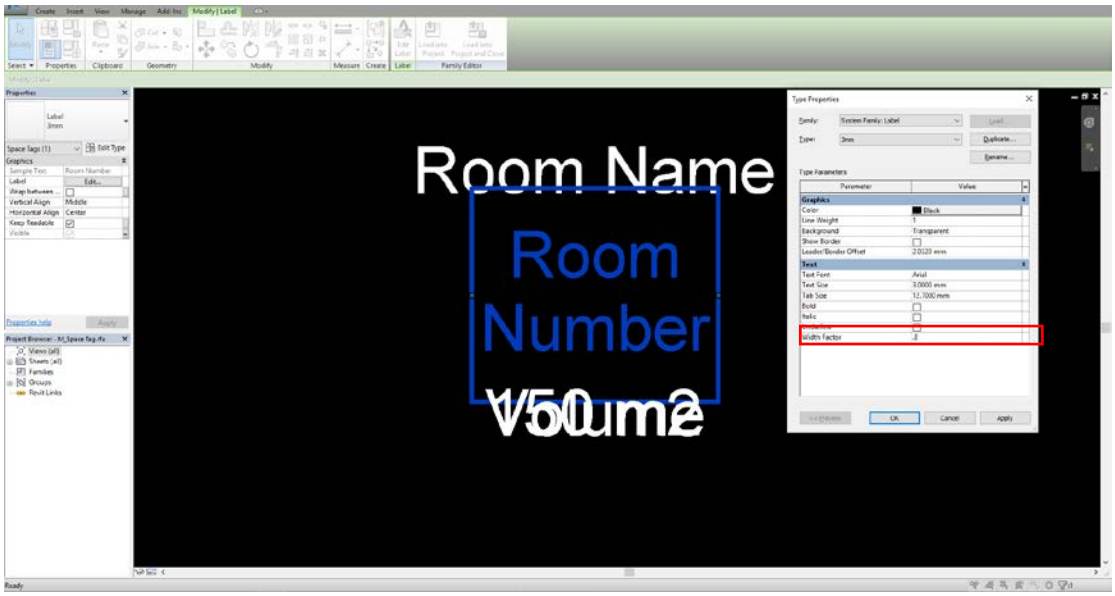


With the Space Name selected, click on edit label. Remove Name parameter with red arrow, then find Room Name parameter and add it with green arrow.

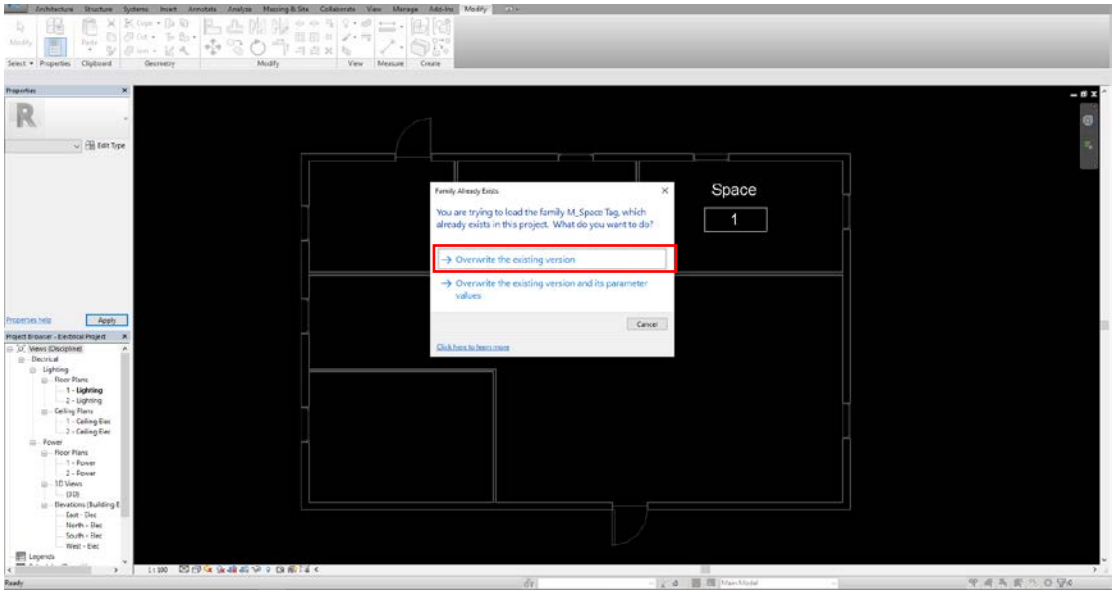


Likewise, with the Number selected, click on edit label. Remove Number parameter, add in Room Number.

Adjust width factor in Room Number's properties window by click on Edit Type.



Load customized family back to the project afterwards. Click on Load into Project. Overwrite the existing version.



Tag other spaces properly.

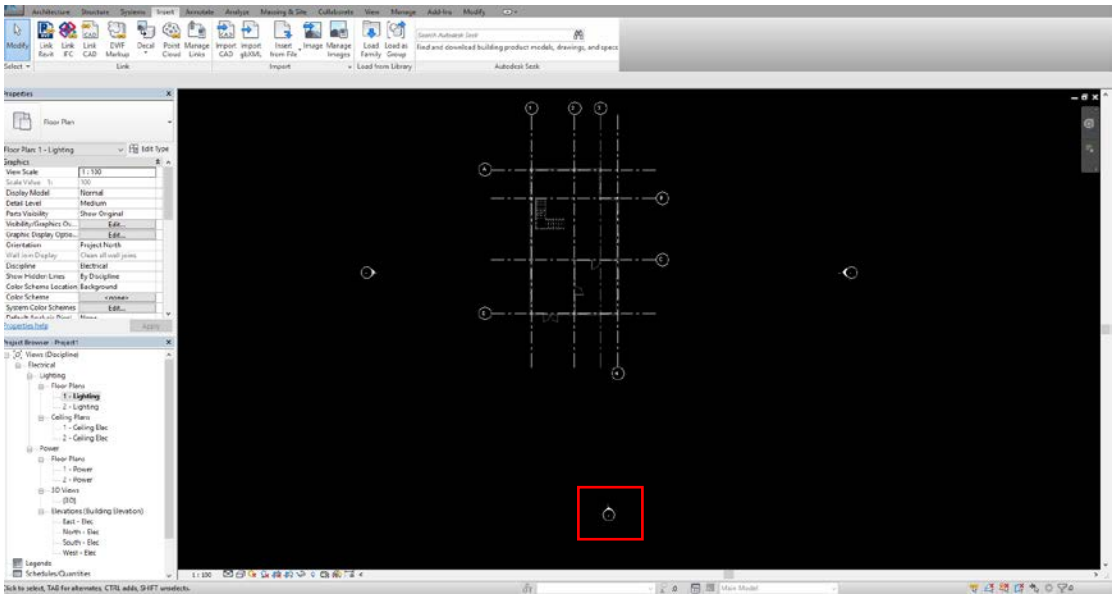
1.5 Copying levels and setting up monitoring

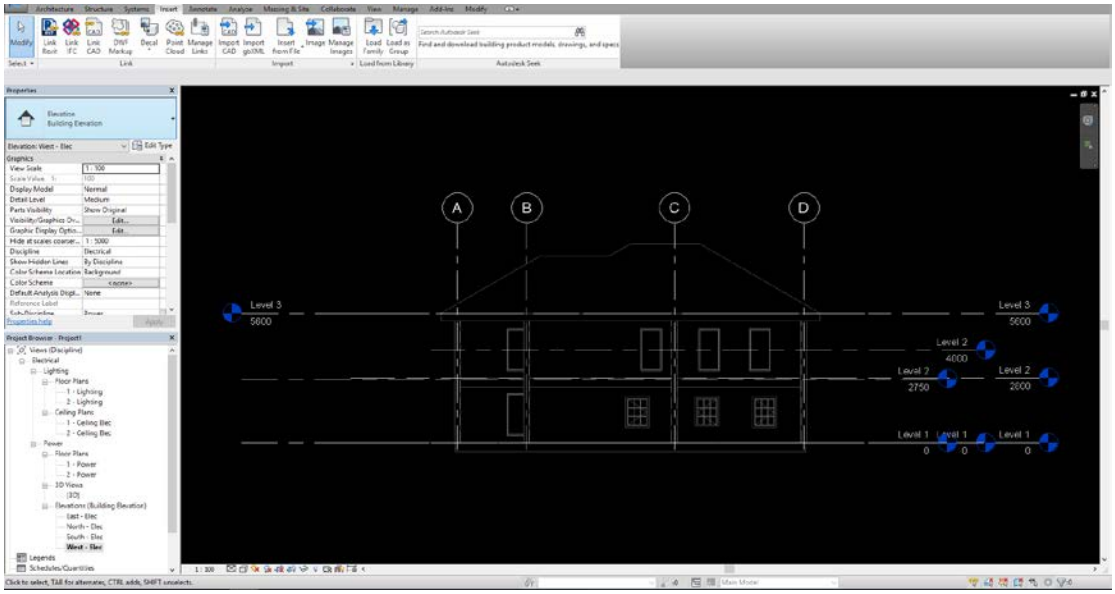
With architectural and structural models linked, these two underlay both have levels in them. We're going to copy levels in architectural file and keep monitor it lively.

This kind of assoication will remind us the changes if architect moves level in the future.

1. Open South elevation

Click on South – Elec view in Project Browser or double click the arrow on south elevation marker will open the south view.

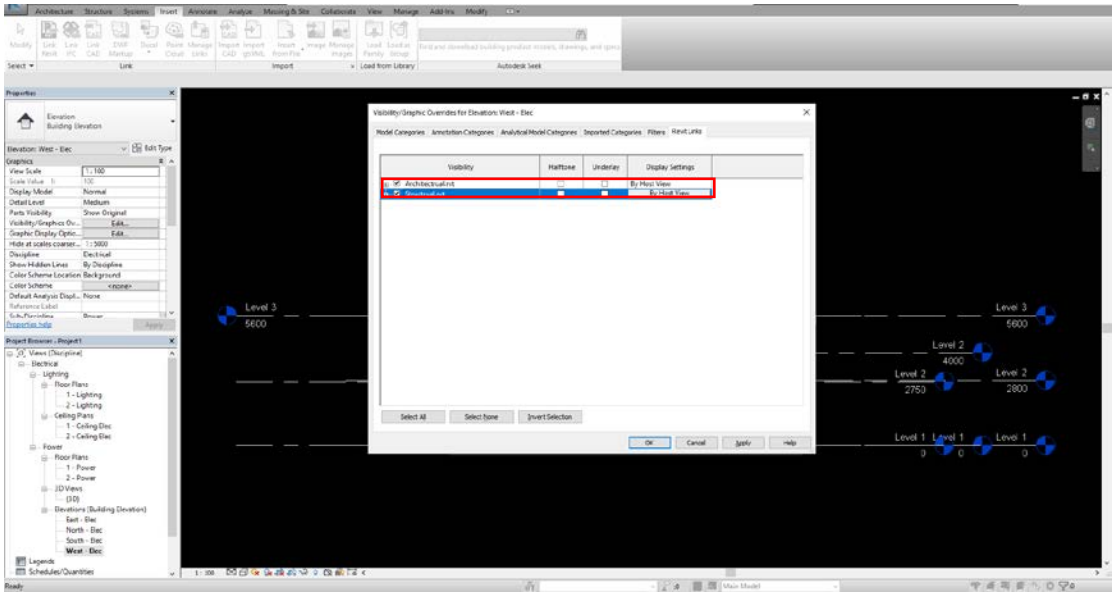




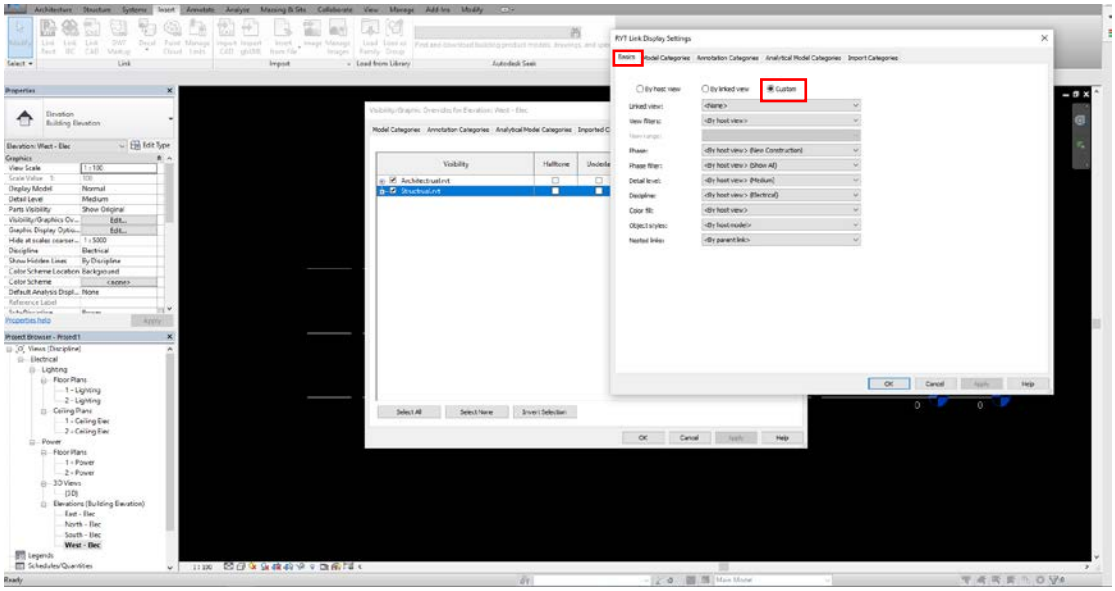
2. Hide extra levels.

Locate Visbility/Graphic in Properties window or simply press V + G on keyboard while keep in mind that visibility changes will only be effective south elevation we're in.

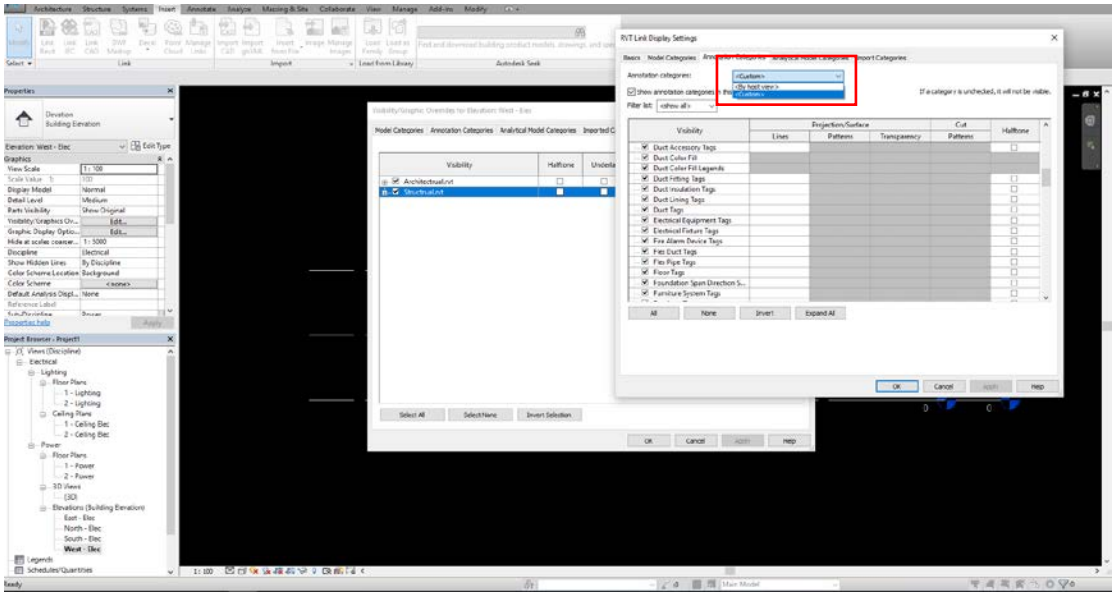
3. Go to Revit links. Find your structural link.



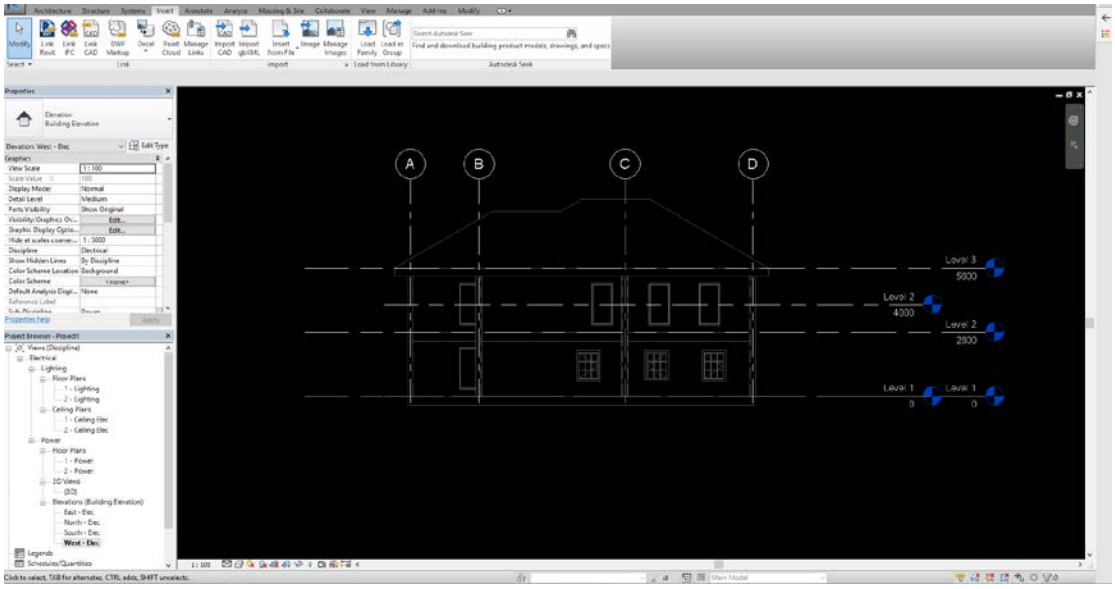
4. Click on By host view, check Custom check box under the Basic tab.



5. Then go to Annotation Categories tab, change **By host view** to Custom.



6. Deselect Levels checkbox in scroll down list. Hit Apply, then OK.

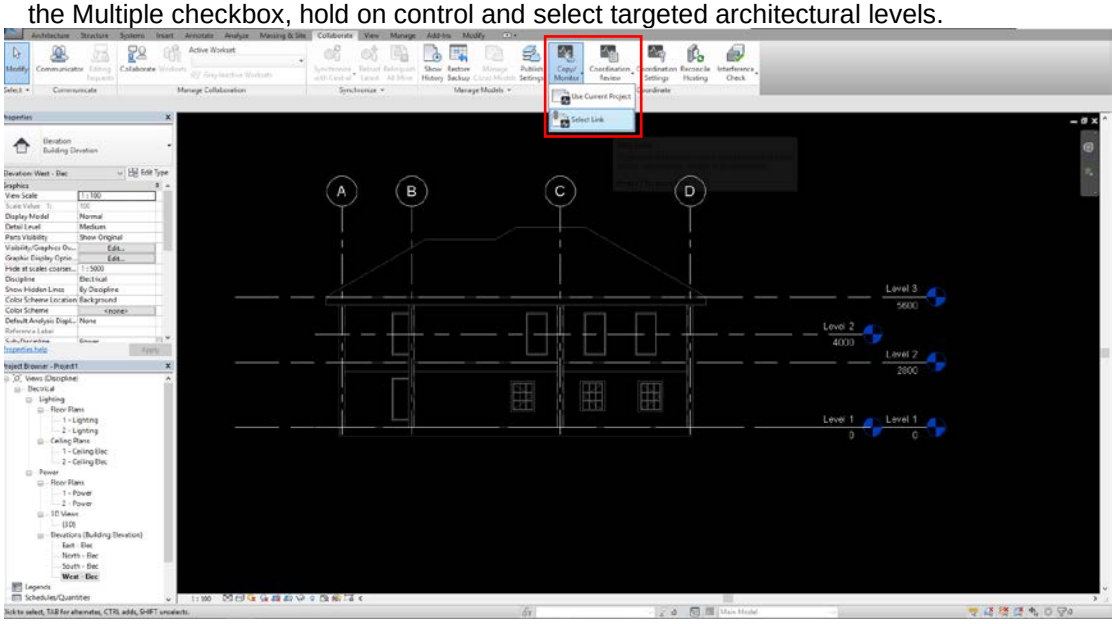


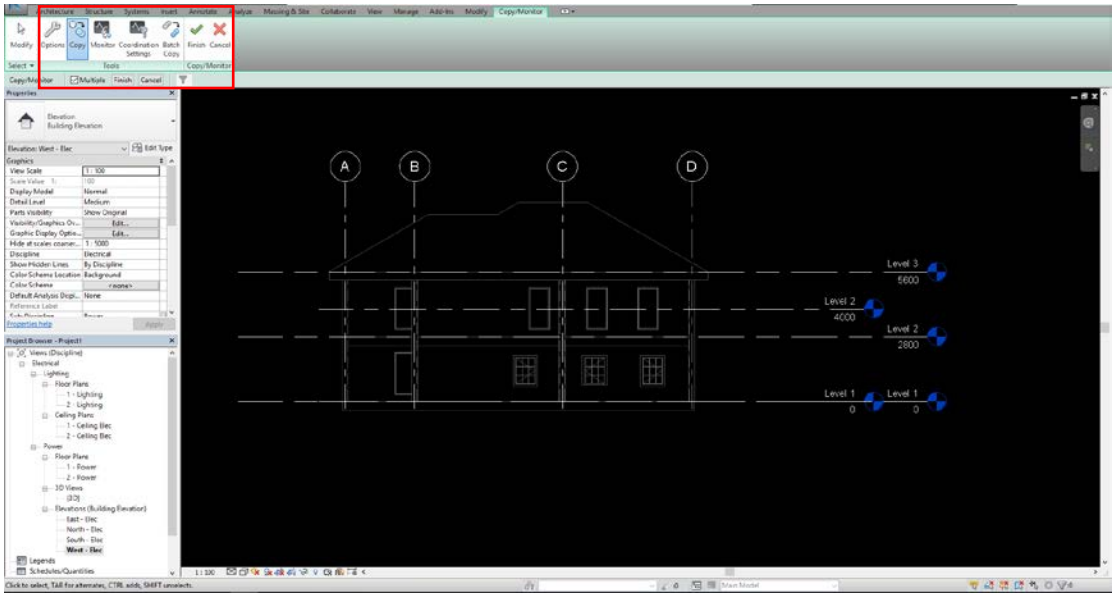
Levels in specific links have been hidden while default levels remind visible.

Match default levels to architectrual levels.

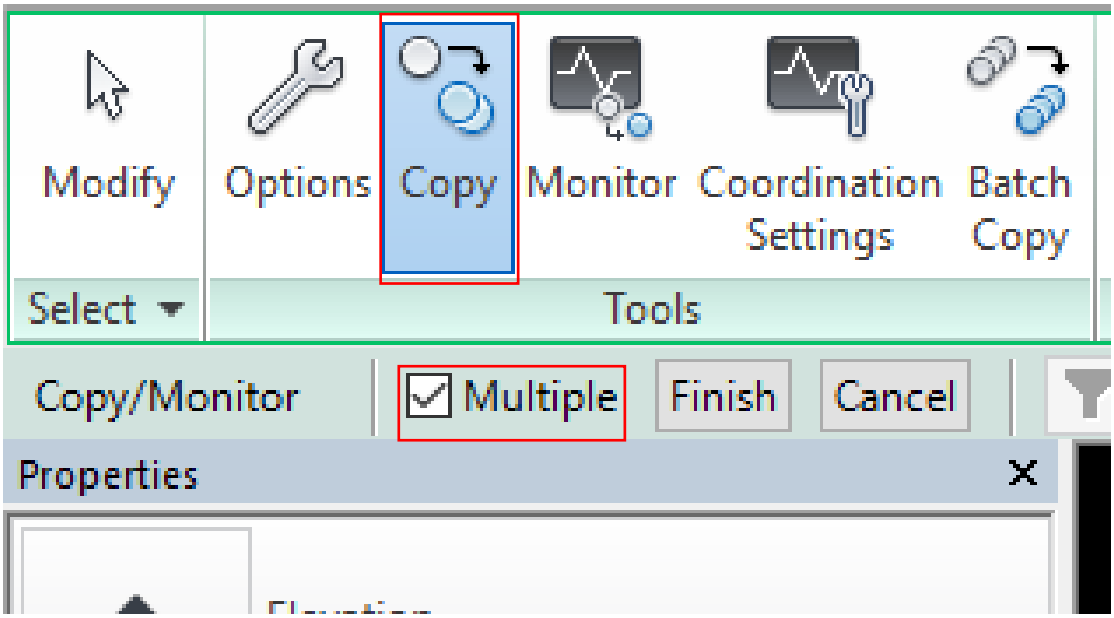
It's possible that your default levels are not matched with your architectural levels. Instead of match it manually, we want Revit to handle this task automatically.

1. Go to Collaborate Tab, click on Copy/Monitor --- Select Link , then click on Copy and check the Multiple checkbox, hold on control and select targeted architectural levels.

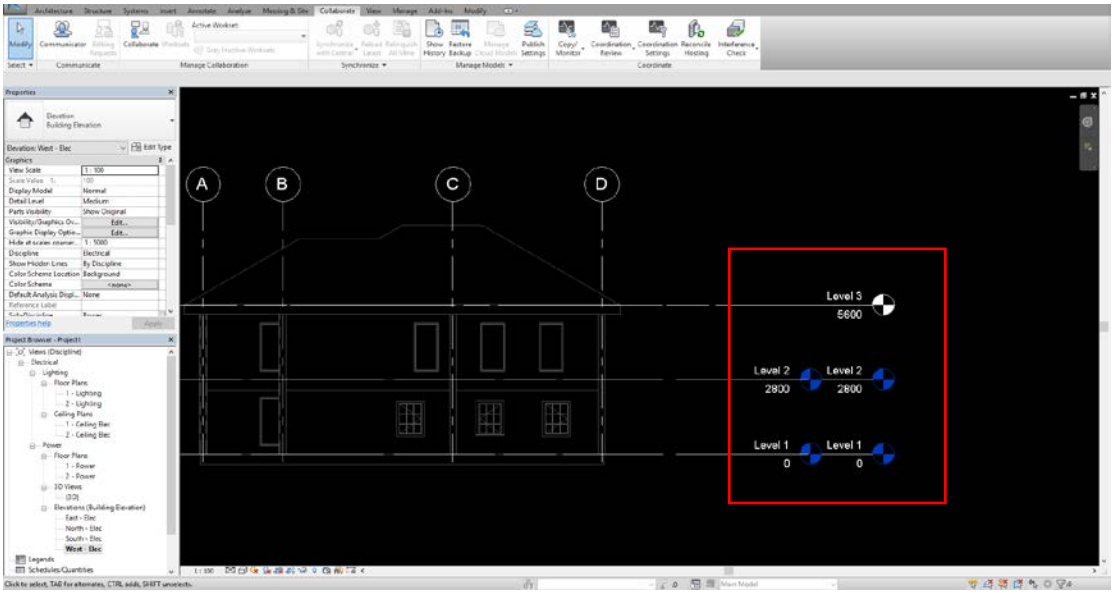




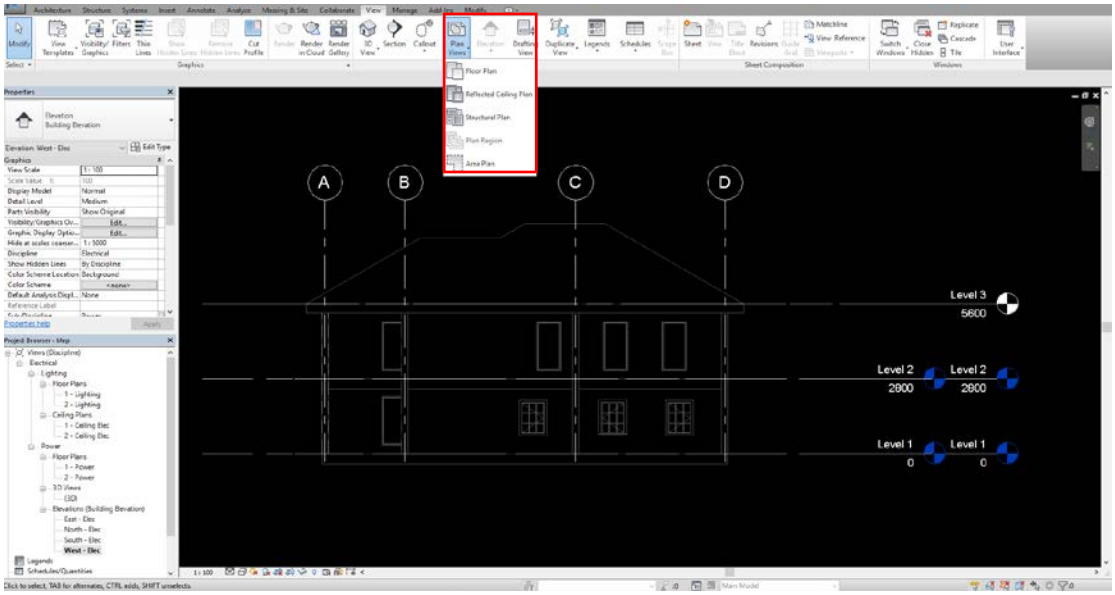
Copy command will duplicate selected levels in specific link and establish monitoring.

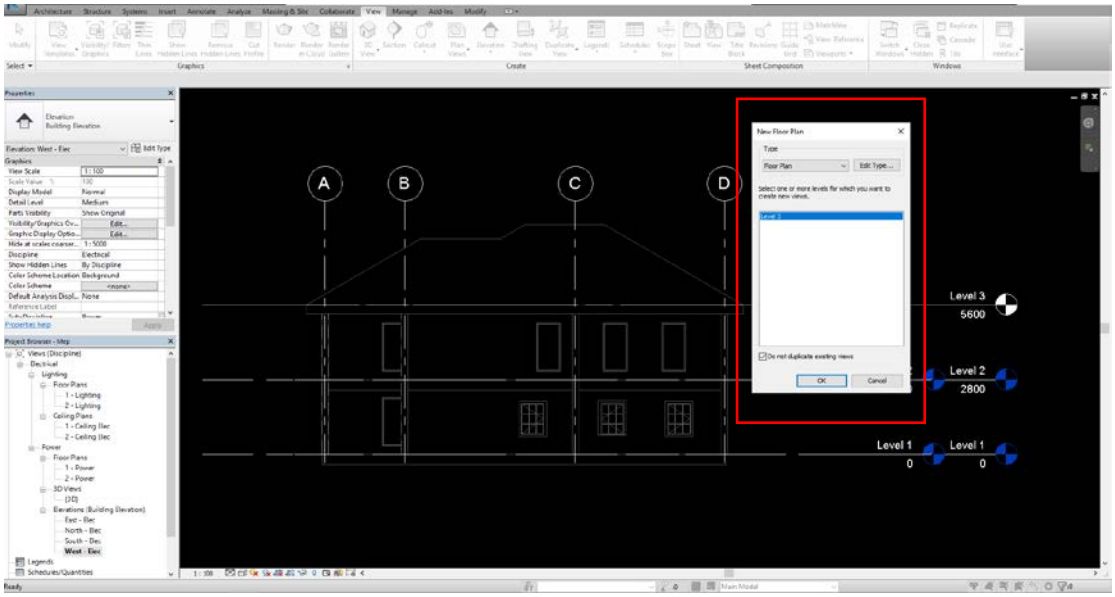


Select architectural levels, then click Finish. Noticed that our default levels have been matched and monitored perfectly.



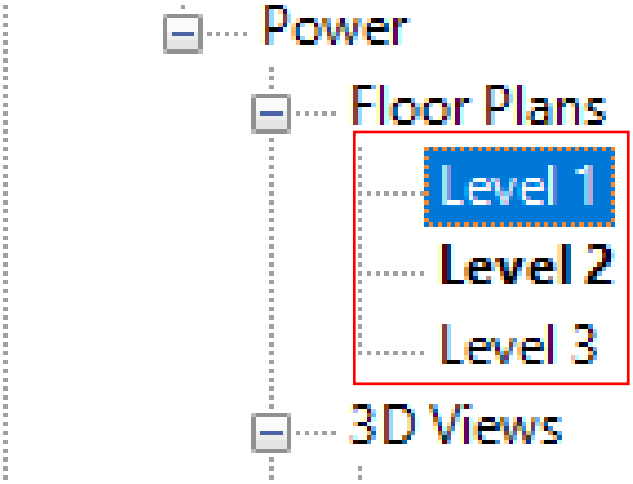
Level 3 has a black and while datum due to missing corresponding plan. To fix it, go to **View** tab.





Click ok and problem solved.

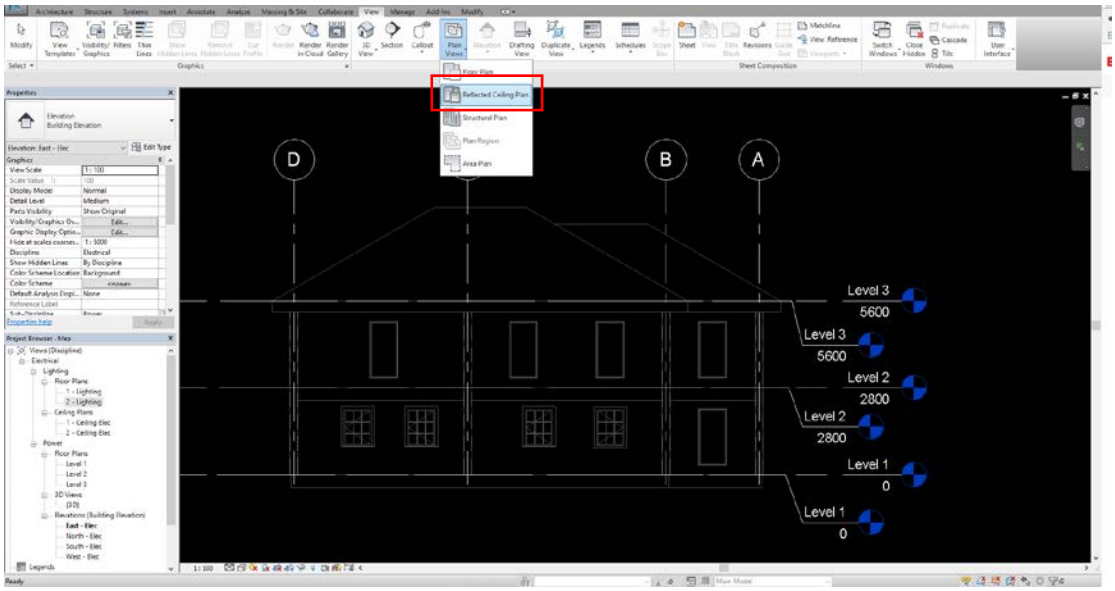
Rename your levels to **Level 1** and **Level 2** in Project Browser.



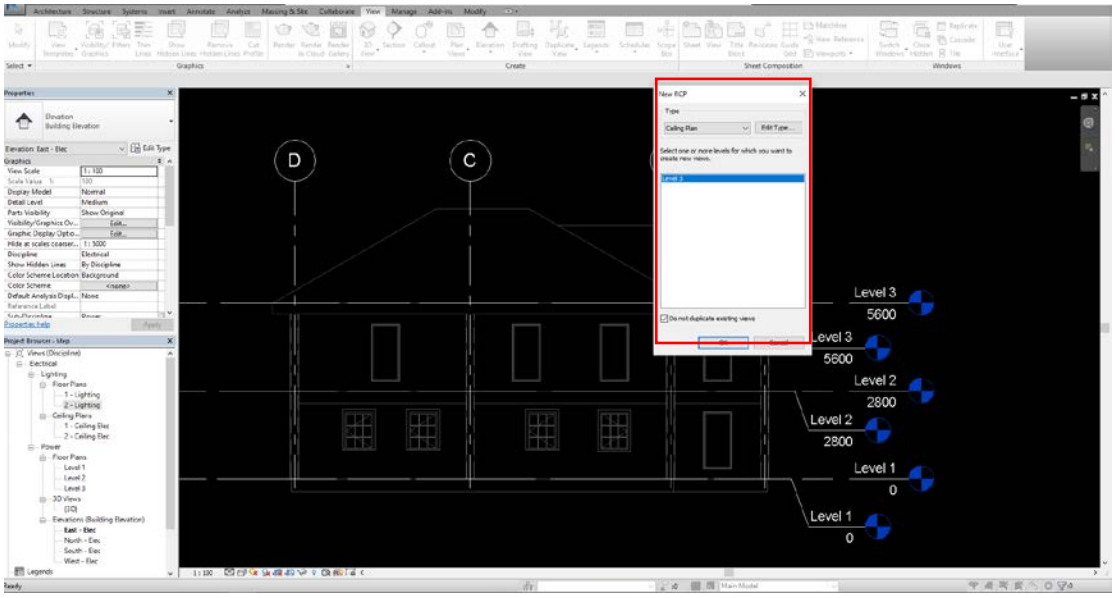
1.6 Creating floor plans

Adding missing plans.

1. Go to View tab, click on Reflected Ceiling Plan

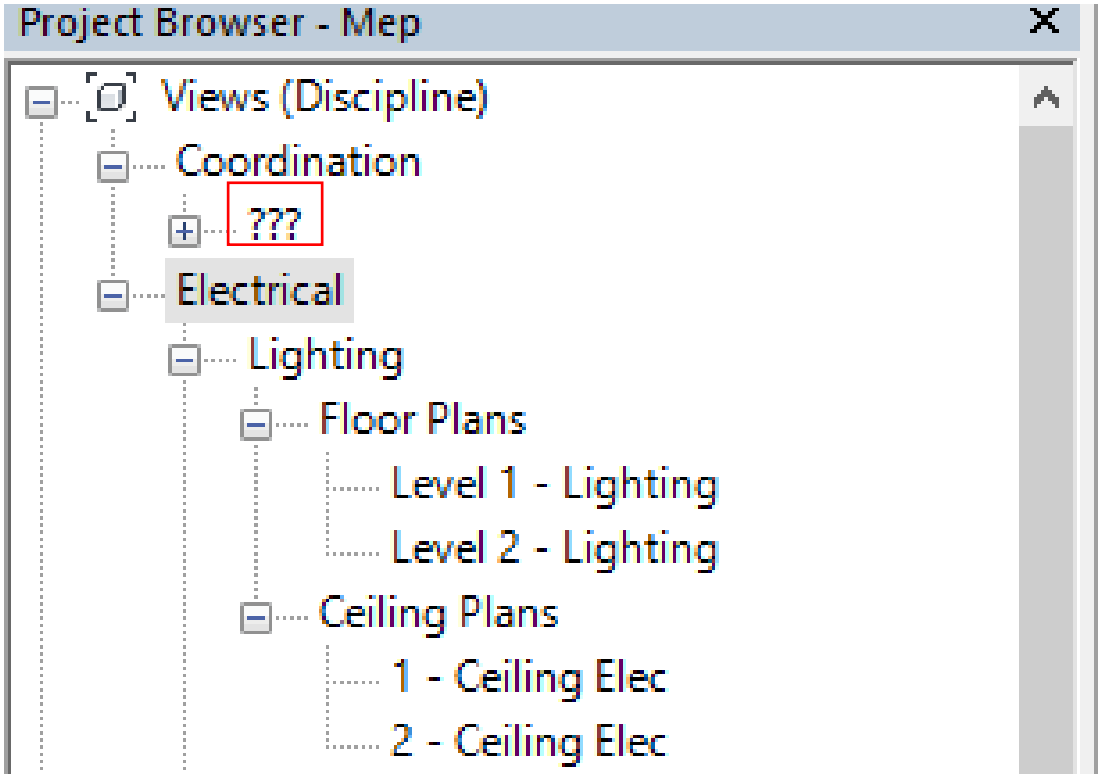


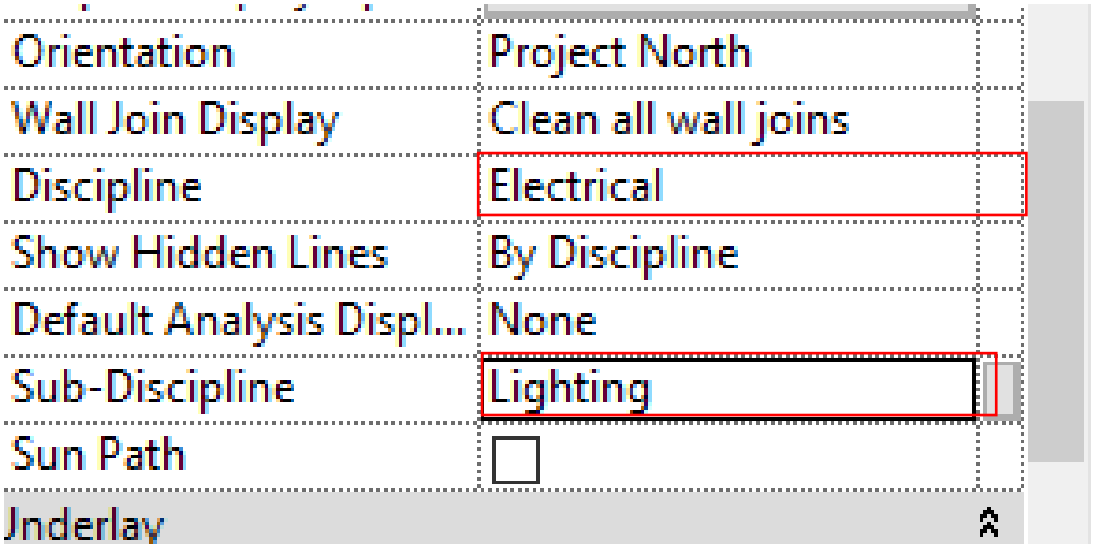
2. Add any missing ceiling plans. (In exercise file there's no need to add ceiling plan to Level 3 since its roof level.)



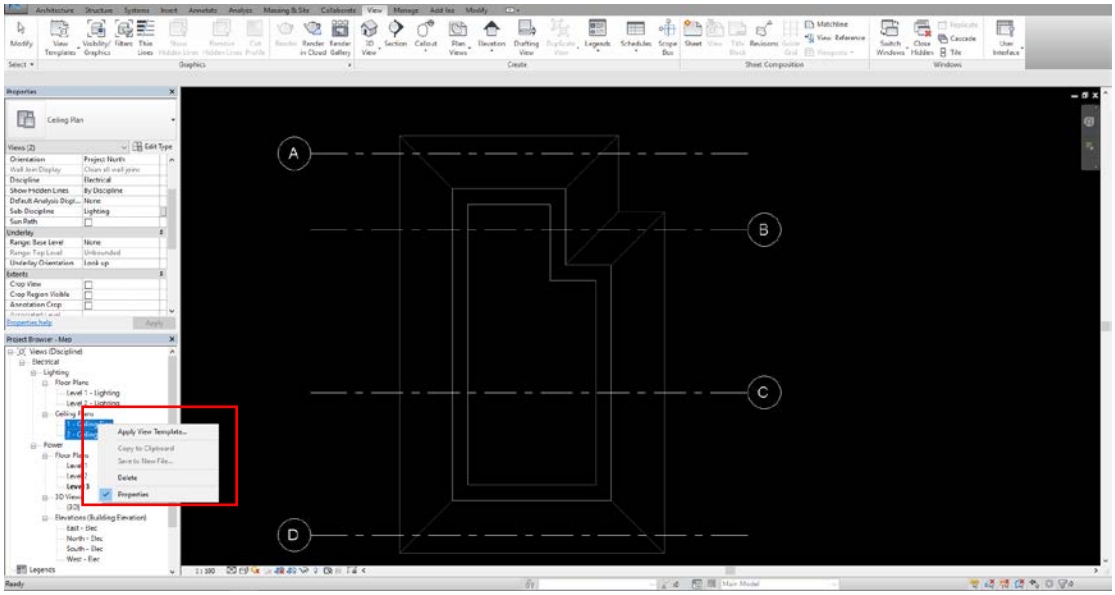
3. Finish adding. In Properties Window, change its discipline to from Coordination to Electrical, sub-discipline from none (what **???** stands for) to Lighting.

.





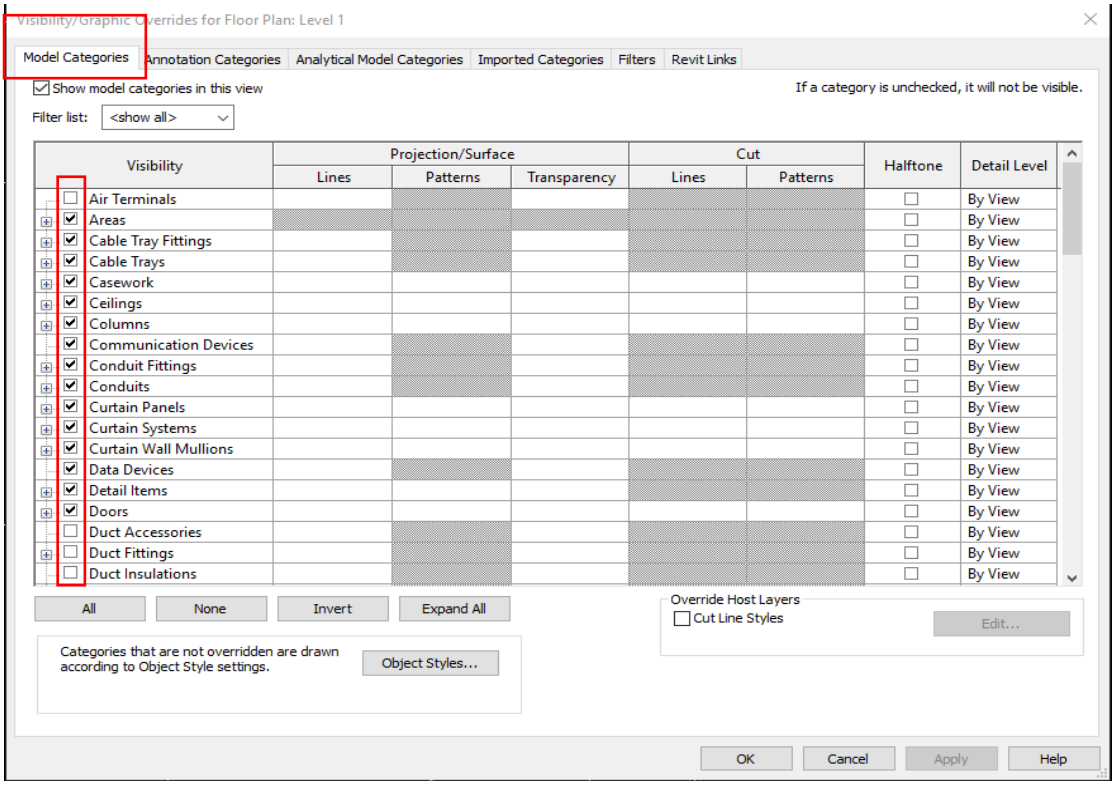
4. Select all ceiling plans in **Lighting** then right click.



Click on **Apply View Template** to let Revit apply electrical template properties to selected ceilings.

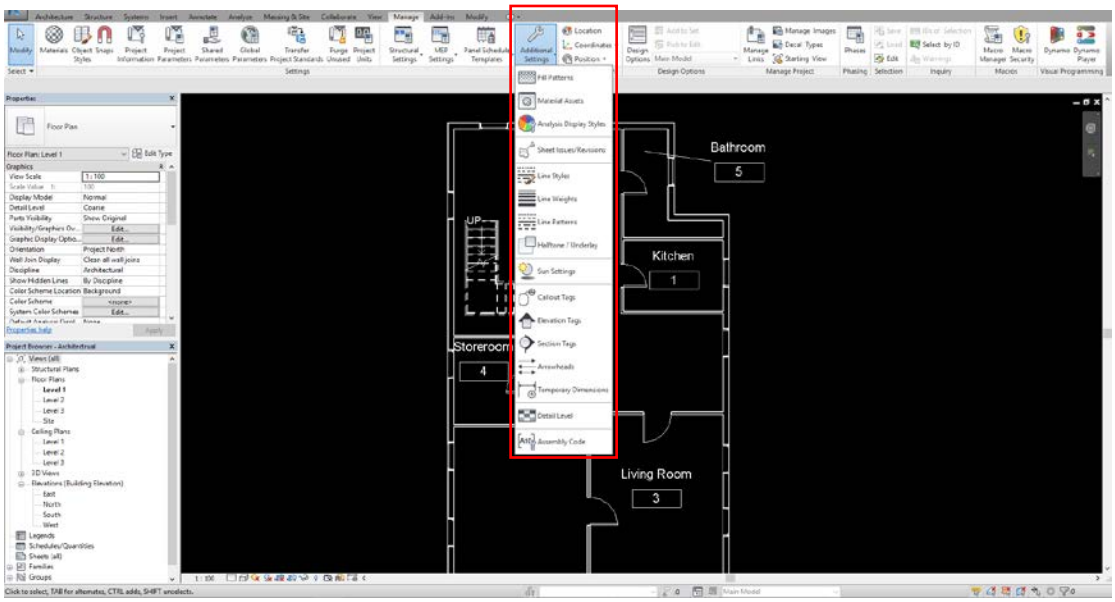
1.7 Viewing the models

1. Go to Level 1 floor plan. Open Visibility/Graphic window (V+G).

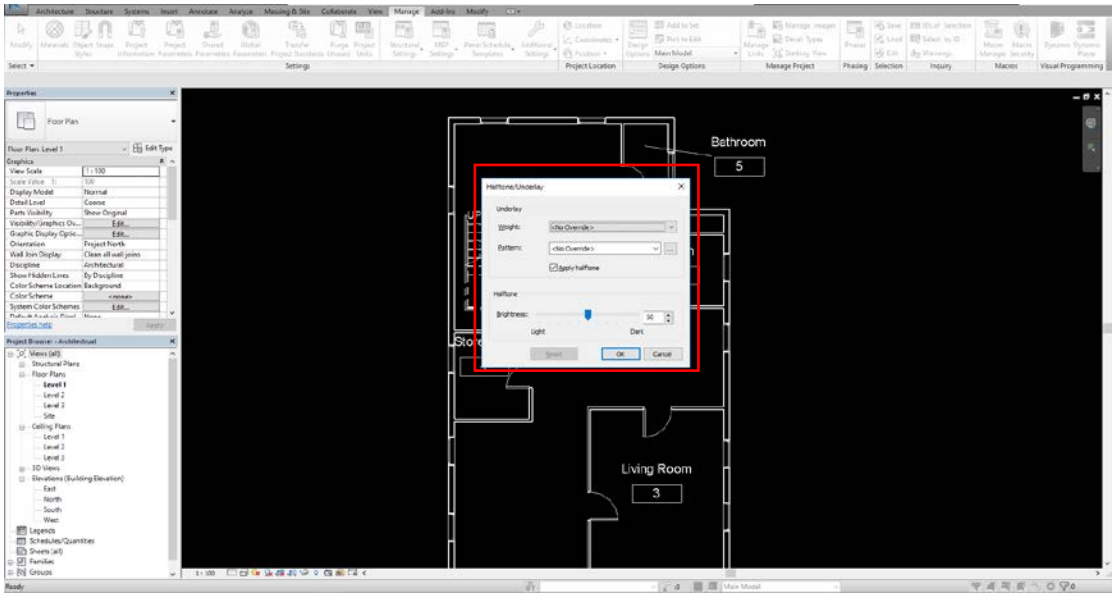


Show/Hide any elements by checking or unchecking associated checkboxes.

2. To make lines darker, go to **Manage** tab, click on **Halftone/Underlay.**

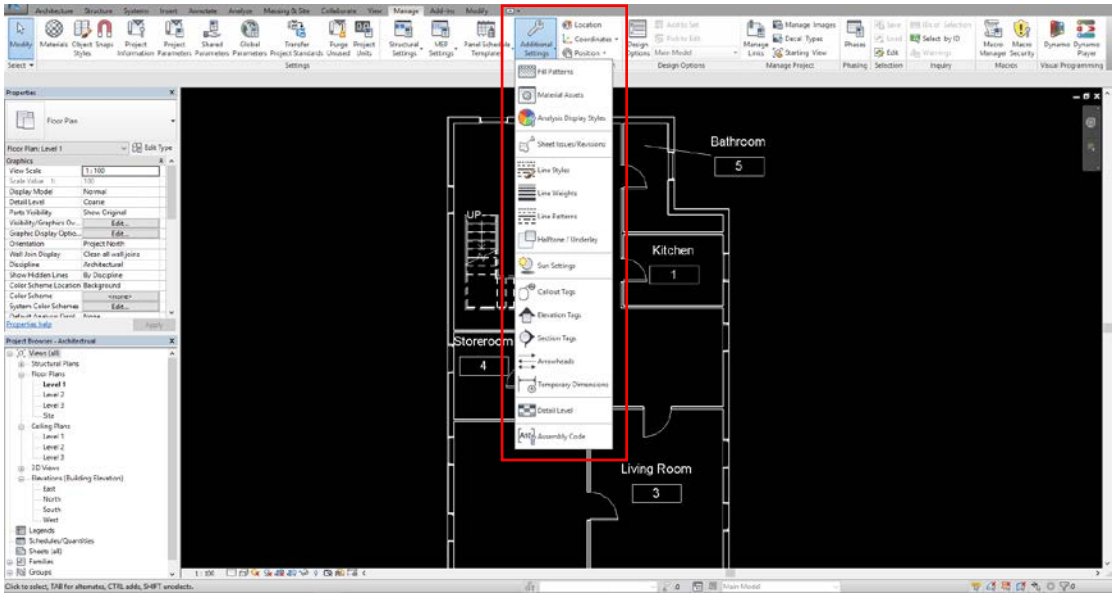


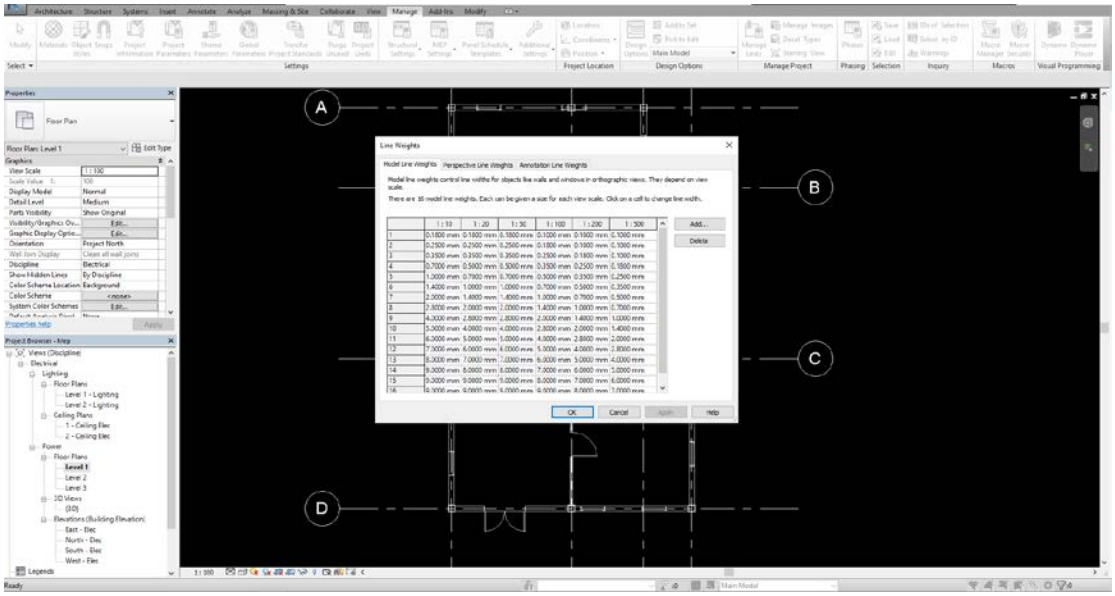
3. Set Weight to 1, Brightness to 80.



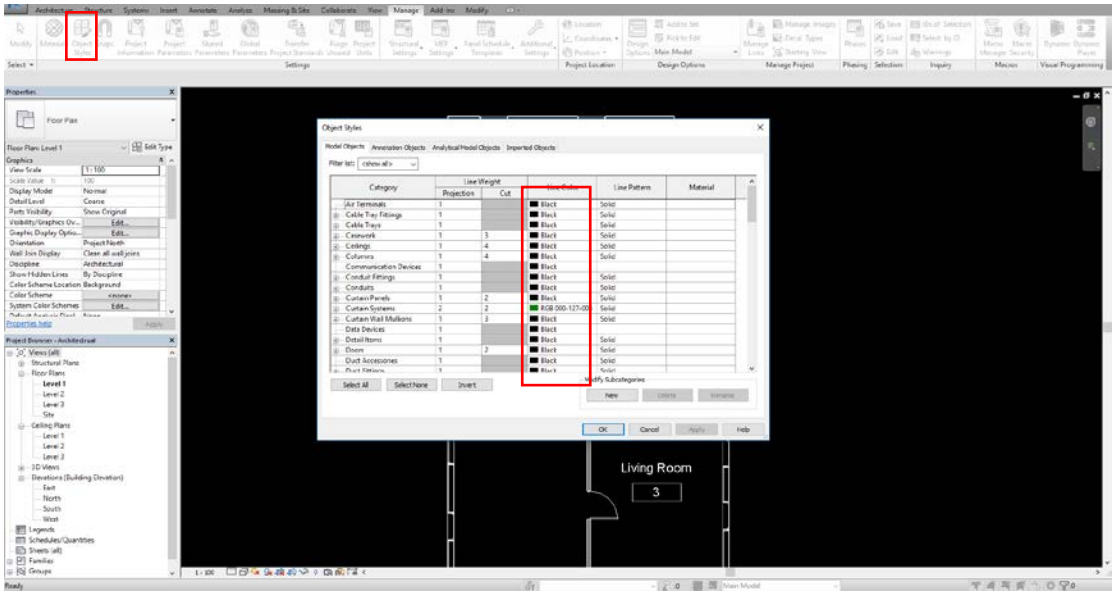
Adjust **Line Weight** and **Line Colours**

1.Go to **Manage** tab and find **Line Weight,** adjust it as you wish.



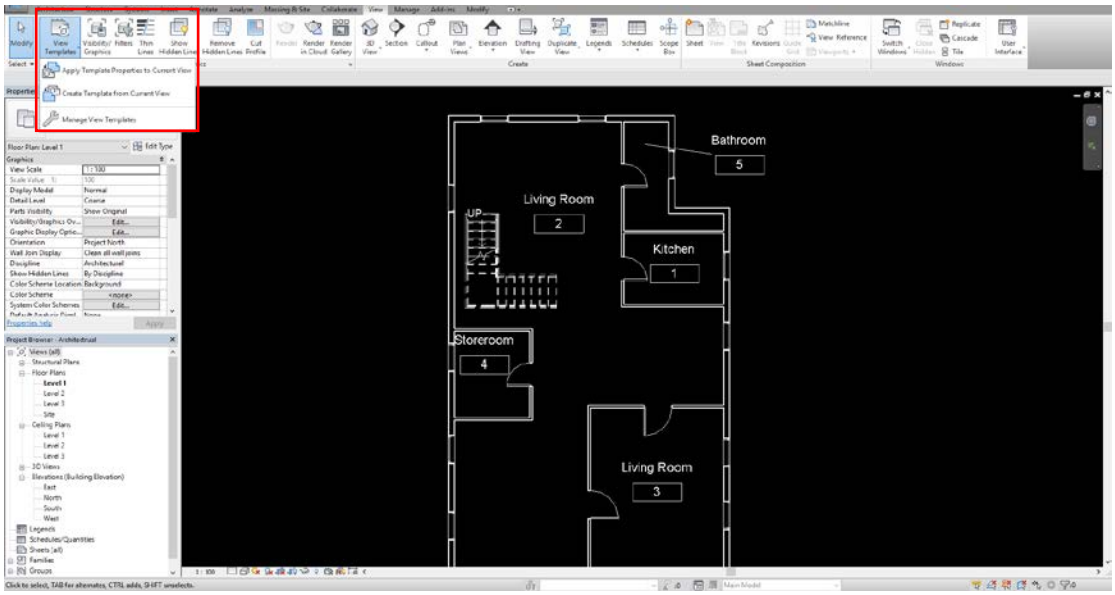


2.Find **Object Style** within **Manage Tab,** change colours to suit your need.

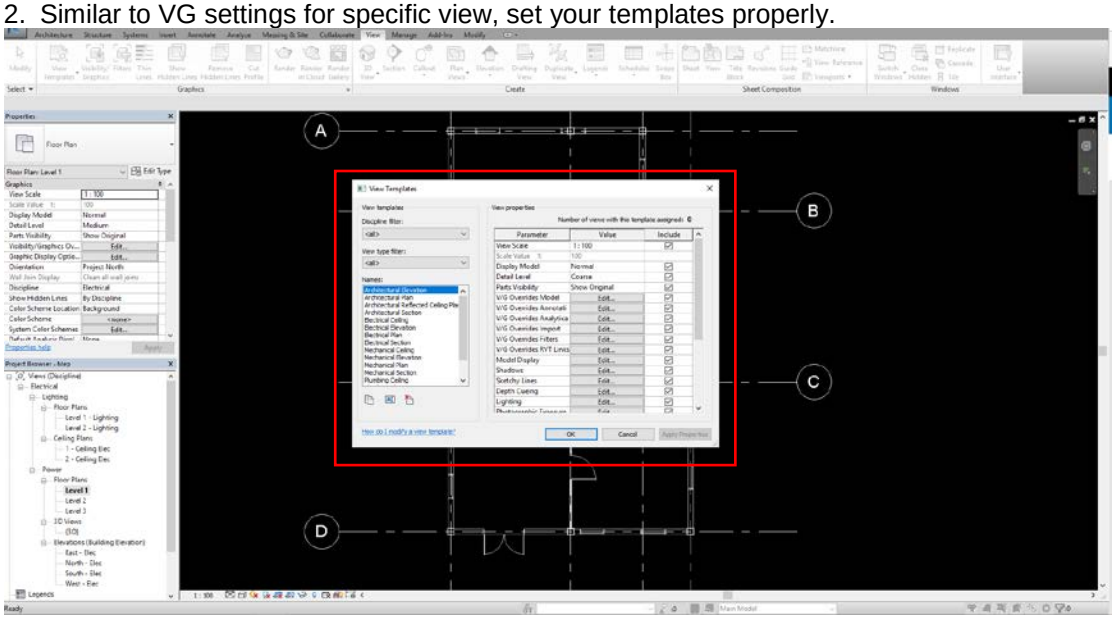


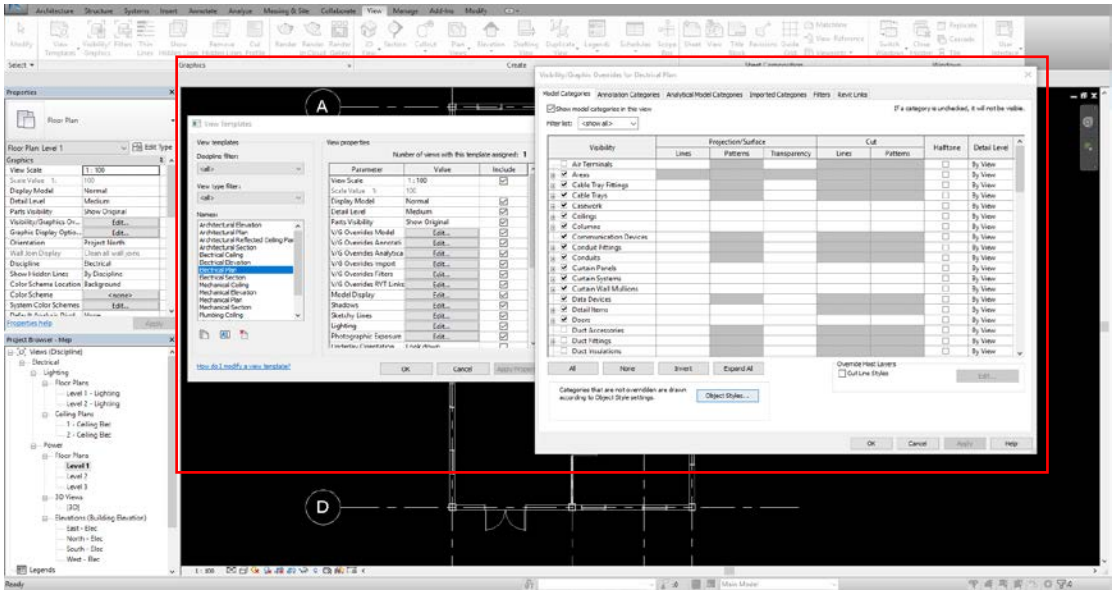
Override Visibility / Graphic settings for your view.

1. Go to **View** tab, find View Templates, click on Manage View Templates in the drop-down manual.

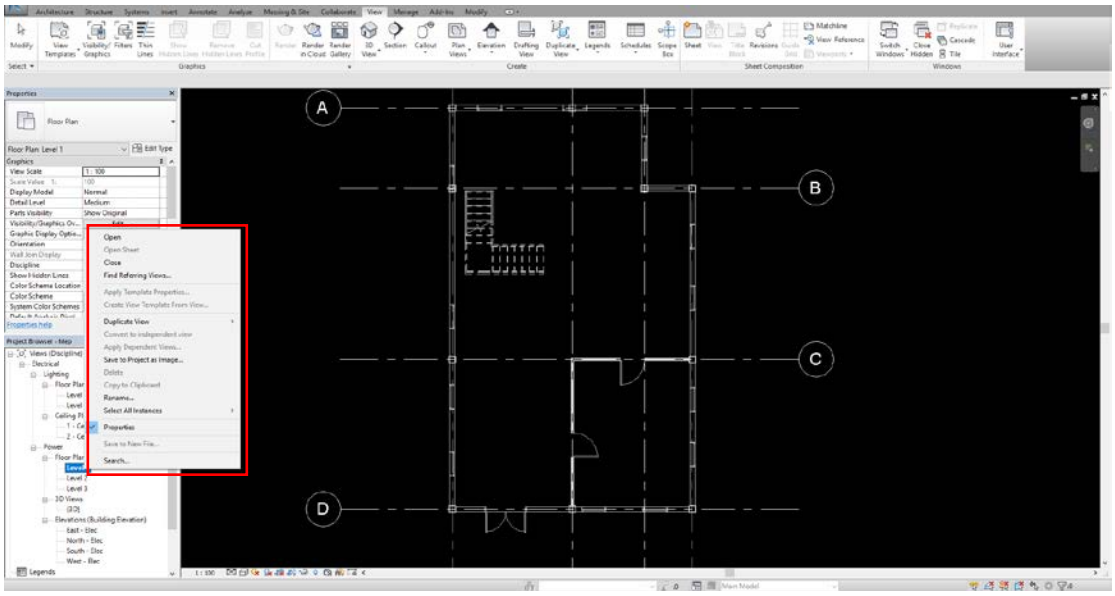


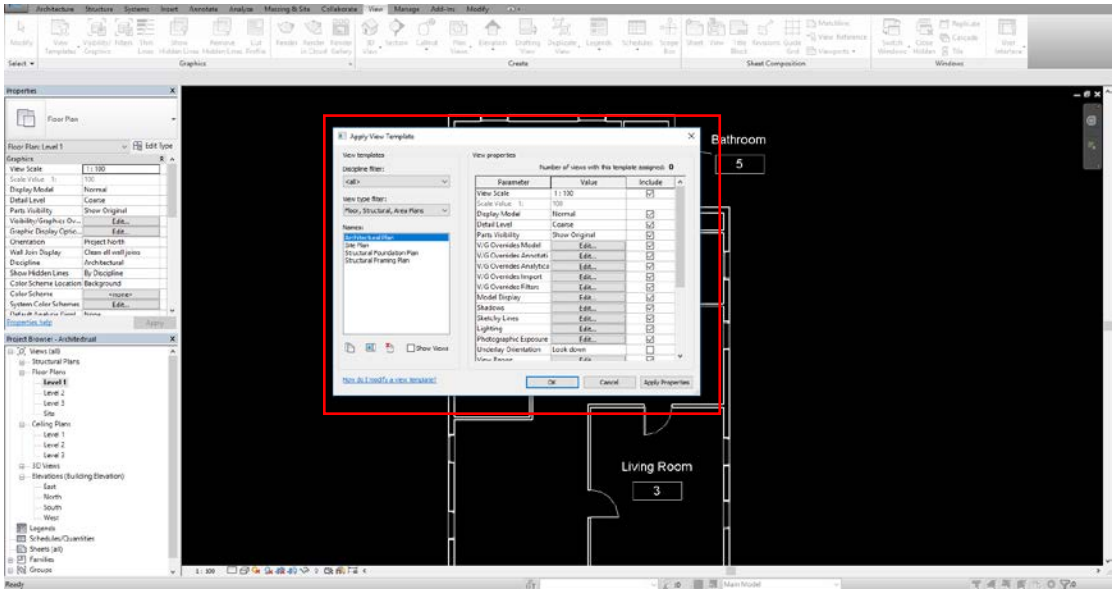
2. Similar to VG settings for specific view, set your templates properly.





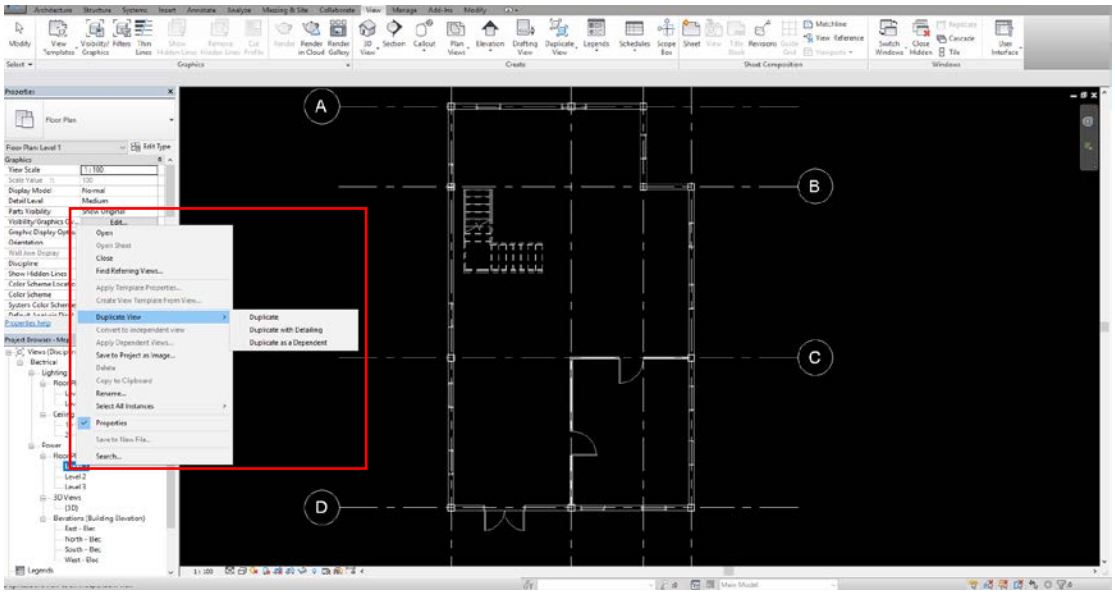
3. In case you want to set certain view's VG back to template default, right click on the view, click **Apply Template Properties**. Choose **Electrical Plan**, then OK.





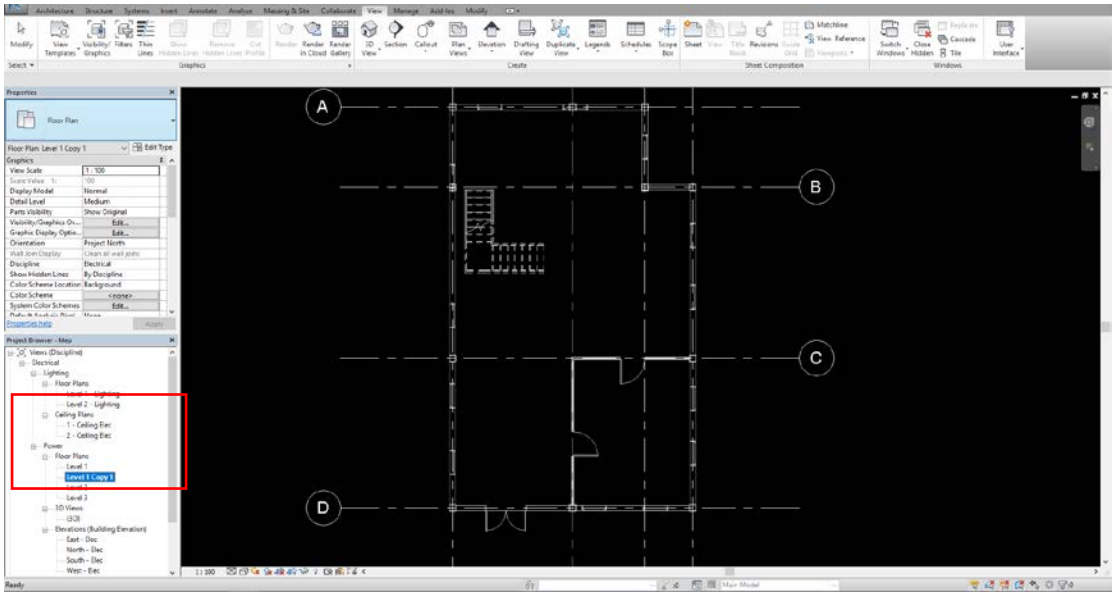
Duplicate a view.

1. Right click on the view, select Duplicate View. Notice that there's three options.



Duplicate only copy models while Duplicate with Detailing will copy dimension and annotations too.

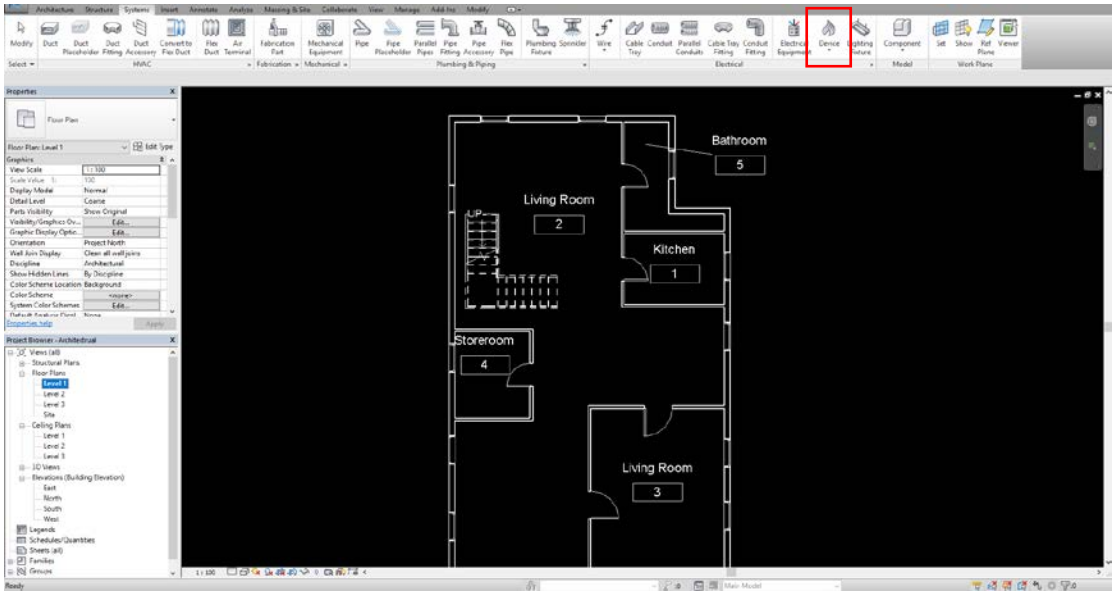
2. Duplicate your view, modify it as you wish without any damage to original view.



2. Revit Electrical

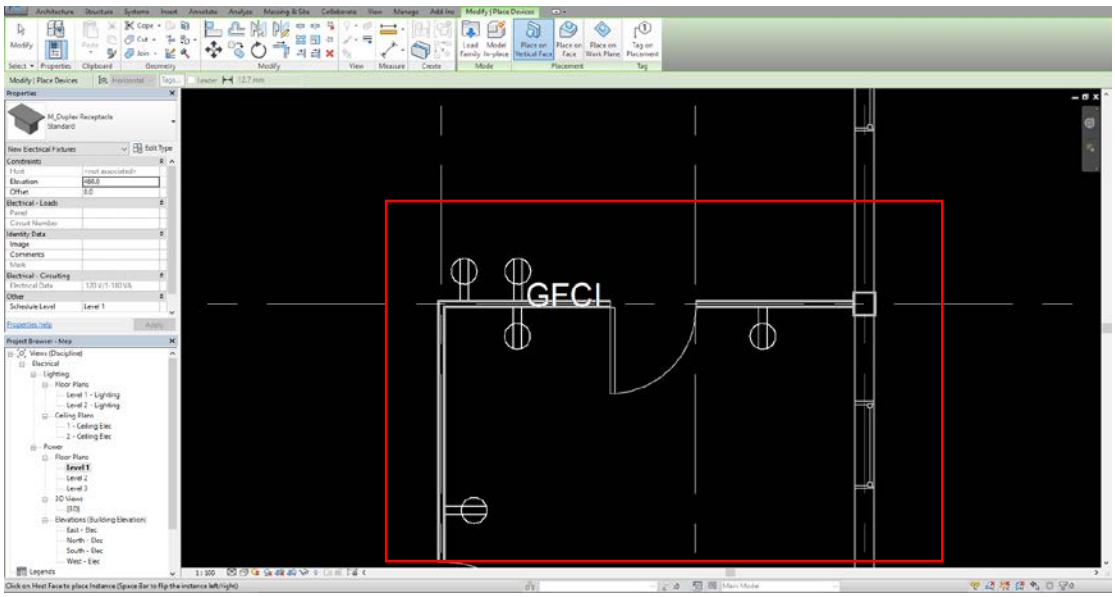
2.1 Adding Receptacles

1. Go to **System** tab, find **Electrical Fixture**.

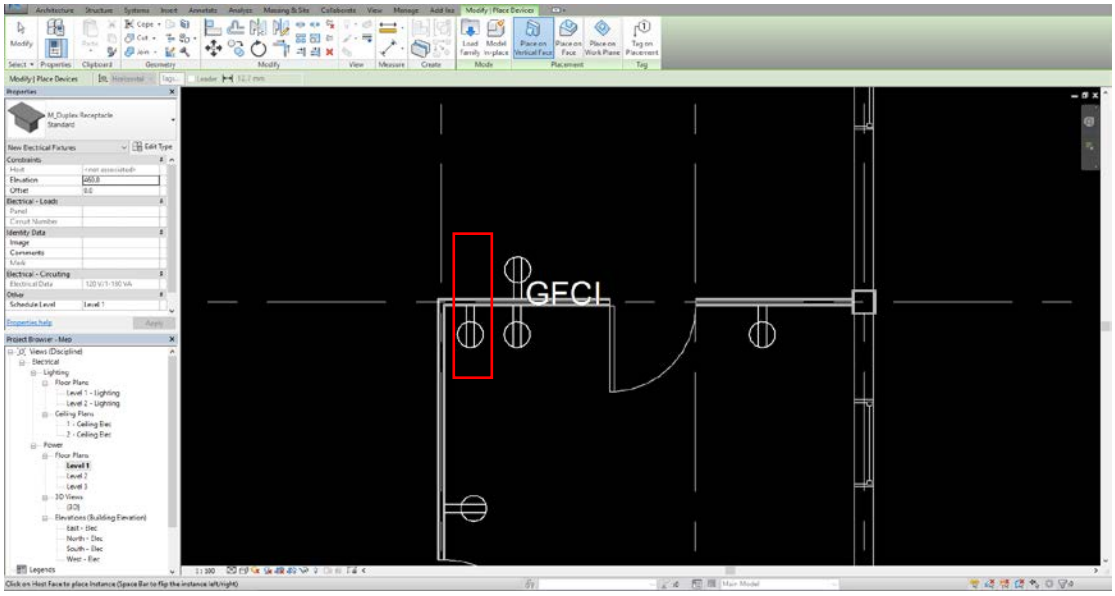


a

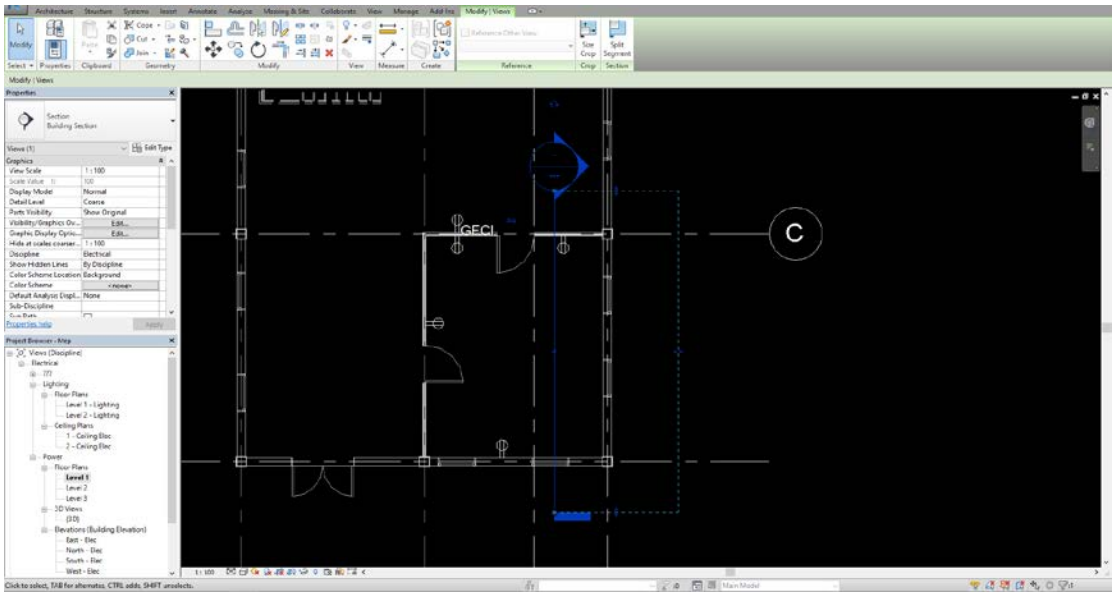
2. Put several **Duplex Receptacle Standard and GFCI** in model.



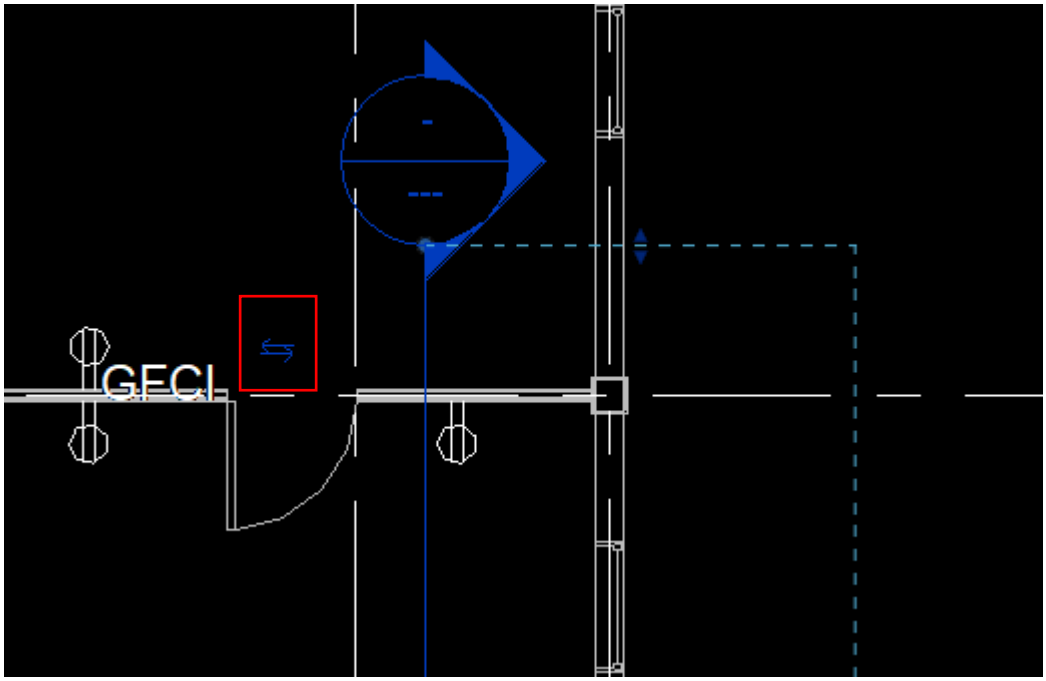
3. By clicking space bar, Revit will automatically snap to proper directions for your fixture.



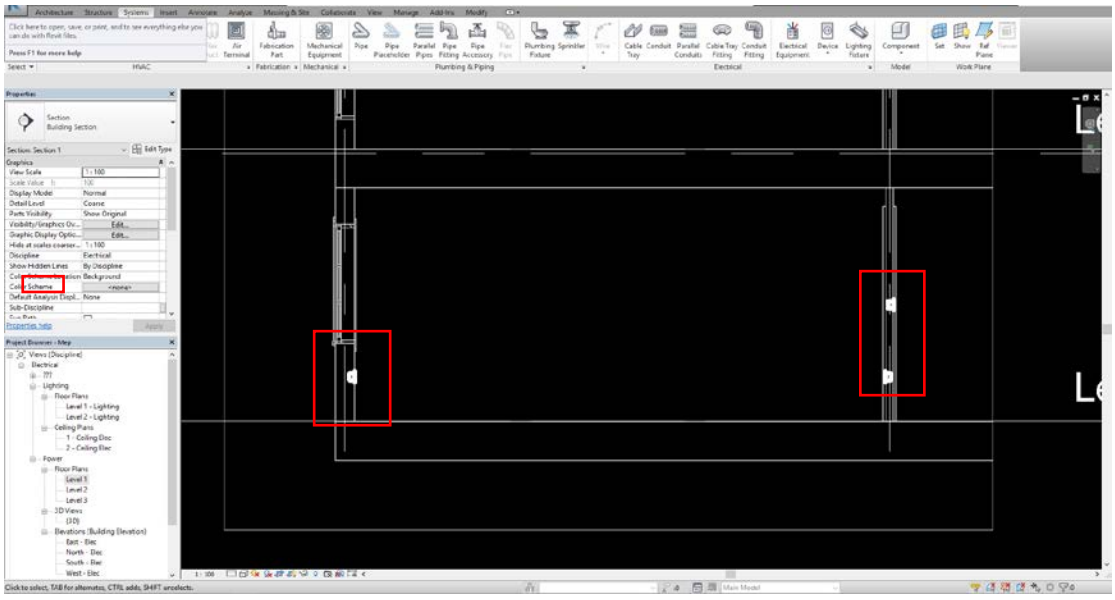
4. Create a section view.



Notice that section view pointing at wrong direction. Simply click **Flip** button.

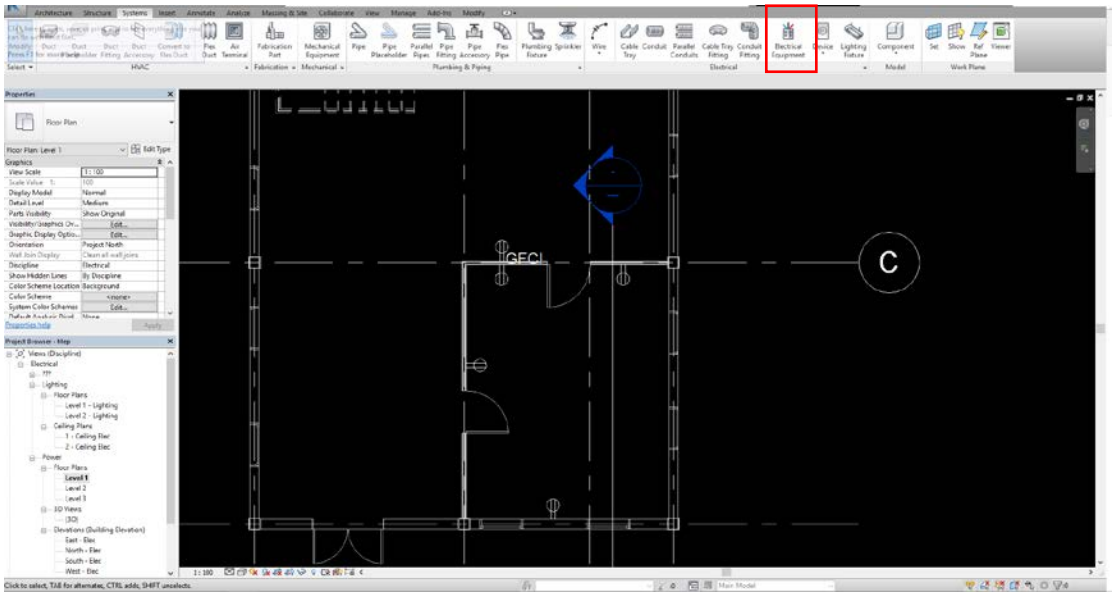


5.Fixtures have been placed properly.

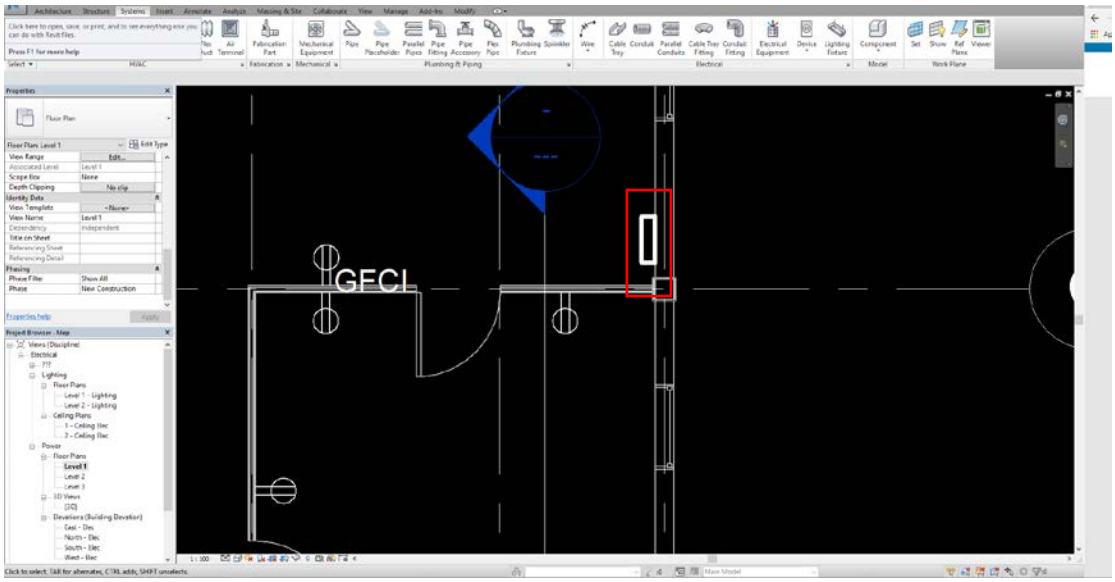


2.2 Adding panels.

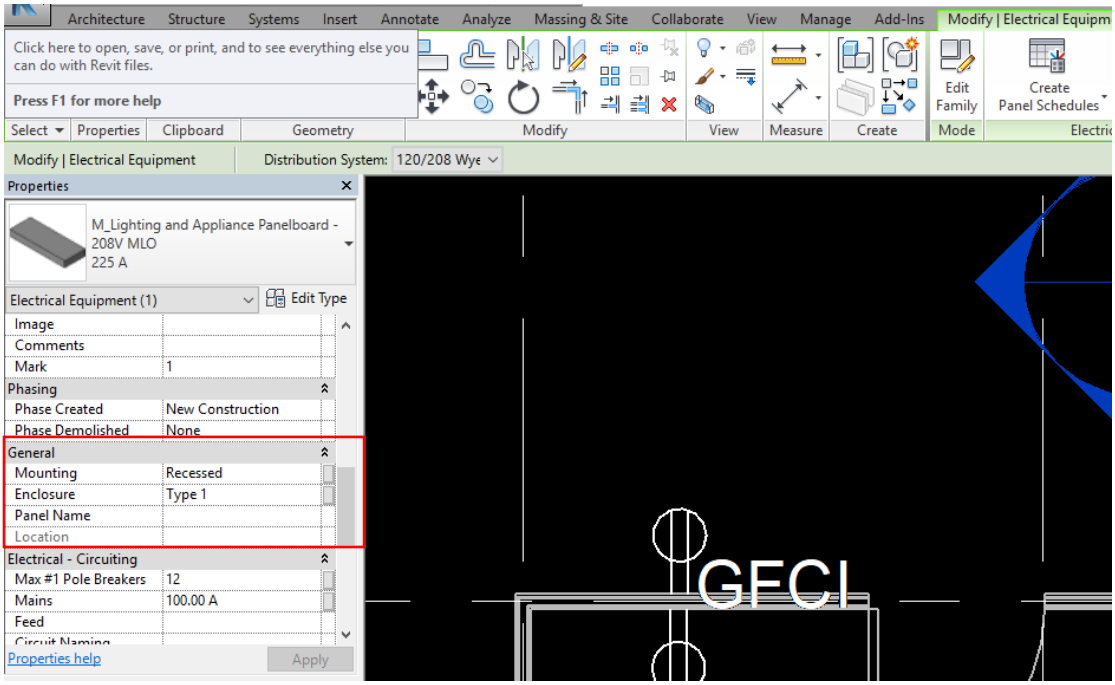
1. Go to **System** tab, click on **Electrical Equipment**.



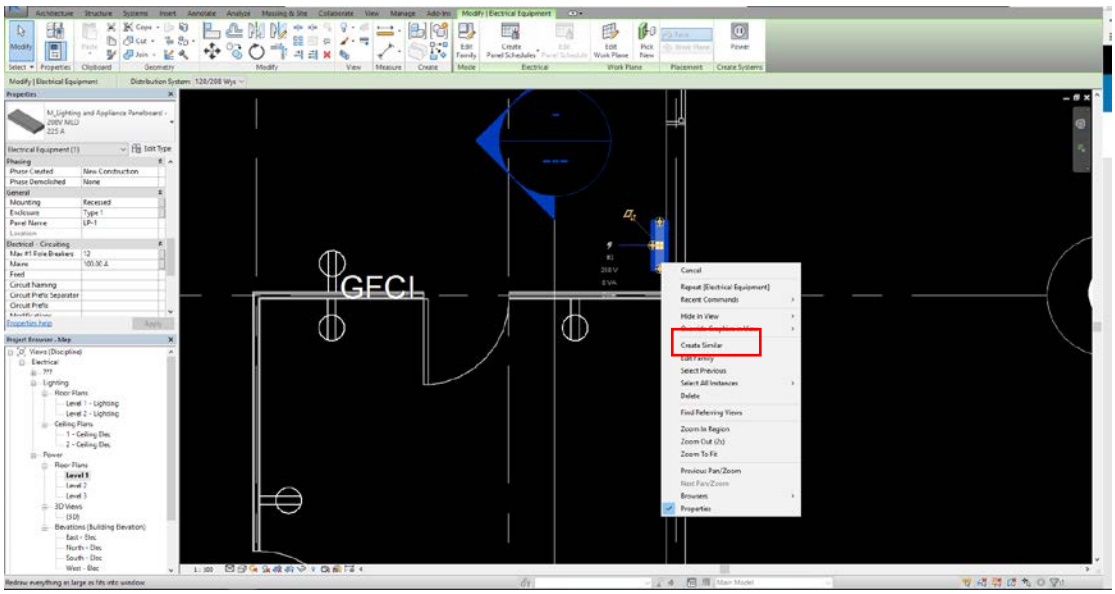
2. Add panel to the wall and switch it from wall mounted to flush mounted by clicking space bar.



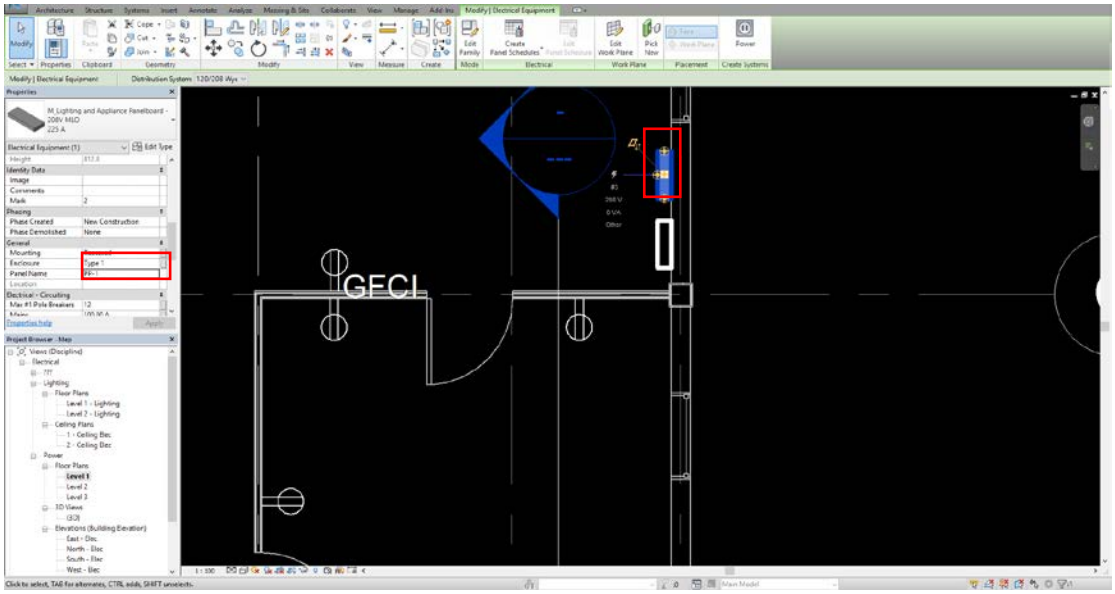
3. Click on the panel, change its name to **LP-1** in properties window.



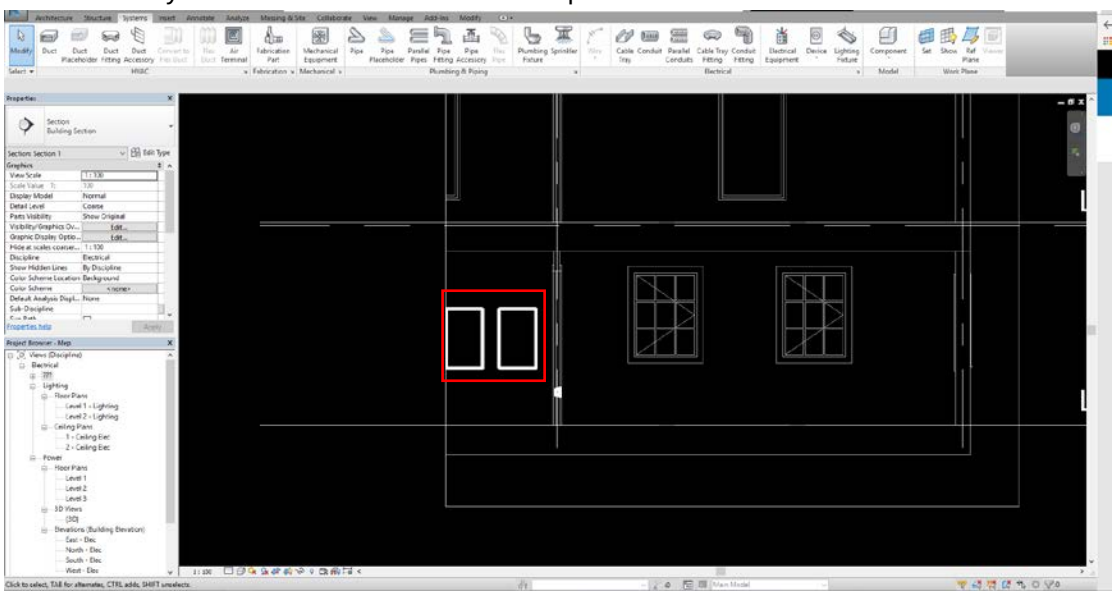
4. Select the panel, right click then **Create Similar**.



5. Likewise, flush mount it to the wall and name it **PP-1**.



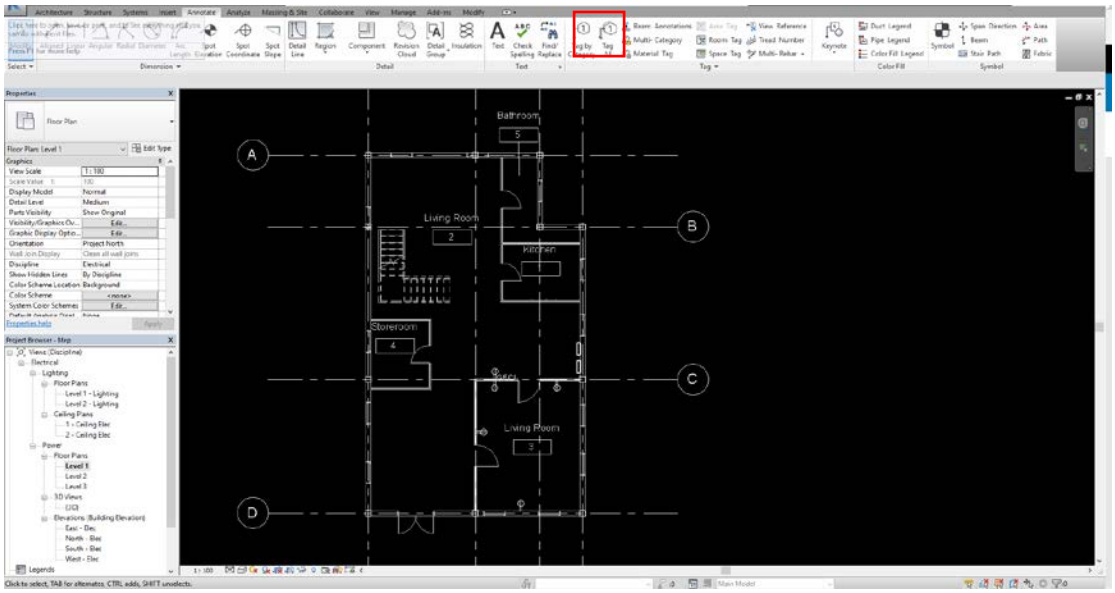
6. Move ready-made section view to check our panels.

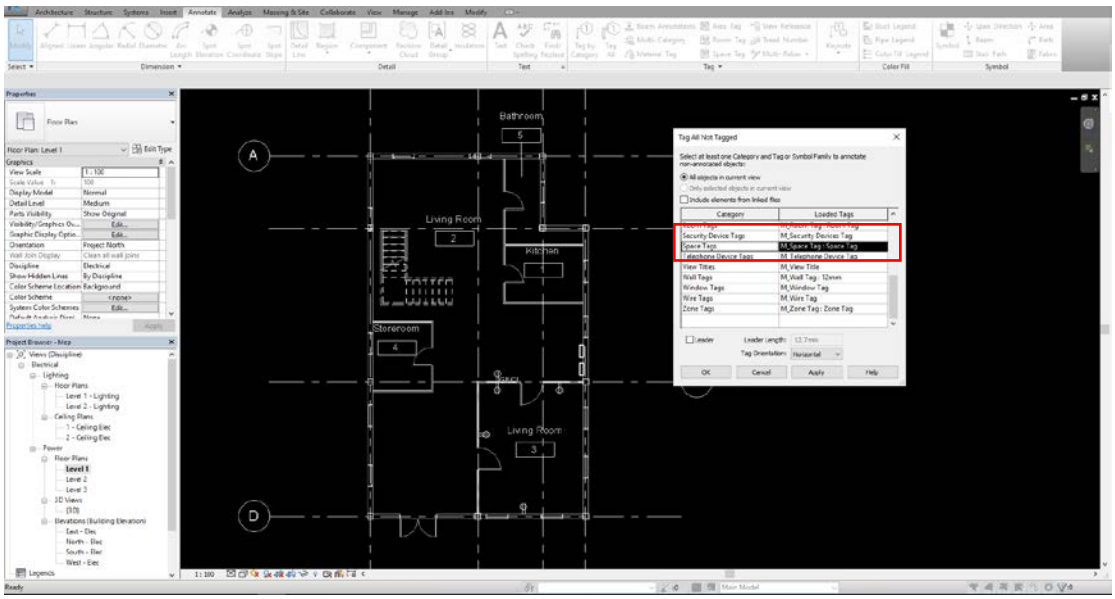


2.3 Creating spaces

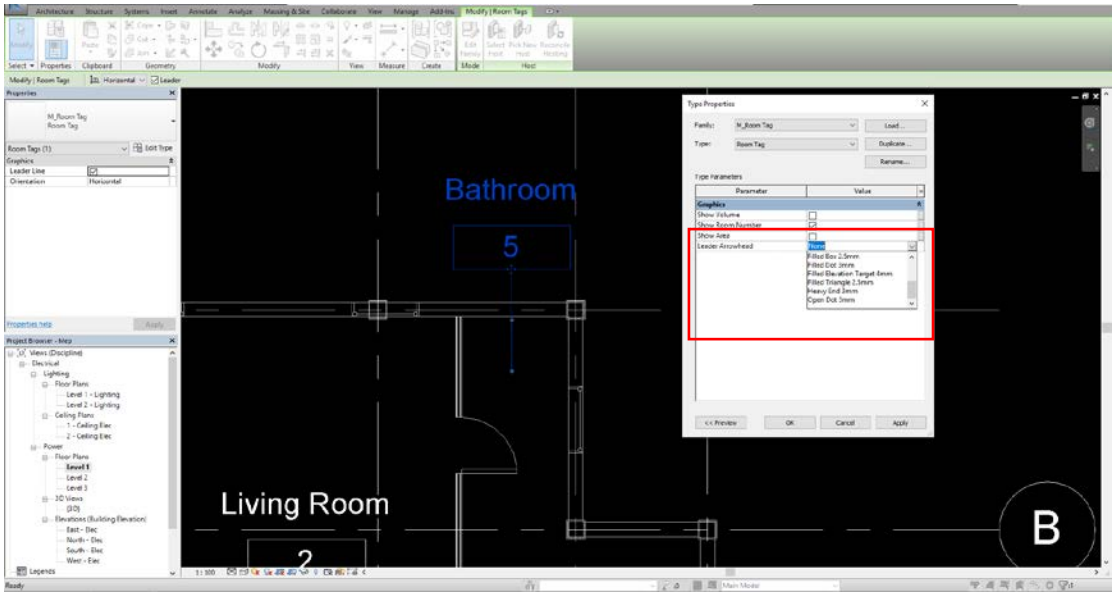
Tag rooms based on architectural links.

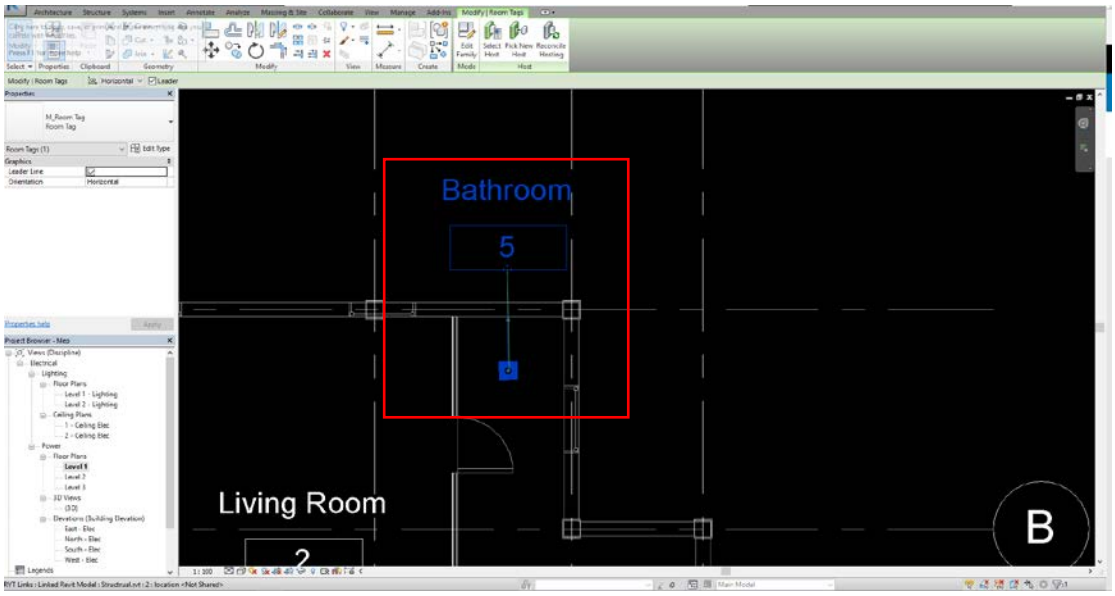
1. Go to **Annotate** tab, then Tag all. Or simply tag rooms with manually if you don't have many rooms in your model.



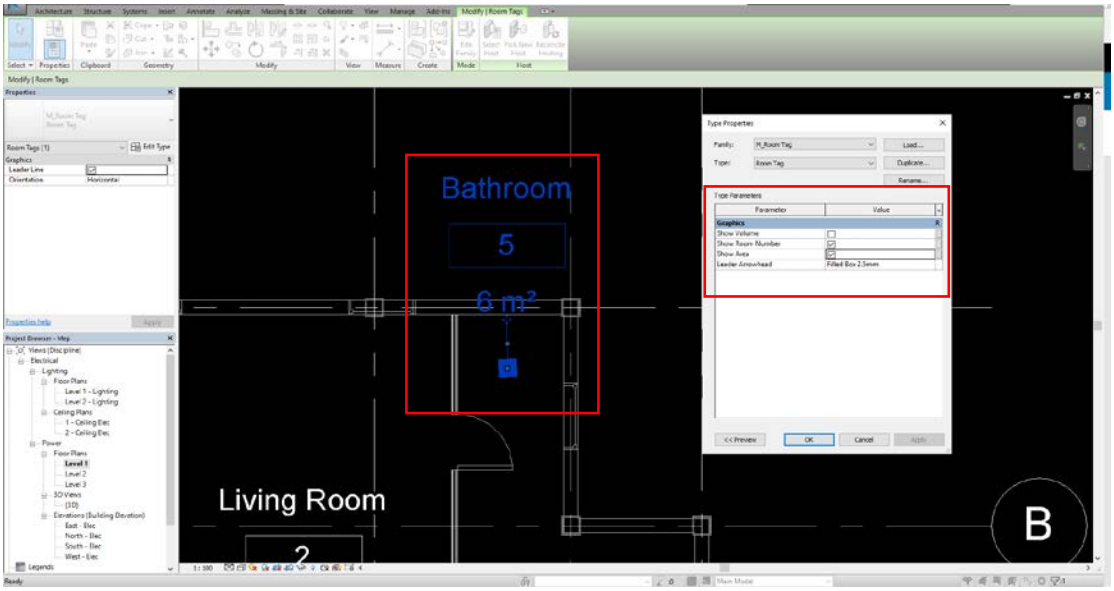


2. Add dot at the end of annotation. Select the annotation, edit type. Choose **Filled Box 2.5mm** for **Leader Arrowhead**.

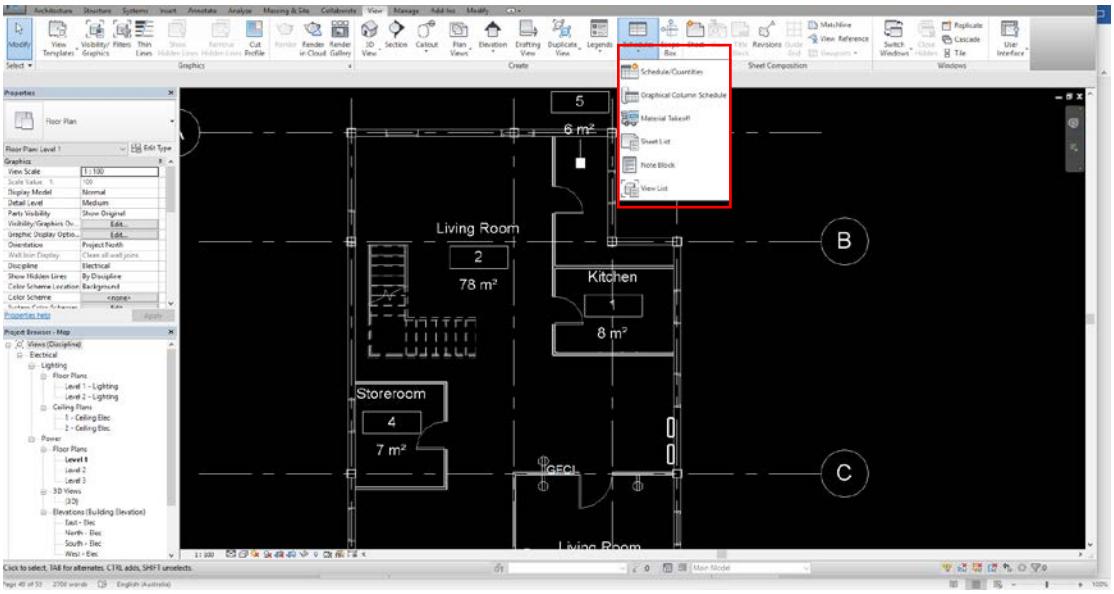




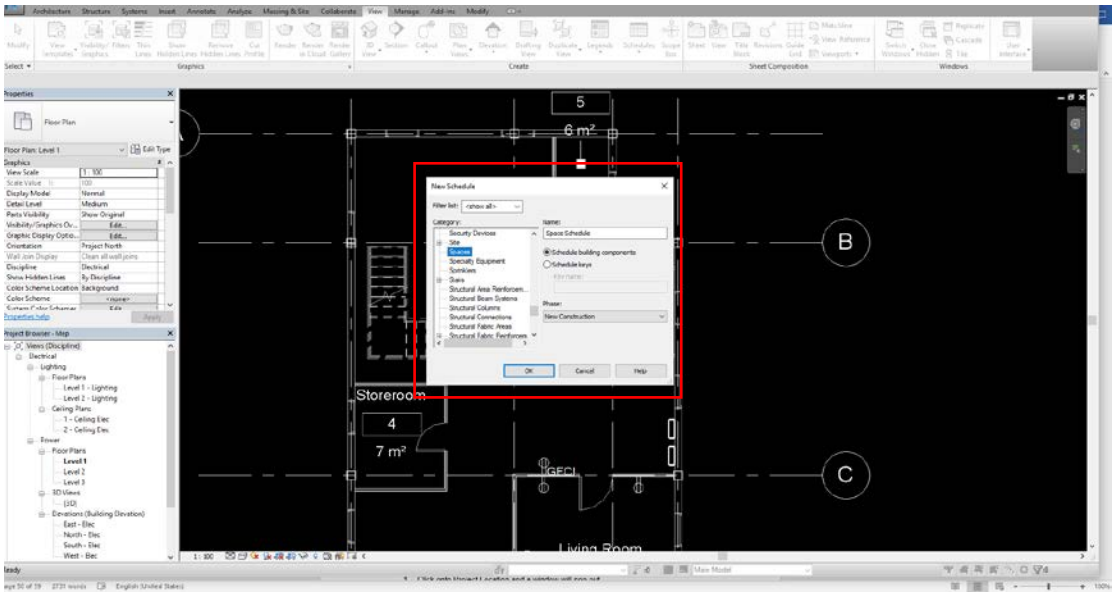
3. Show area in tags. **Edit type**, check **Area** checkbox.

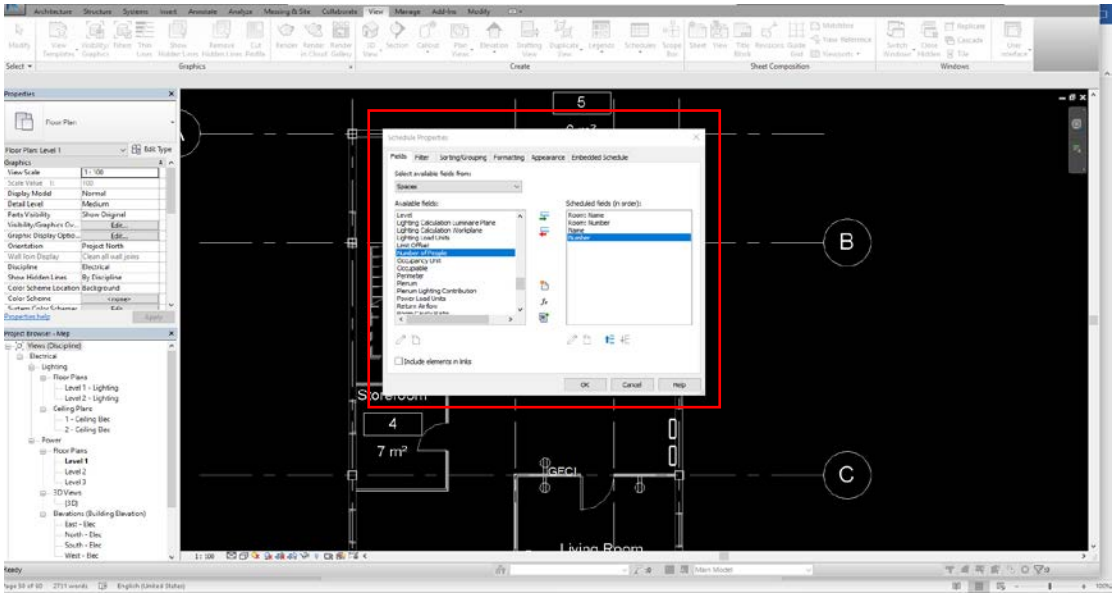


4. Go to View tab, Click on Schedule, then Schedule / Quantities.



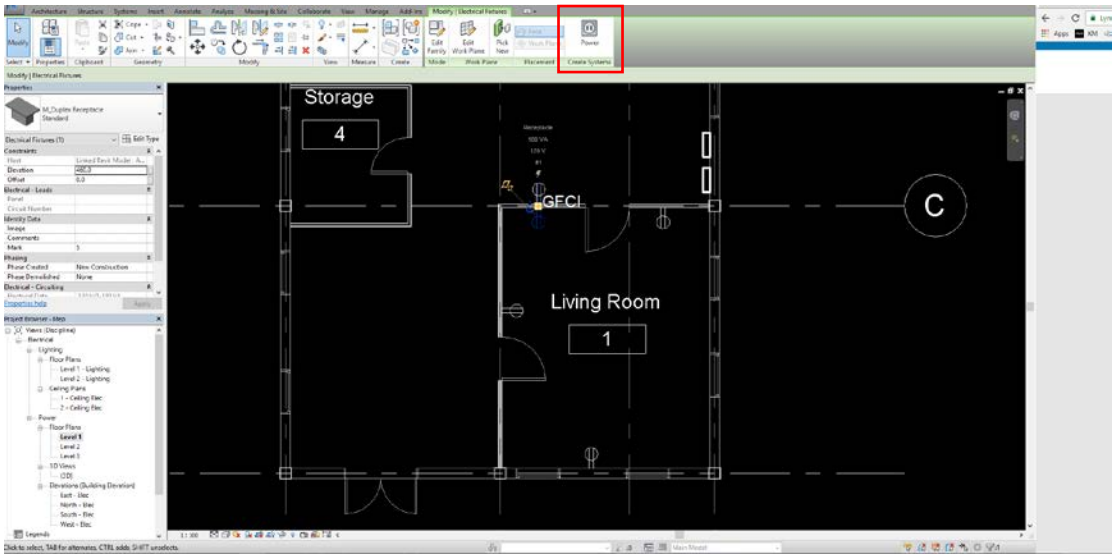
5. Find **Spaces** in drop-down menu, then add in **Room Number** / **Name** and **Space Number/ Name** to the schedule.



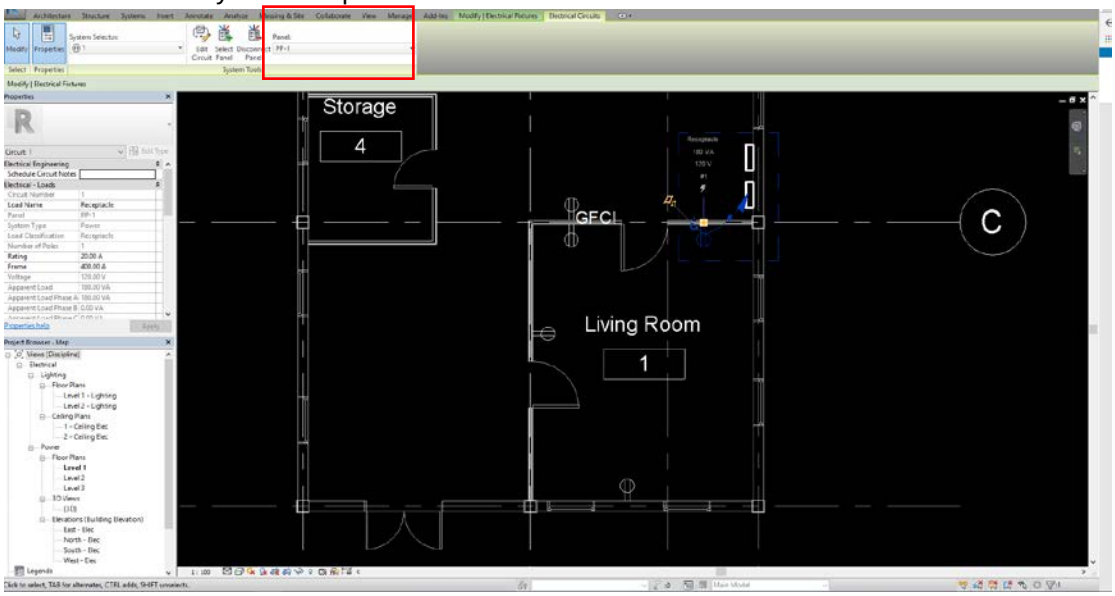


2.4 Creating a circuit

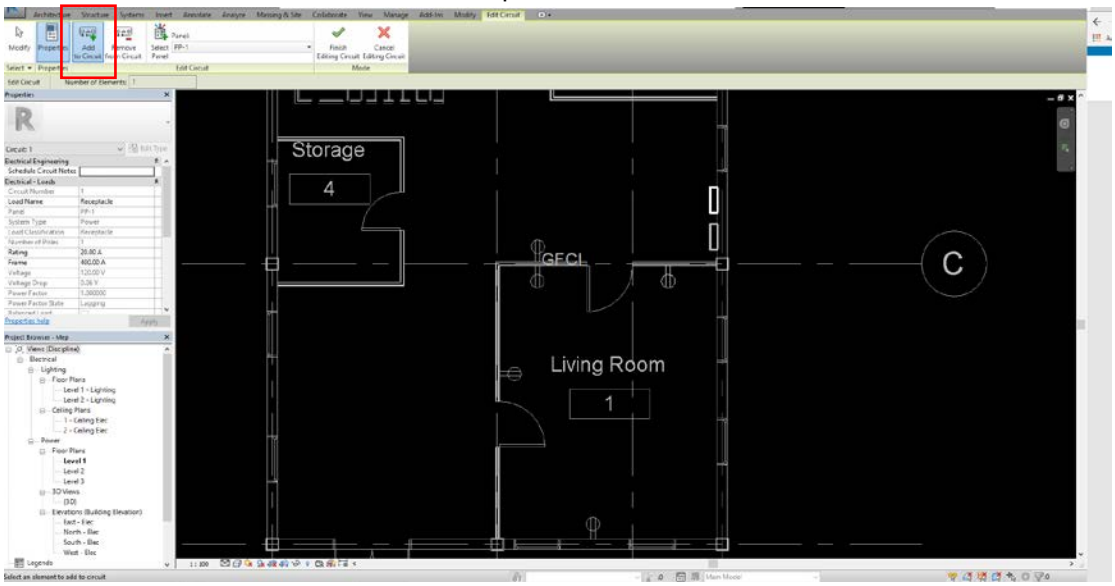
1. Select one of your receptacles, click on the Power icon.



2. Connect it with your PP-1 panel.

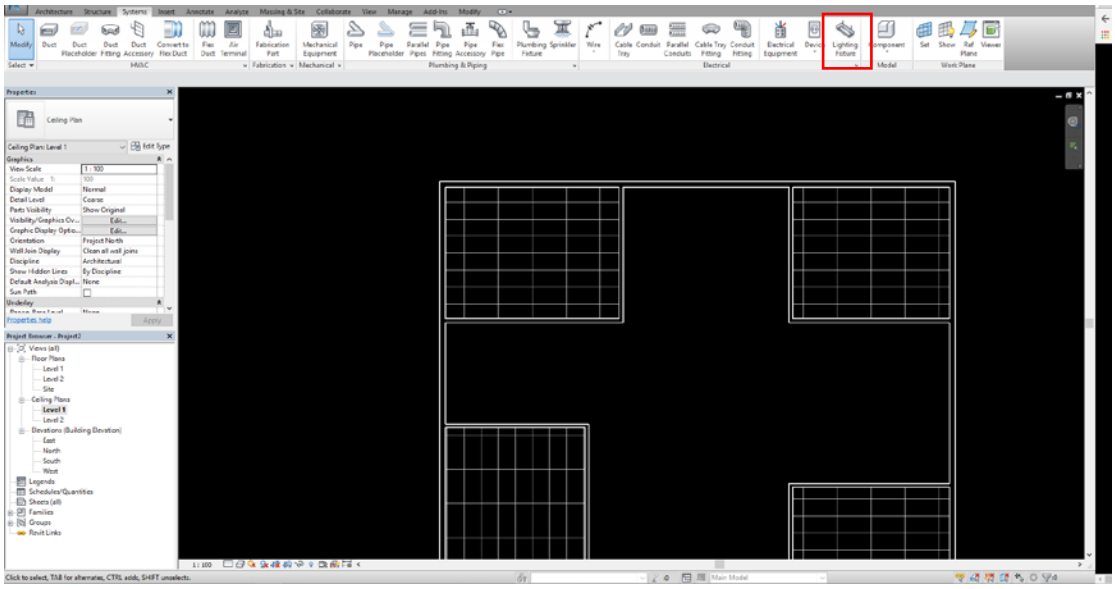


3. Click on Edit Circuit to add in more receptacles.

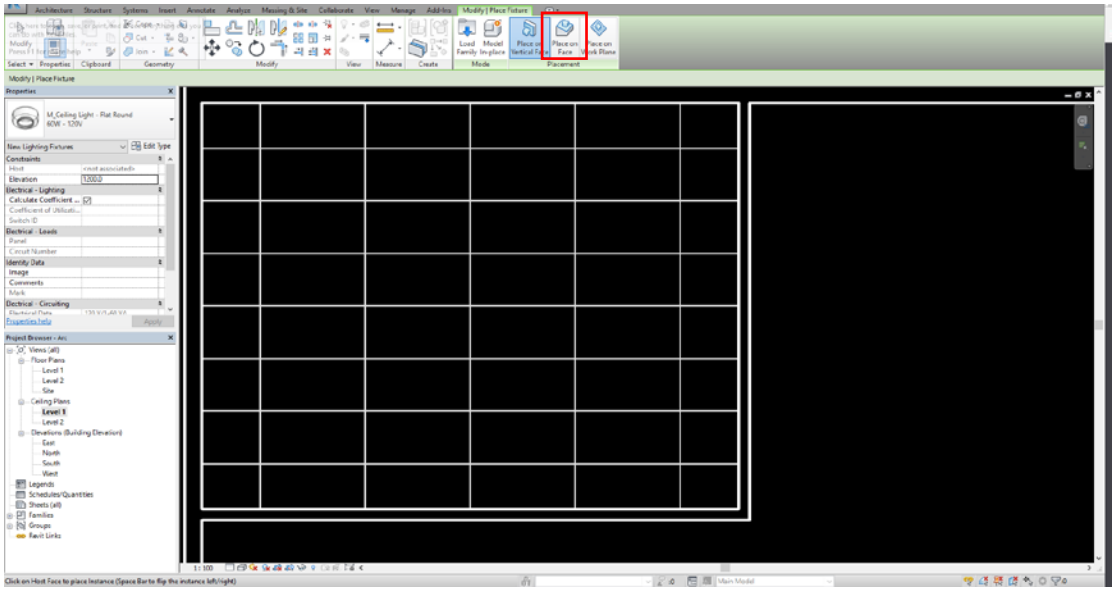


2.5 Adding lighting fixtures

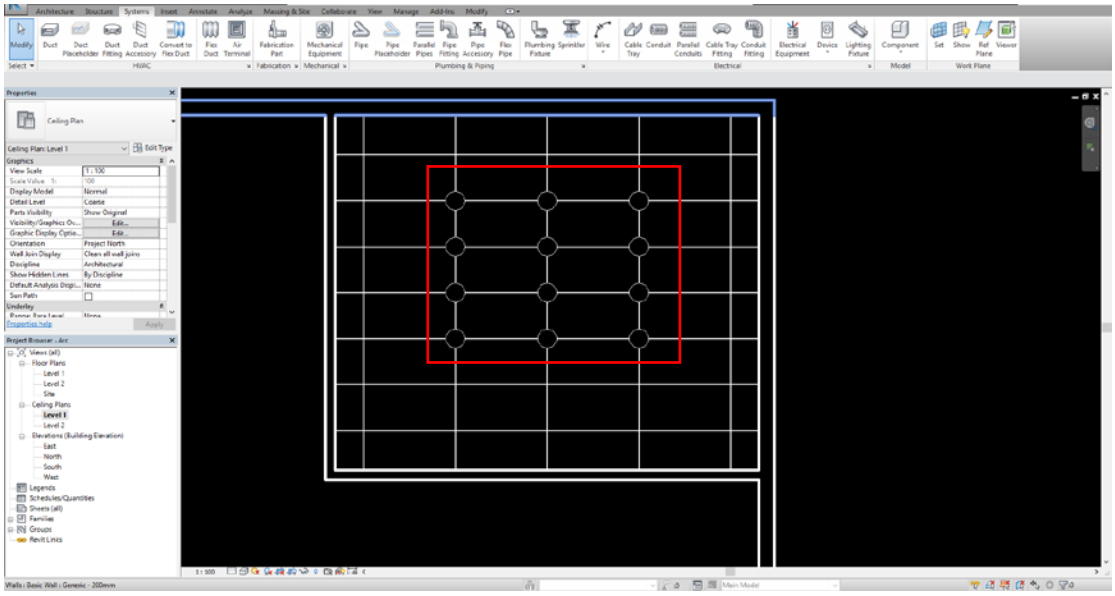
1. Go to one of your ceiling views. Then find Lighting Fixture in System tab.



2. Place lighting fixtures on your ceiling. Remember to place it with **Place on Face** command.

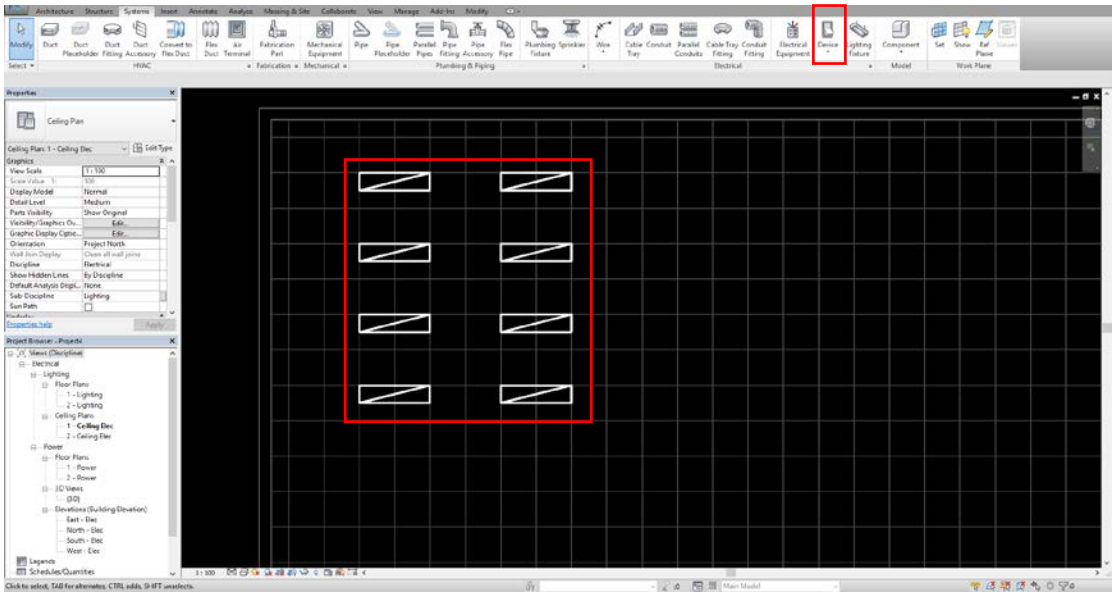


3. Notice that Revit manage to help placing fixtures by snapping.

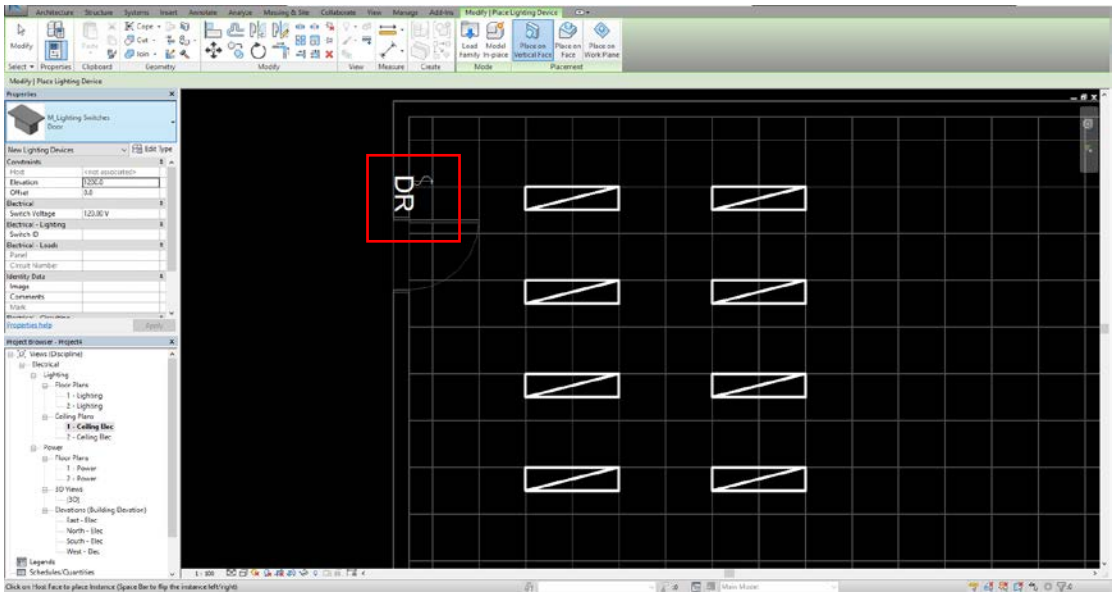


2.6 Adding switches

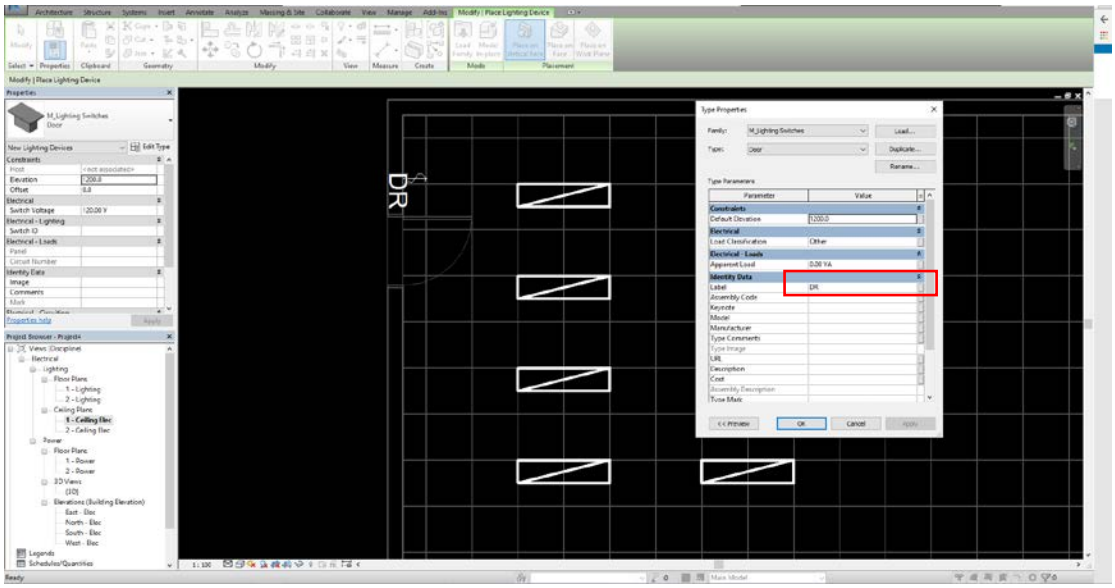
1. Go to **System** tab, **Device**, click on **Lighting** in the drop-down menu,



2. Add switches to lighting fixtures

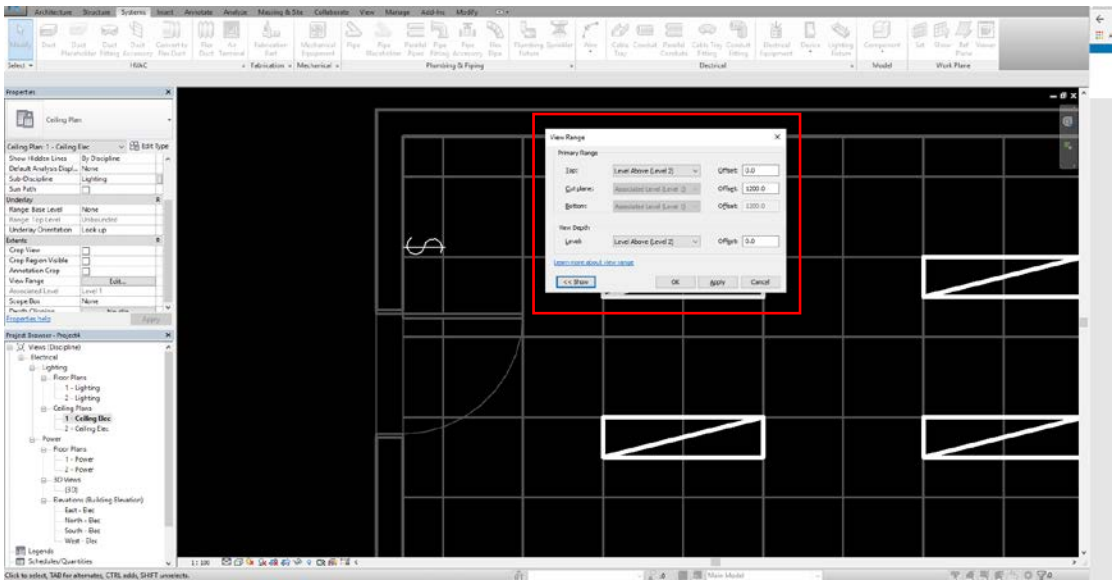


3. Noticed that DR is short for Door, to get rid of unnecessary labels, go to Edit type, delete DR in label column.

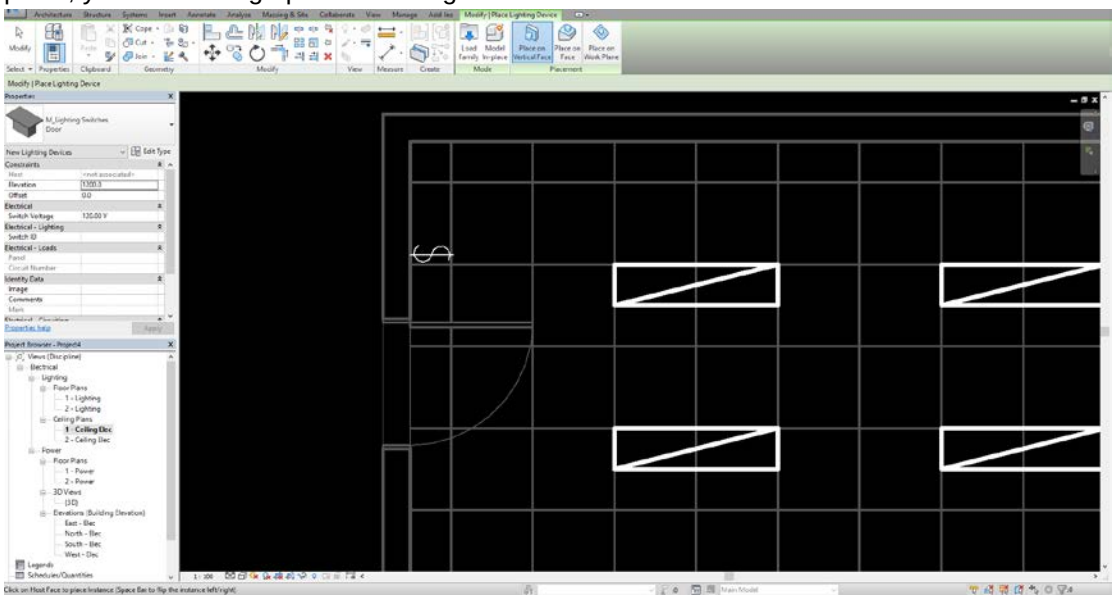


It's possible that you cannot see your switches in current view. Simple fix would be adjusting **View Range** of current view.

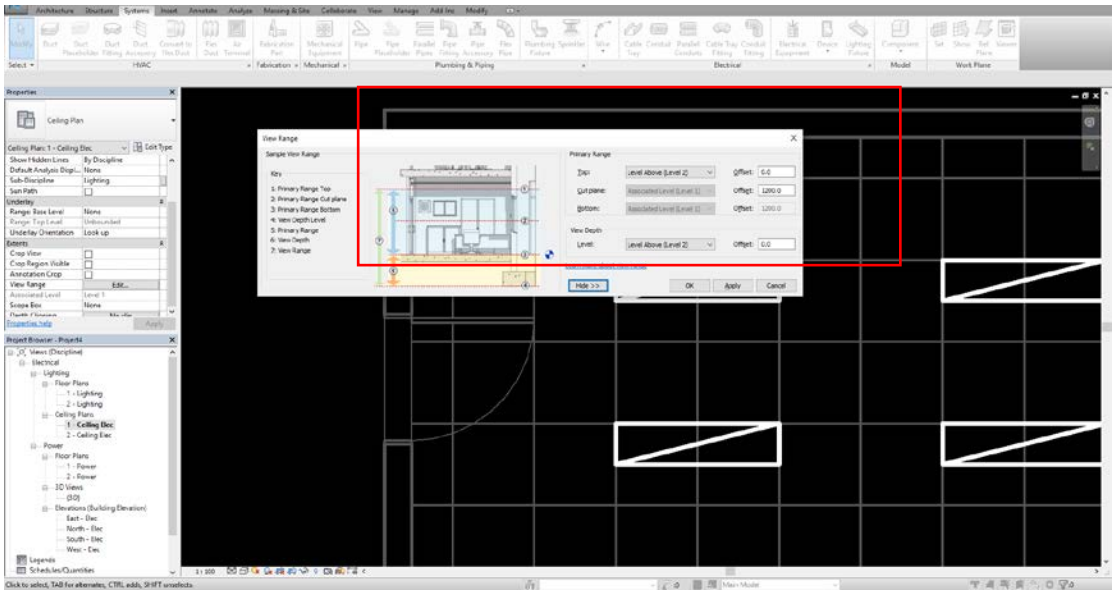
1. Go to Properties window, Edit **View Range.**



2. Click on show to give you an idea of how current view works. Notice that in reflected ceiling plans, you are looking up to the ceiling.

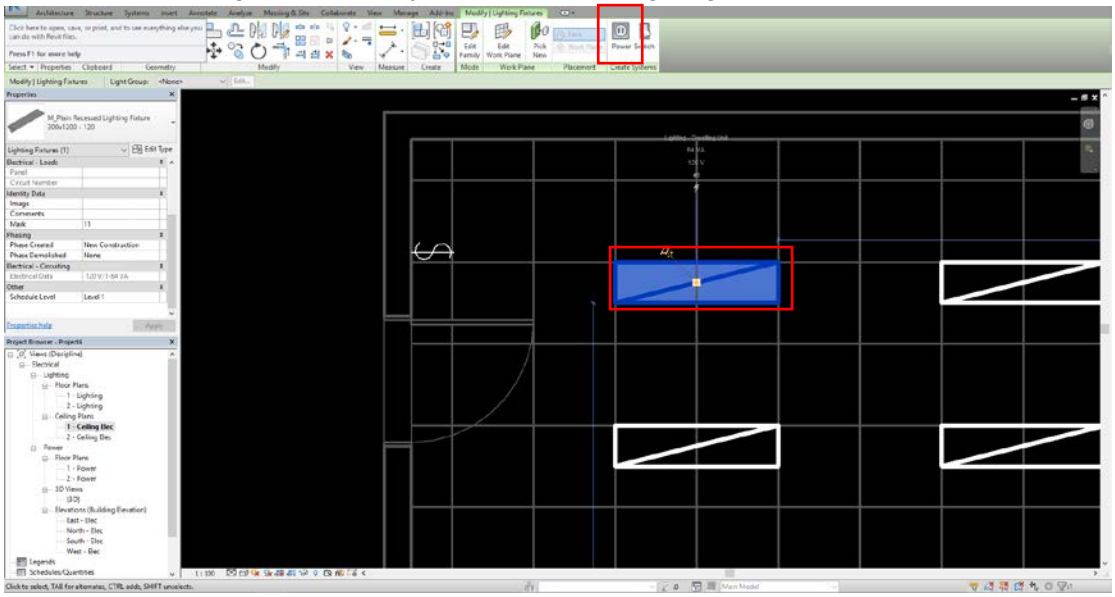


3. Make sure your **Cut plane offset value** is **1200**. Generally it will suit your work.

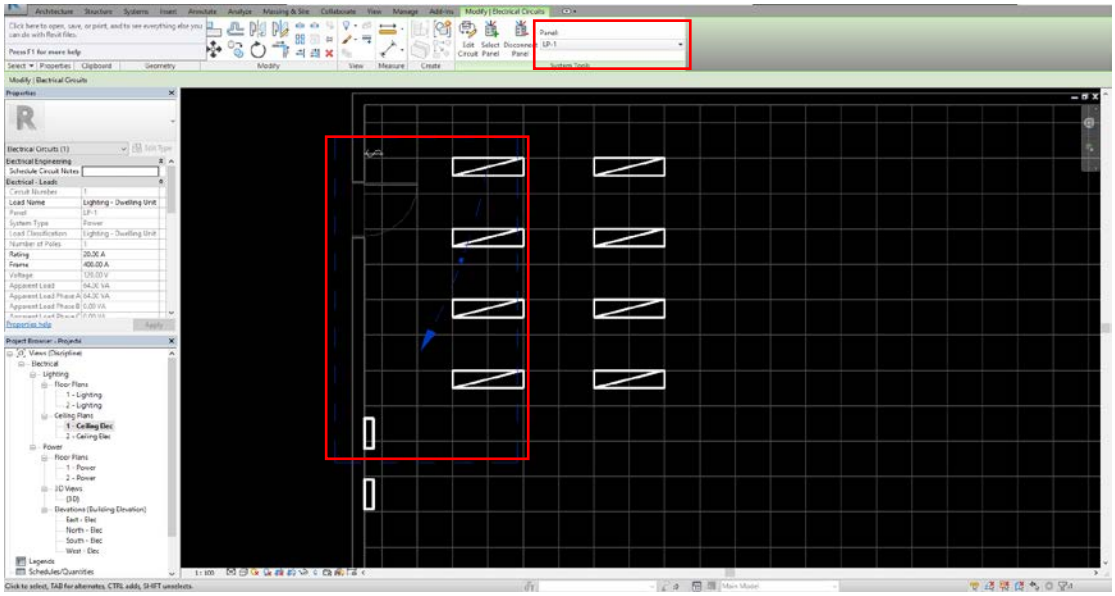


2.7 Creating a lighting circuit.

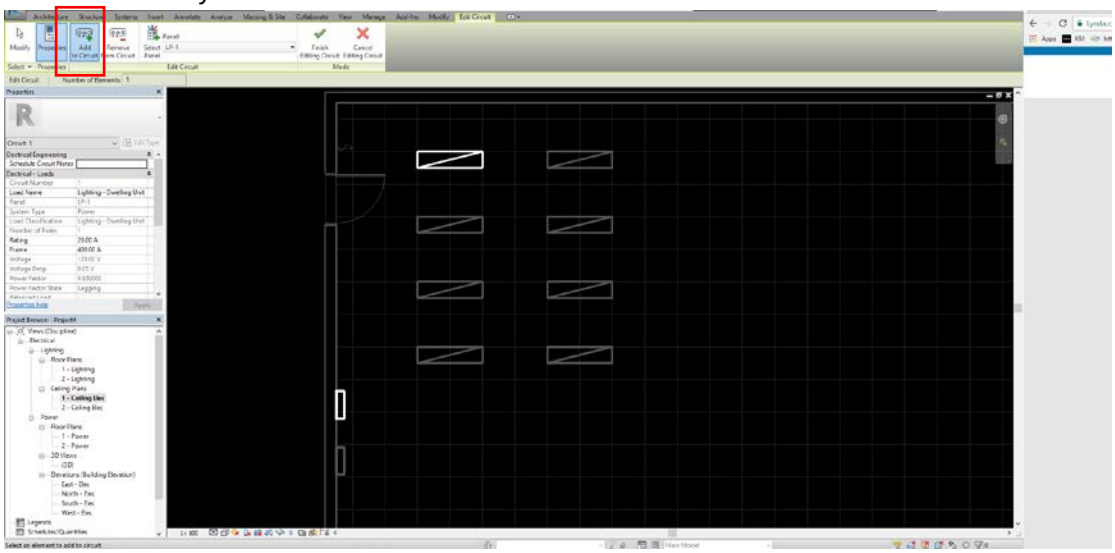
1. Simliar to creating a circuit, firstly select one of the lighting fixtures then click on **Power**



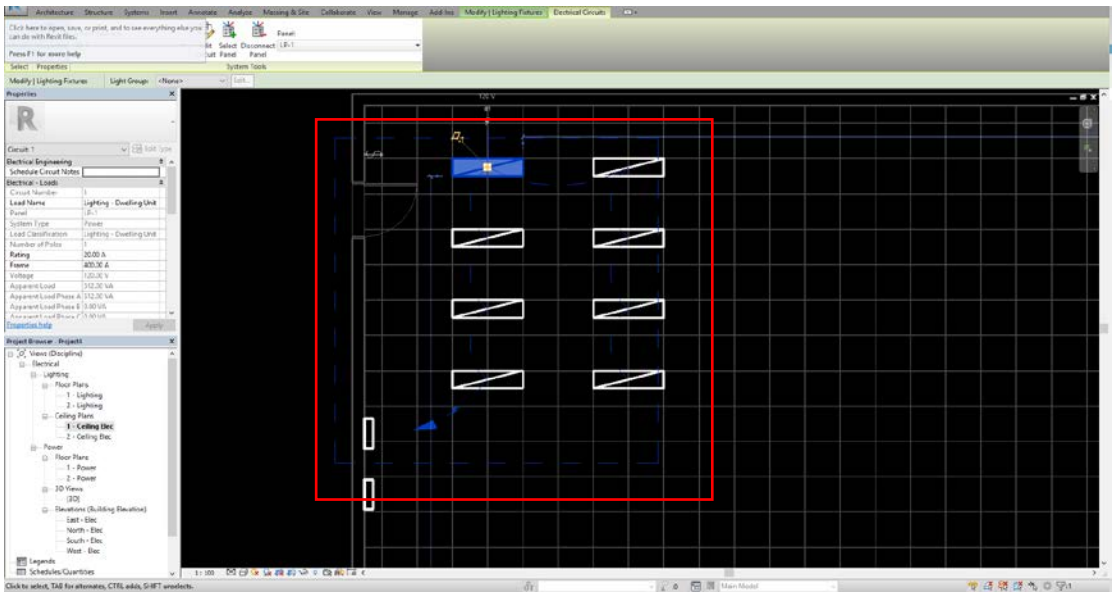
2. Set Panel to LP-1



3. Add in rest of your fixtures to the circuit. Edit Circuit first then add in fixtures.

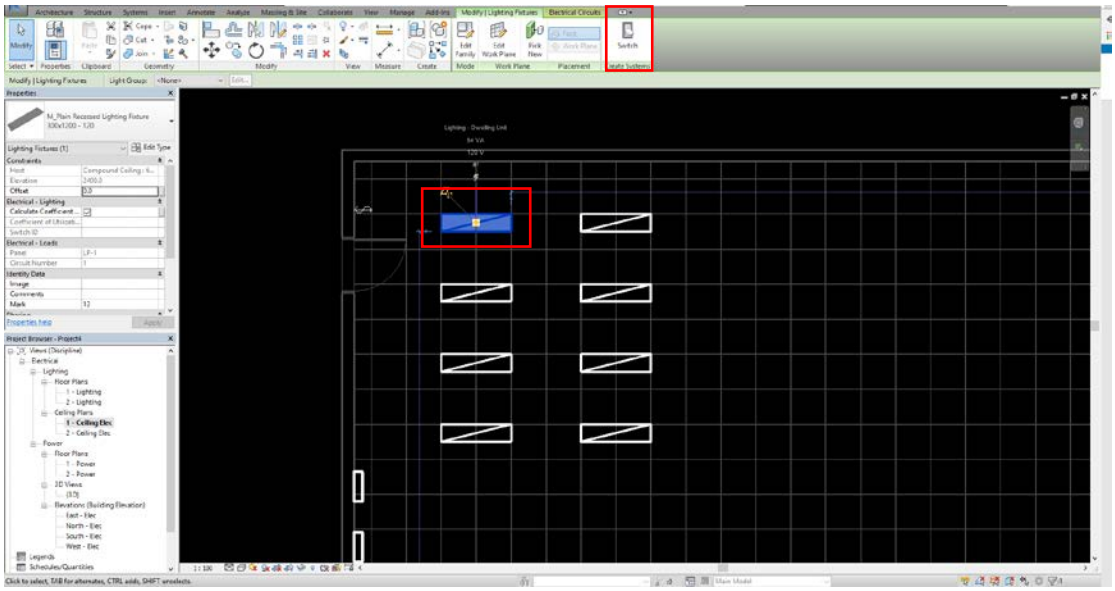


4. Lighting circuit completed.

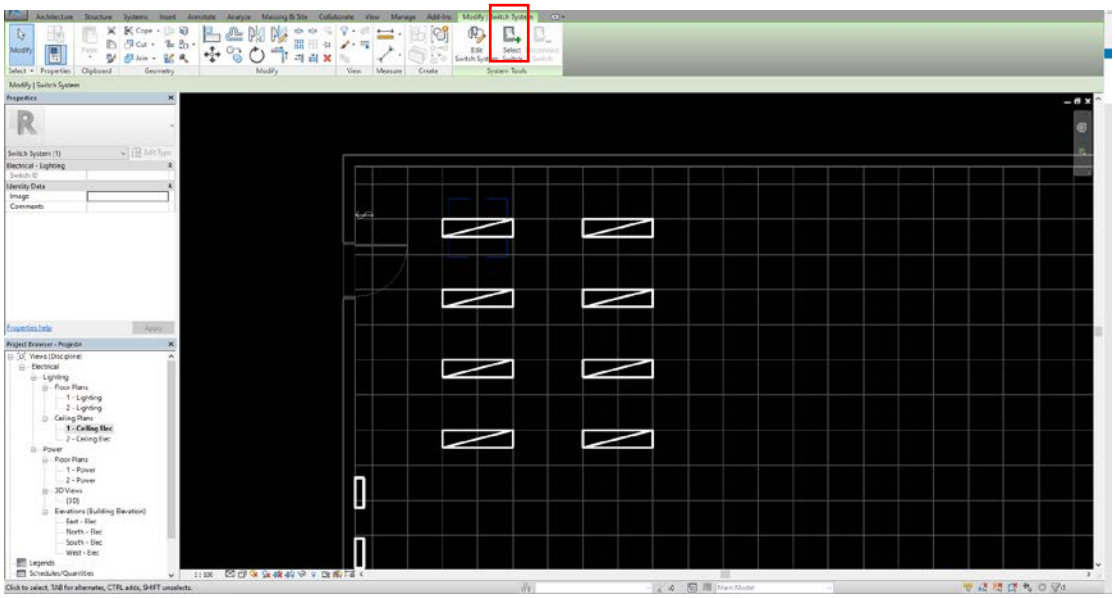


2.8 Creating a switch circuit.

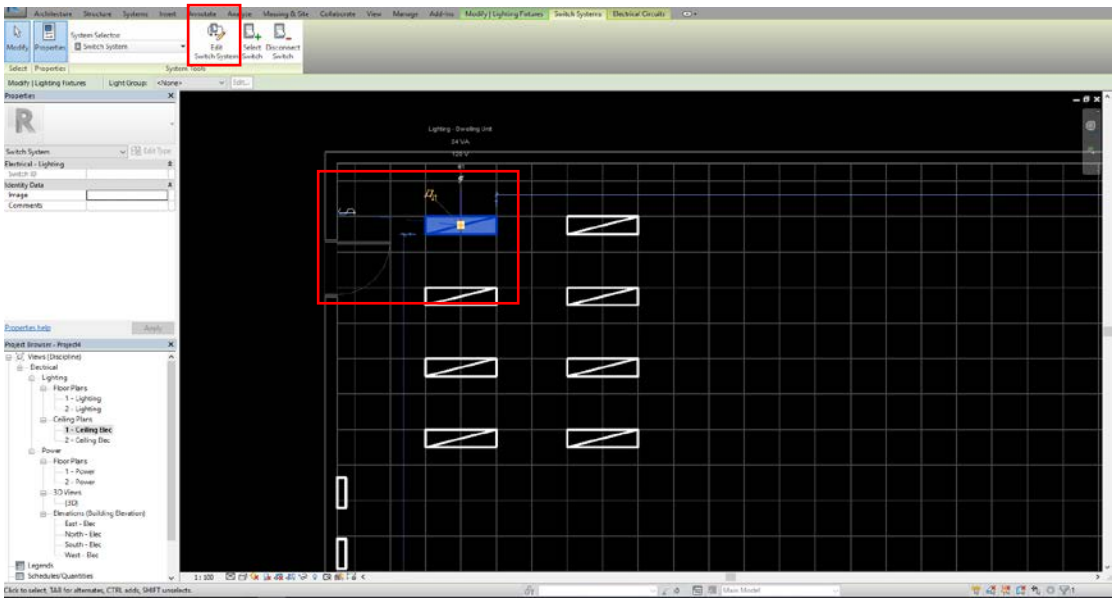
1. With one of lighting fixtures selected, click on Switch command.



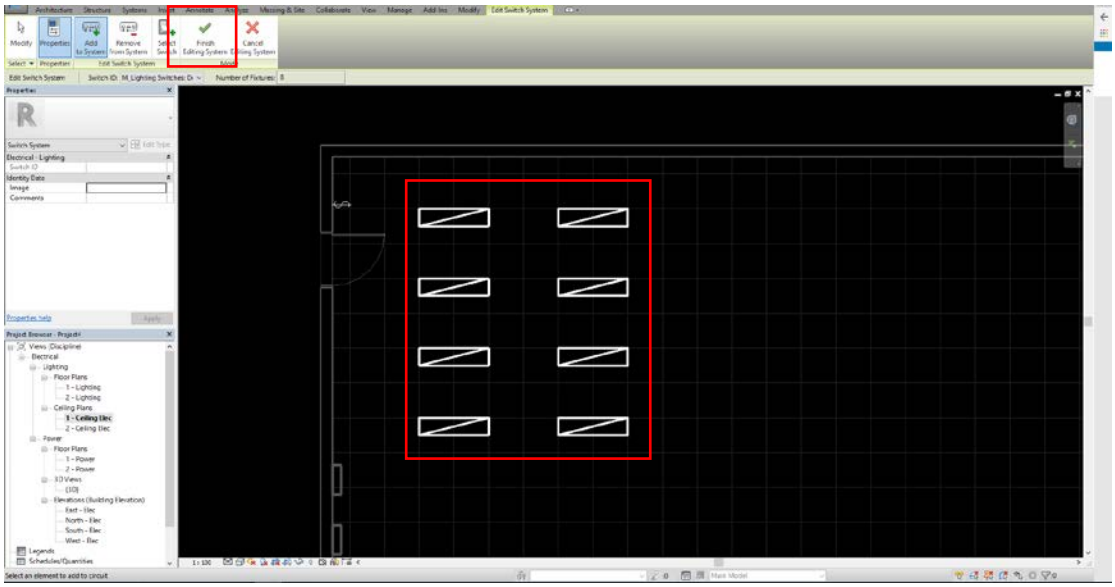
2.Select switch.



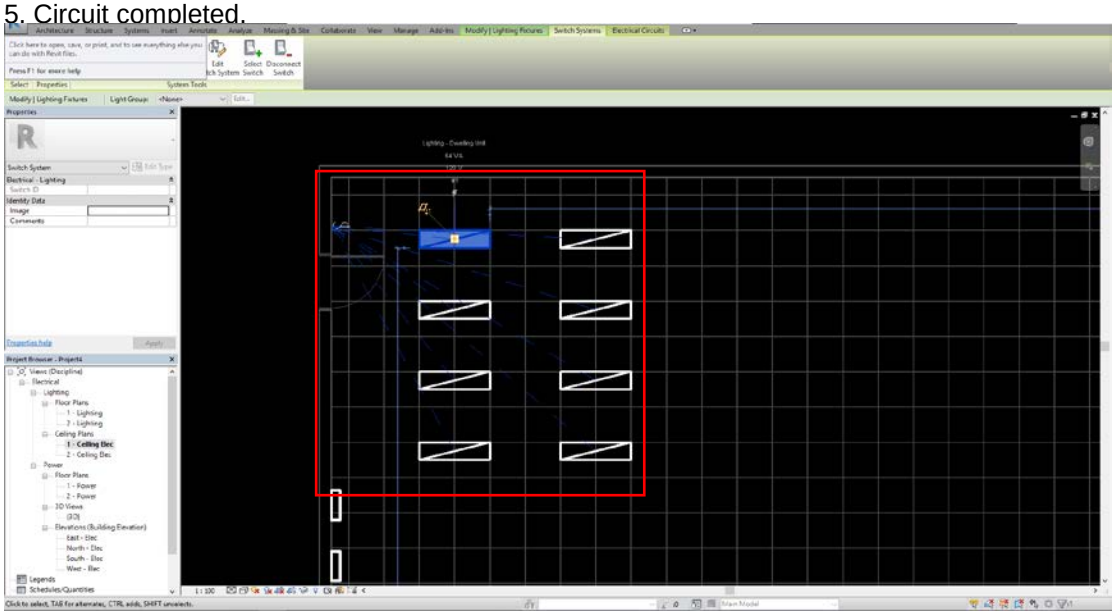
3. Notice that our light and switch are connected. Then **Edit Switch System** to add in more lights.



4. Add in rest of fixtures then click Finish Editing.

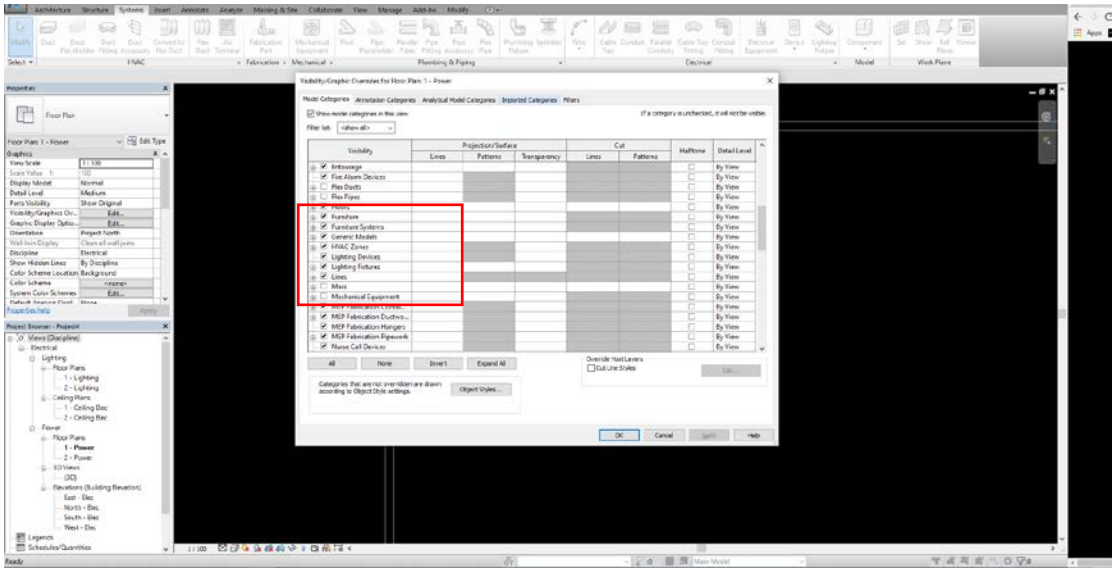


5. Circuit completed.

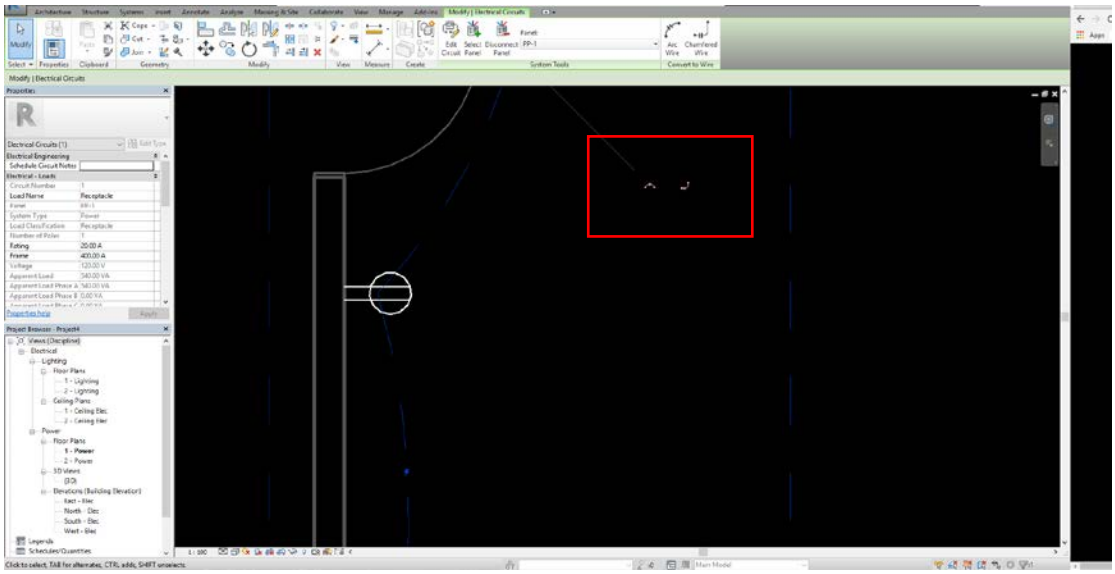


2.9 Creating and labeling a wiring plan

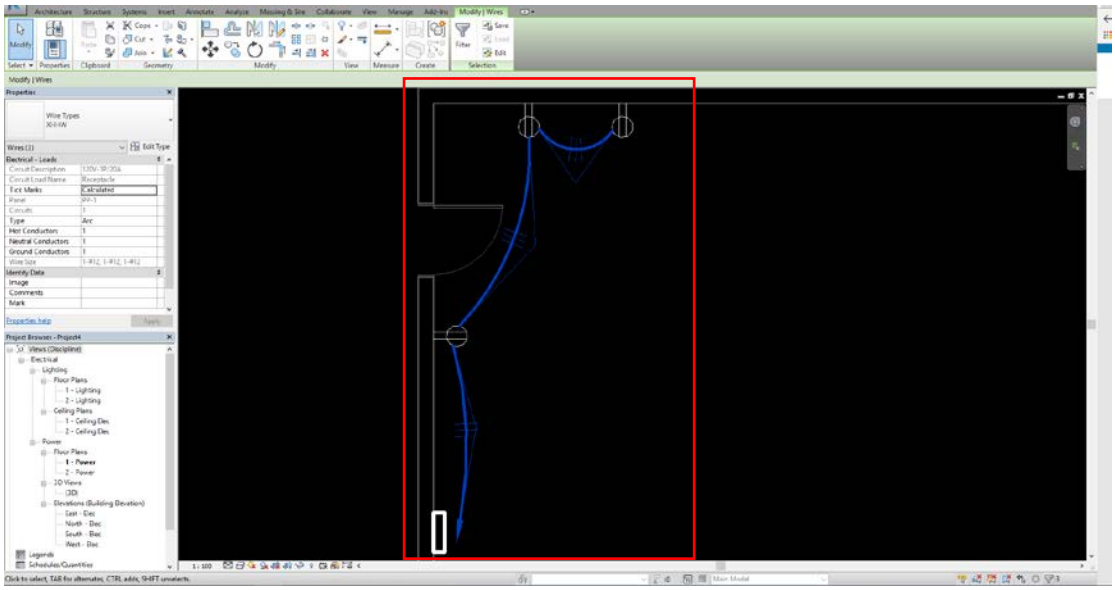
1. Hide any lighting elments in your floor plan. Press V+G, uncheck Lighting Fixtures and Lighting Devices.



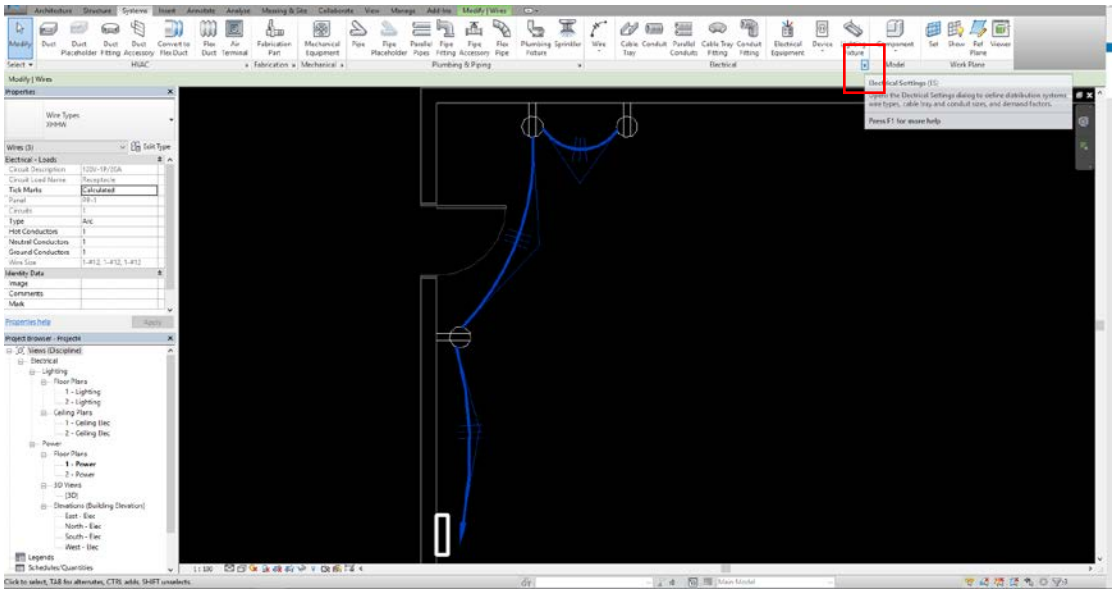
2. Hover over one of your lighting fixtures, press Tab on keyboard then select the fixture.



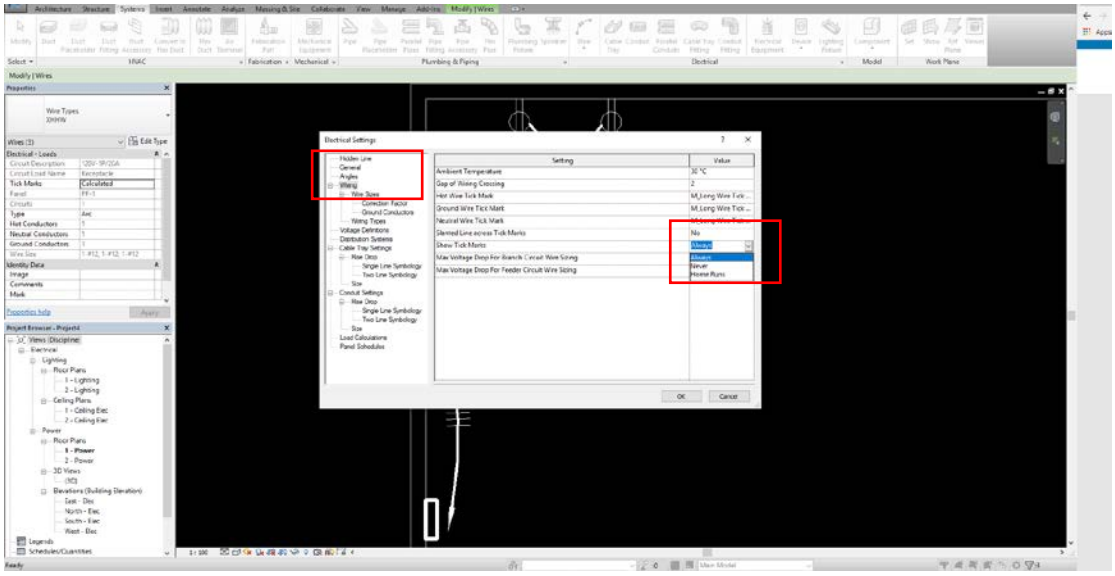
3. Notice that there's two options that Revit will automatically wire these fixtures for us, Arc Style Wire and Chamfer Wire. Simply click on one of these.



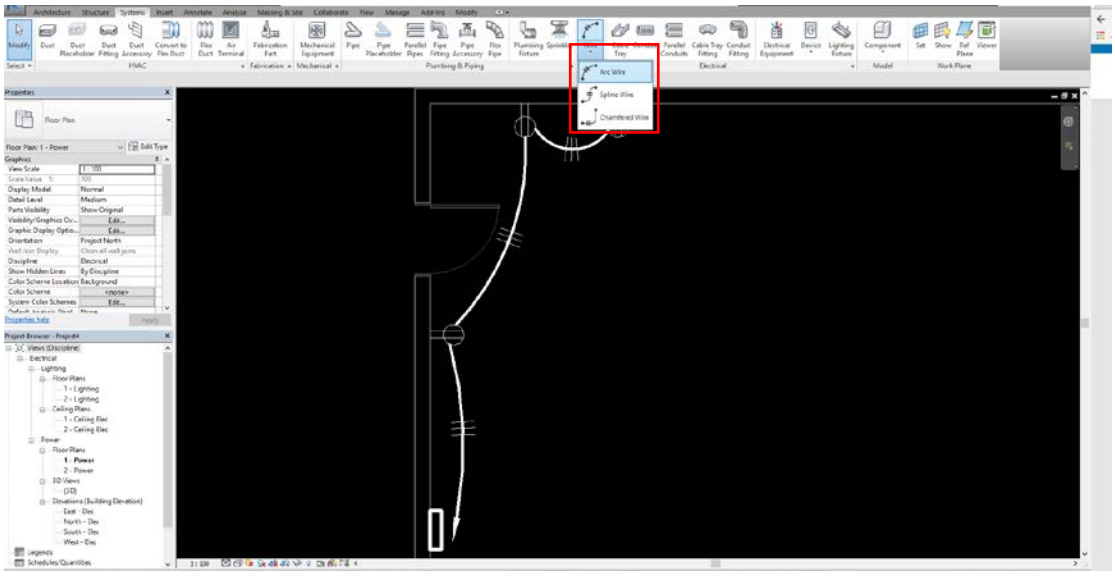
4. To people who are not very fond of tick marks on wire, go to Electrical Settings button.



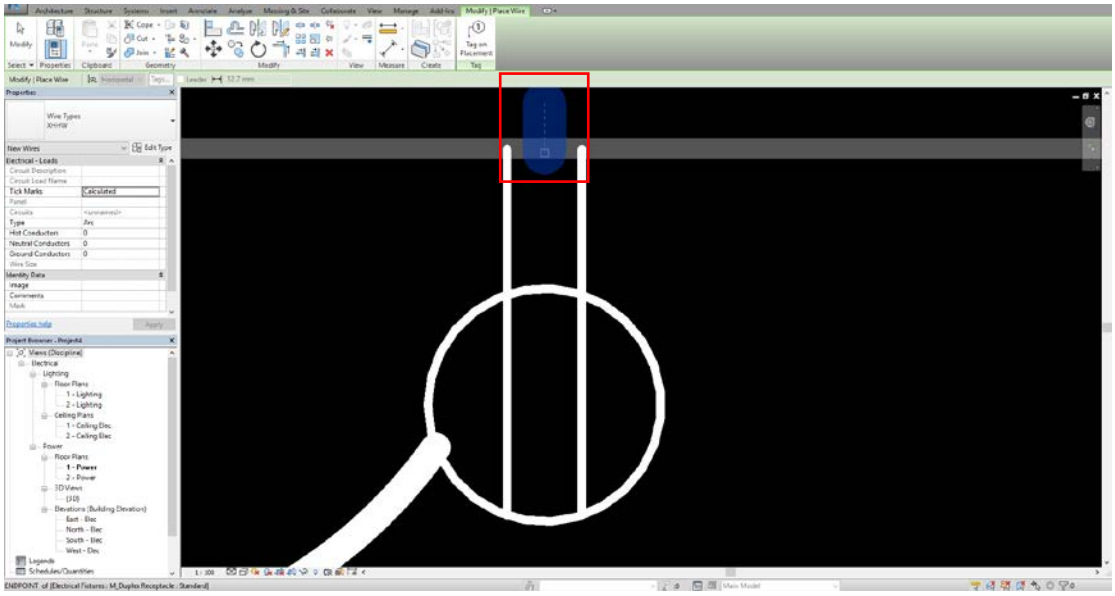
5. Click on **Wiring**. Change Show tick marks from **Always** to **Never**.



6. Revit allow user to wire manully by using spline wire. Go to System tab, Wire, Spline Wire.

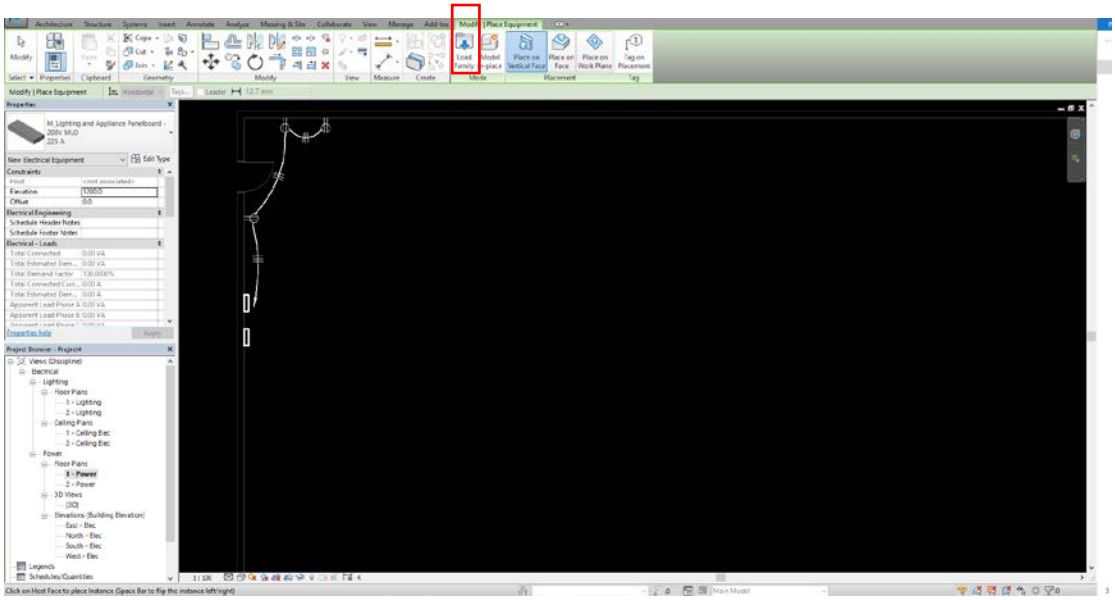


7. Pay attention to nodes when wiring manully. Always connect fixtures on their nodes.

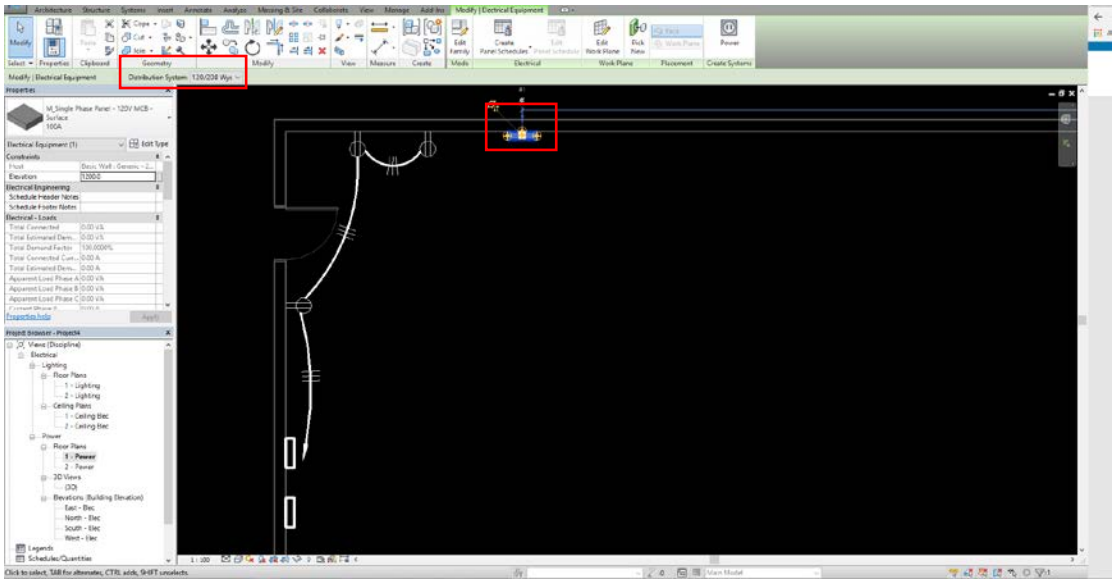


2.10 Adding conduit.

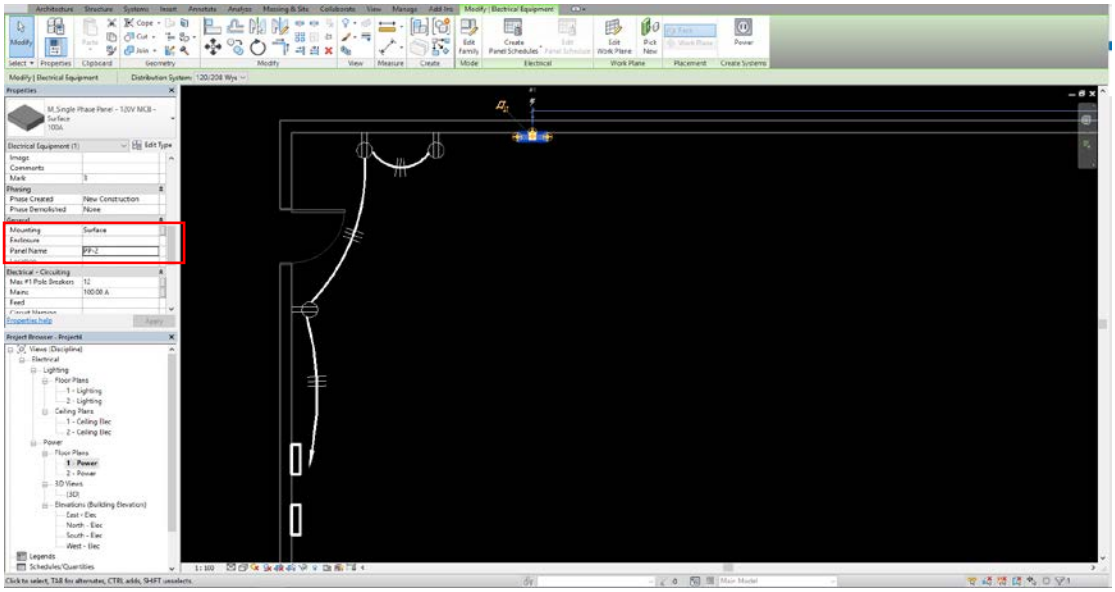
1. Go to System tab, Electrical Equipment, Load Family.



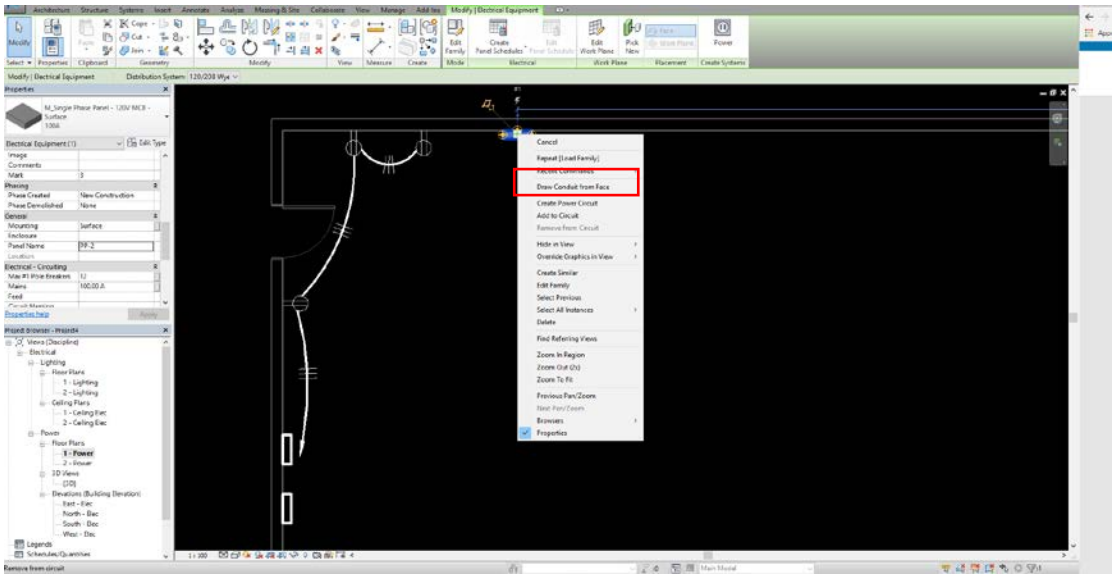
2. Load in **M_Single Phase Panel - 120V MCB – Surface.** Place it on the wall then select **120/208 Wye Distribution System**.



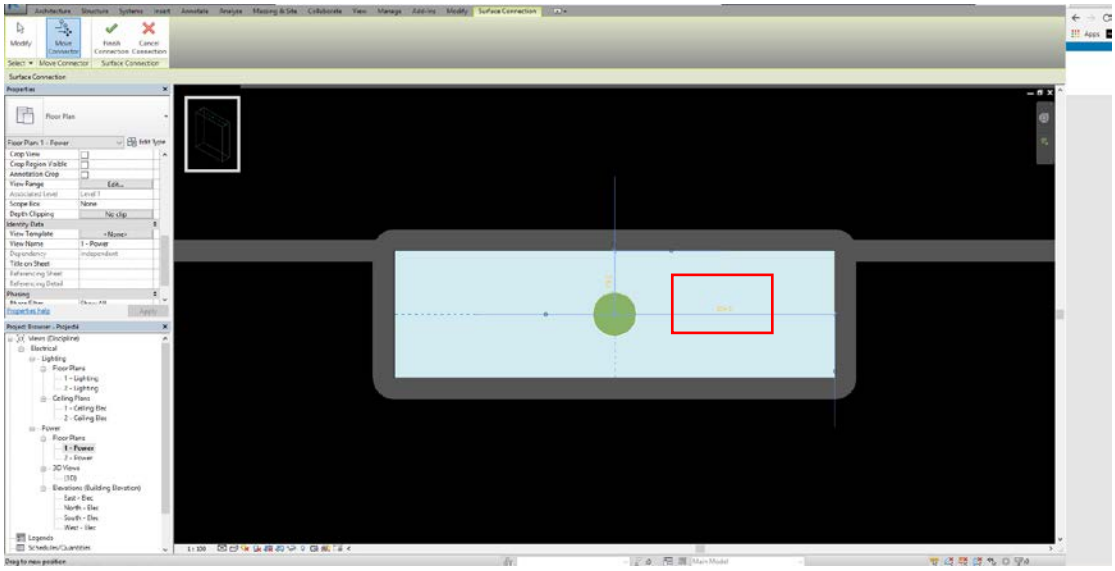
3. Name is **PP-2**.



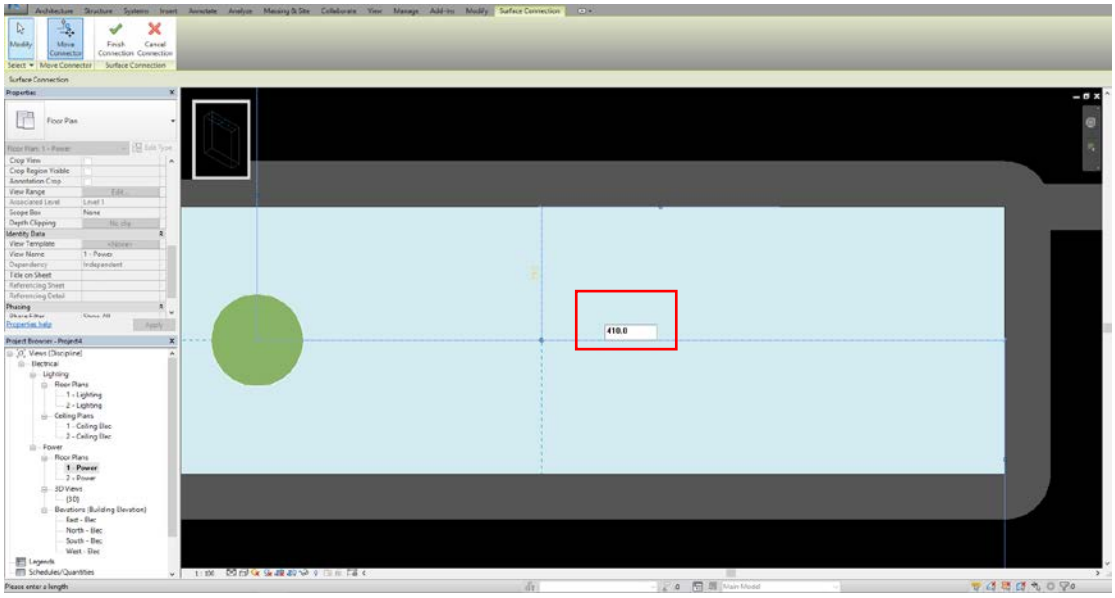
4. Right click on the node of this panel. Click **on Draw Conduit From Face** option.



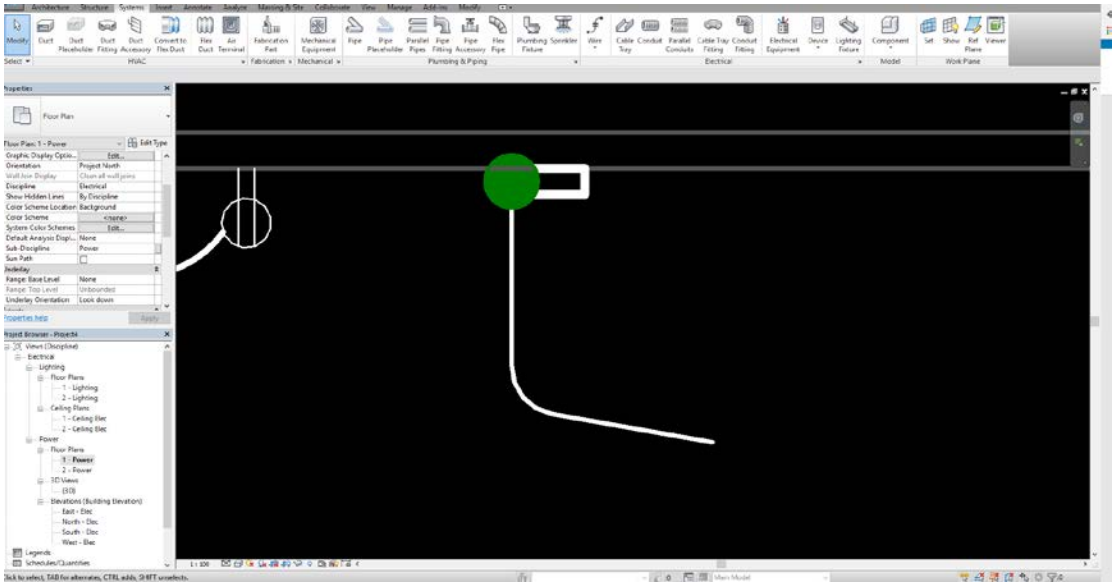
5. Notice that Revit interface shift its focus on PP-2 panel.



6. Replace 254 with 410 to move the node. Finish connection.

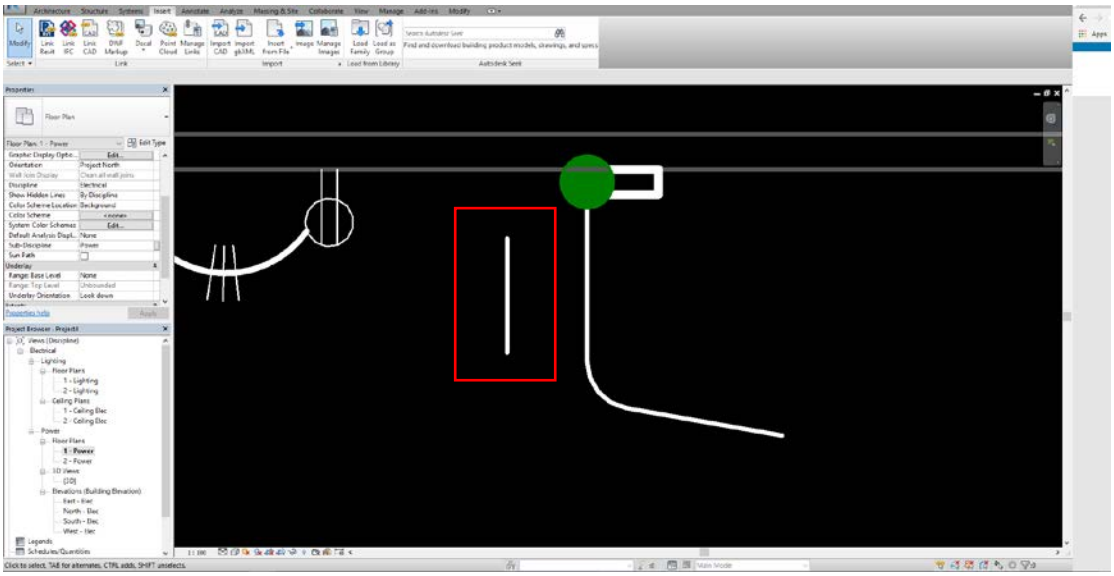


7. Start to draw your conduit.

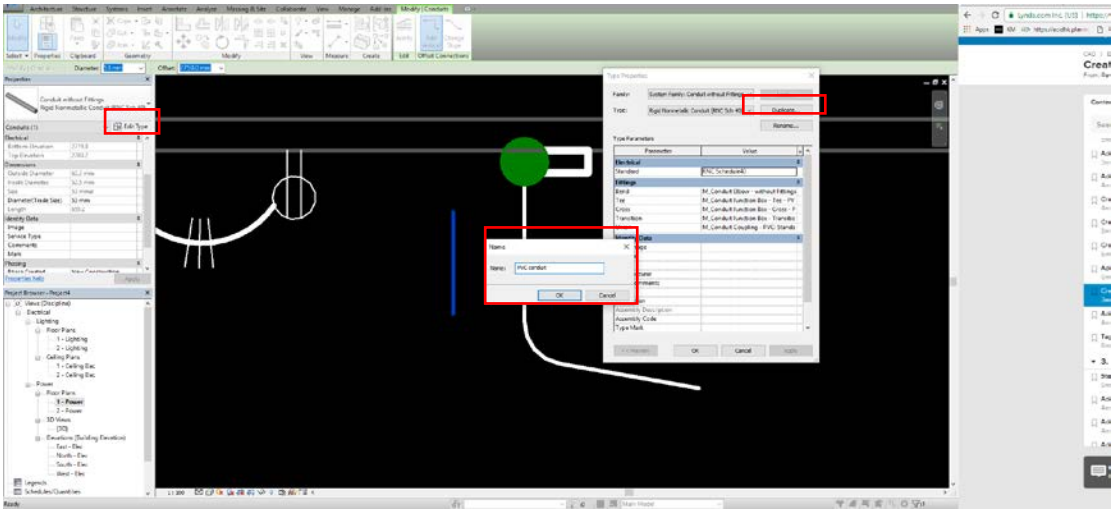


2.11 Creating conduit types.

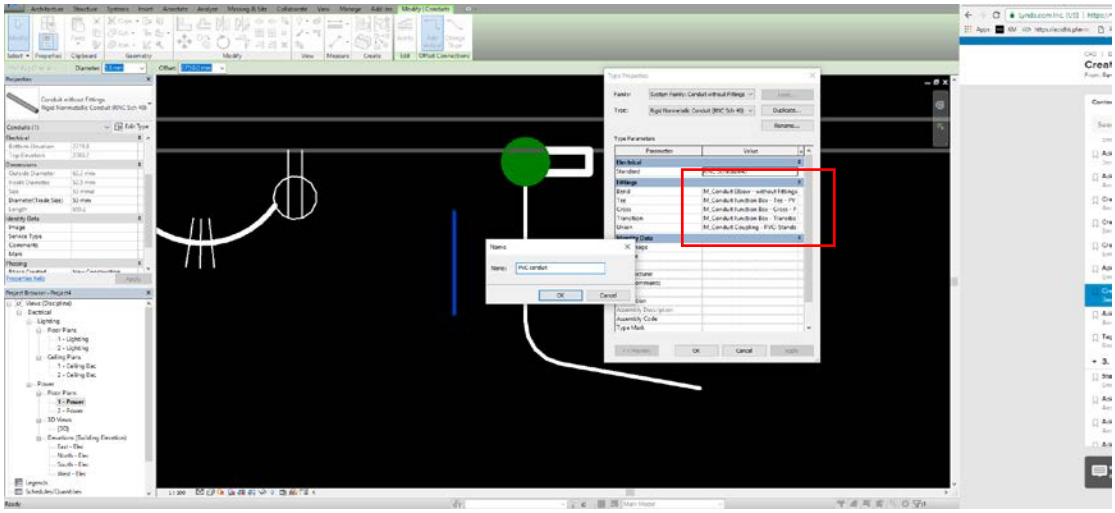
1. Select any part of your conduit and copy it.



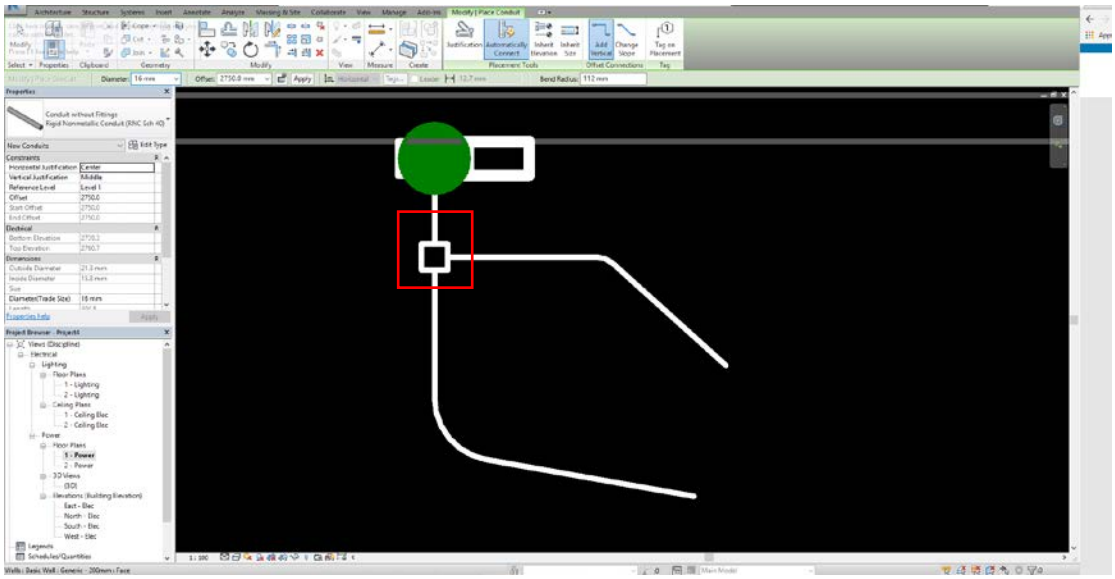
2. Duplicate its type and simply name it **PVC conduit**.



3. Notice that Revit provide many types for us to customize our conduit.

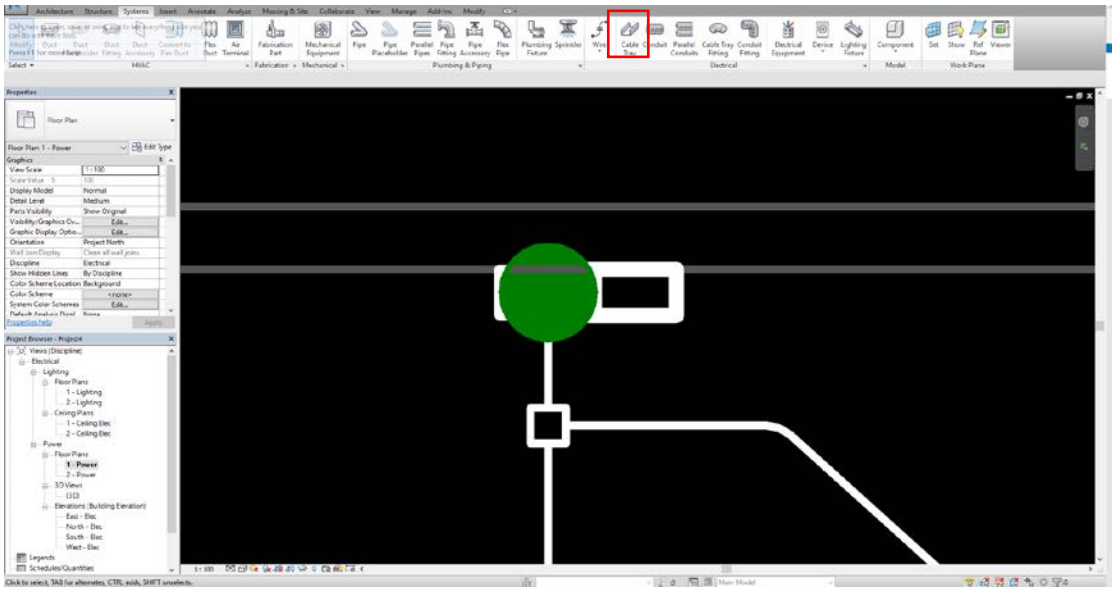


4. Go to **System** tab, then click on **Conduit** command, start to draw your types of conduit. Since default conduit has the same diameter and offset value with our customized conduit, joint box will be created automatically.

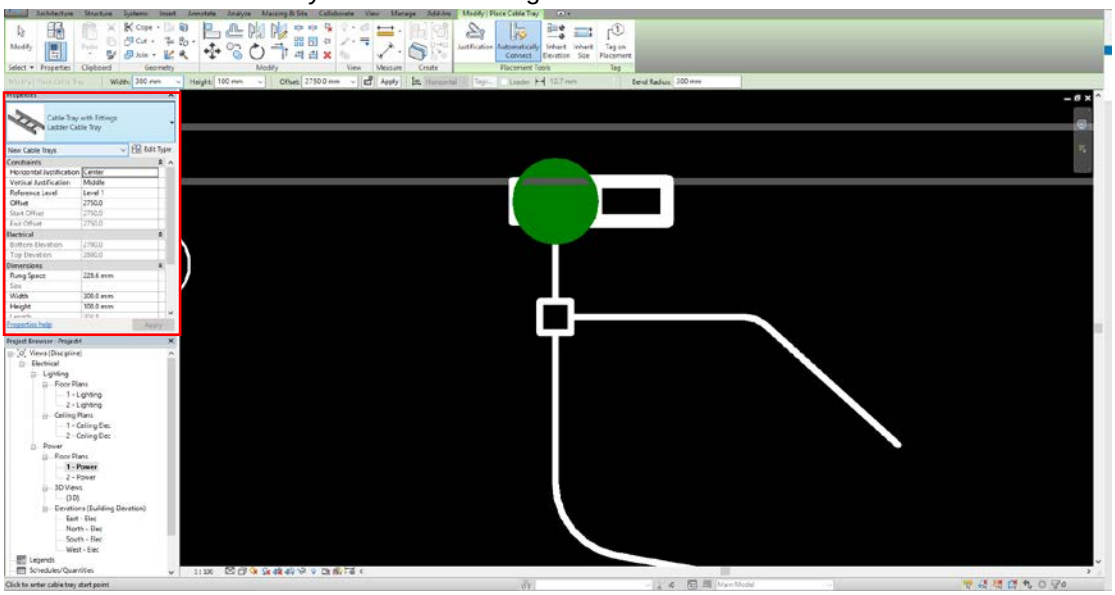


2.12 Adding cable tray.

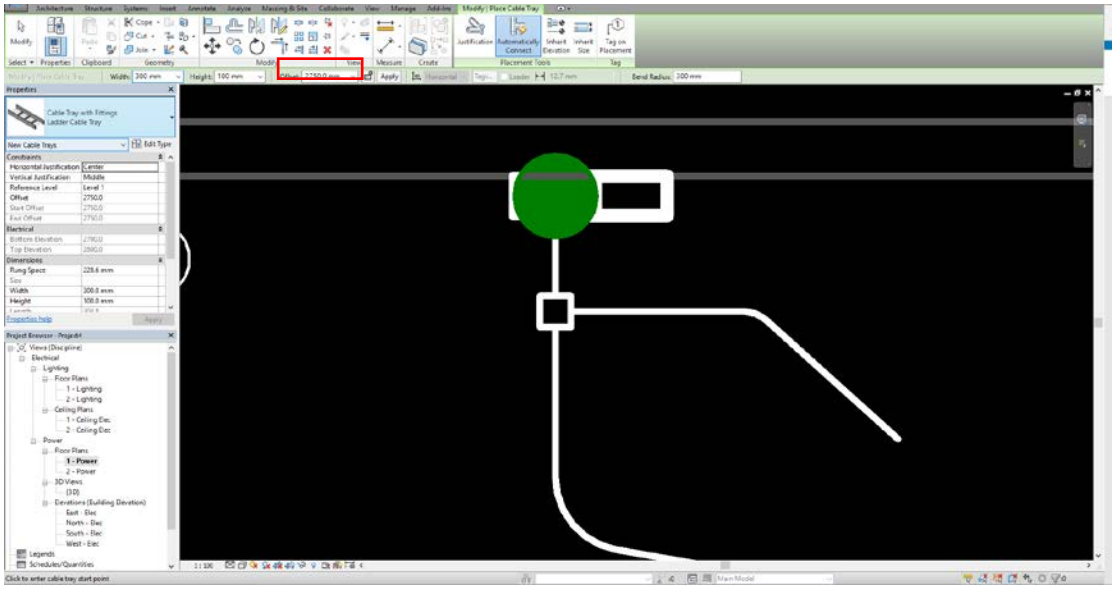
1. Go to System tab, Cable tray.

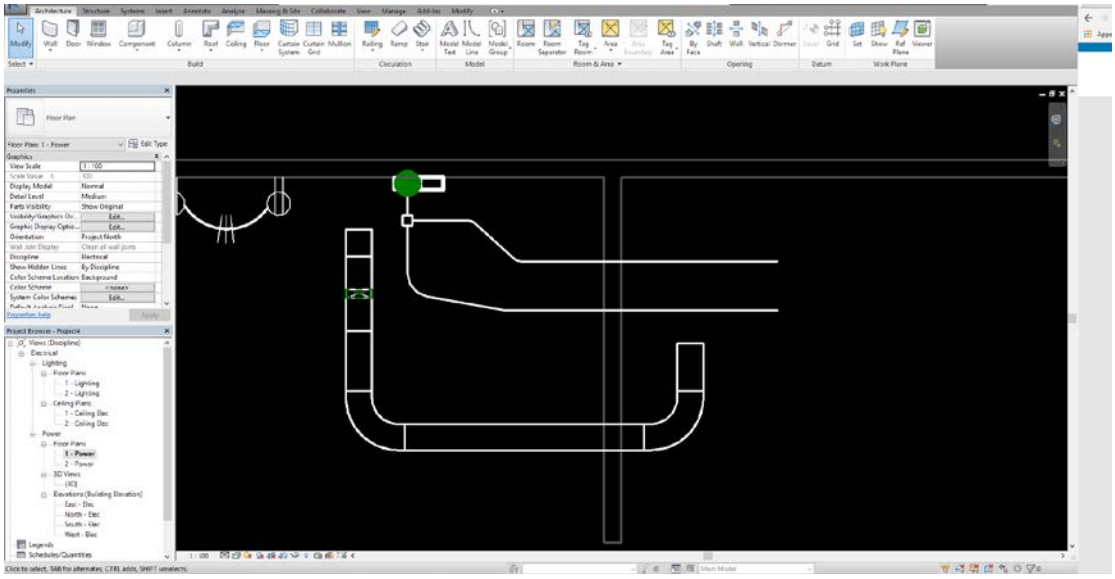


2. Select Ladder cable tray then start drawing.

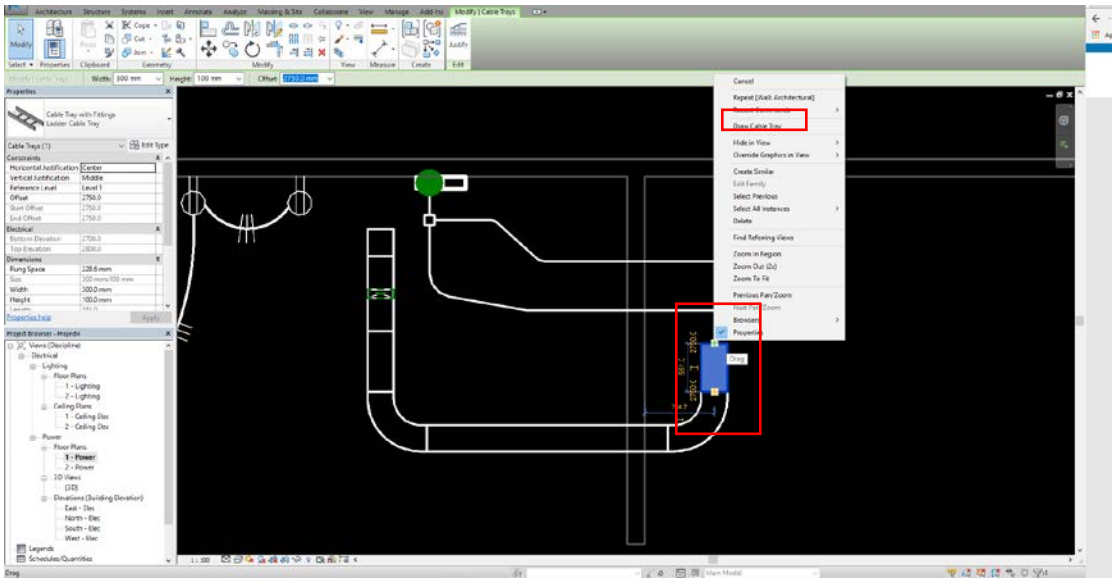


3. Instead of 2750mm, we want our cable tray start low on the ground. Offset value set to 50mm would be fine.

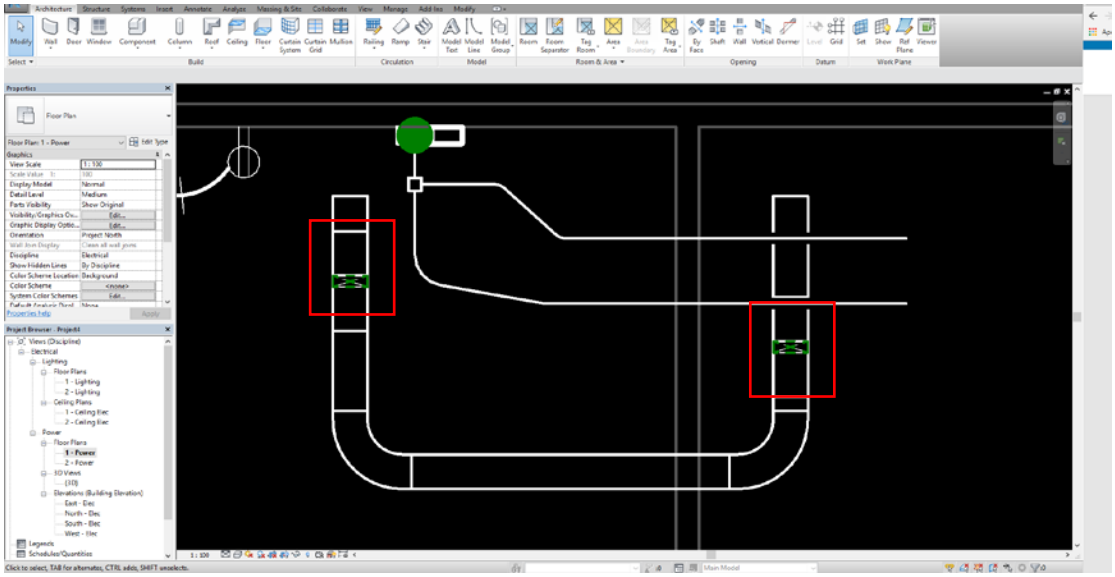




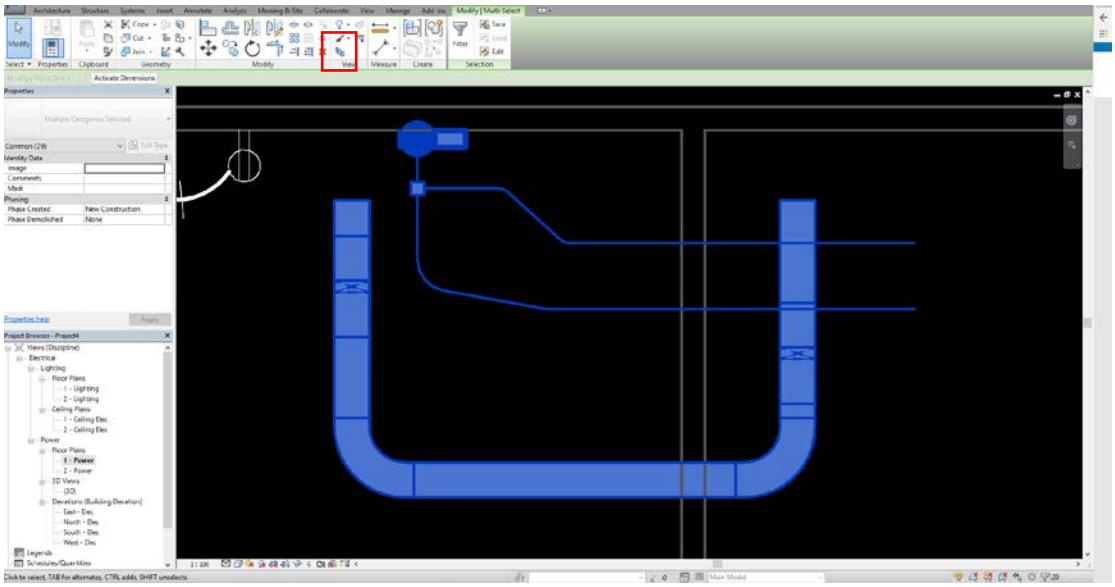
4. To continue drawing cable tray, right click on the end of it, then select Drawing cable tray. Here we'll set offset value back to 50mm to land our cable tray.



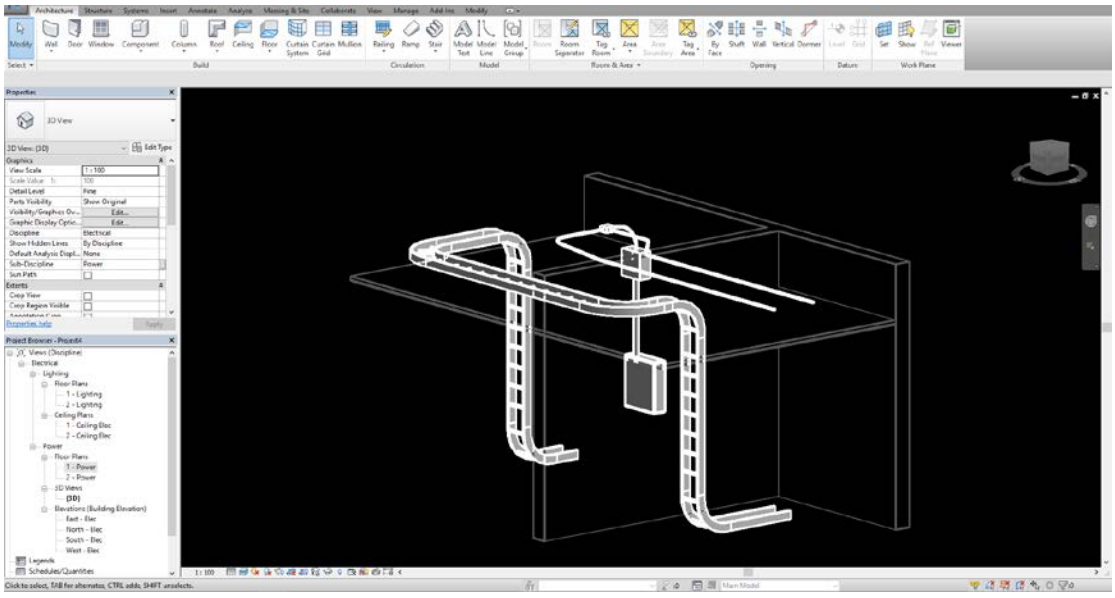
5. Notice rising location and landing location has been marked.



6. Select all works we did in this section. Go to View panel (not View tab) , click on Selection Box.



7. Mini 3D view created specifically for selected part. Welcome to BIM.



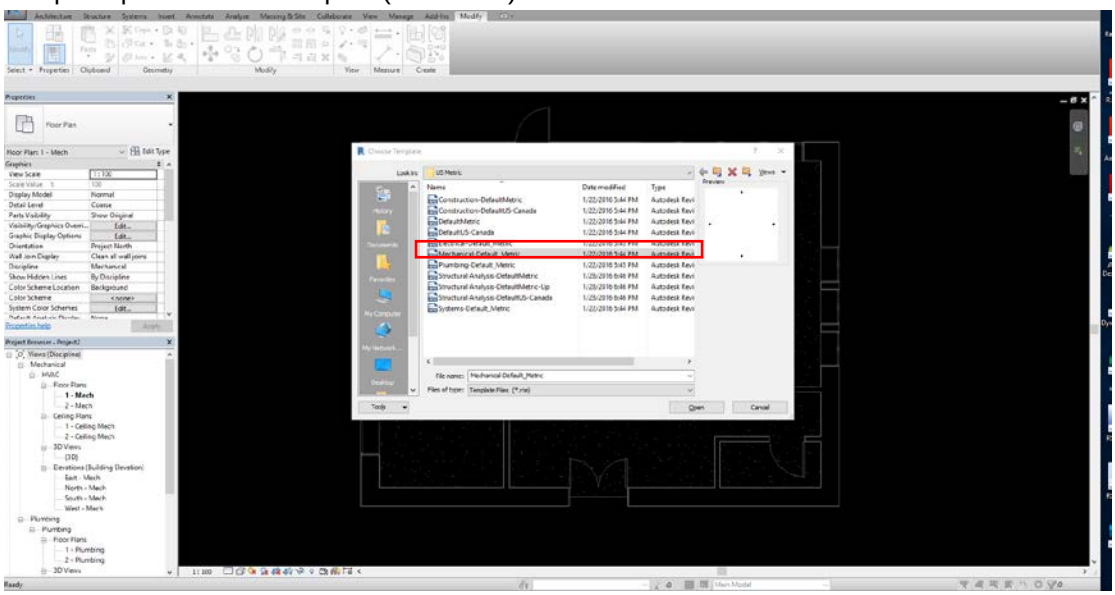
(Note: Grey-out part belongs to links from other discipline, as you pin your links and ban Link selection properly, your selection box will only react to your MEP model.)

Till here

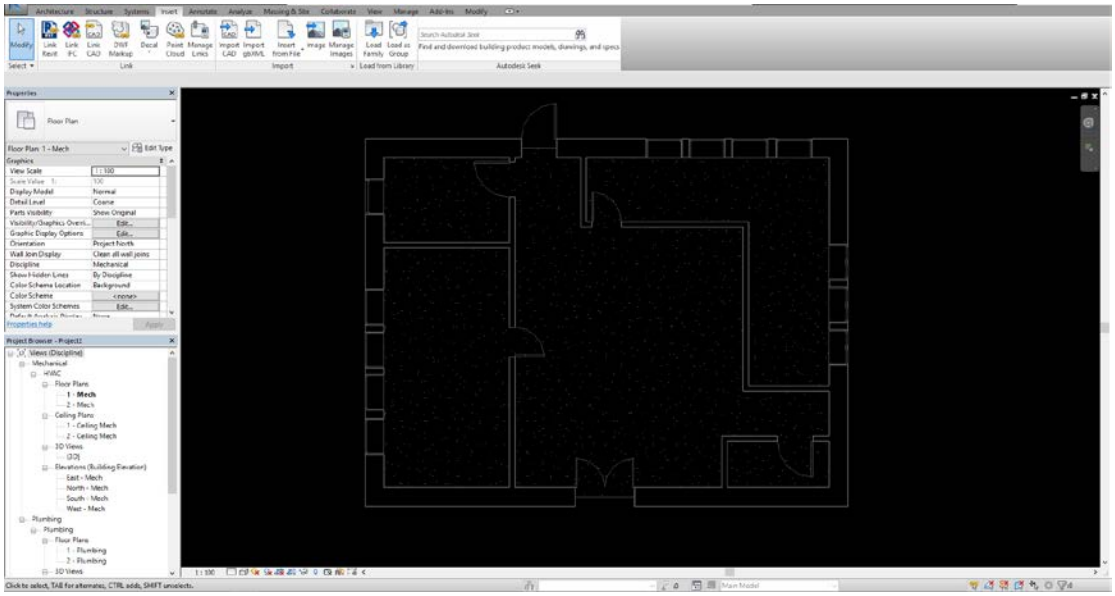
3. Revit Mechanical

3.1 Starting a mechanical project.

1. Open up Mechnical Template(US metric)

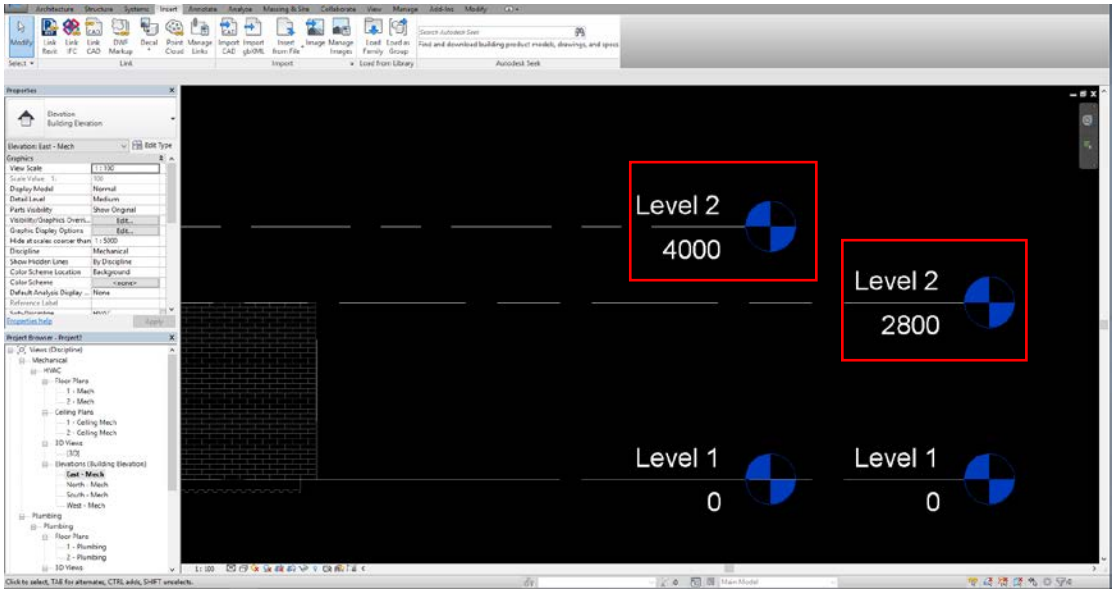


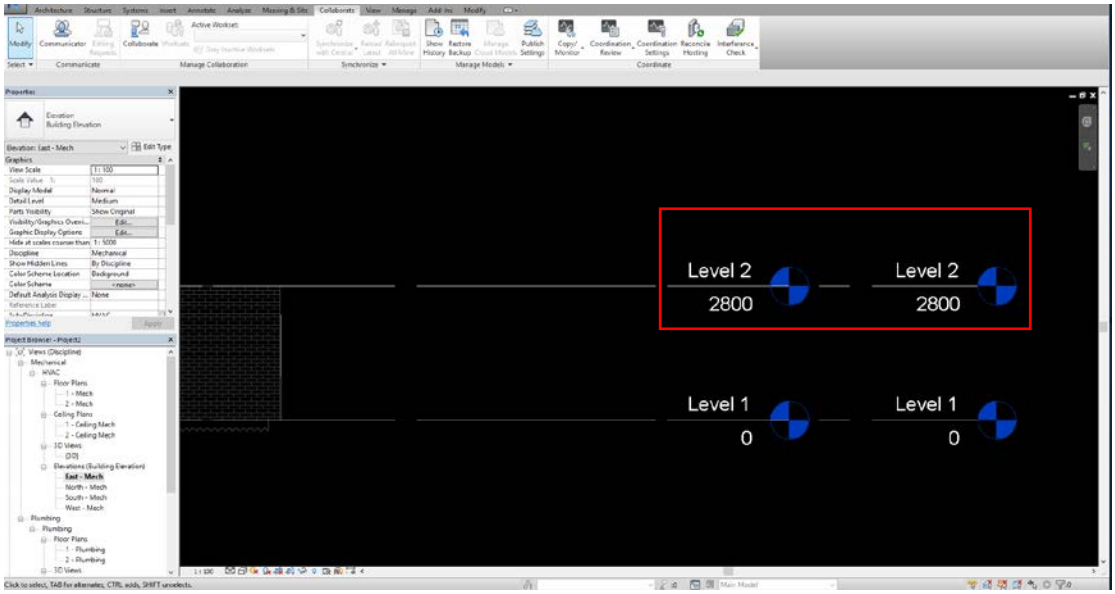
2. Link your architectural model. (Once inserted, go to **Edit Type**, check **Room Bounding**)



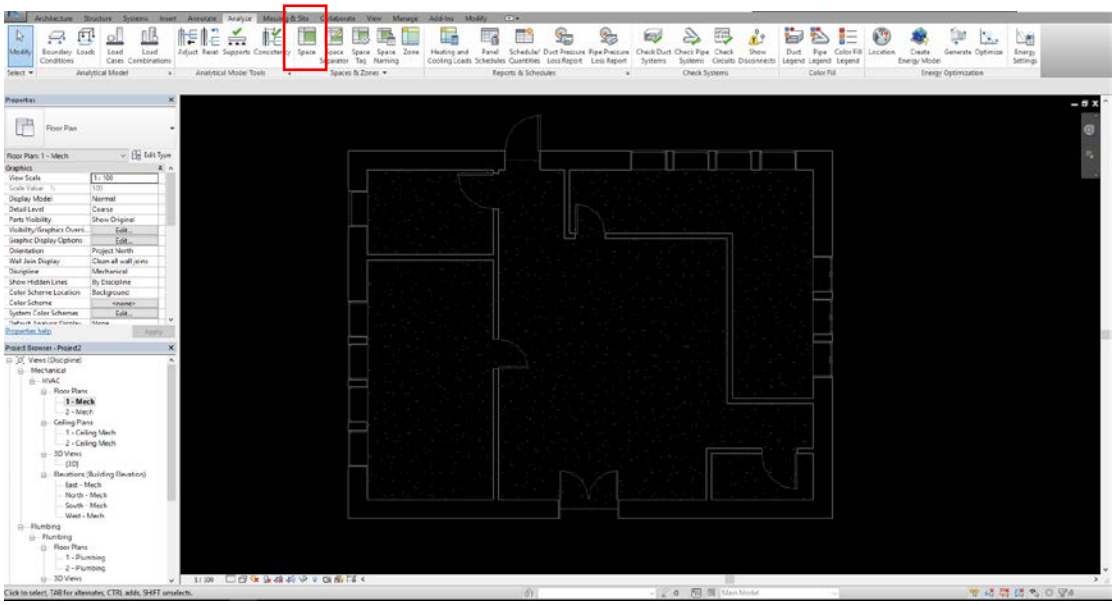
3. Match default levels to levels in architectrual underlay.

(Copy/Monitor, Click & Drag or Creating Similar will do the trick)

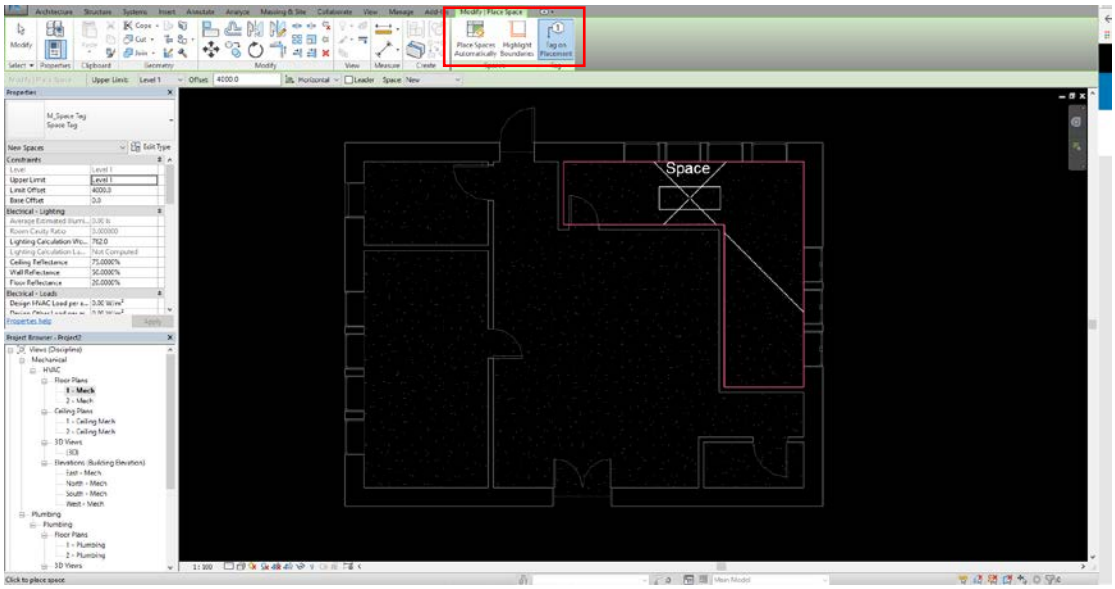

Level 2
4000
Level 2
2800
Level 1
0
Level 1
0


Level 2
2800
Level 2
2800
Level 1
0
Level 1
0

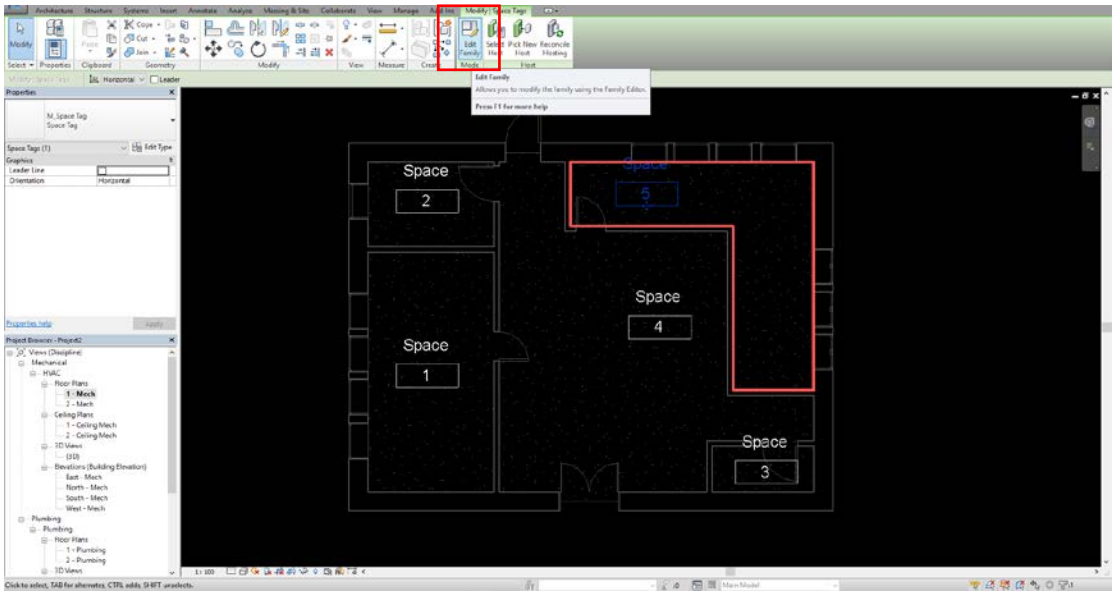
4. Tag spaces based on architectural link. Go to **Analyse** tab, click on **Space**.



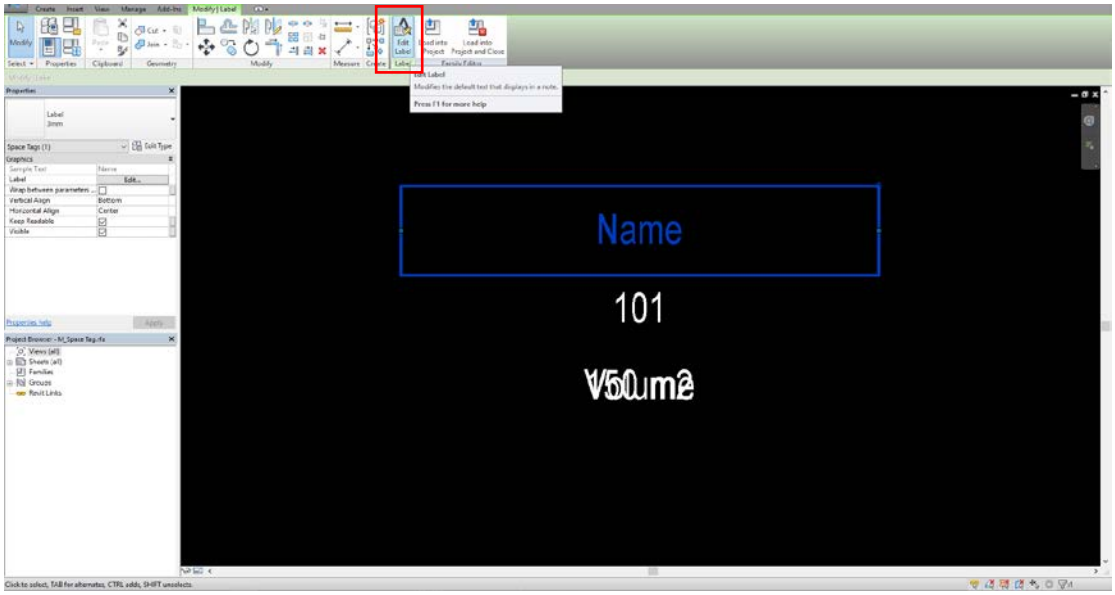
5. Automatically generate space tags or tag rooms manually. (If Space Lable doesn't show up, make sure you Tag on Placement is selected.)



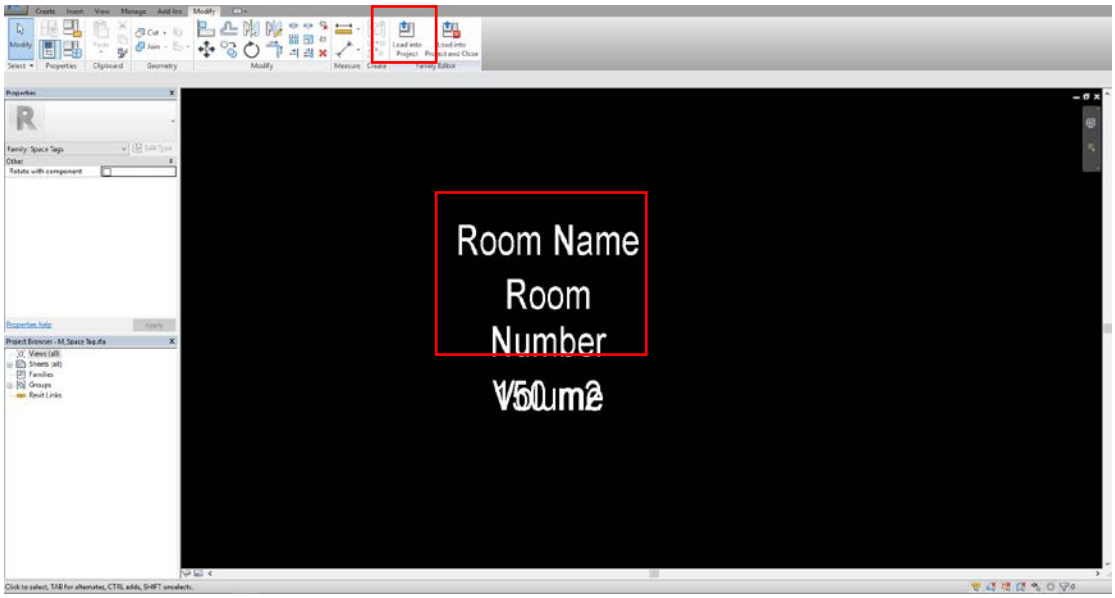
6. Select any of space tags, go to **Edit Family**.



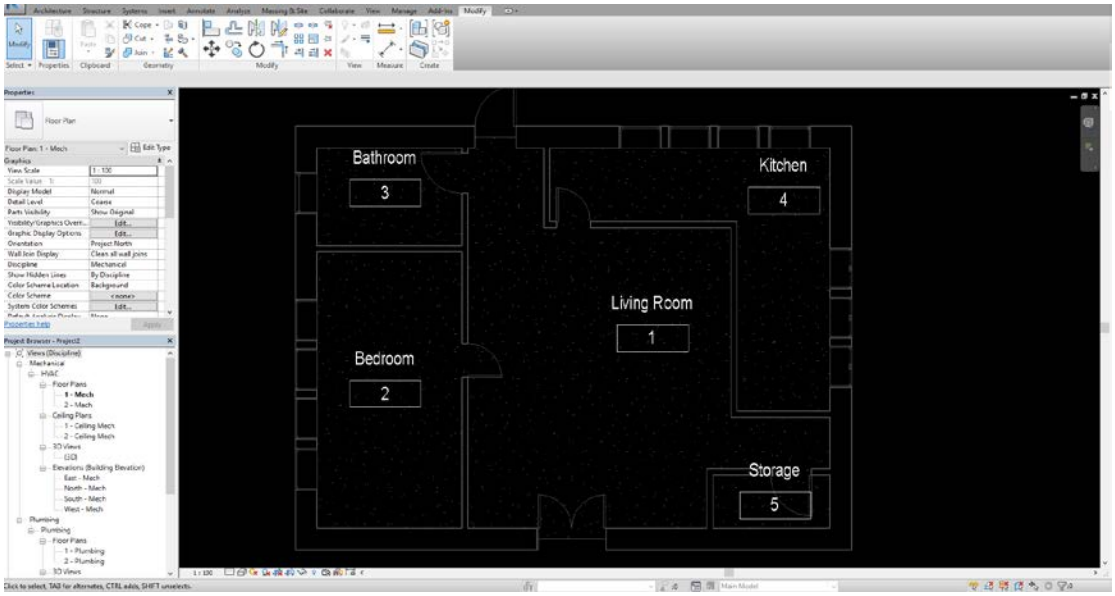
7. Edit Lables.



8. Remove Name then add in Room Name. Likewise, add in Room Number. Load into project.

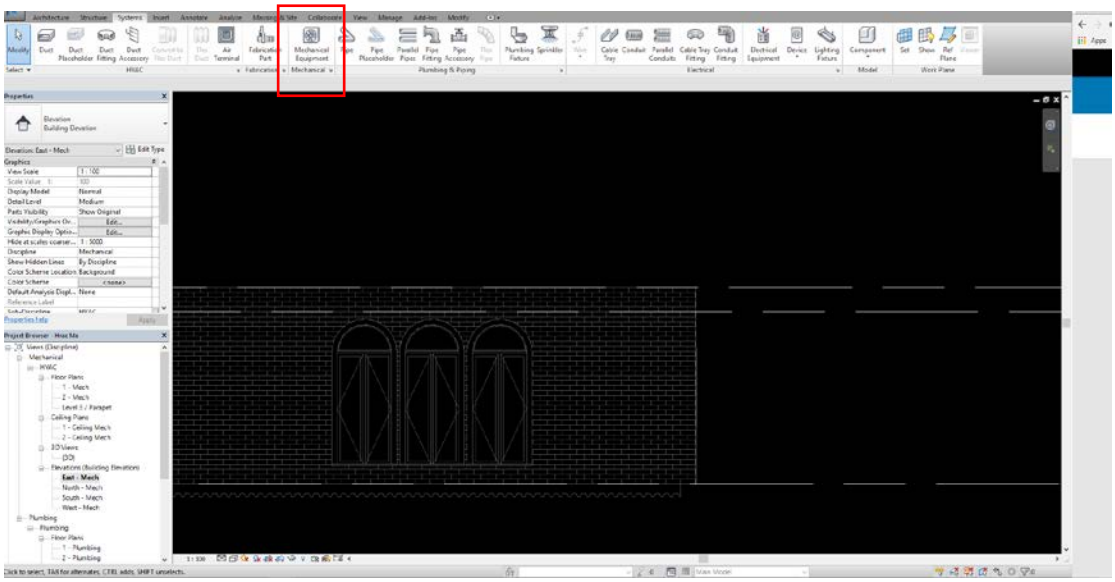


9. Tags based on architectural link have been added to project properly.

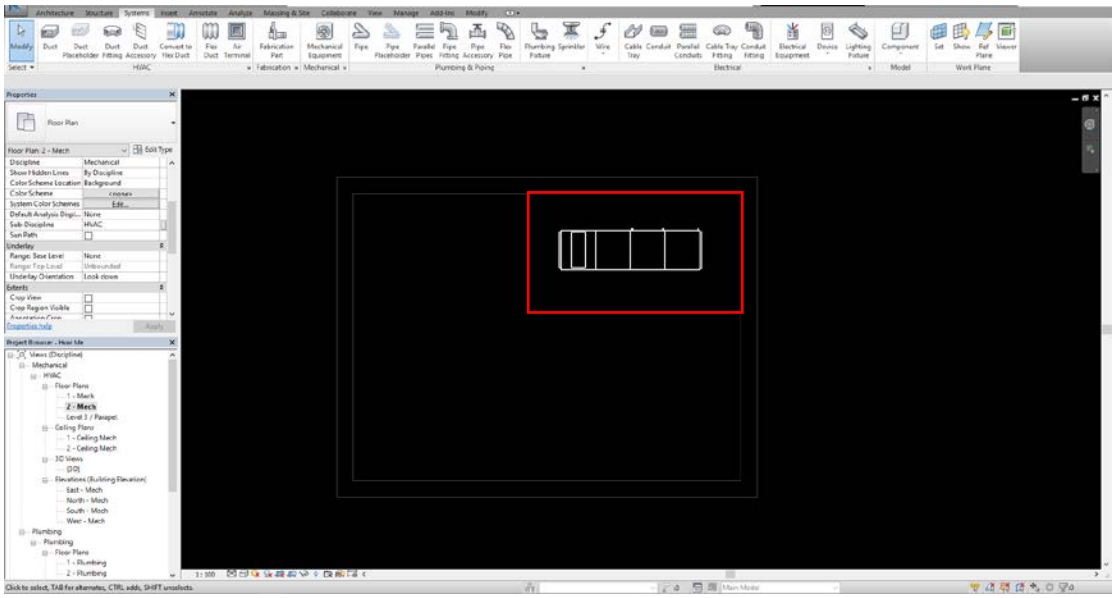


3.2 Adding mechanical equipment

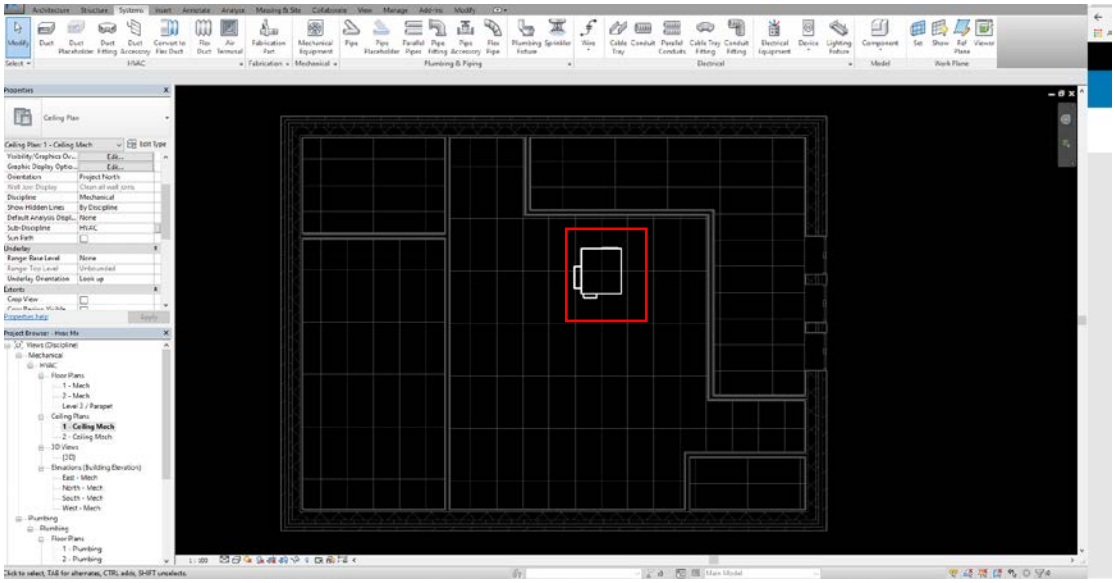
1. Adding AHU. Go to System tab, Mechanical equipment. Load in M_Outdoor AHU – Horizontal. (Mechanical – MEP – Air Handling Units)



2. Place it on roof.

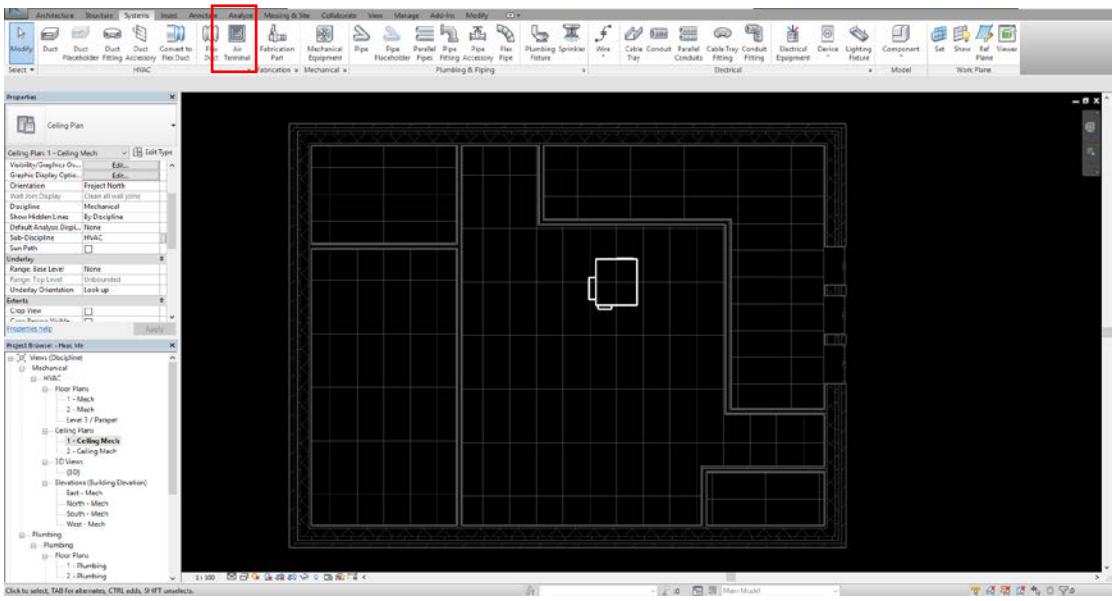


3. Likewise, place your VAV box on ceiling level.

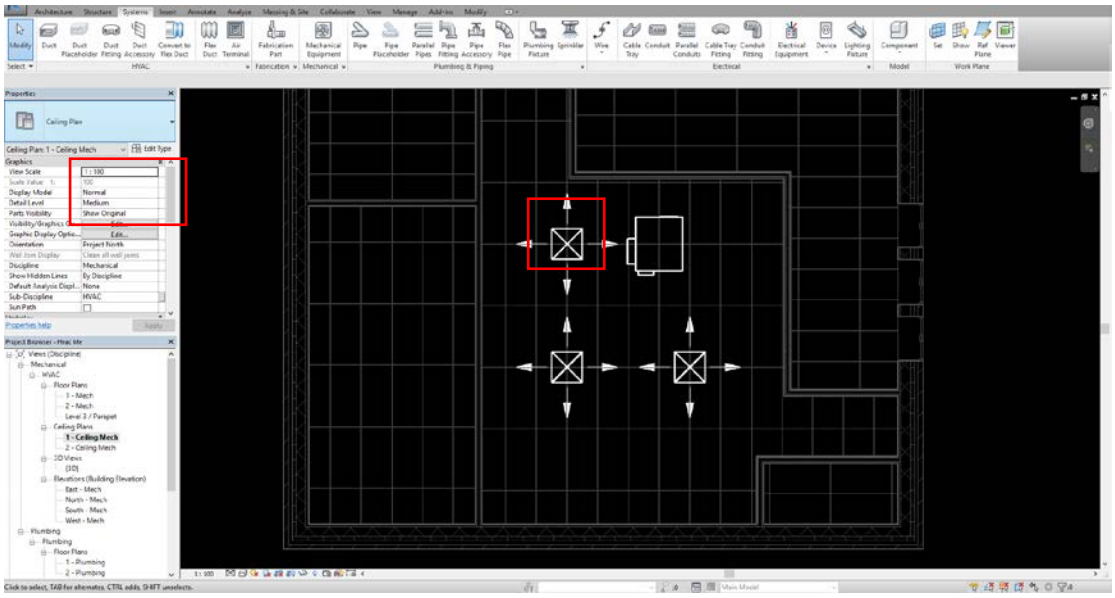


3.3 Adding air terminals

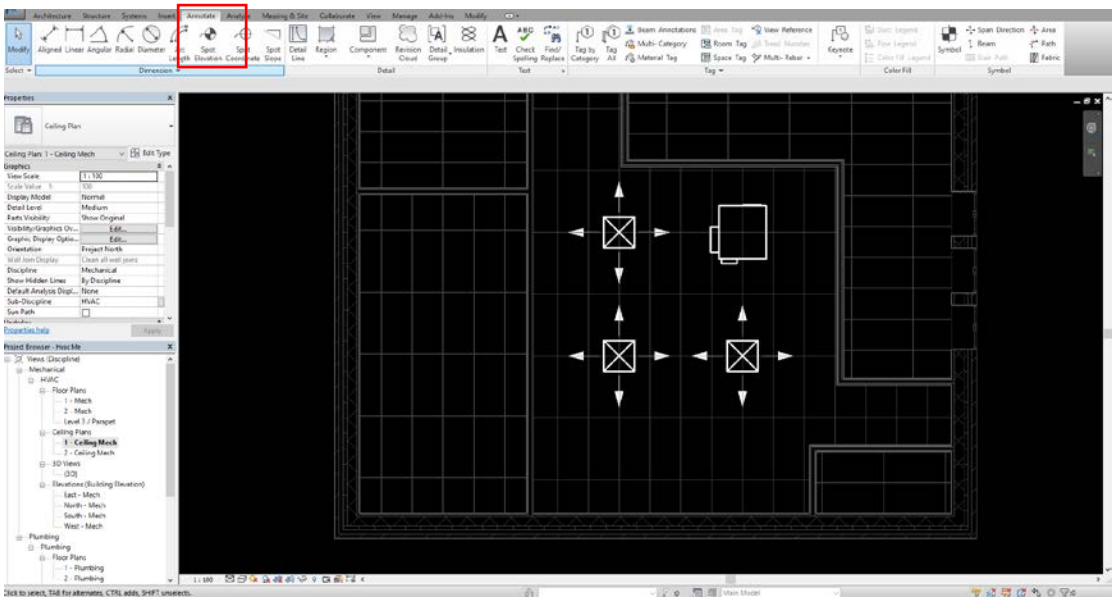
1. Double click your ceiling plan. Go to System tem, Air terminal.



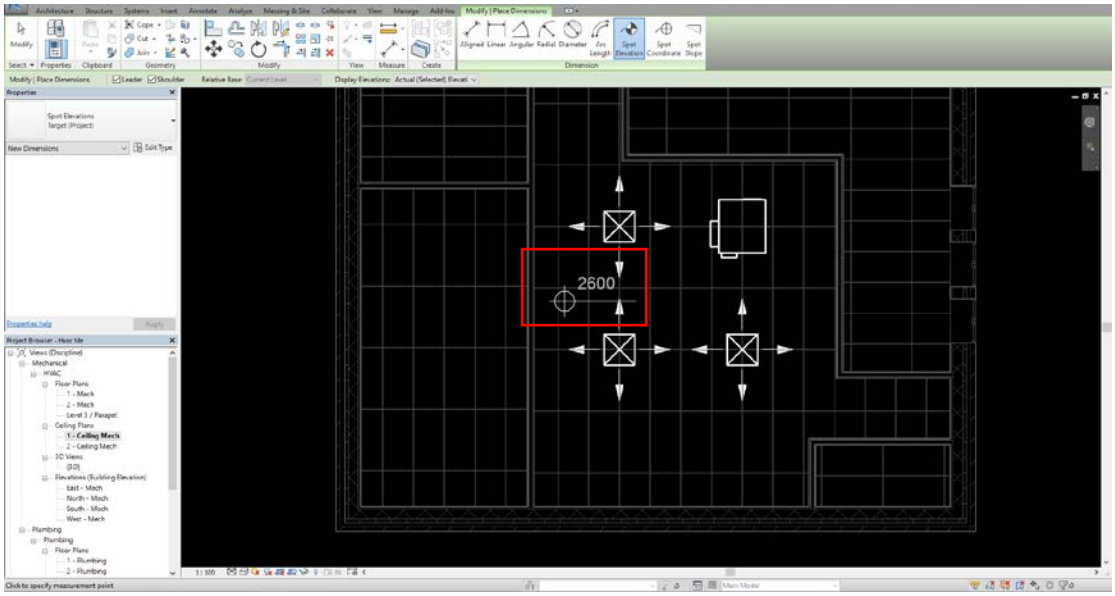
2. Grab a terminal you want. Set offset value to ceiling level and place terminals.



3. Go to Analyse tab then click on Spot Elevation.

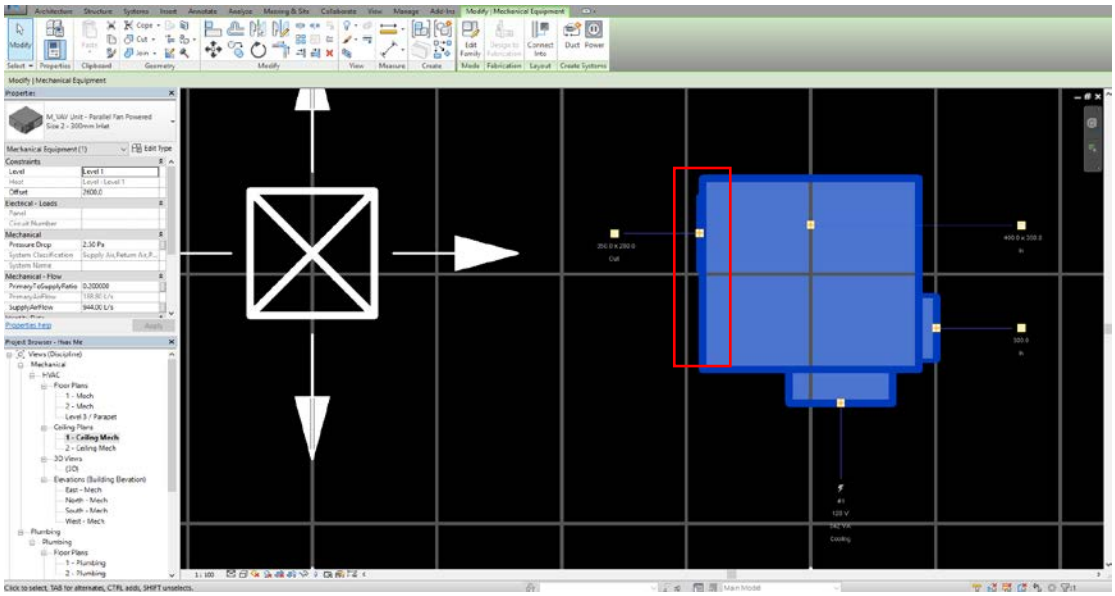


4. Hover over anywhere you wish to know its elevation. Notice that our terminals have been placed on ceiling.

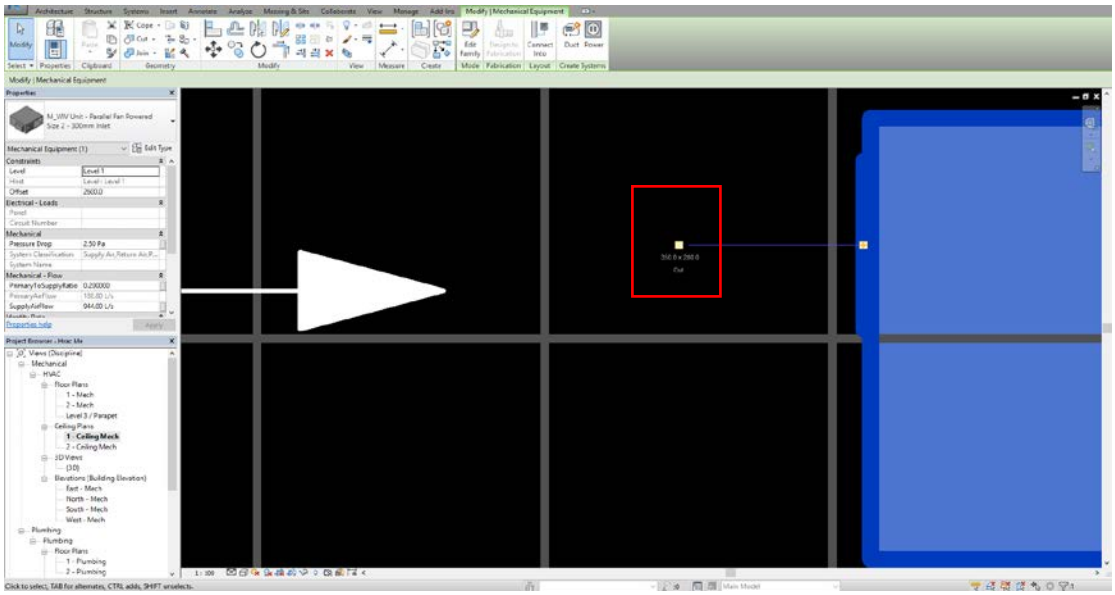


3.4 Adding a supply duct.

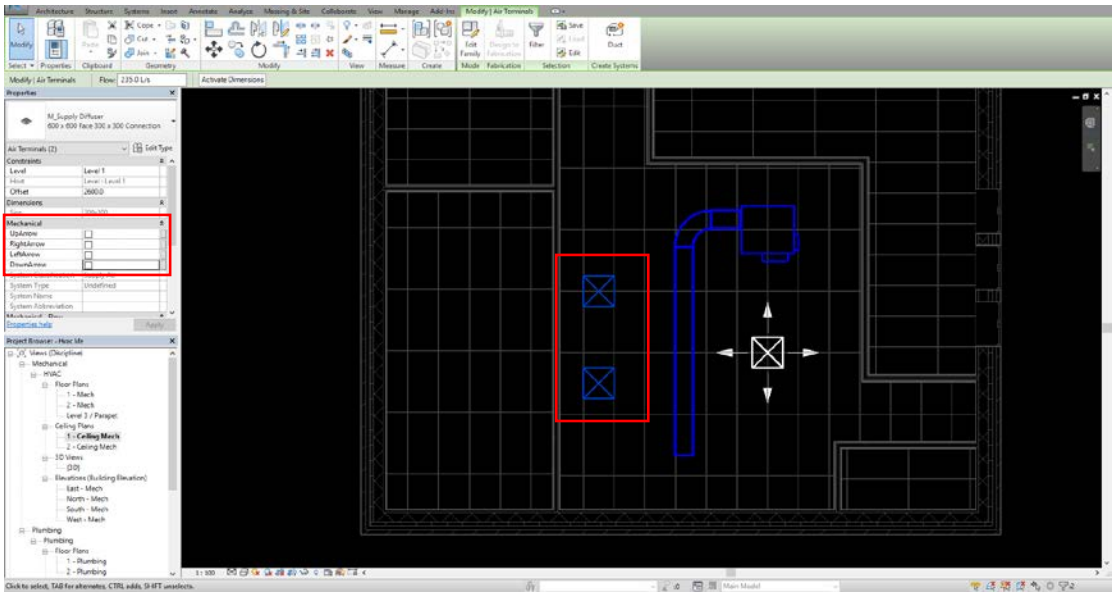
1. Select your VAV box, find the out let of air flow.



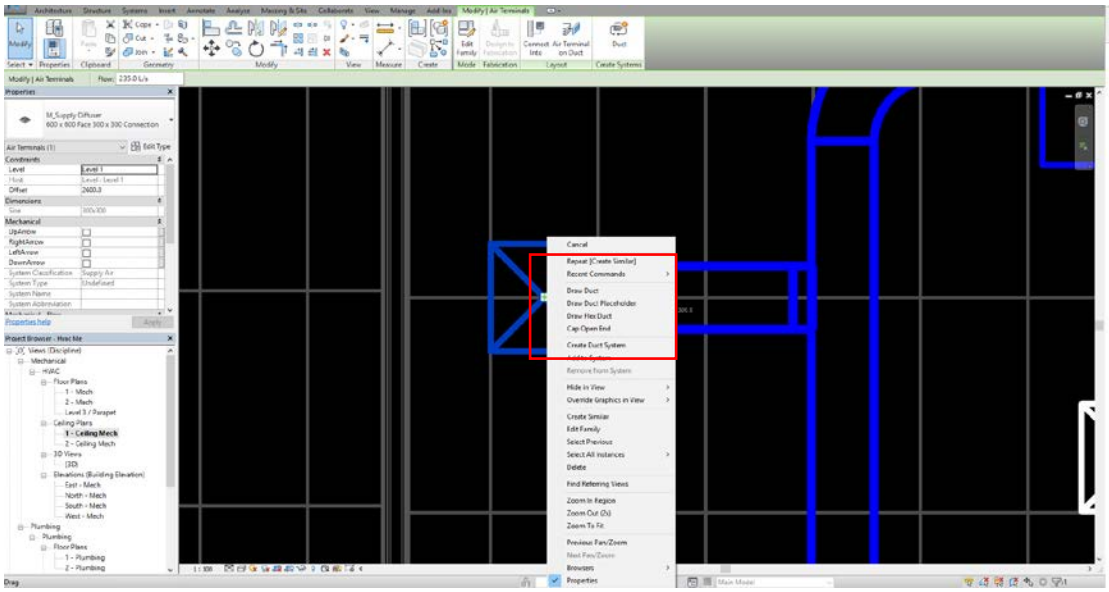
2. Start drawing supply duct from the outlet.



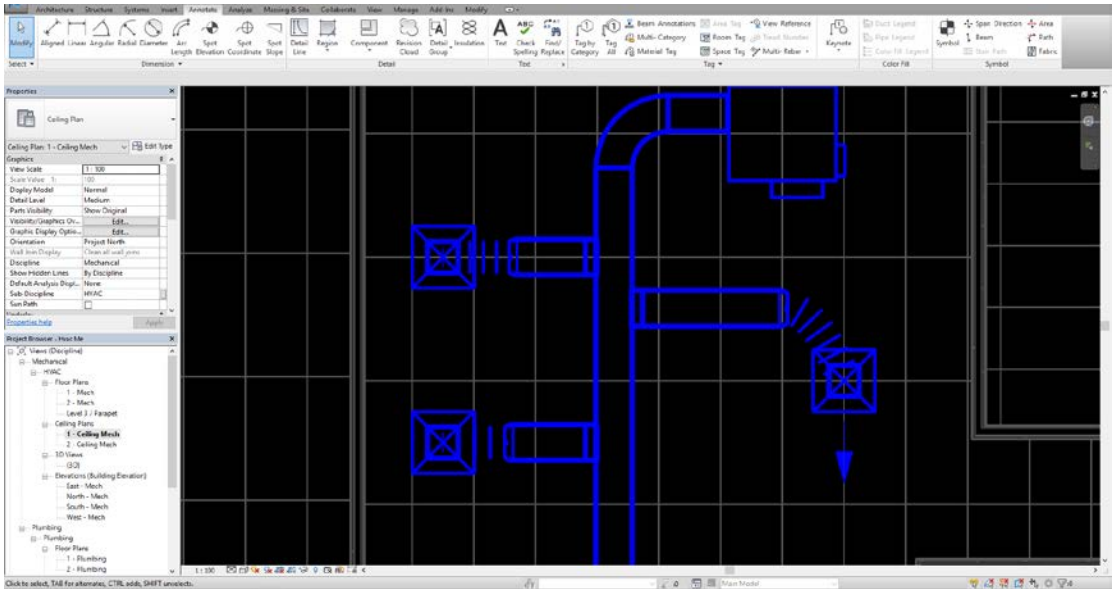
3. As you drawing your duct, turn off flow arrows would come in handy. Go terminal's property panel. Uncheck arrows.



4. Connect terminals and main duct by flex duct. Right click on the termial's node, draw flex duct.



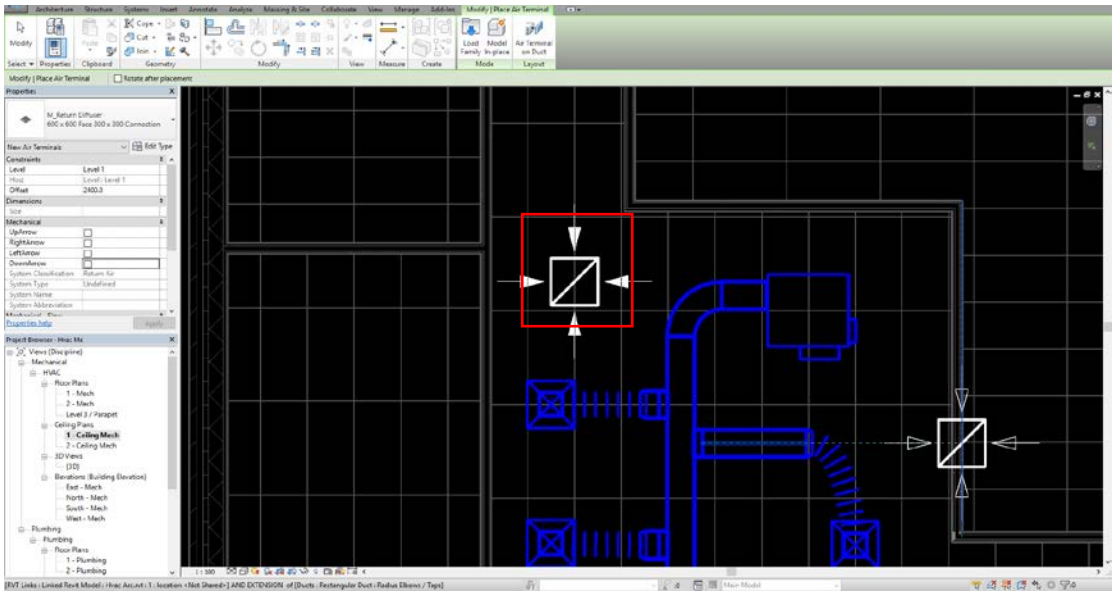
5. Finsh the rest of supply duct system.



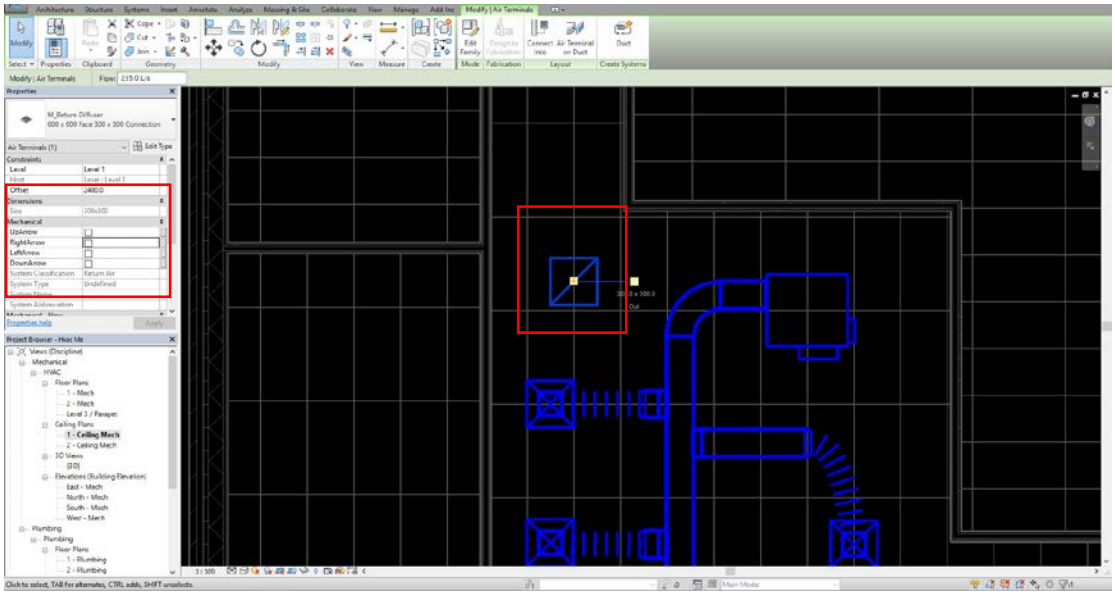
(Note: Depending on the offset of you terminals, flex ducts maybe invisble if we insist on embed terminals on ceiling. Lower your terminals will solve this problem.)

3.5 Adding return duct.

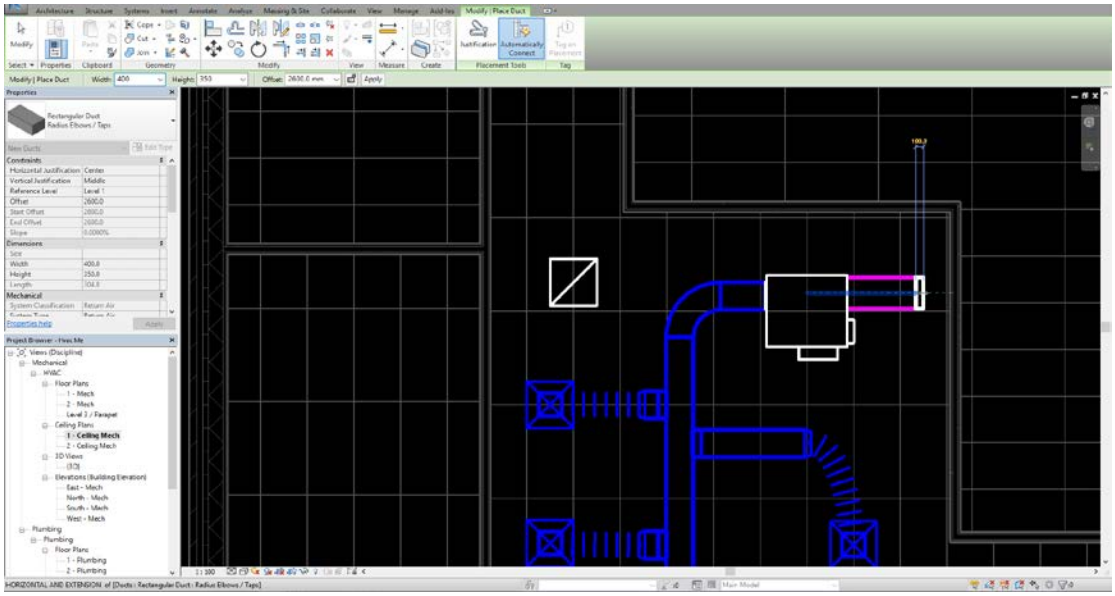
1. Similar to supple duct, firstly, place return terminal on your ceiling.



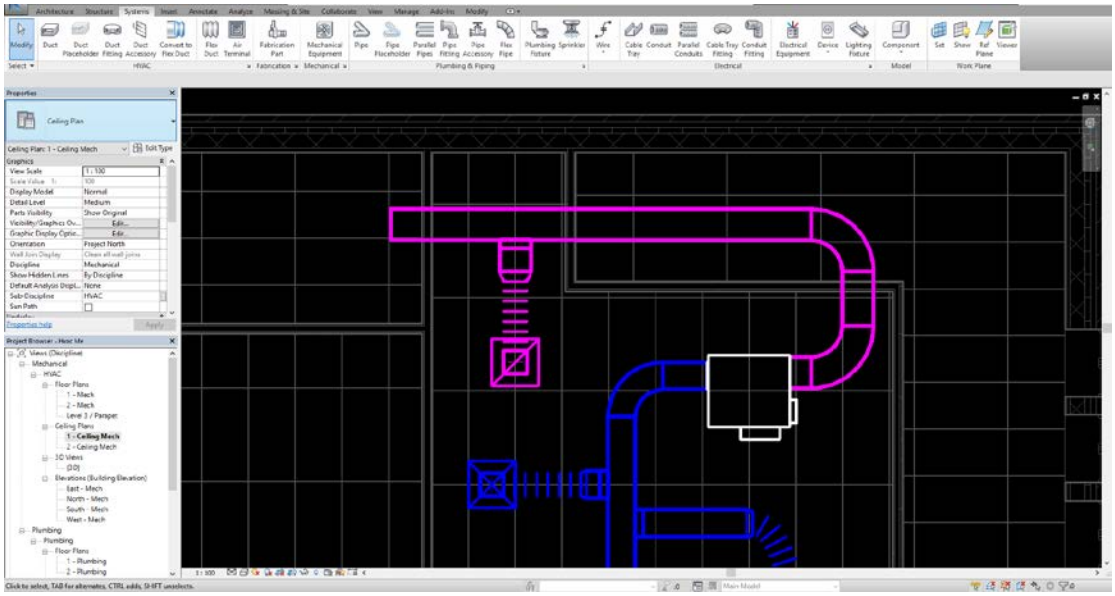
2. Turn off arrows as you wish.



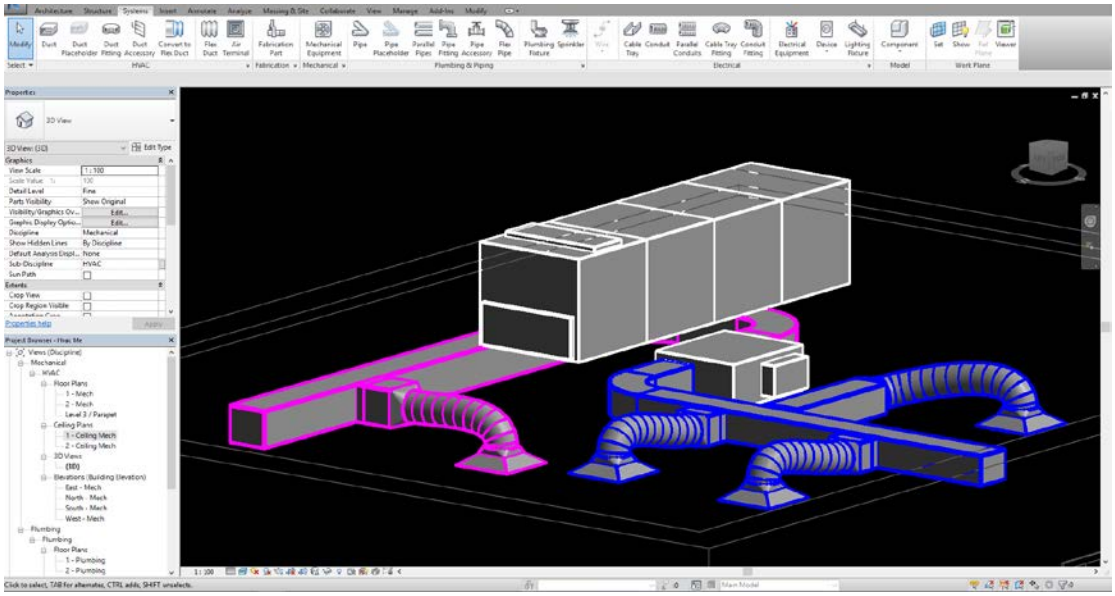
3. Start drawing return duct from VAV box (Find return node).



4. Connect ducts to terminal.

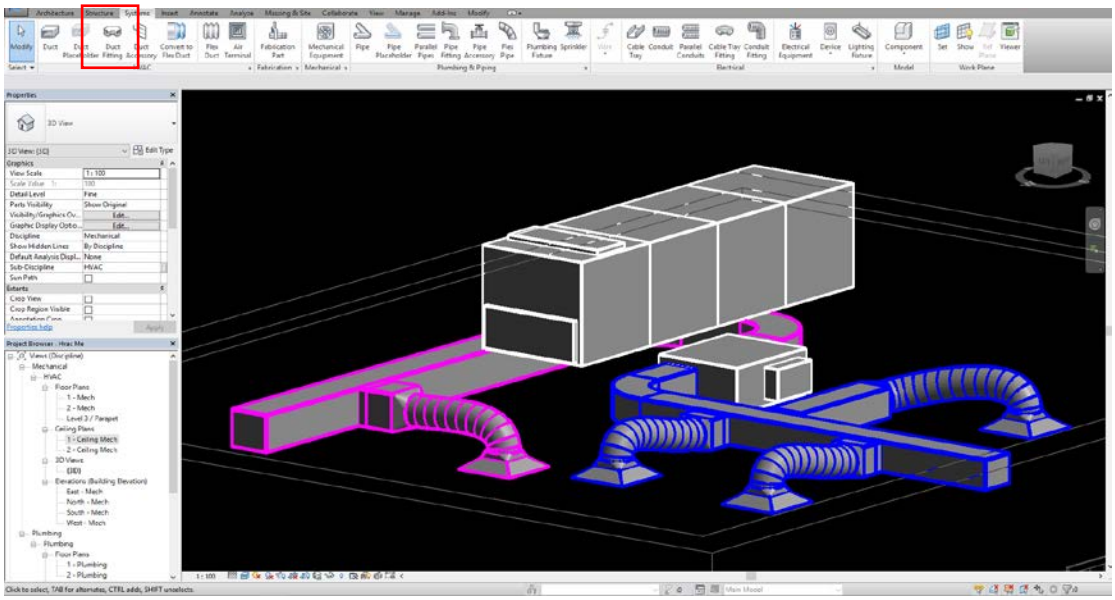


5. Air distribution system finished.

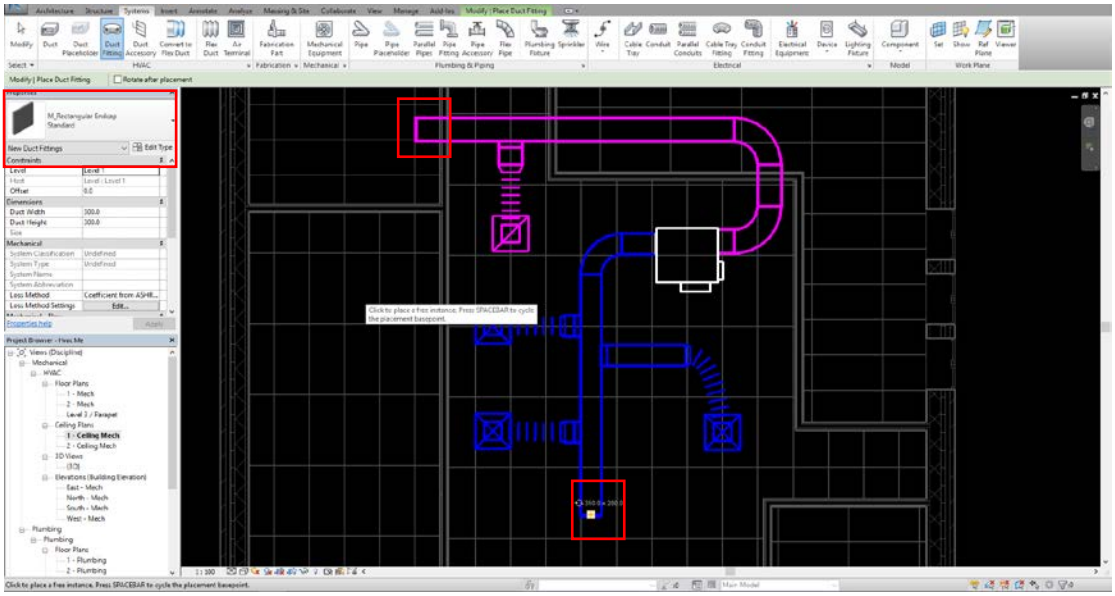


3.6 3.6 Adding duct accessories and fittings.

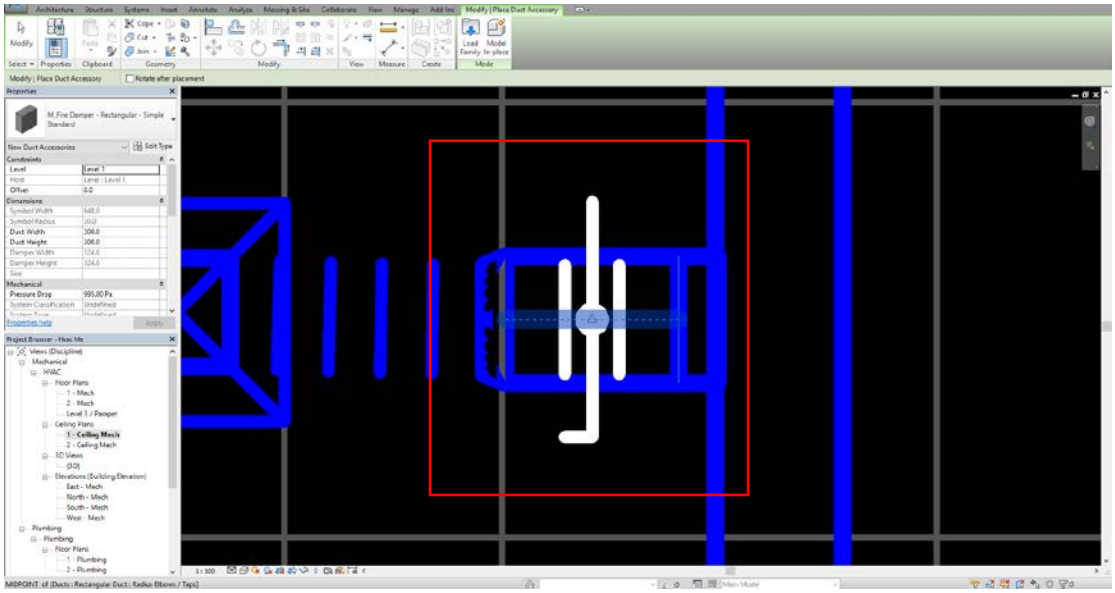
1. Add Endcaps. Go to System tab, HVAC panel, Duct Fitting.



2. Find Rectangular Endcap Standard, place it at the end of your main pipes.



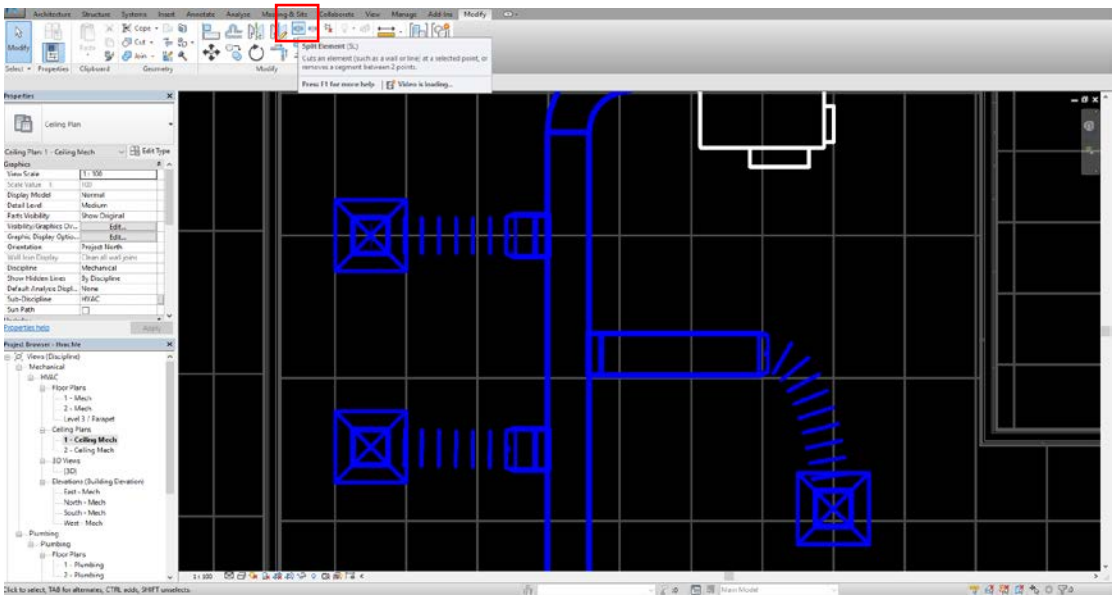
3. Click on Duct Acessories. Place default damper on branch ducts.



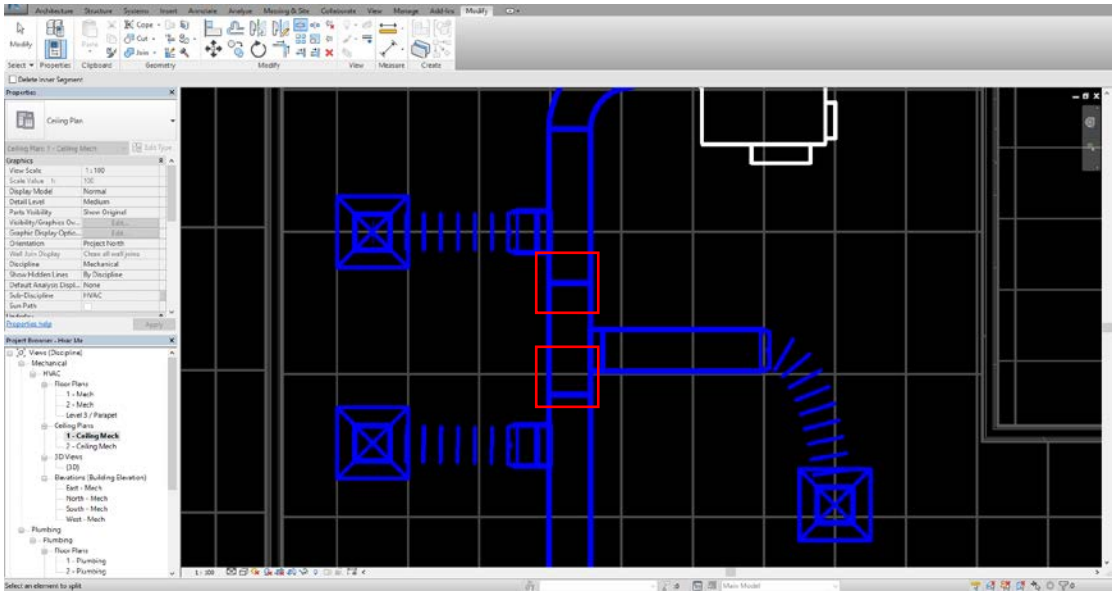
3.7 Sizing duct

Revit is capble of sizing air duct automatically for users.

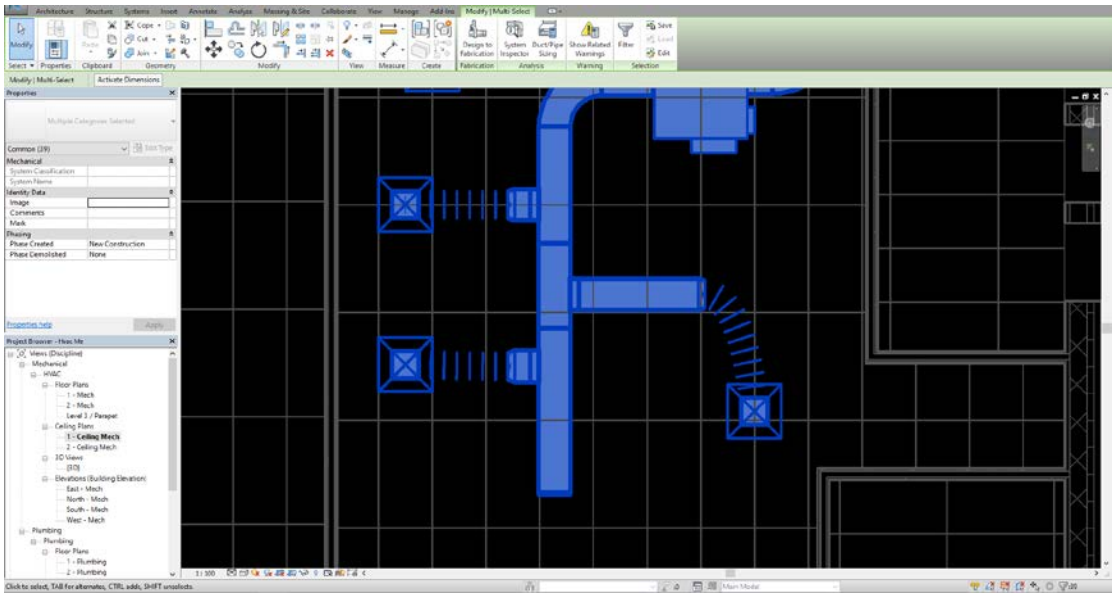
1. Split duct. Go to Modify tab, click on Split command or use keyboard short cut, S+L.



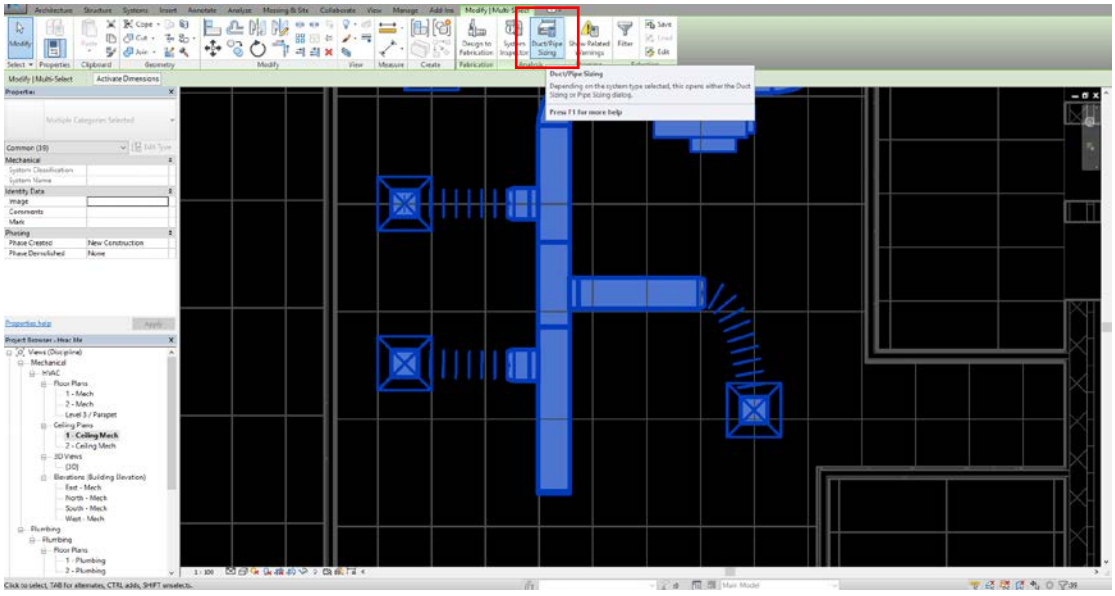
2. Click on places where air flow rate would change.



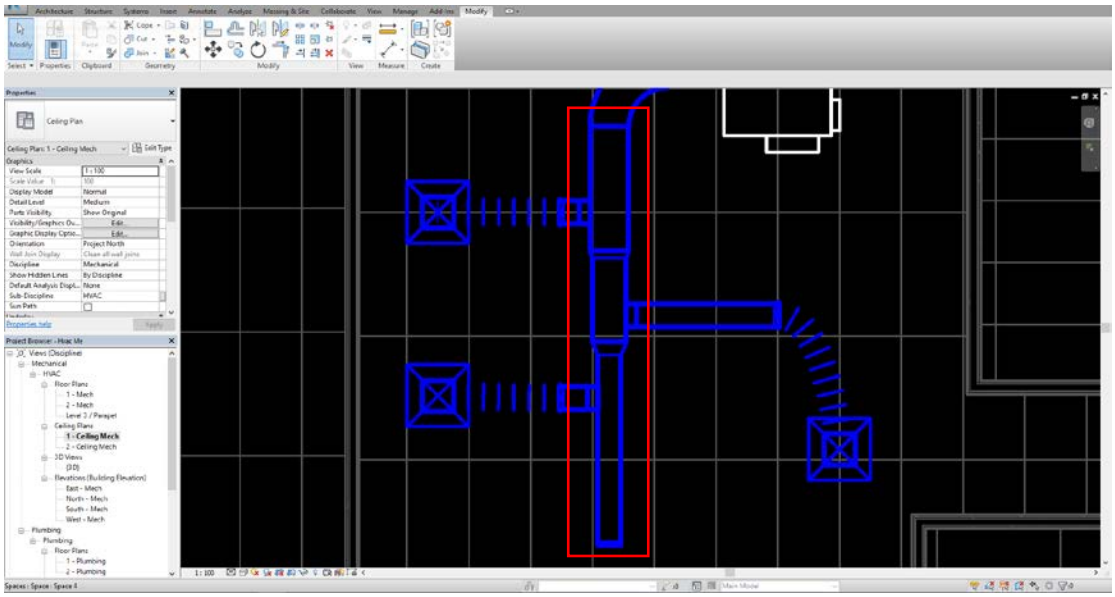
3. Hover mouse cursor over the terminal, press Tab three times till entire two systems are lit up. Select that piece of duct.



3. Click on Duct / Pipe Sizing.

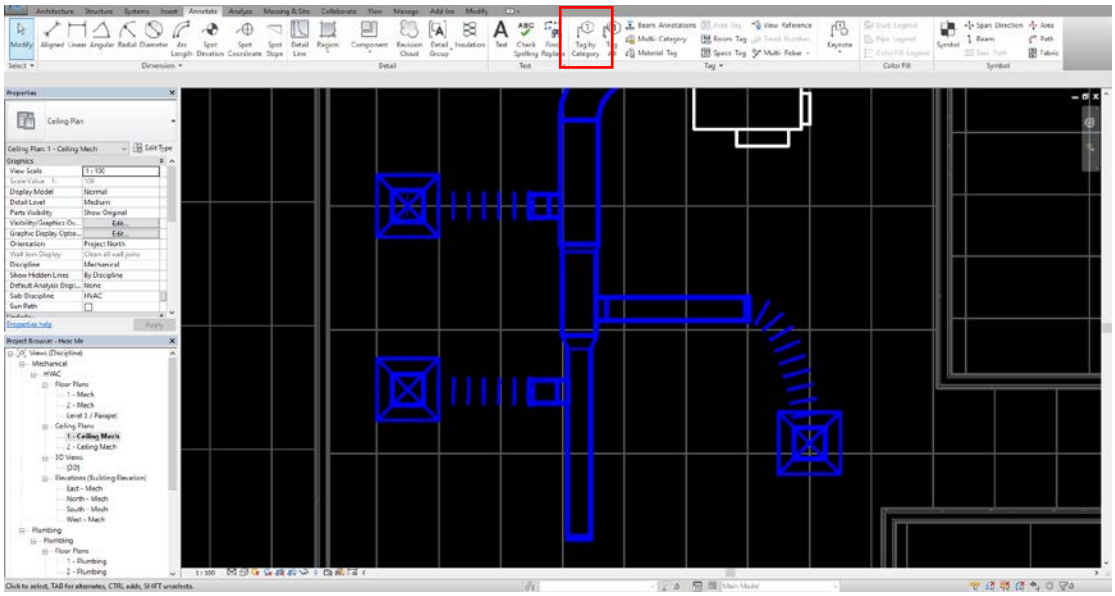


4. Leave velocity at default, click OK. Finish sizing.

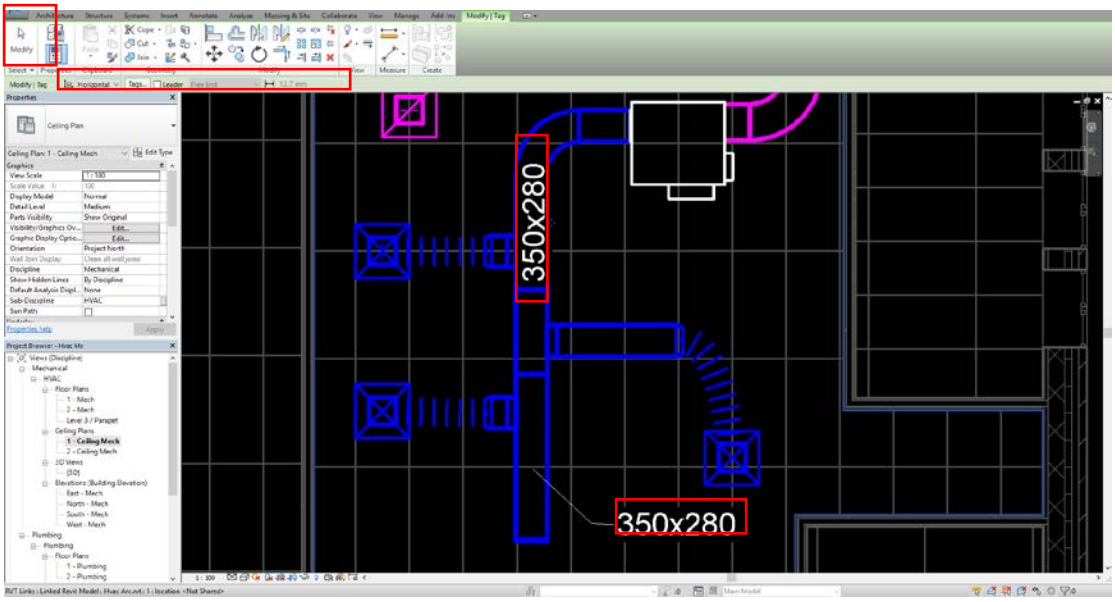


3.8 Tagging duct

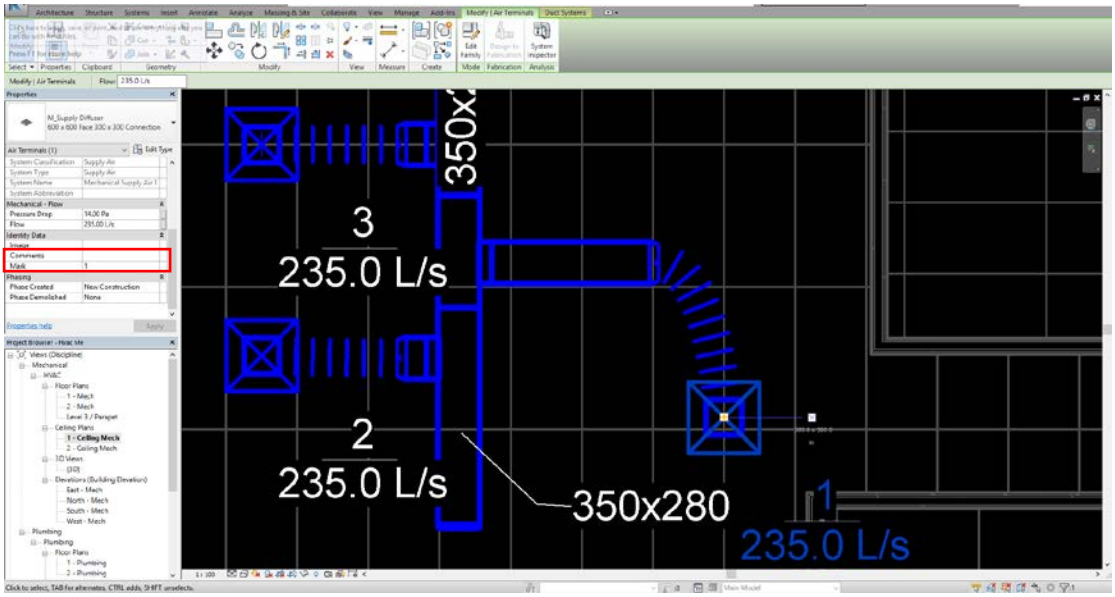
1. Go to **Annotate** tab or simply press **T+G** will invoke Tag by Category command.



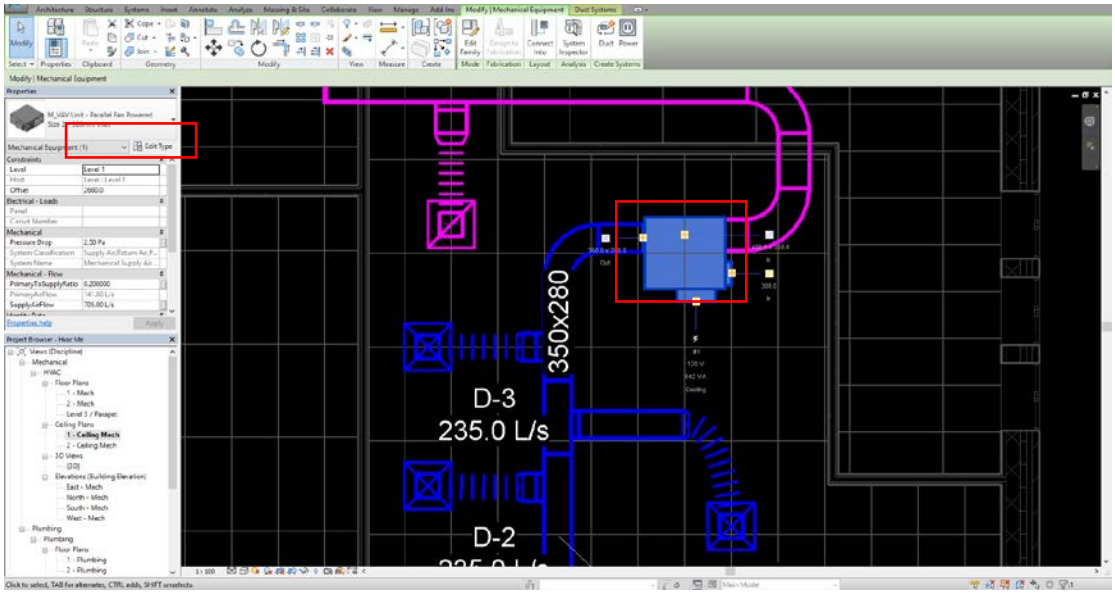
2. Tag your ducts. As long as you want tags stick on the duct, uncheck Leader on the ribbon.



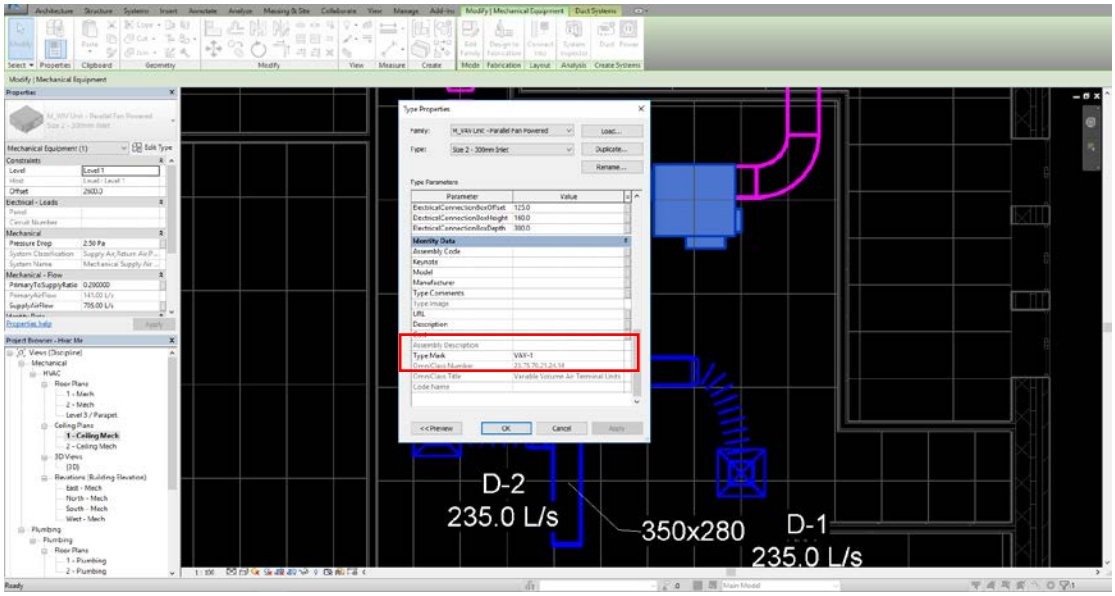
3. Tag terminals. And rename its mark on **Property** window.



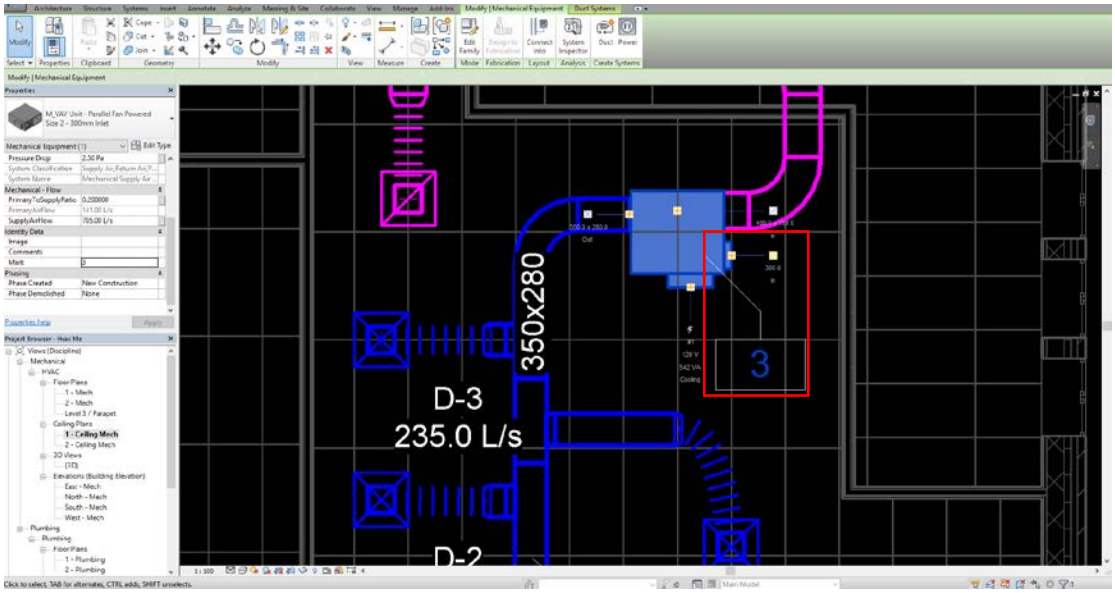
4. Select your VAV box, go to Edit Type.



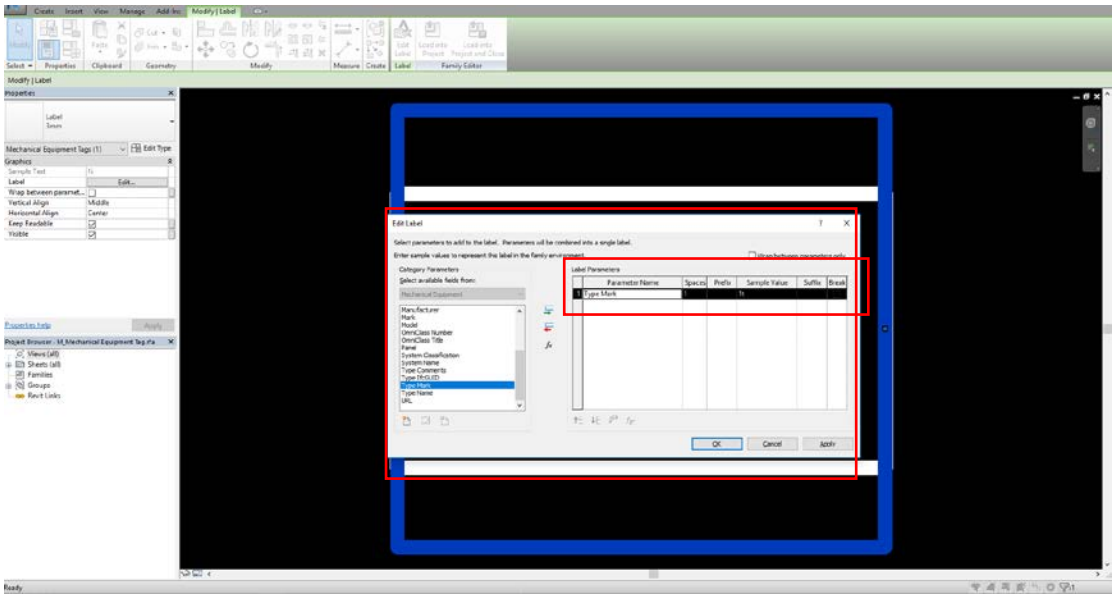
5. Scroll down to Identity Data, rename its Type Mark to VAV-1

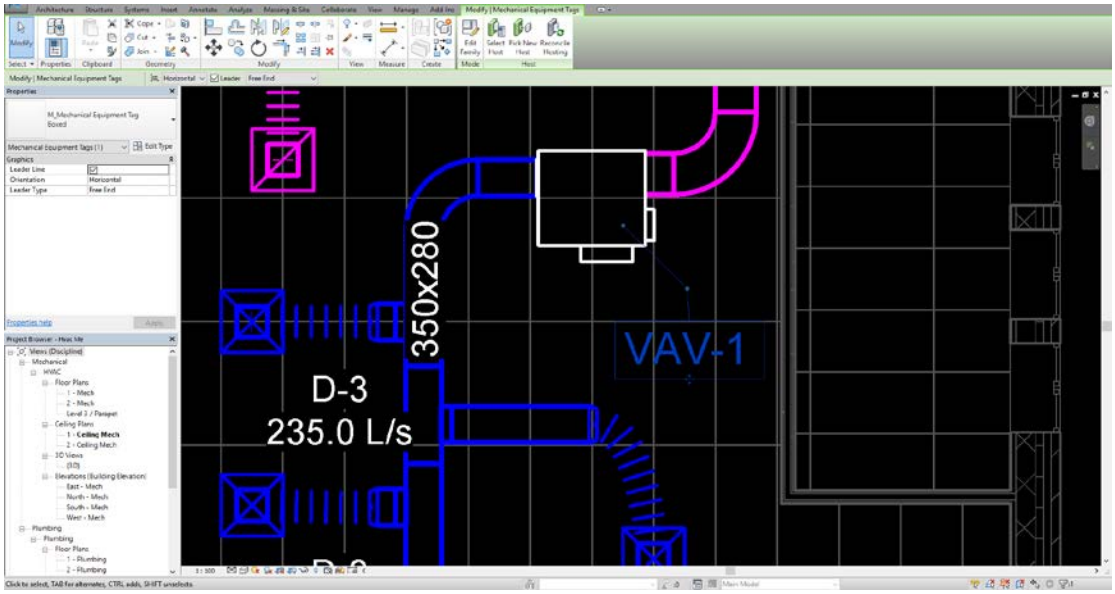


6. Tag your VAV box.



7. With its tag selected, go to Edit Family. Replace your Mark with Type Mark, notice that it will be replaced with VAV-1 which we just edited.

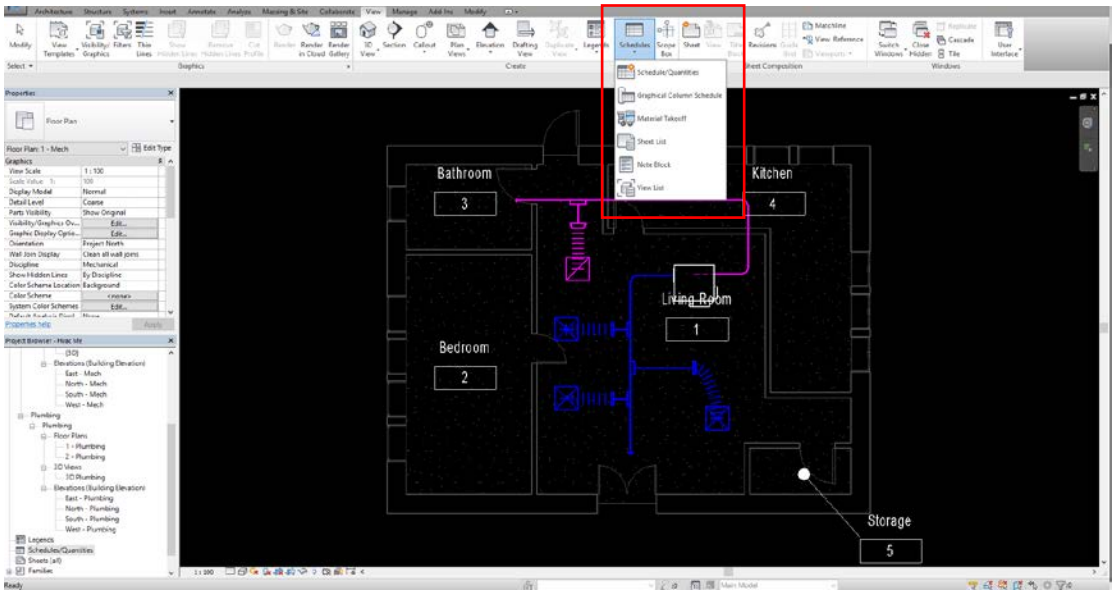




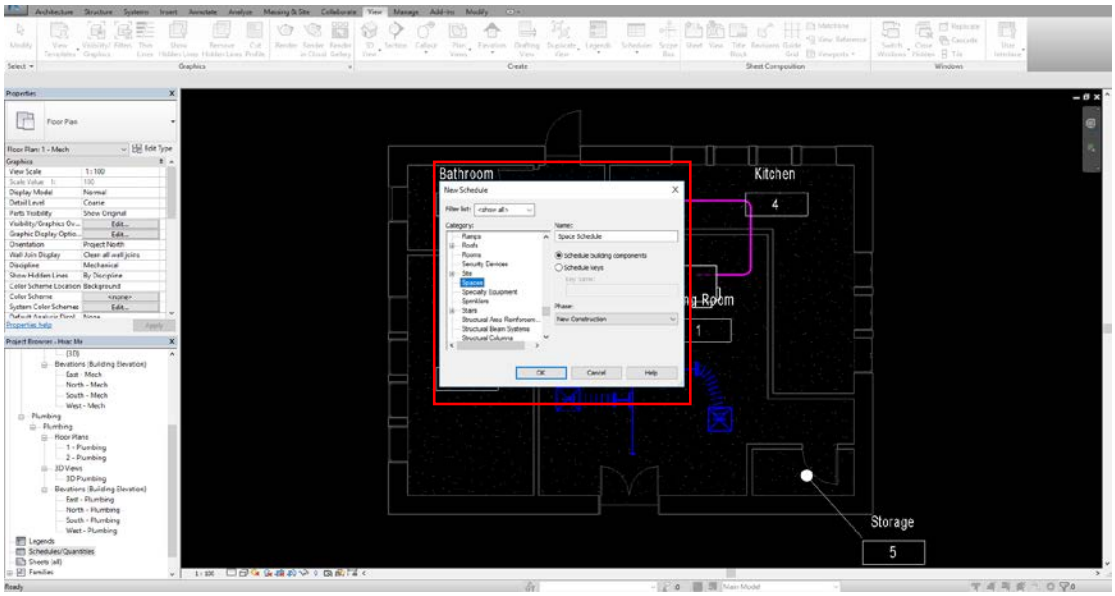
3.9 Adding zones and heating and coolings loads.

Sometimes a collection of spaces should be combined as a Zone. In order to do that.....

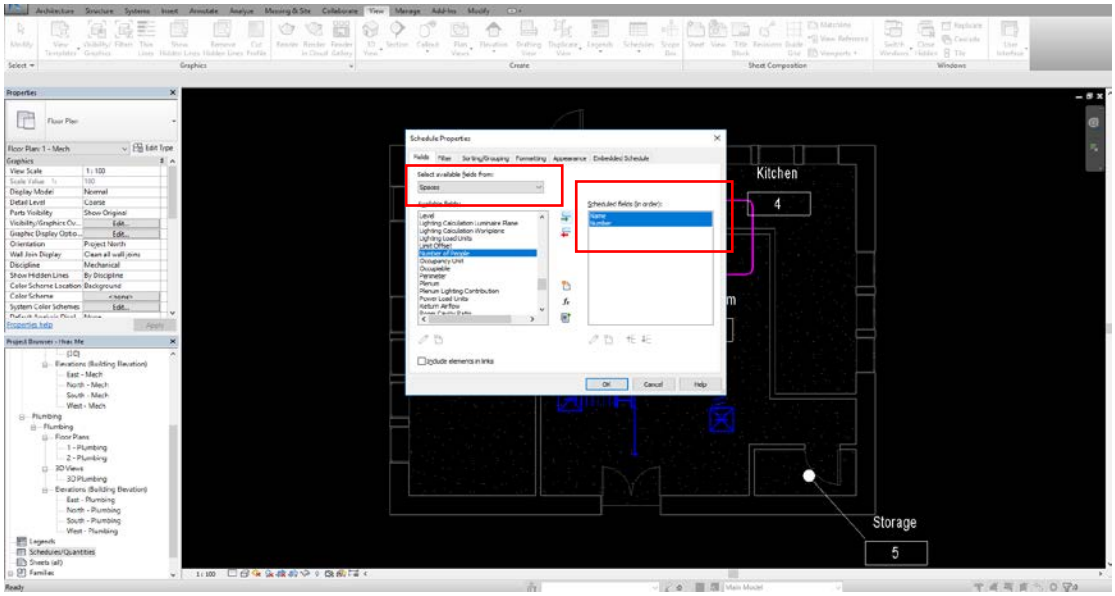
1. Creating schedule for our spaces. Go to View tab, select Schedule, then click on Schedule / Quantities.



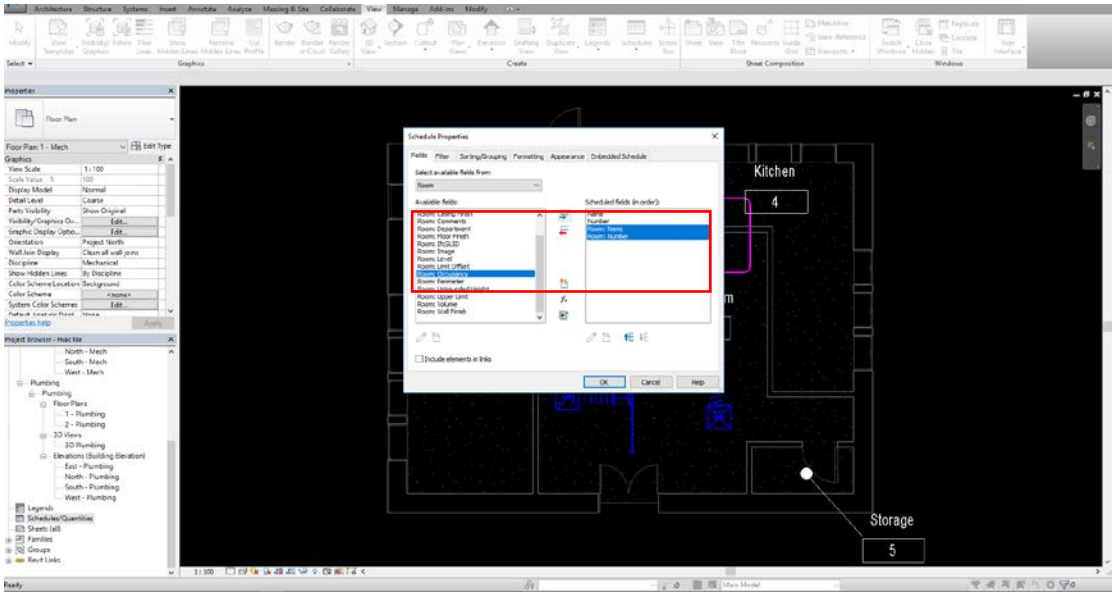
2. In New Schedule window, select Space, then click on OK.



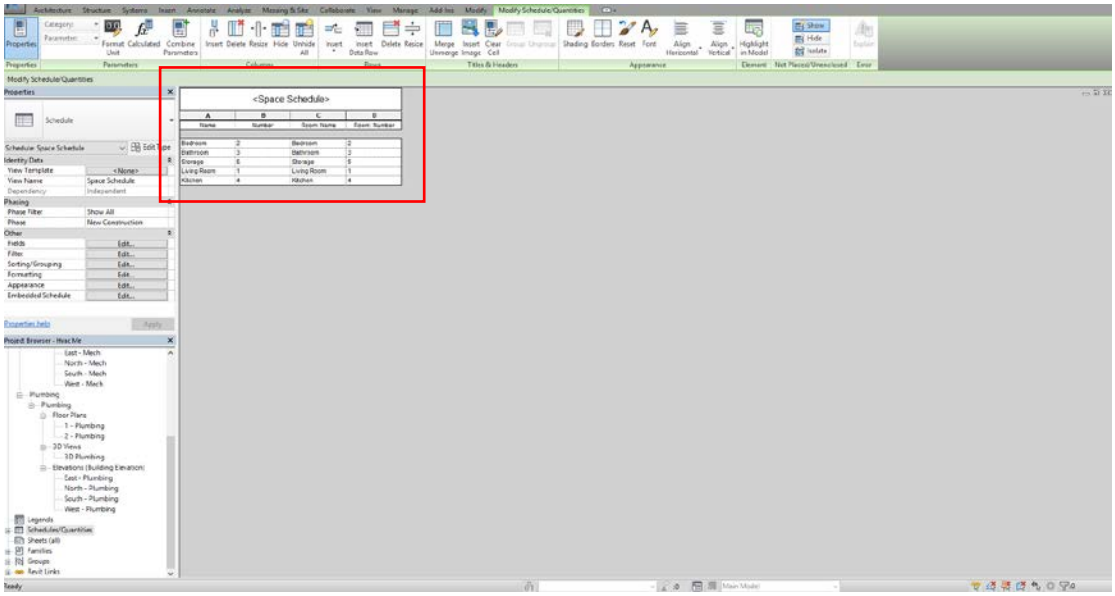
3. In Schedule Properties, find and add in Name and Number.



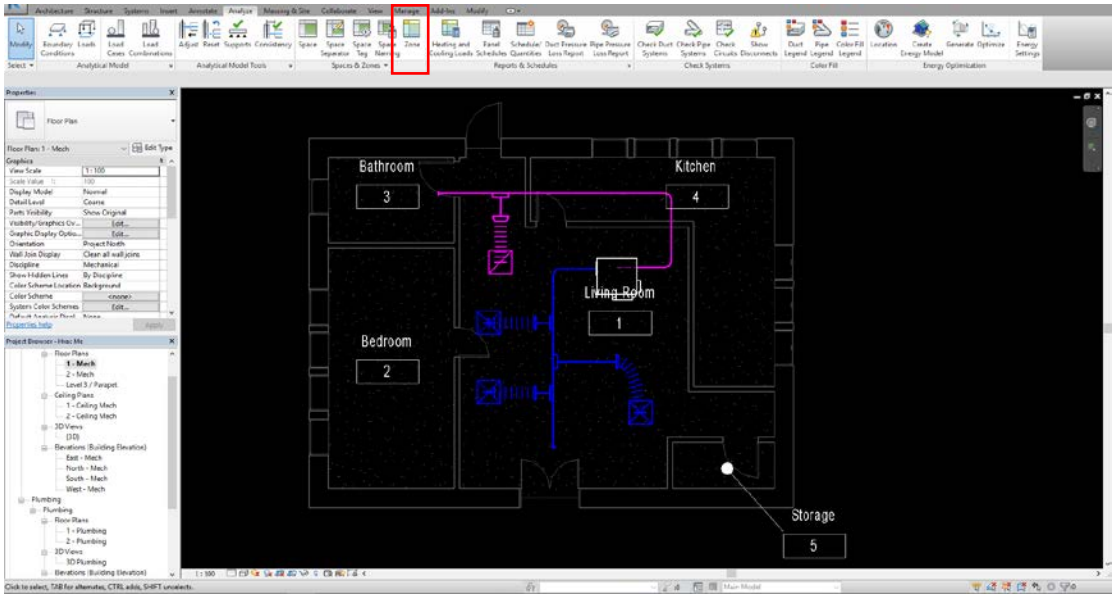
3. For Room, add in Room Number and Room Name.



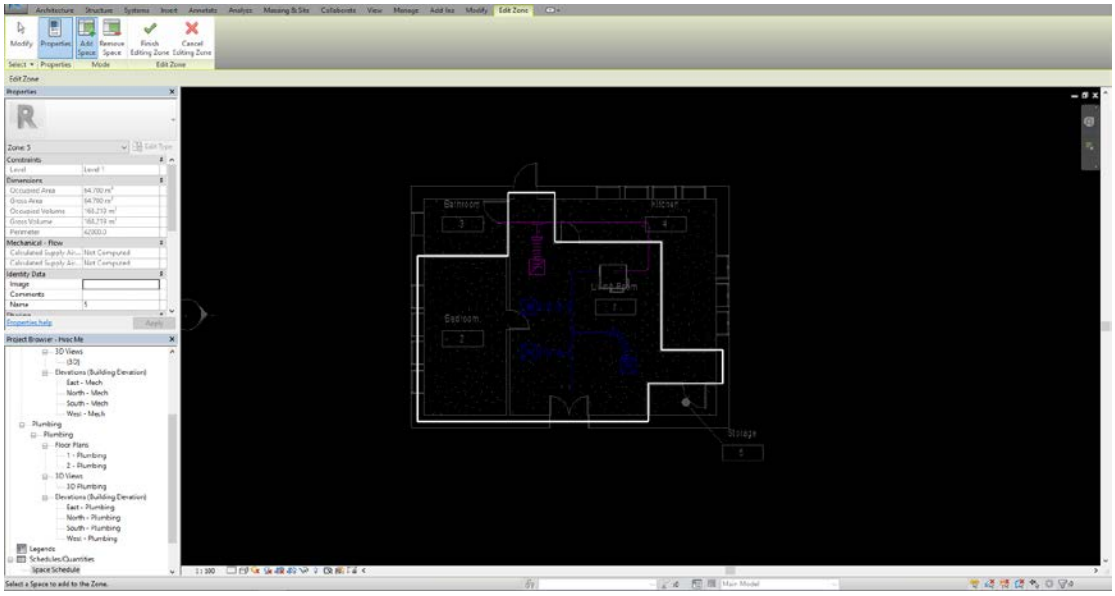
4. Match space numbers and names with that of the rooms'.



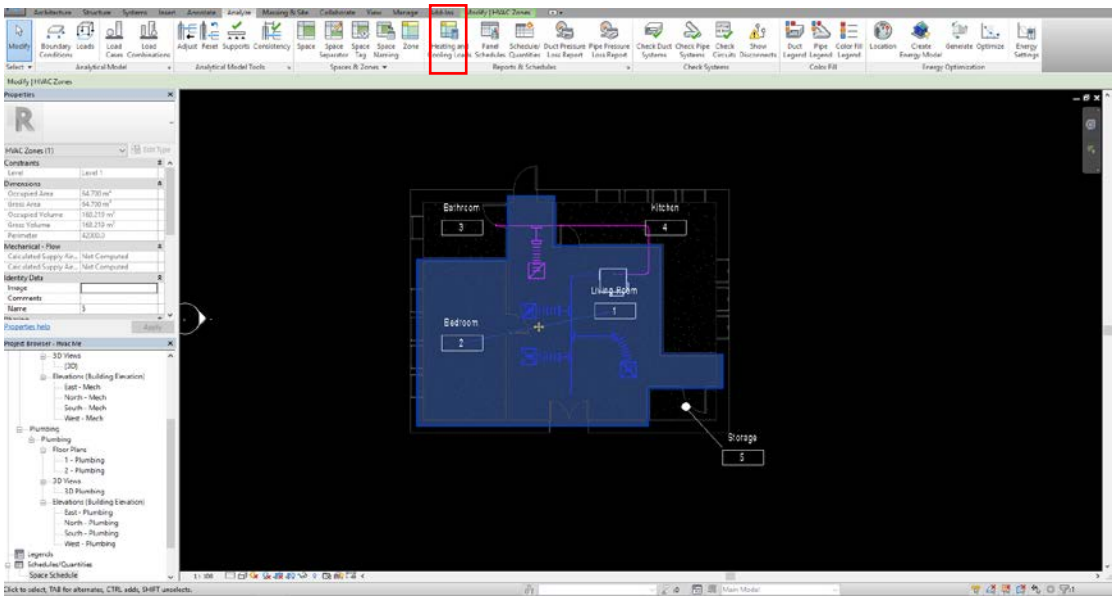
5. Go to Analyse tab, then click on Zone.



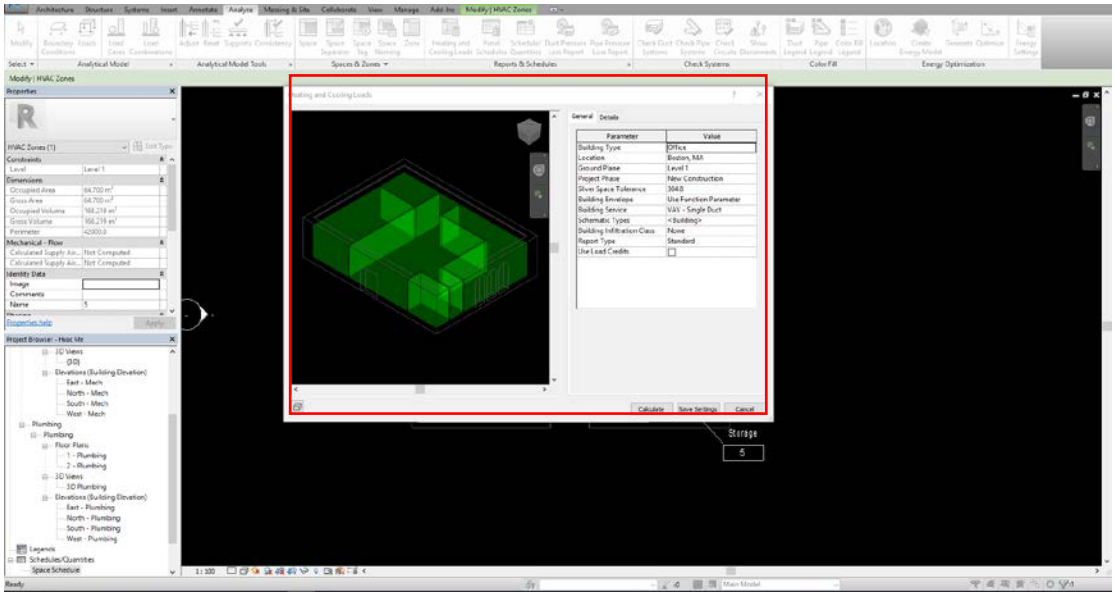
6. Edit Zone. Combine spaces into one zone.



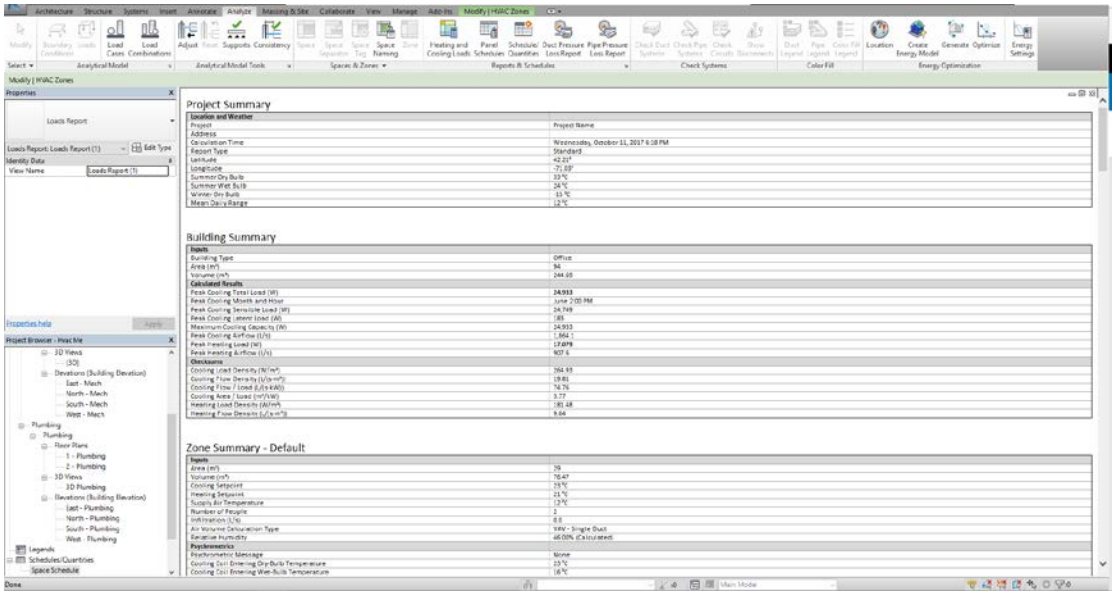
7. Select our zone then go to Analyse tab, Heating and Cooling Loads.



8. Classify your zone’s type, location and etc.



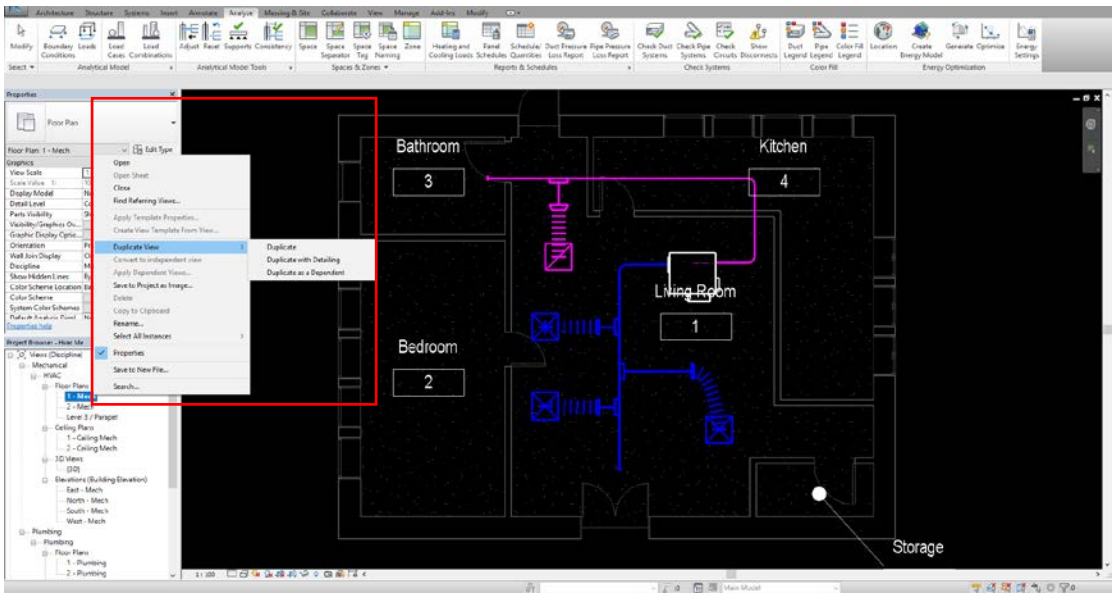
9. Click on Calculate to generate your report.



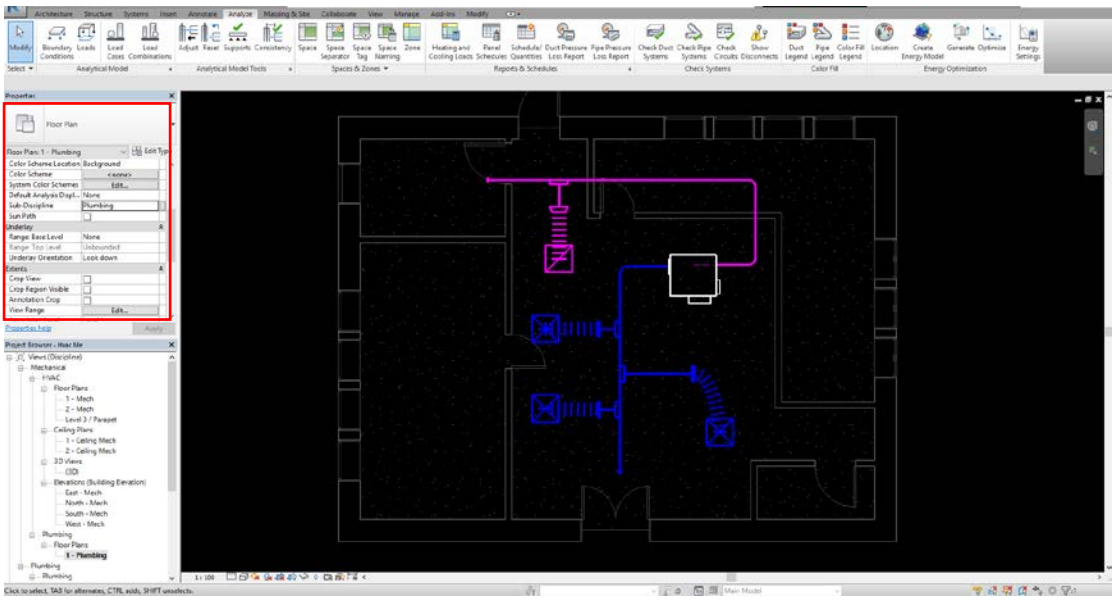
4. Revit Plumbing

4.1 Creatintg a plumbing view.

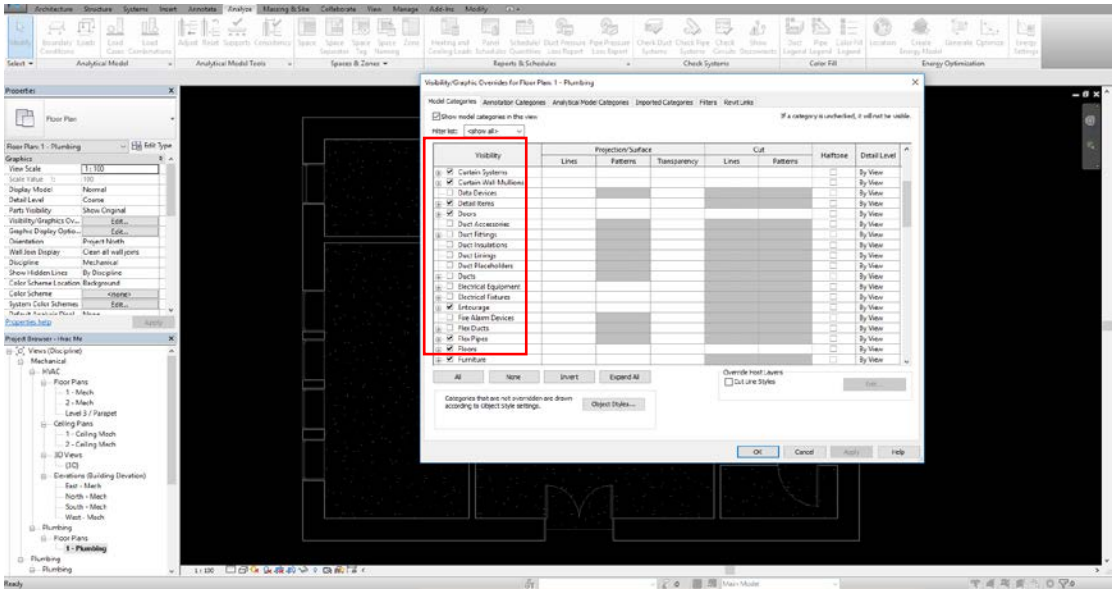
1. Duplicate 1-Mech under HVAC sub-discpline.



2. Rename it as 1-Plumbing, change its sub-displine to Plumbing in Properties window. (Delete original 1-Plumbing view so you can rename duplicated view we just made)



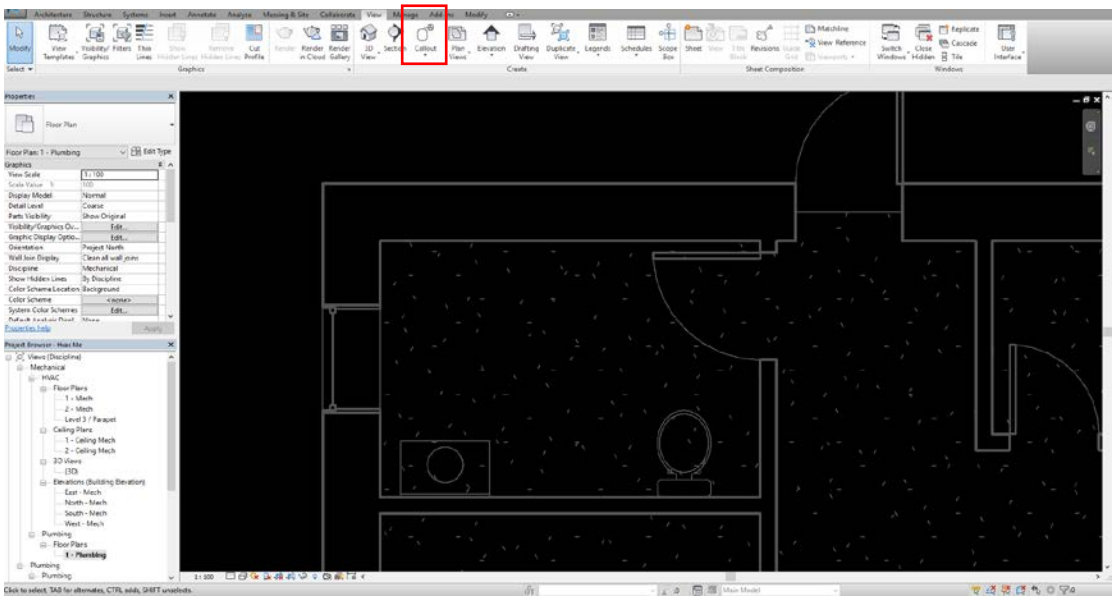
3. V + G, hiding HVAC elements to clear your plumbing view.



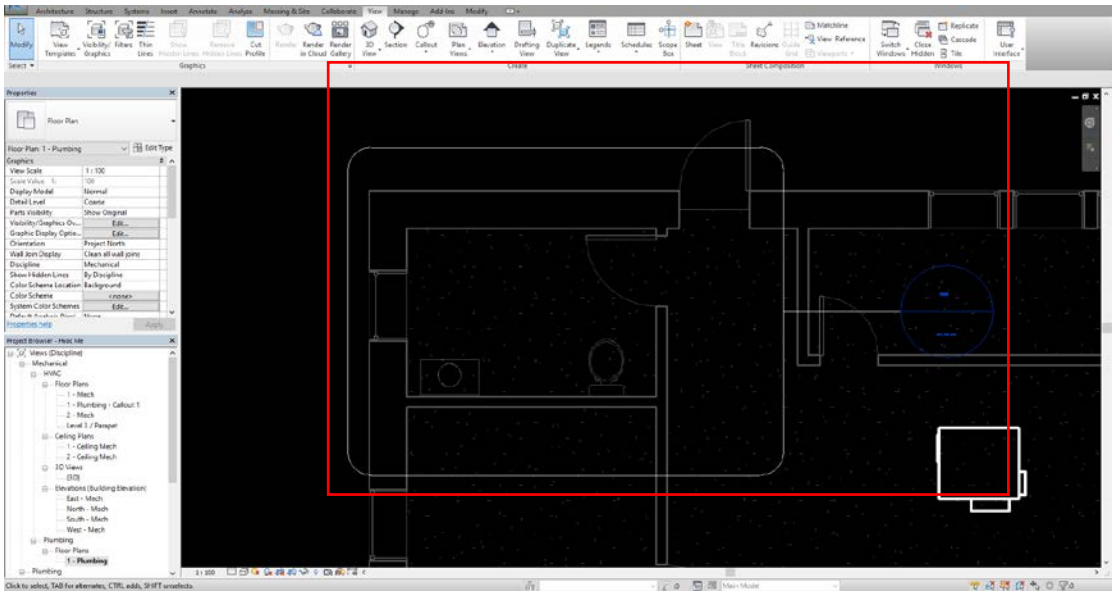
4.2 Adding fixtures and domestic supply piping

Due to plumbing fixtures are usually displayed on architectural files, there's no need to place them again in plumbing discpline.

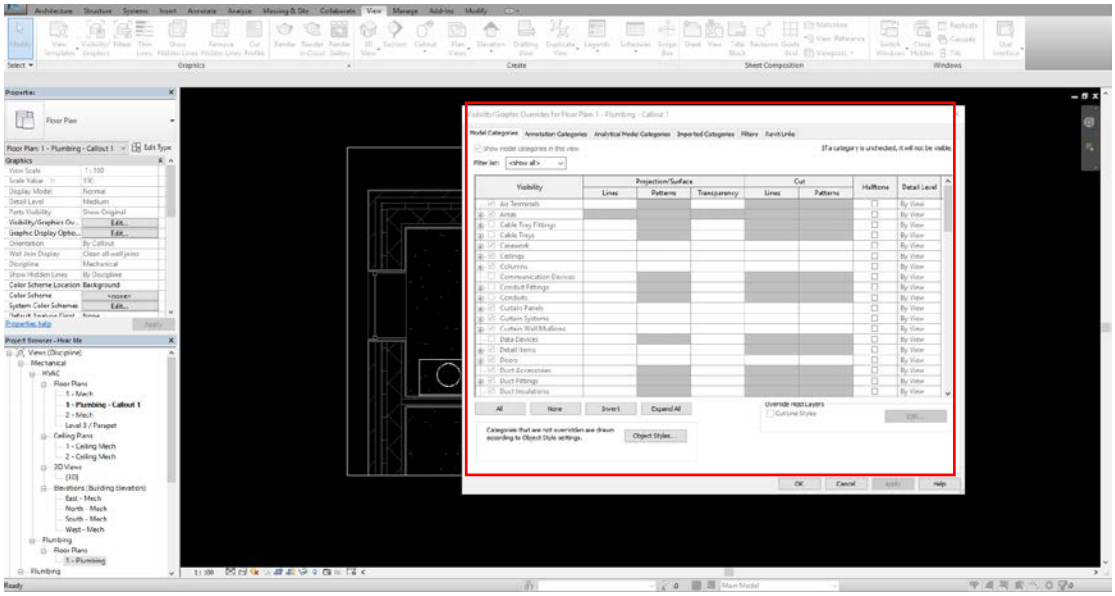
1. Make a call-out view focusing on bathroom. Go to View tab, click on Call Out.



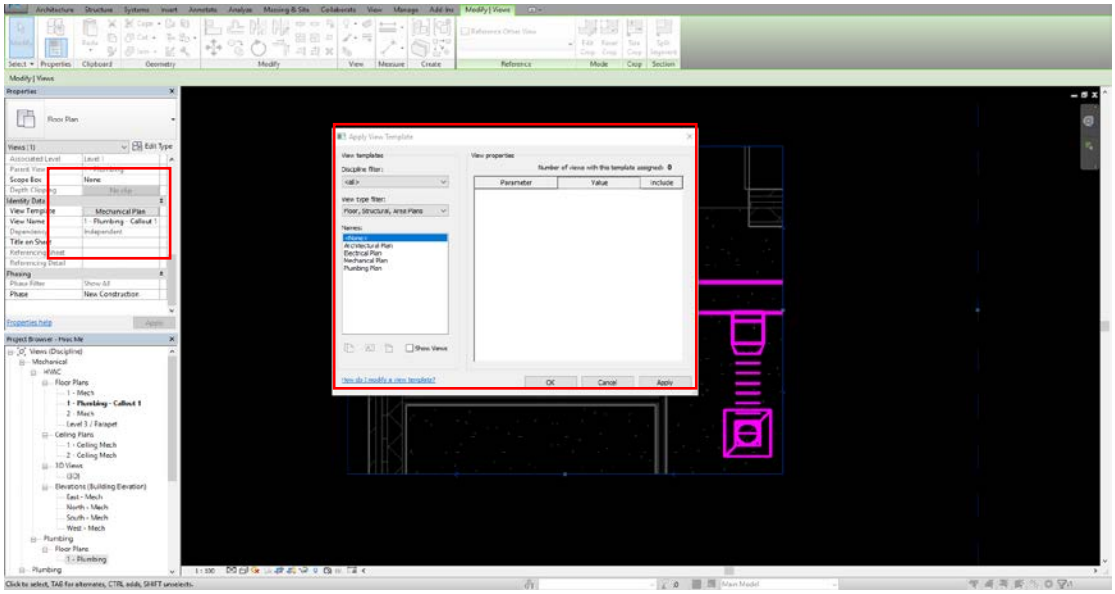
2. Double click on it, then clear our call-out view.



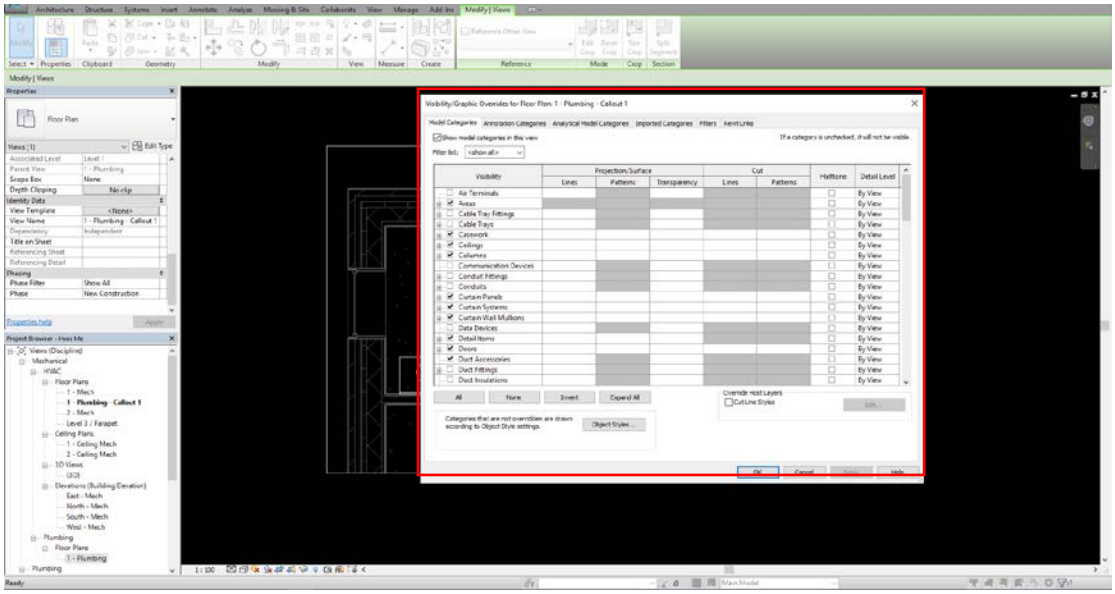
3. Notice that all VG options are grey-out.



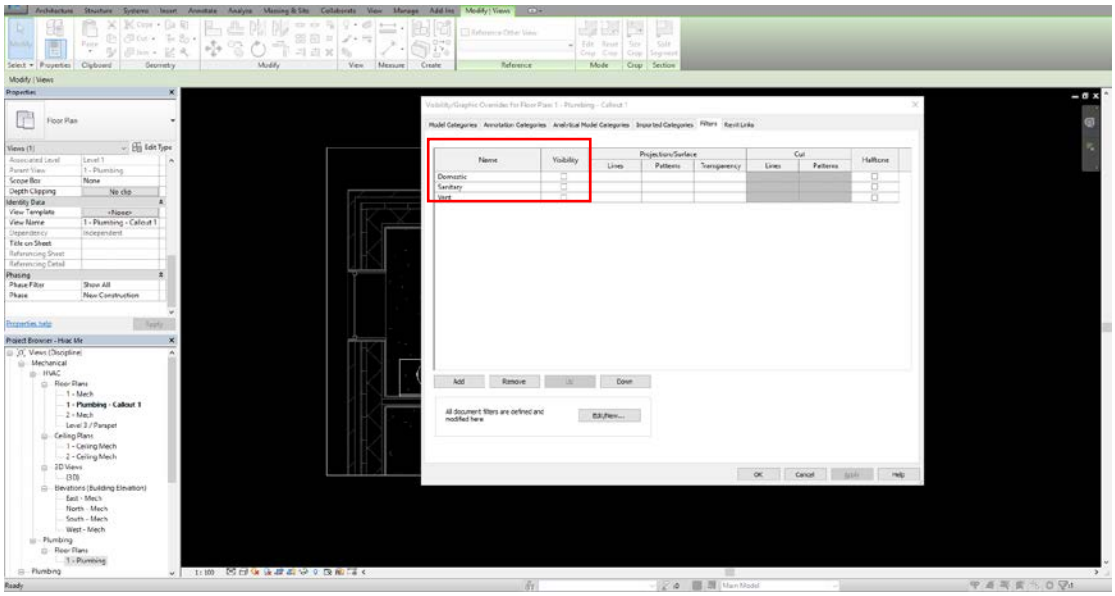
4. Go to Properties window, unbind it from Mechanical Plan to None.



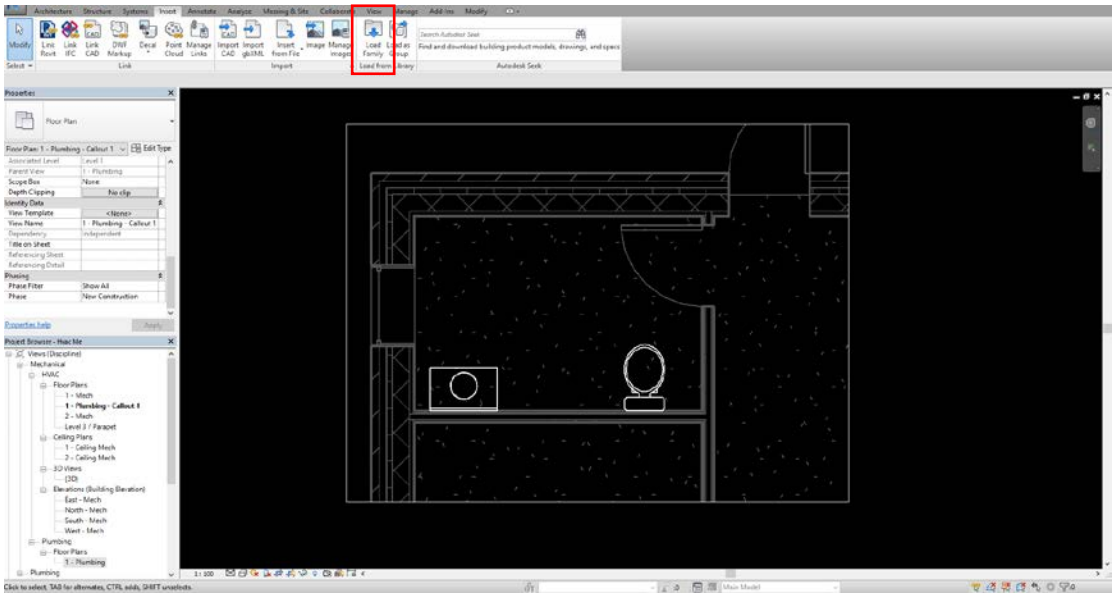
5. Go to VG settings, hide none-plumbing fixtures and floor pattern.



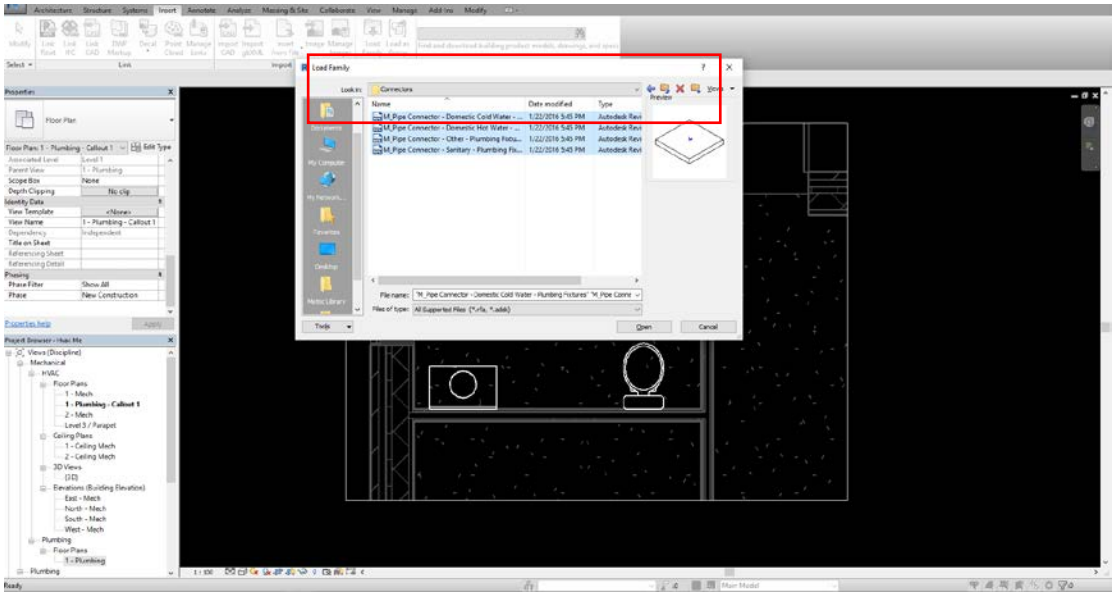
5. Set up filter to allow us to display different types of piping. Tick on these checkboxes.



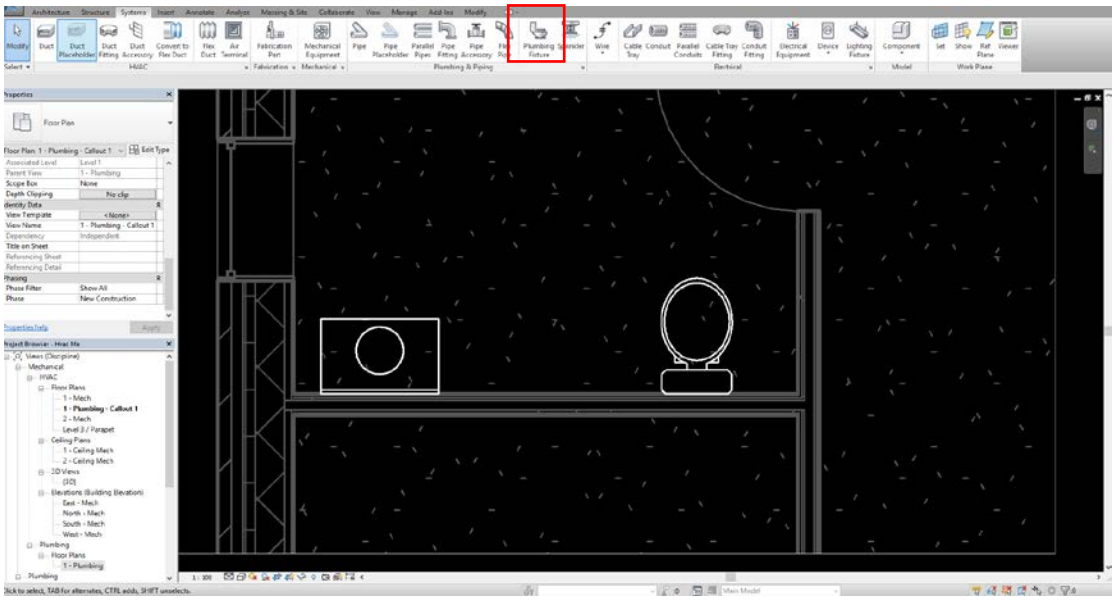
6. Load in Connectors. Go to Insert tab, Load family.



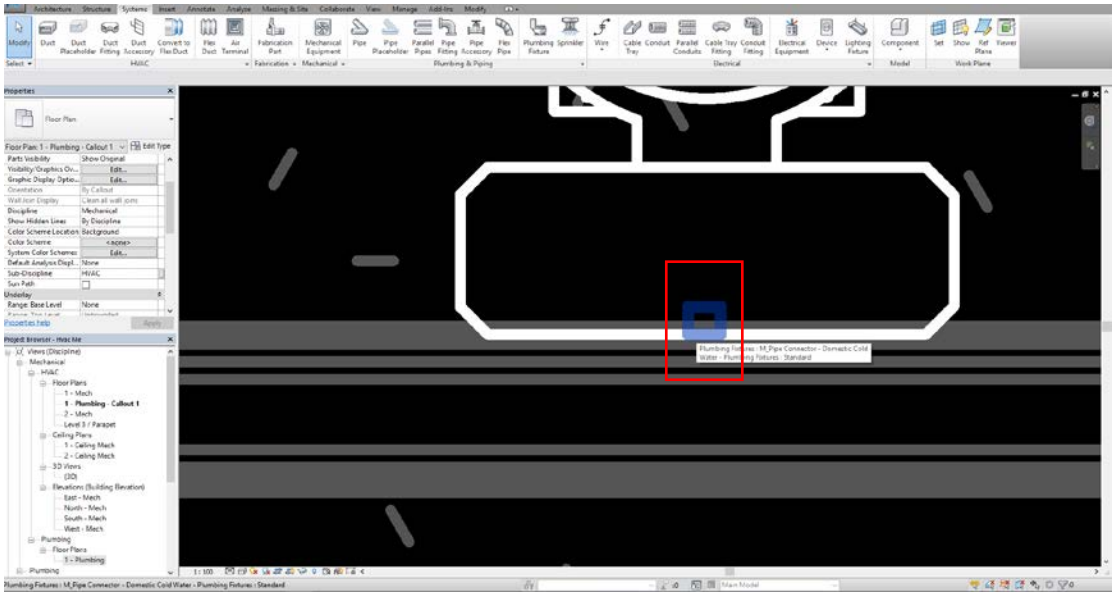
6. Load in our connectors.



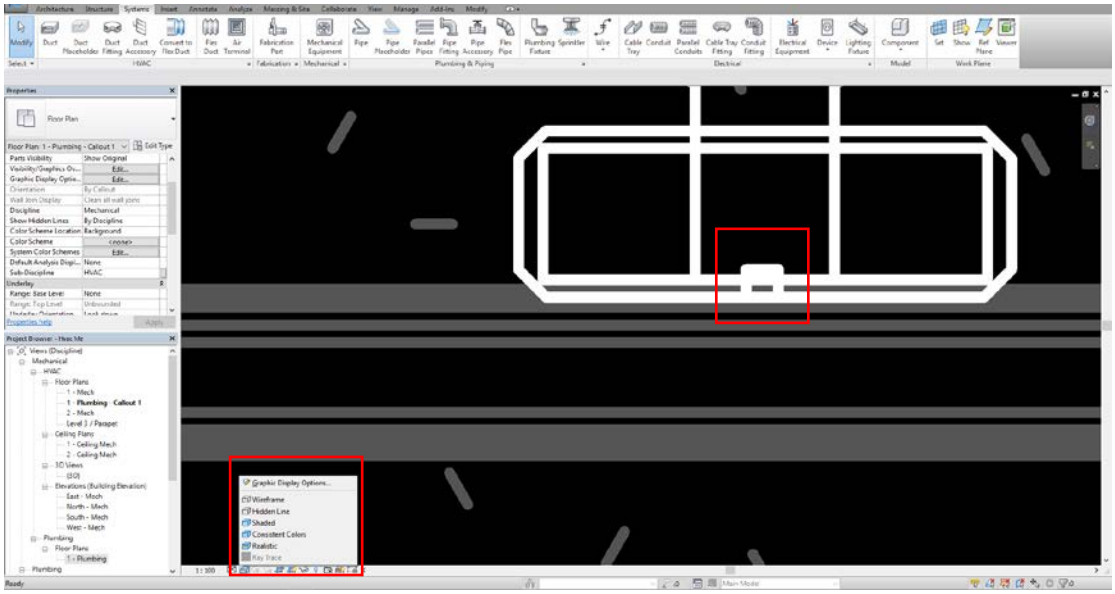
7. Go to System tab, Plumbing fixtures, place Pipe Connector – Domestic Cold Water – Plumbing Fixture to our water closet.



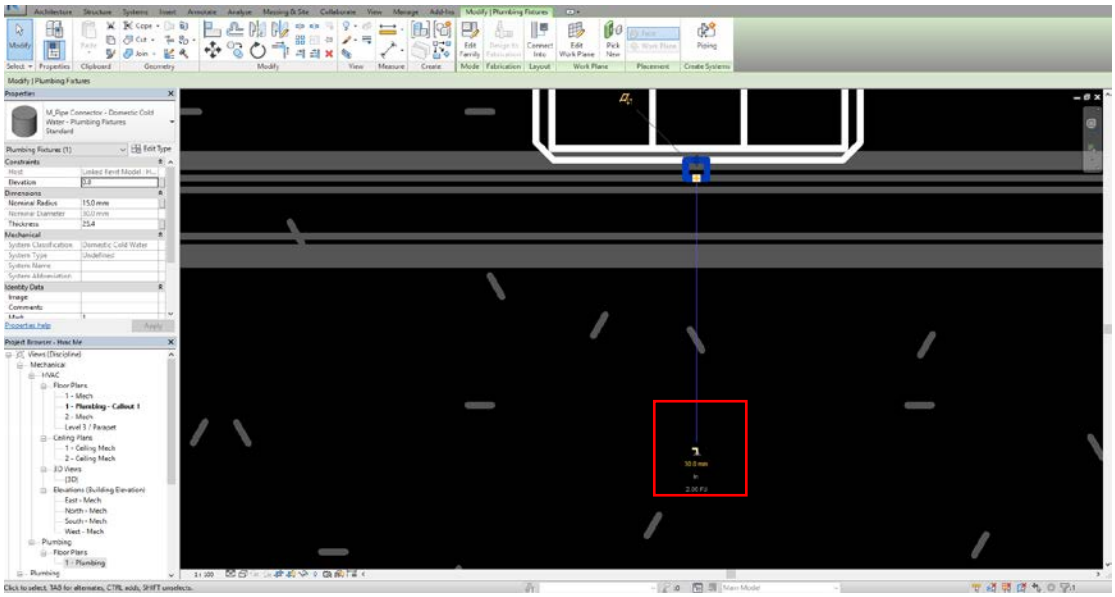
8. Notice that our connector is invisible.



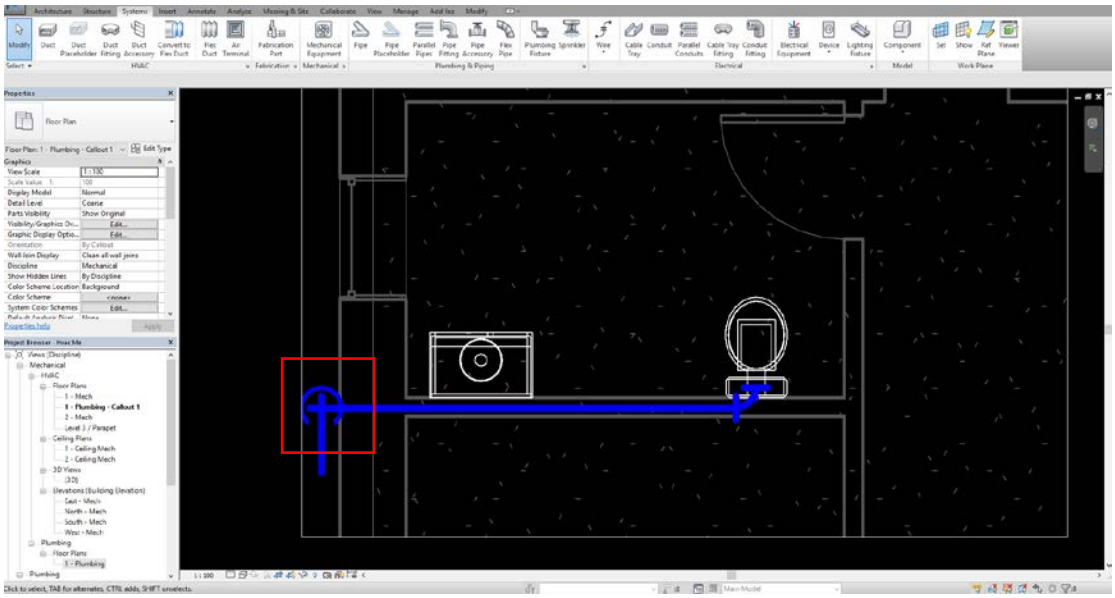
9. Simply change the view from Hidden Line to Wire Frame.



10. With our connector selected, we can start drawing our pipes. (Flip your connector if it's not facing the right direction.)

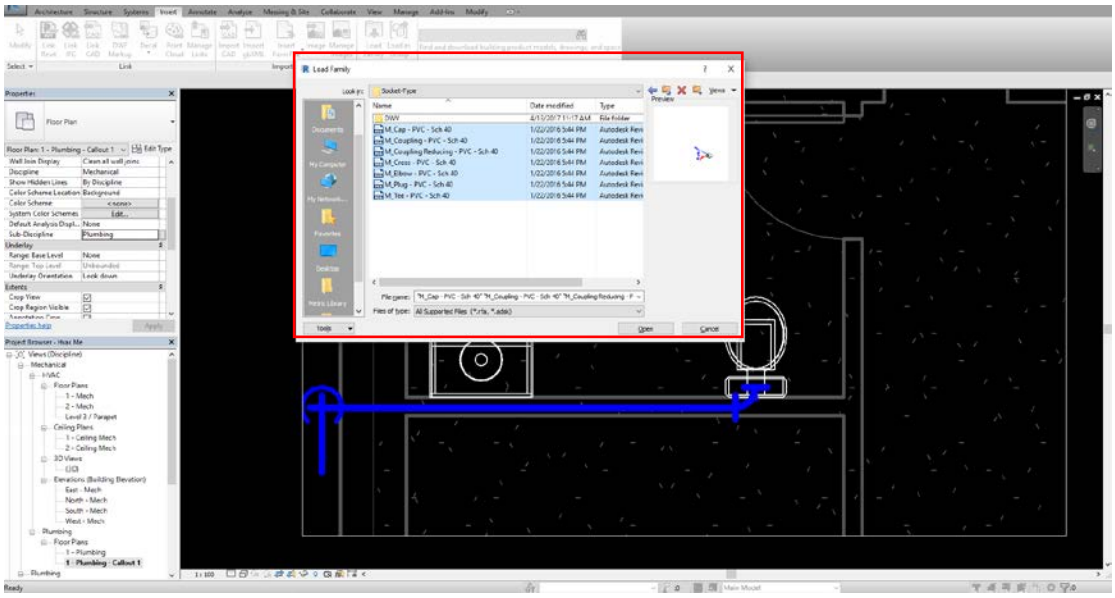


11. Change offset value if pipes need to go up. Notice that Revit will automatically create elevation marks for you.

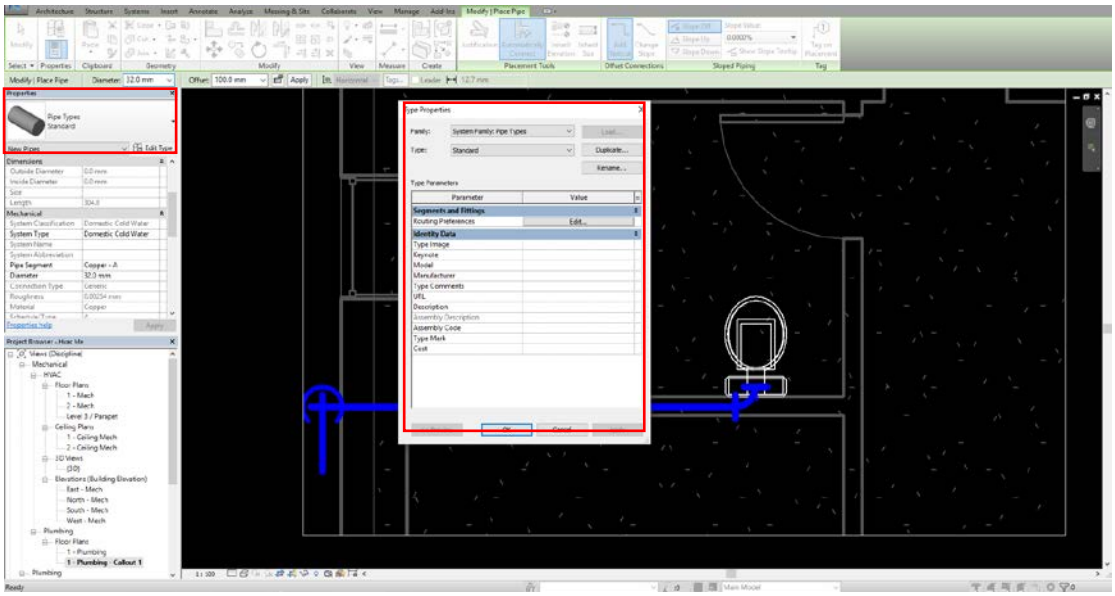


4.3 Adding sanitary sloped piping

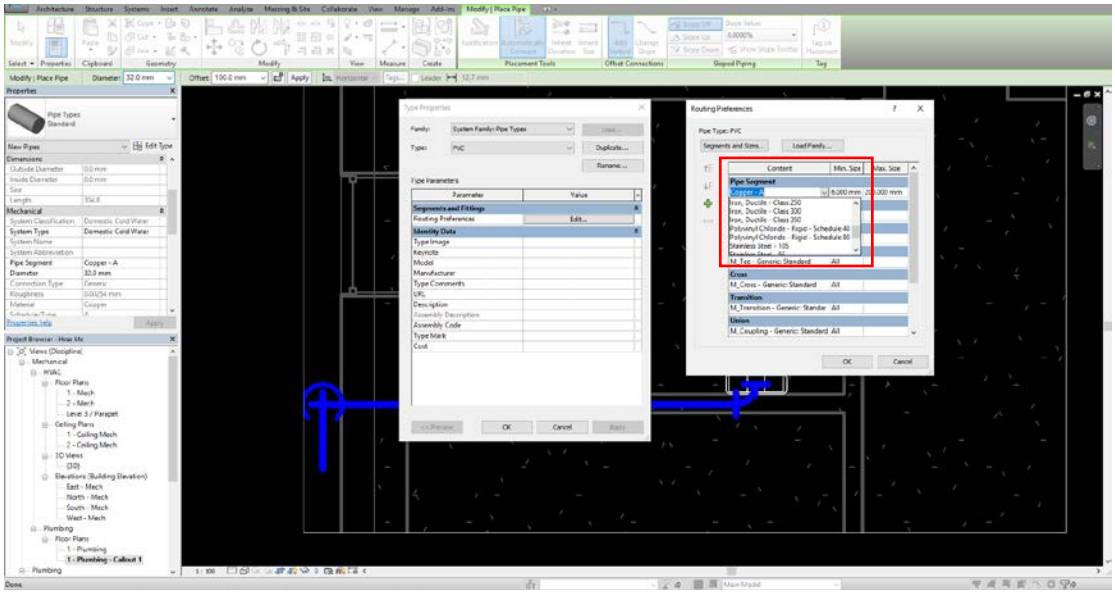
1. Load in families. (Pipe – Fittings – PVC – Sch 40 – Socket-Type).



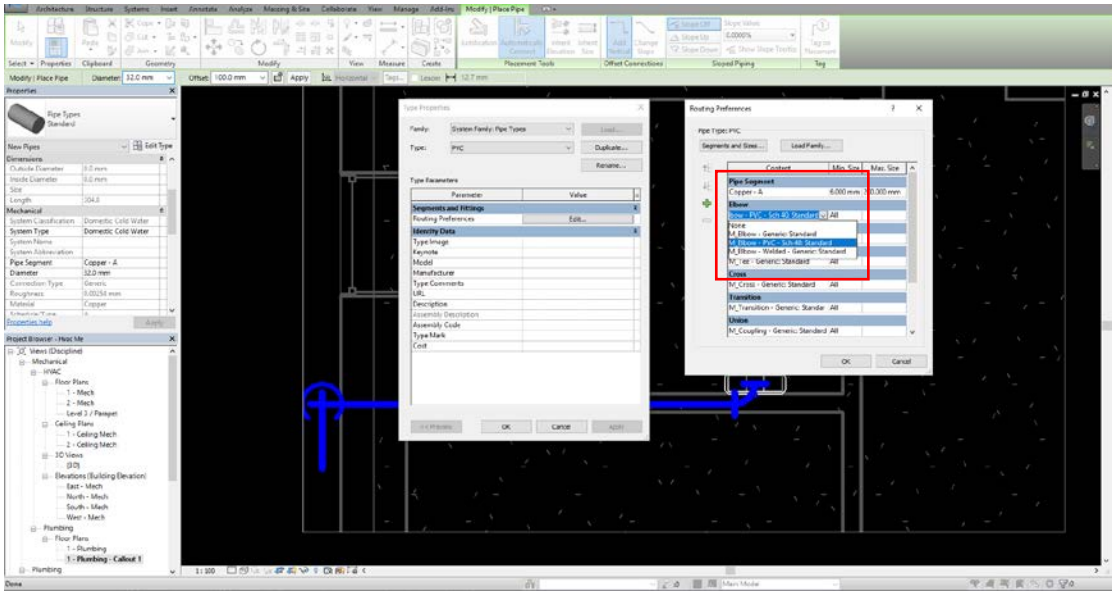
2. Go to System tab, Pipe. Duplicate standard Pipe Types and name it PVC.



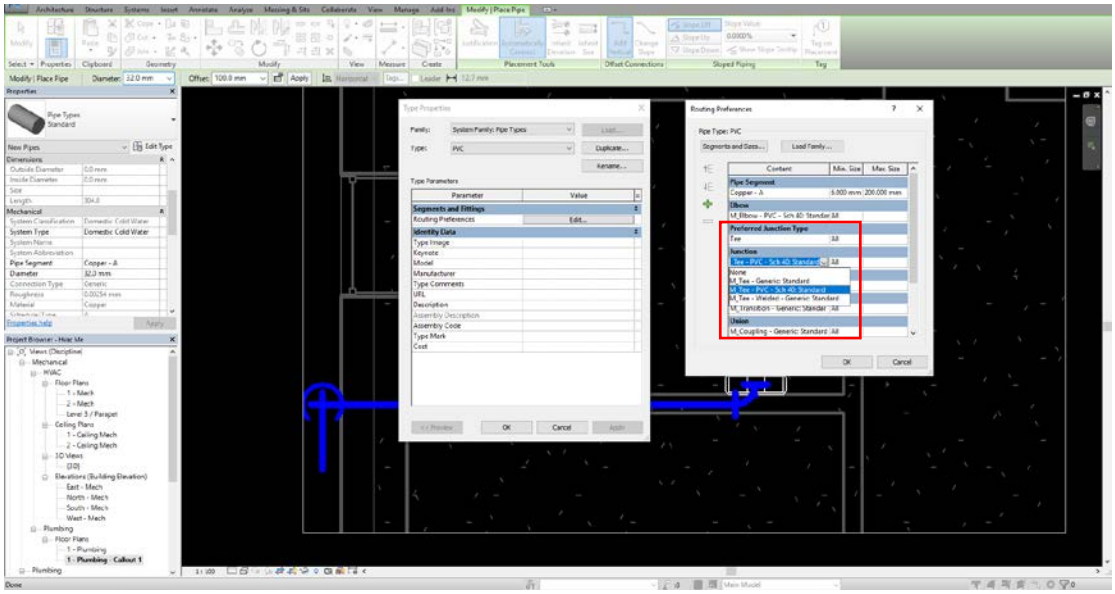
3. Edit Routing preference, Pipe Segment, select Polyvinyl Chloride – Rigid, Schedule 40.



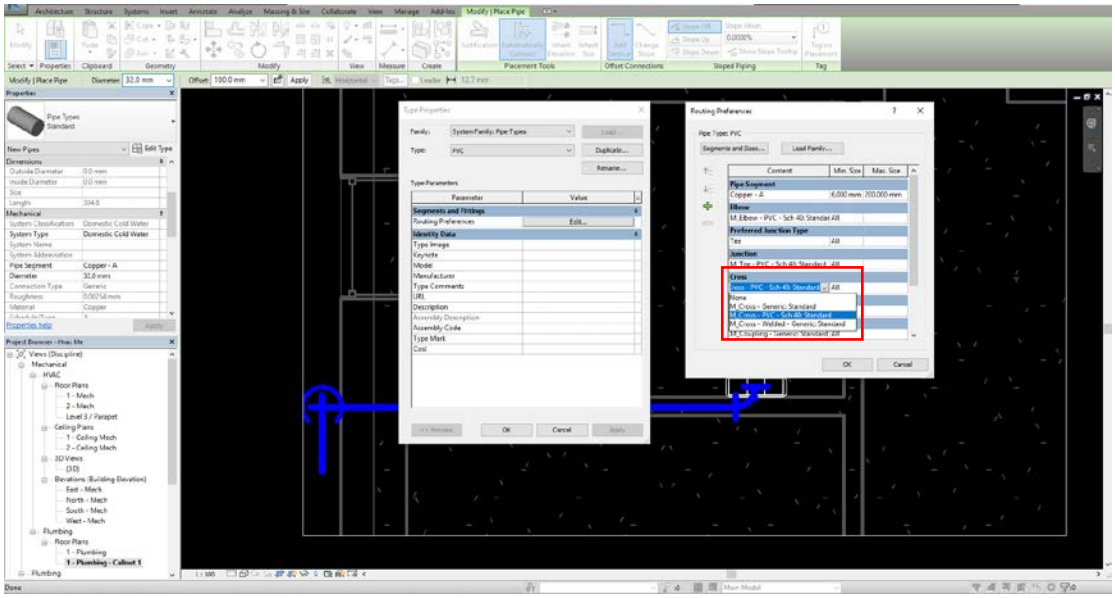
4. Elbow – PVC – Schedule 40



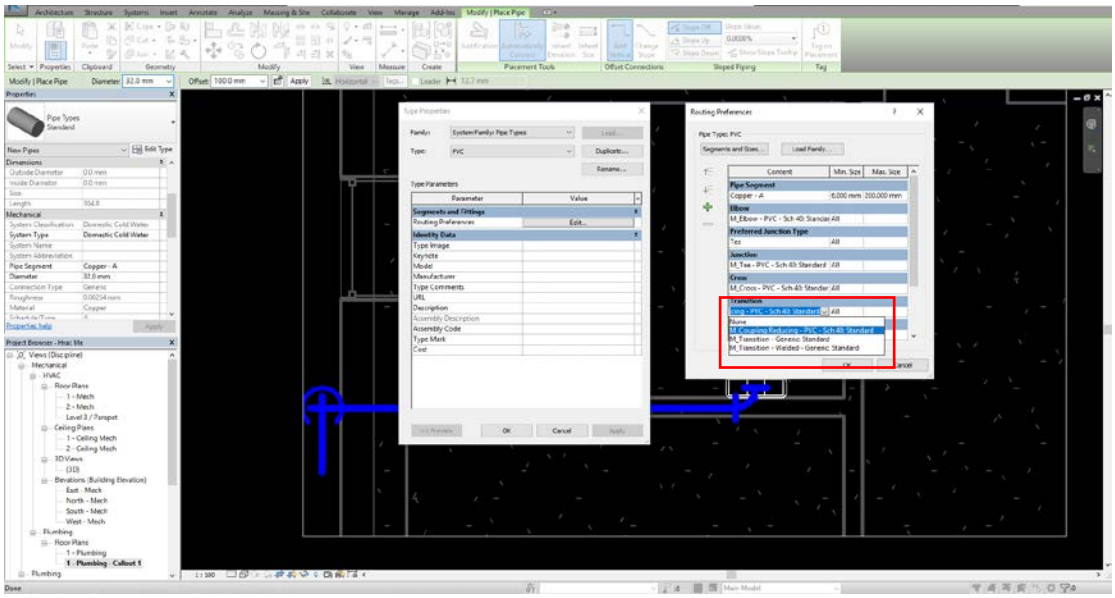
5. Junction, Tee – PVC – Schedule 40

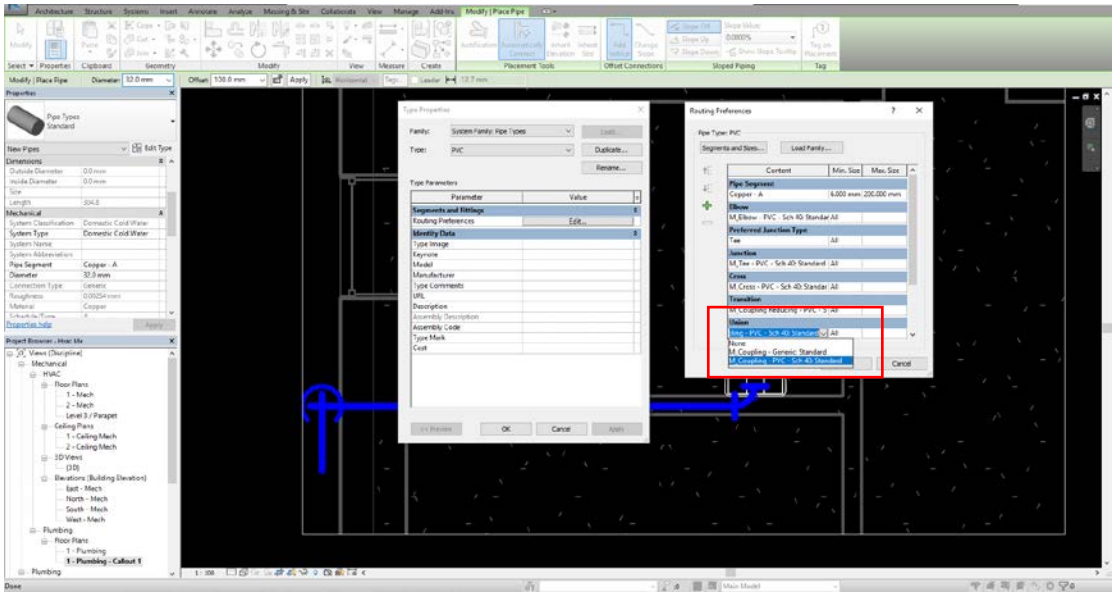


6. Cross – PVC –Schedule 40

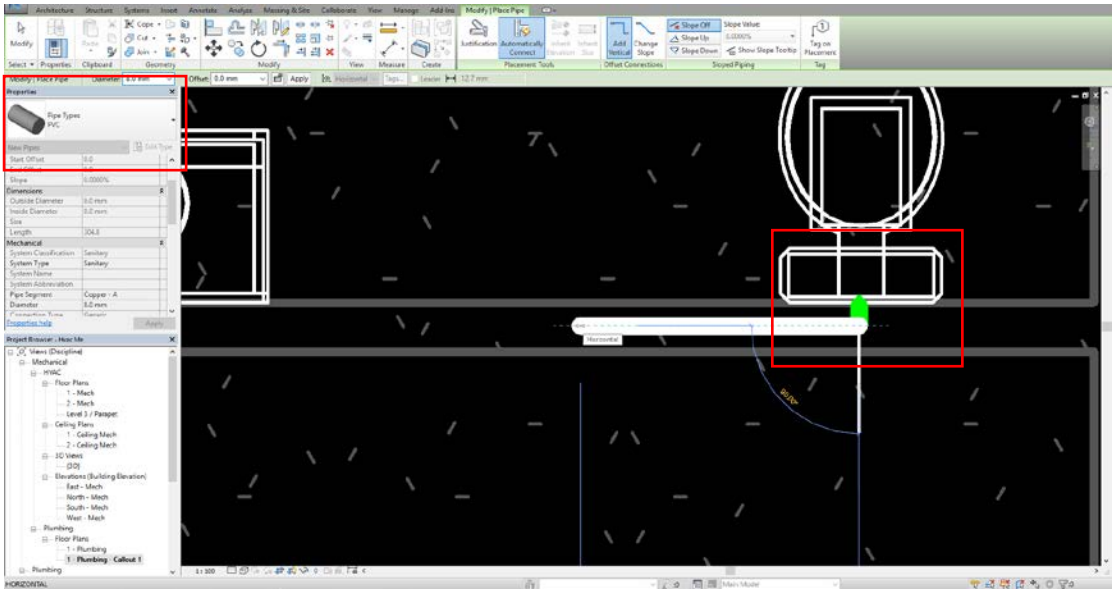


7. Coupling Reducing – PVC – Schedule 40 for Transition. Coupling – PVC – Schedule 40 for Union.

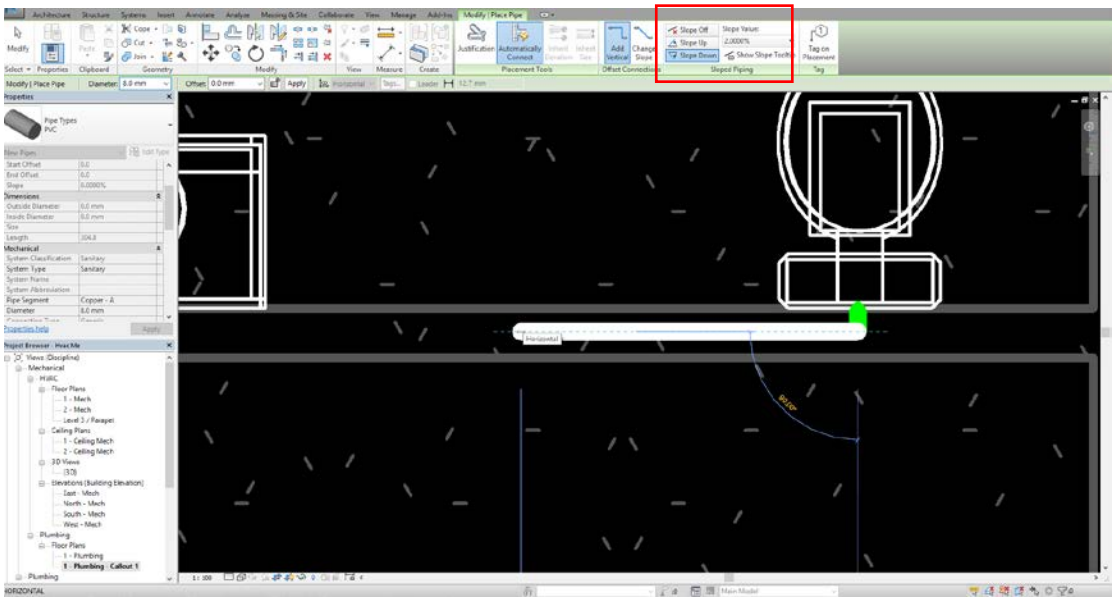




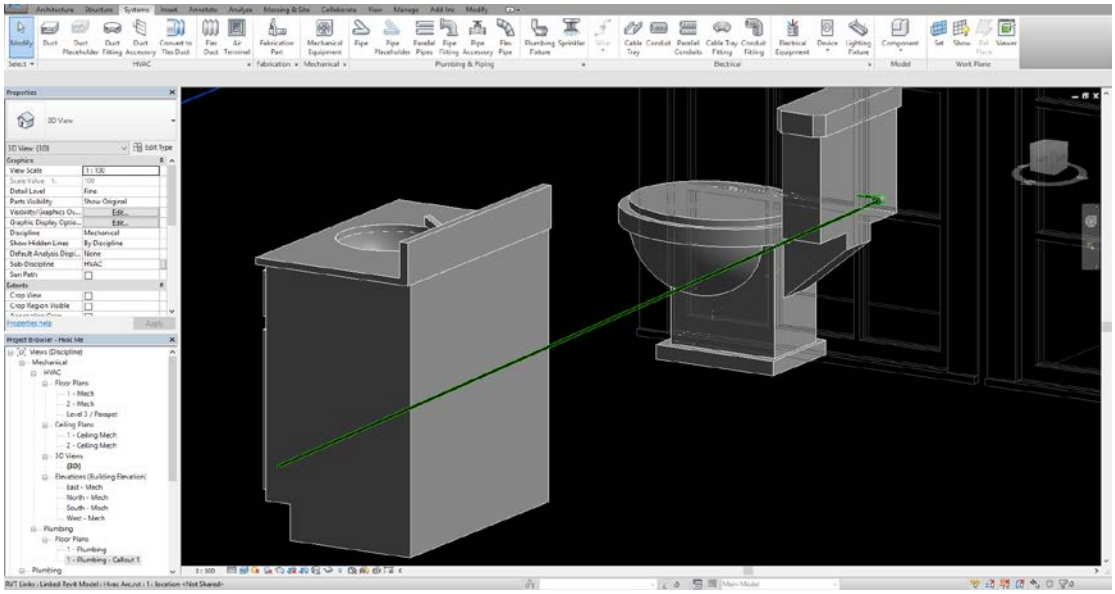
8. Add sanitary connector to water closet, then right click on it to create pipes.



9. Slope down 2%.

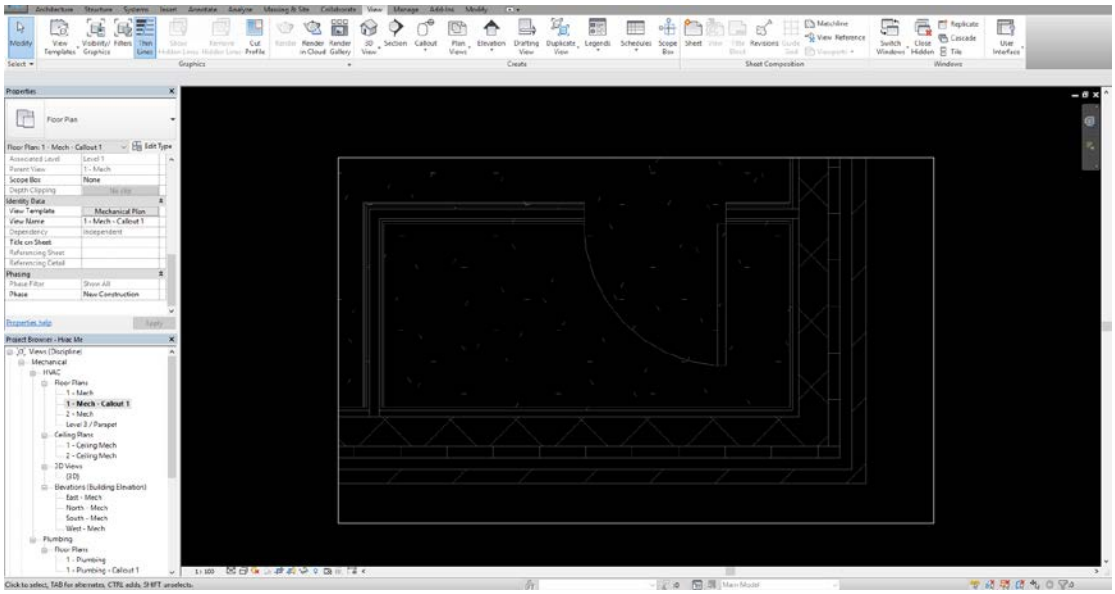


10. Go to 3D view, press T+L (stands for thin line) to view our pipes.

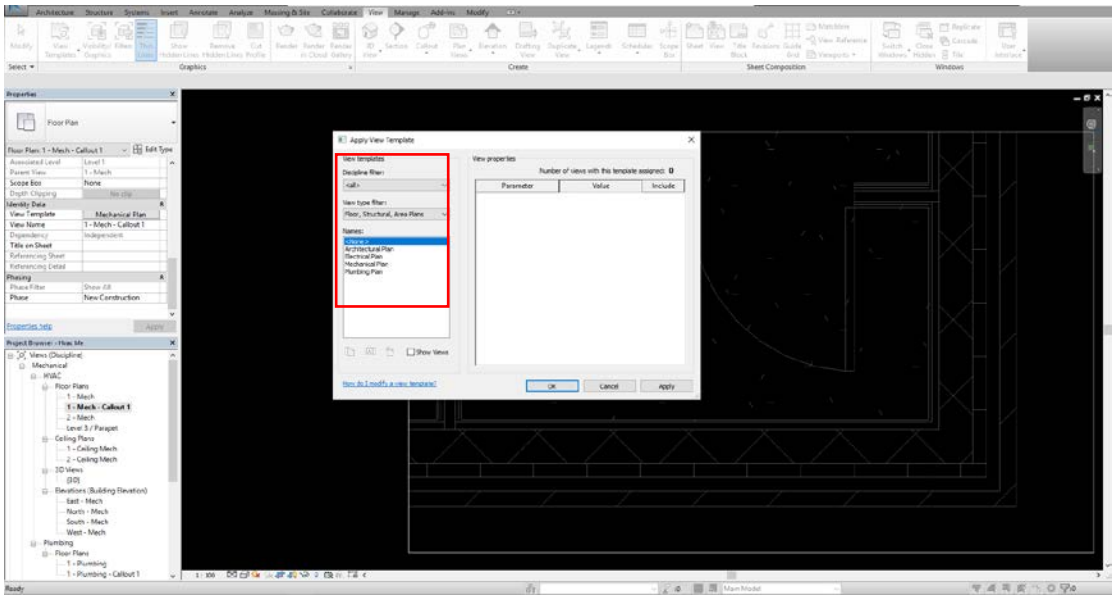


4.4 Adding equipment

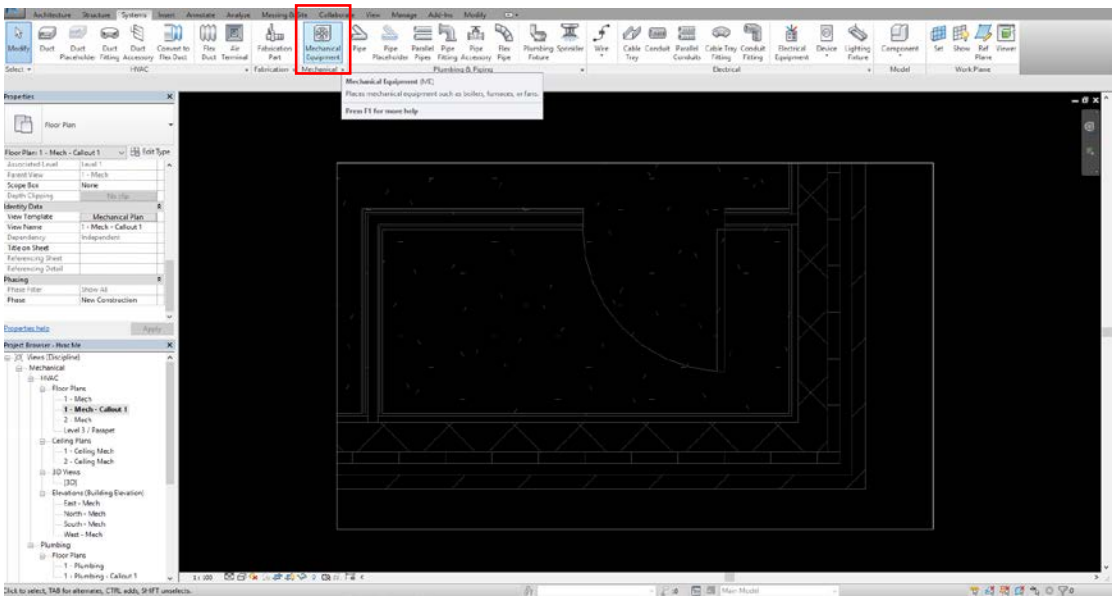
1. Creating call-out view for your machine room.

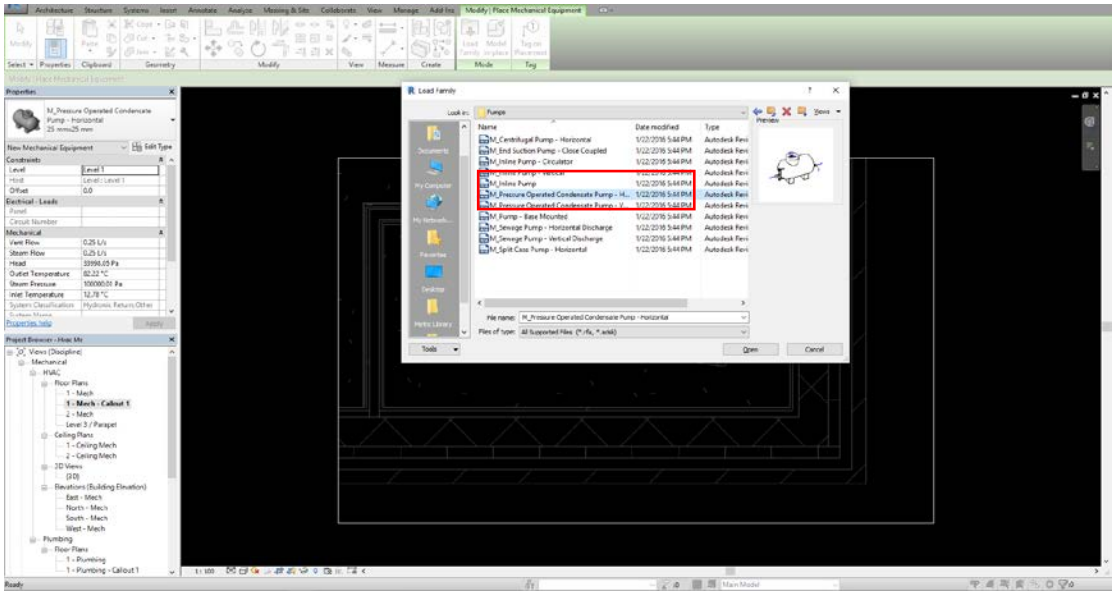


2. Like what we did in previous chapter, View Template set to None. Clear your view as you wish.

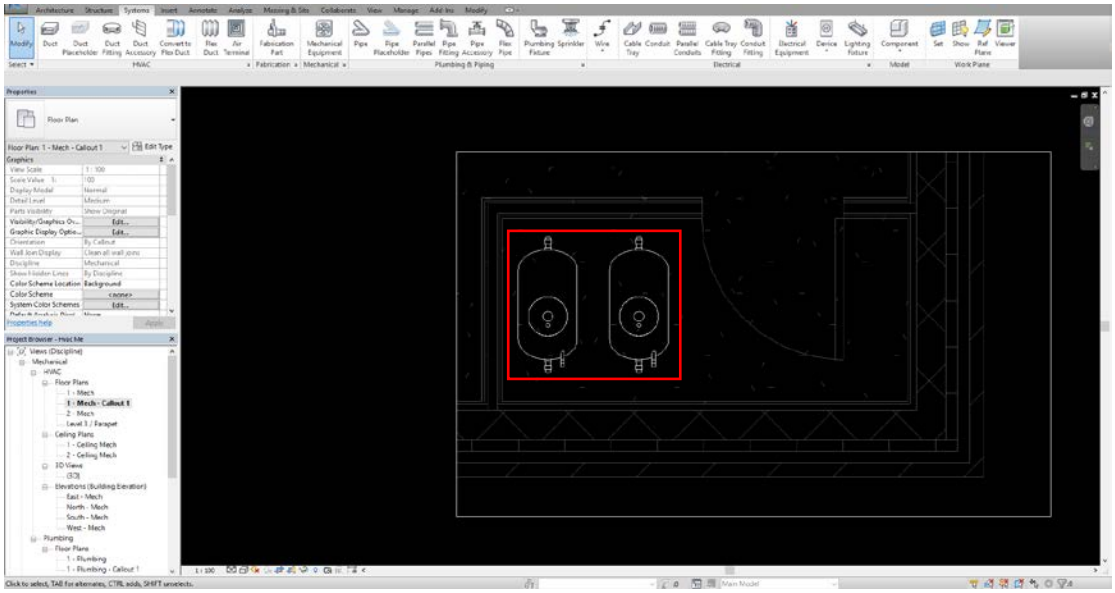


3. Go to System tab, Mechanical equipment, load in condensate pumps. (Mechanical – MEP – Water-Side Components – Pumps – Pressure Operated Condensate Pump horizontal)



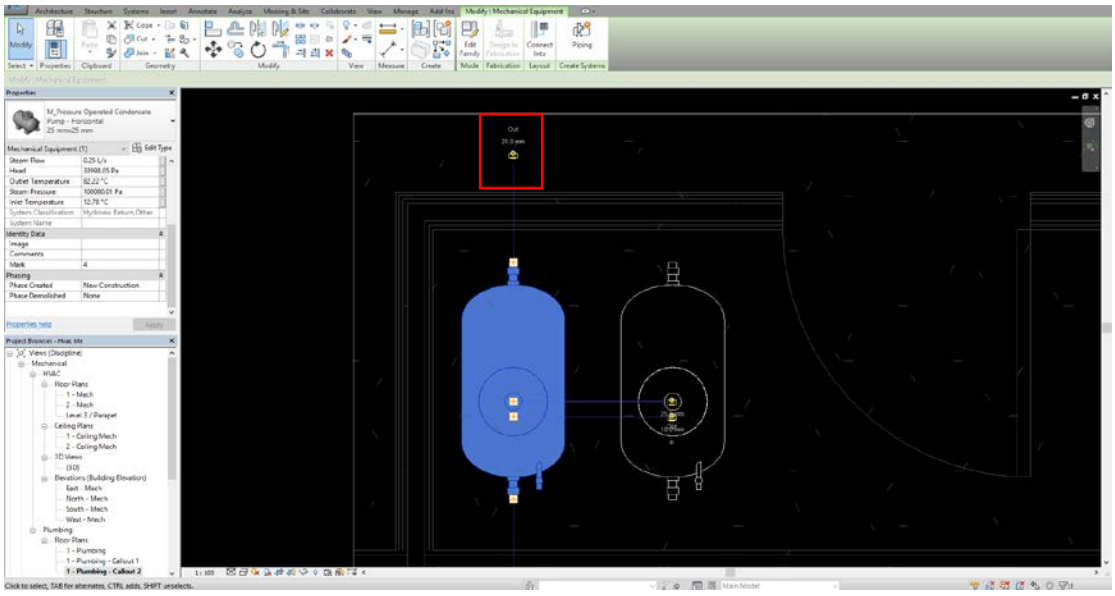


4. Place your equipment. Make sure its offset value is zero.

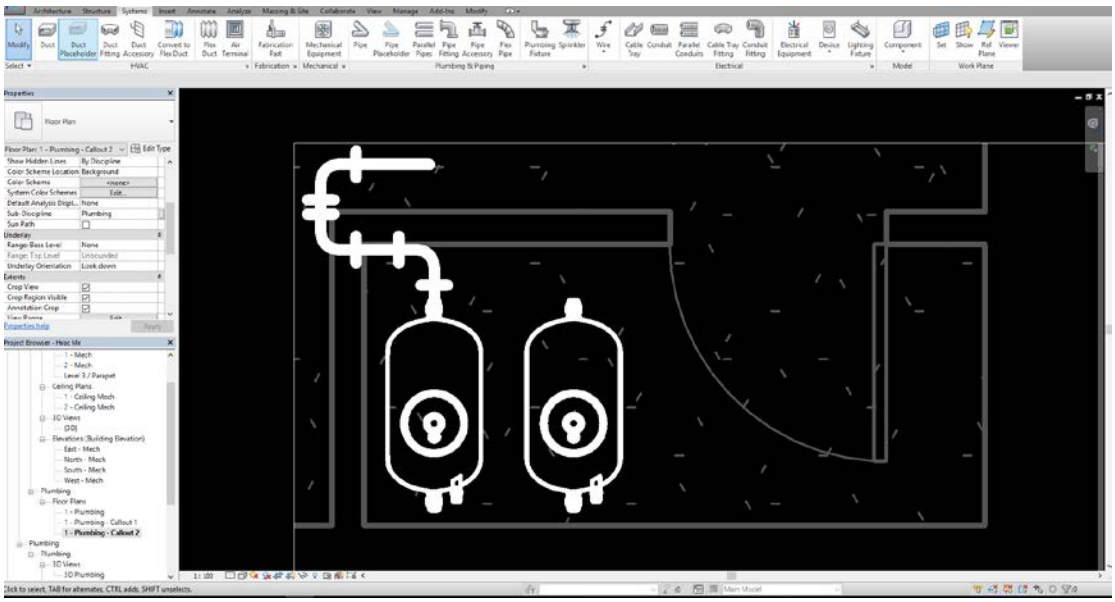


4.5 Adding more piping

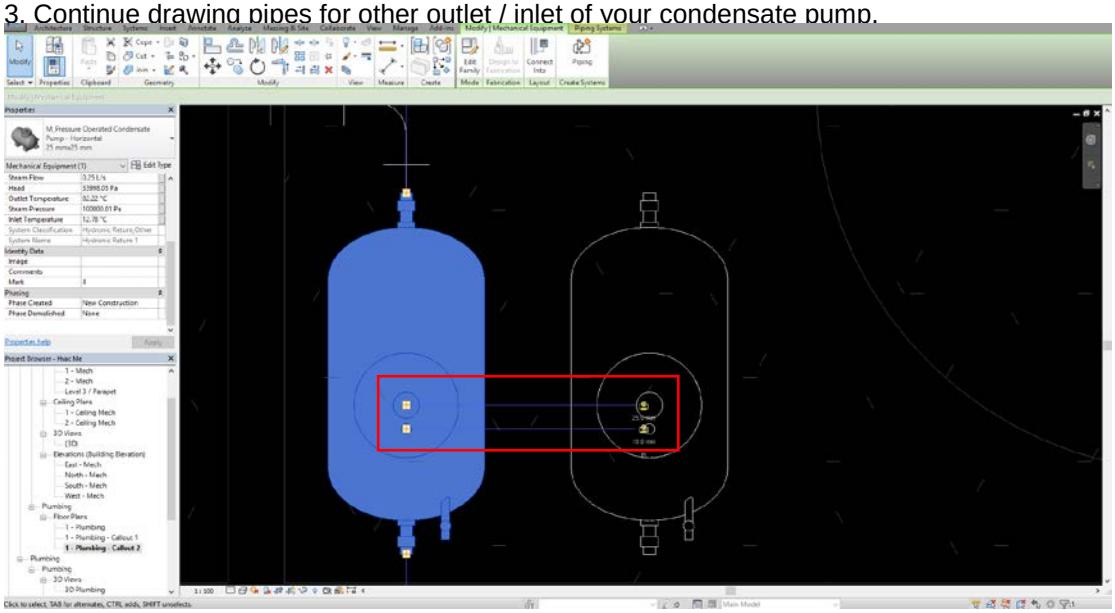
1. Select one of your condensate pumps. Click on Create Pipe button.



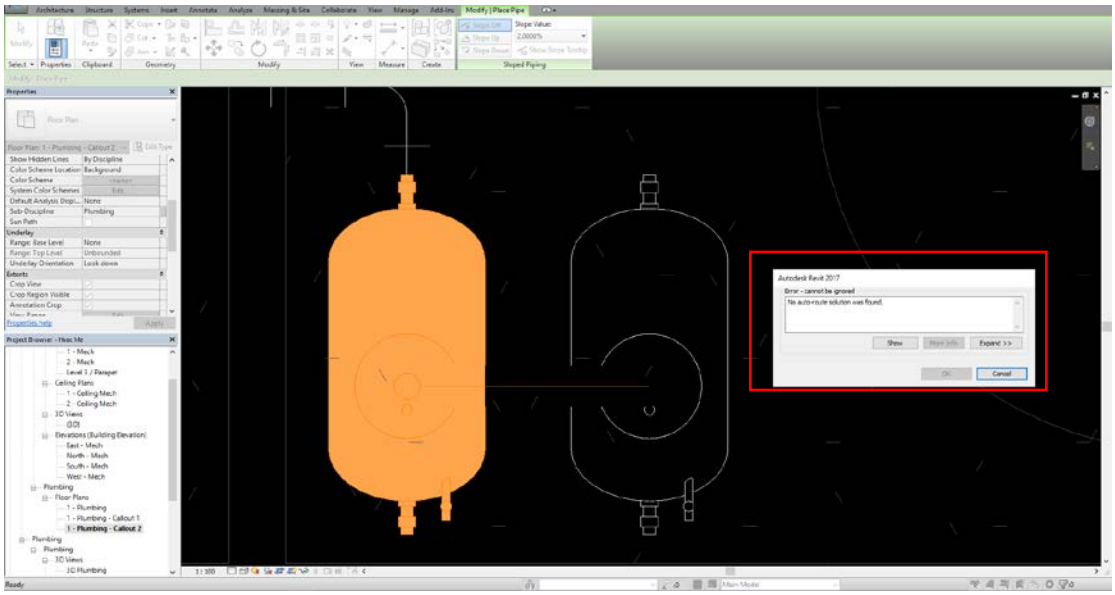
2. Start to draw you pipes.



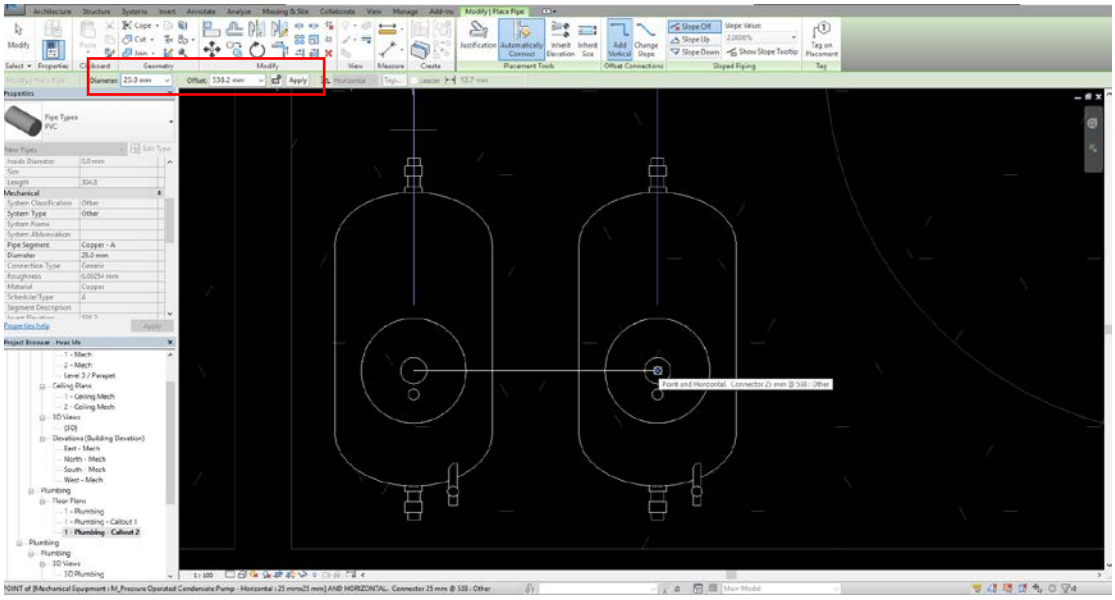
3. Continue drawing pipes for other outlet / inlet of your condensate pump.



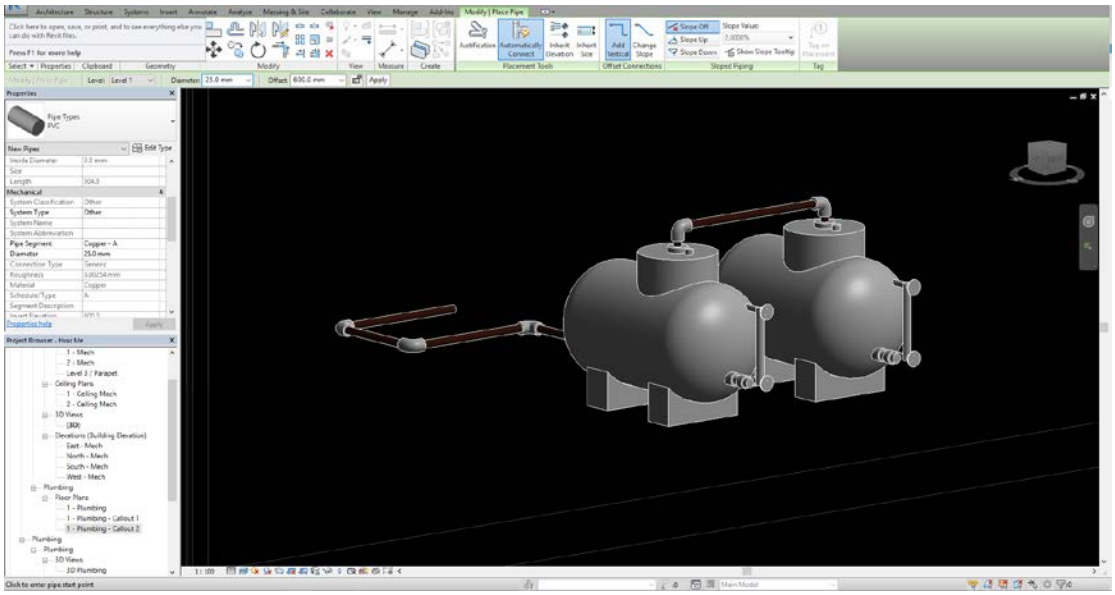
4. Notice that Revit will send us a warning, “No auto-route solution was found.”



5. Because there's physical elevation of the equipment, connect two pumps at current height would be unrealistic. Simply increase your offset value and finish connecting.

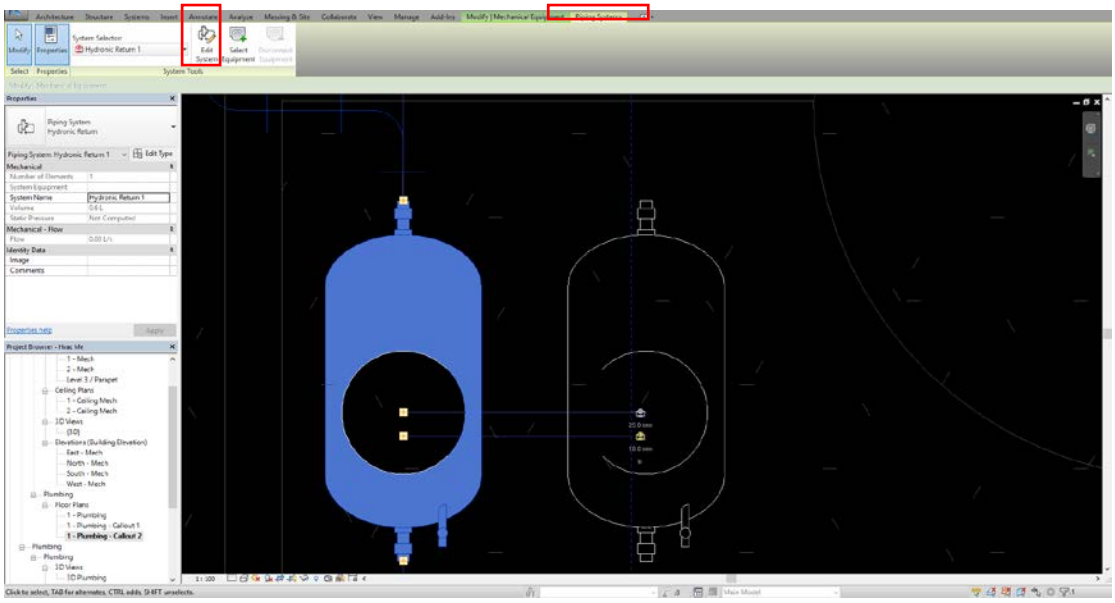


6. Go to 3D view, check our pipes.

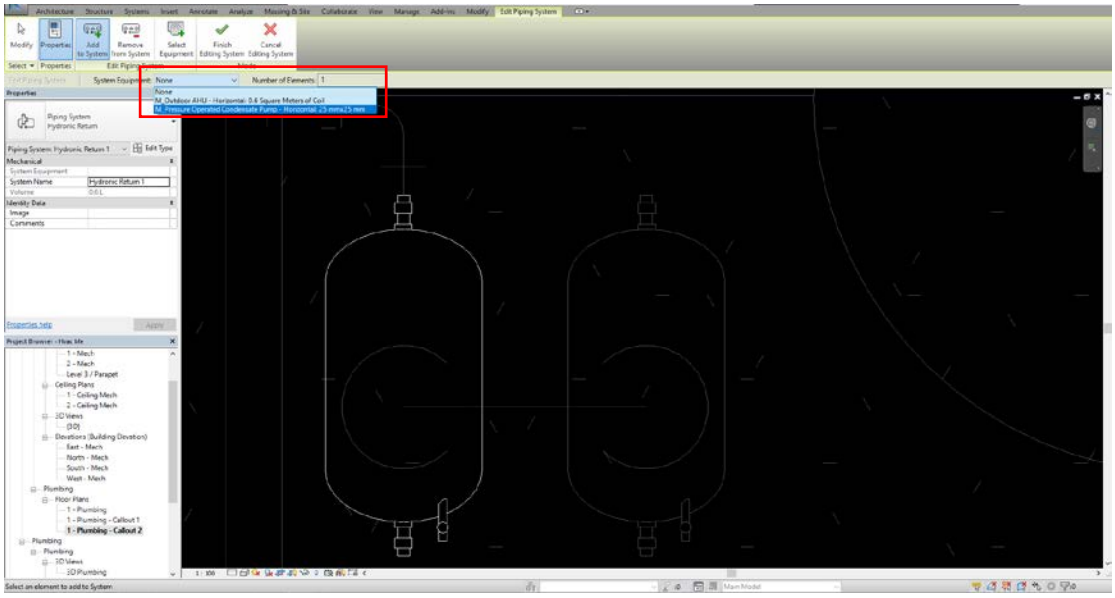


4.6 Creating a system

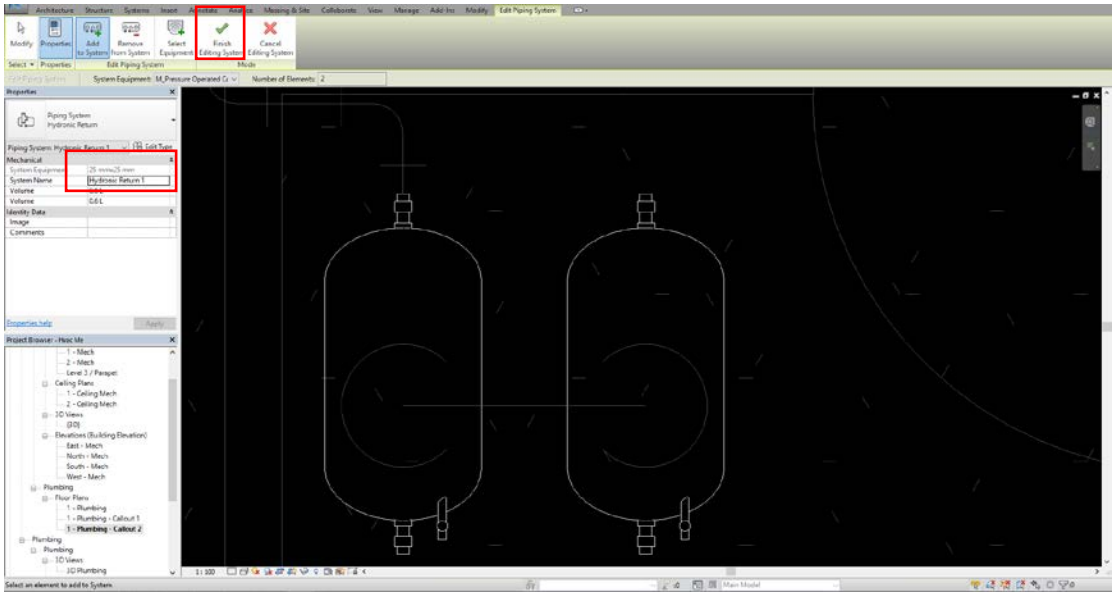
1. Select one of your condensate pump, go to Piping System. Then Edit system.



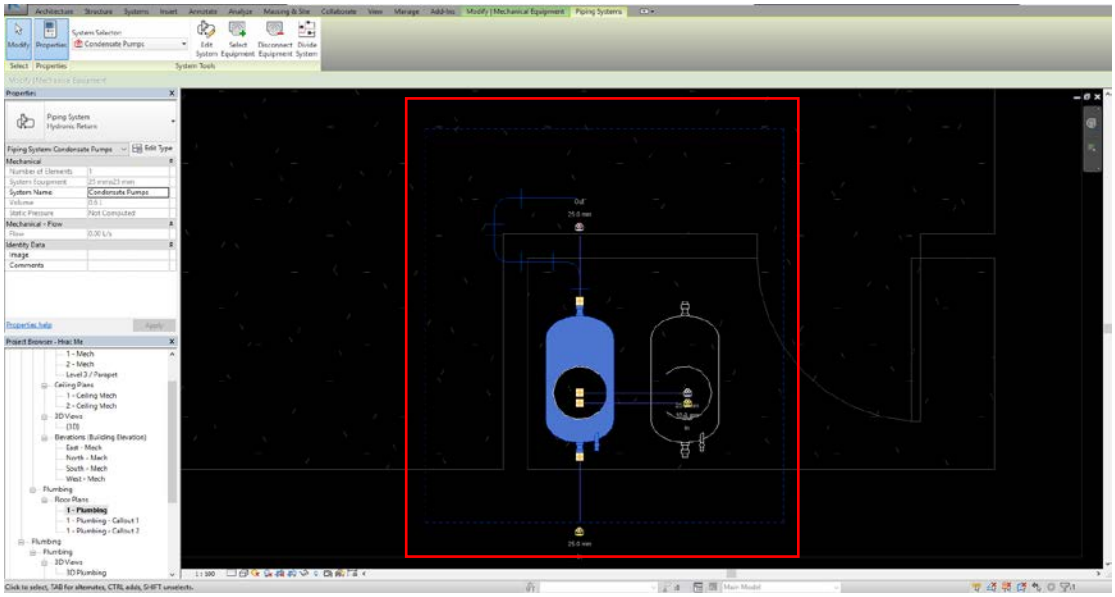
2. Add another condensate pump from System Equipment drop-down menu.



3. Name your system as Condensate Pump. Then finish editing.

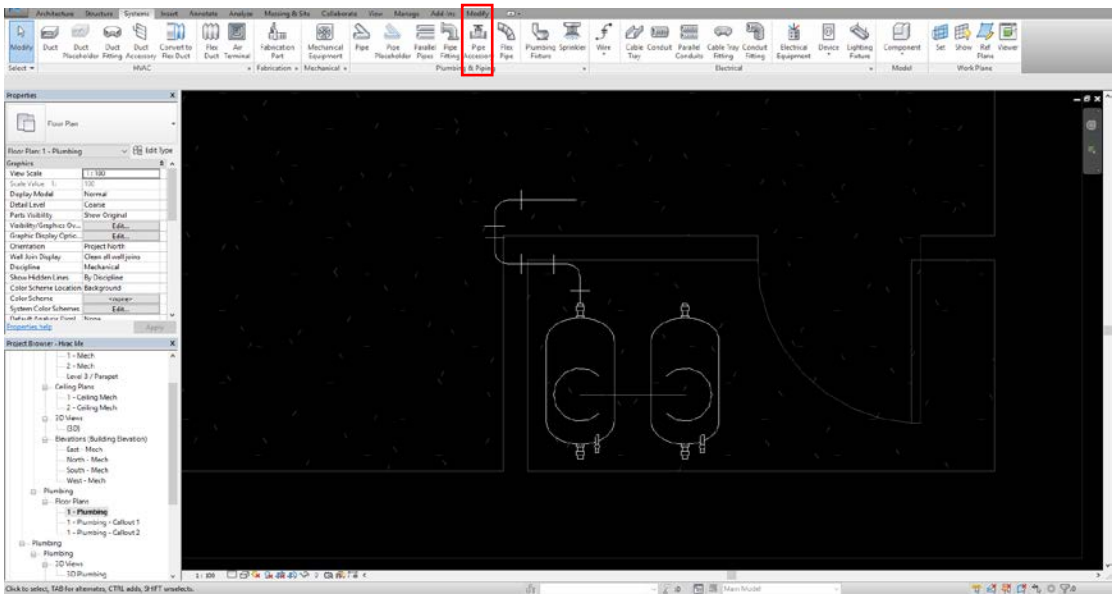


4. Click on any of your condensate pumps, then go to Piping Systems. Notice our pumps has become a united system.

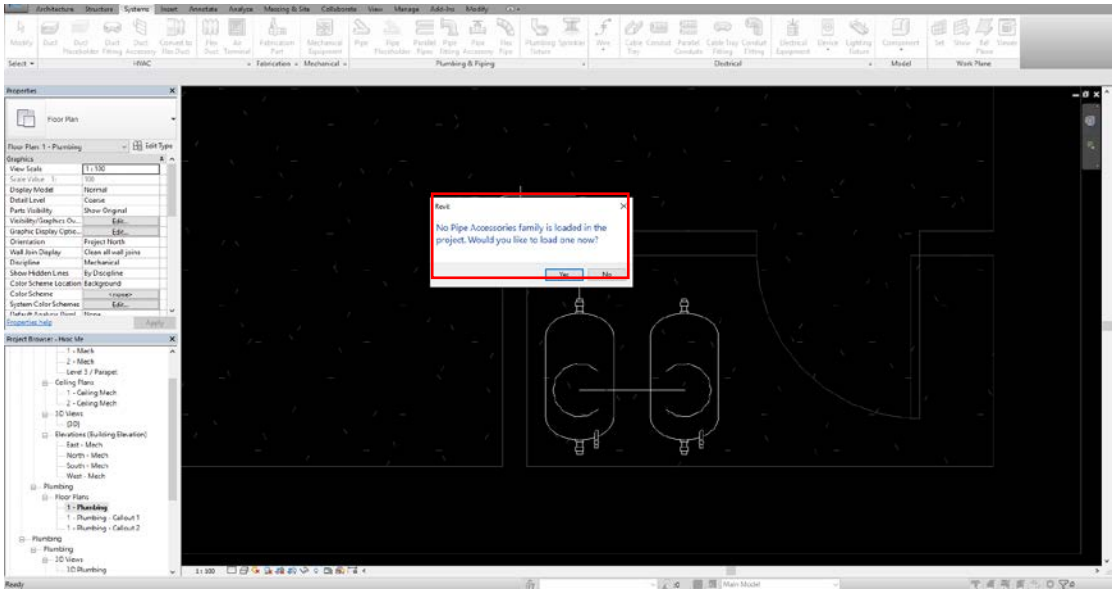


4.7 Adding pipe accessories

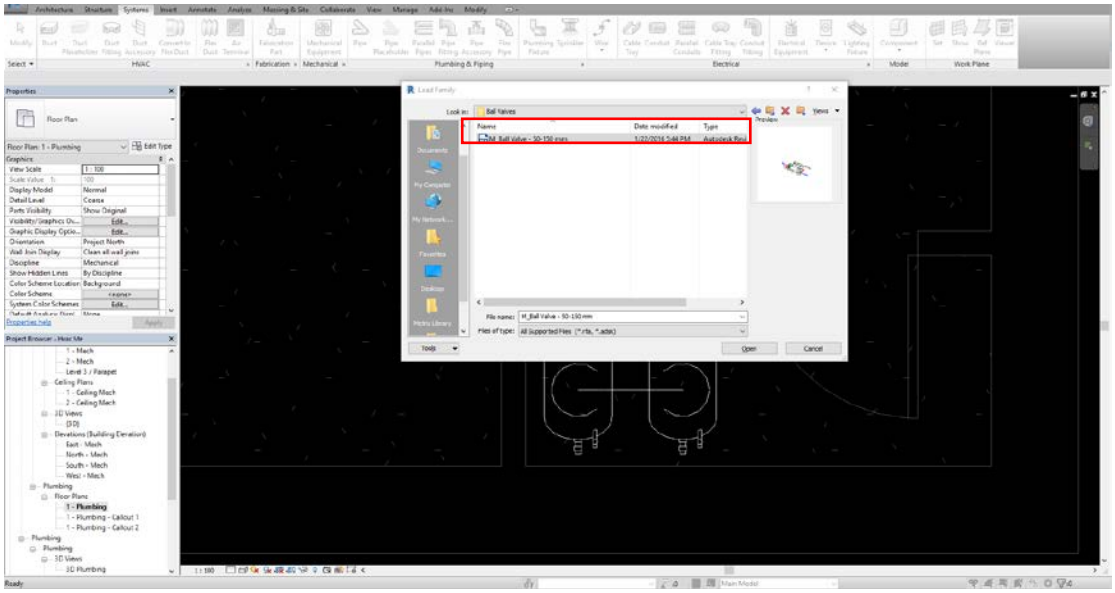
1. Go to System tab, find the Pipe Accessory (valve icon).



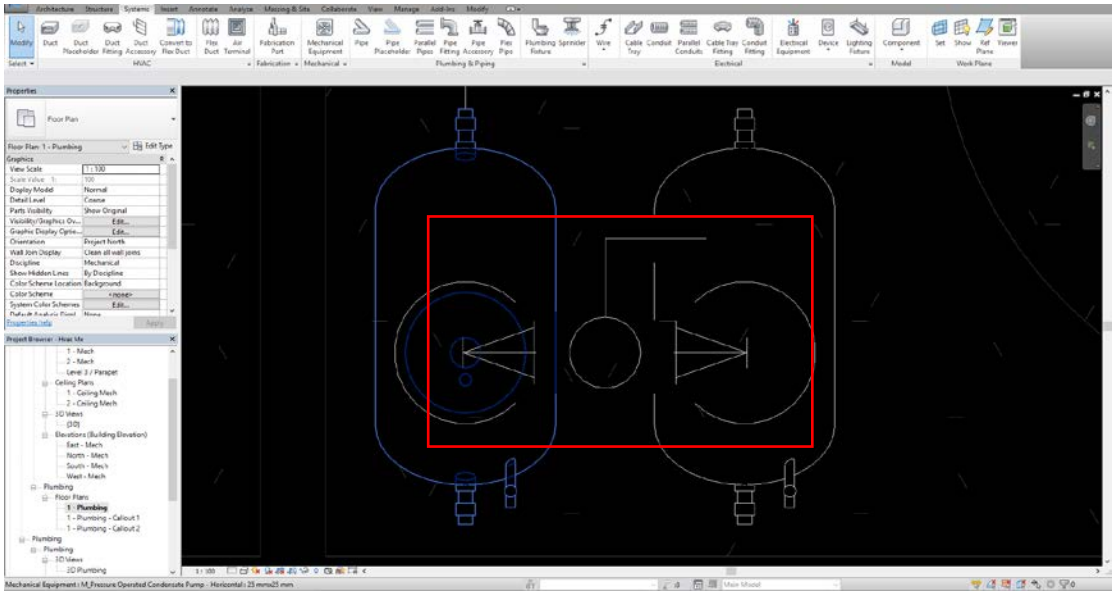
2. Since we never insert any Pipe Accessories into Revit, it will remind us to load in related families.



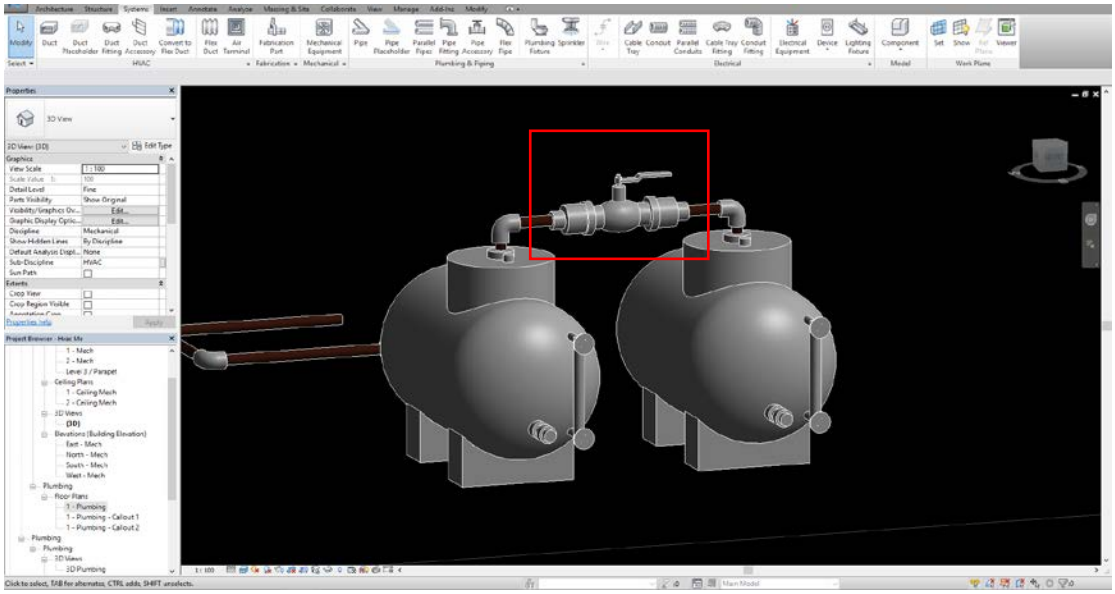
3. Navigate yourself to Ball Valve. (Pipe – Valves – Ball Valve)



4. Place it on pipe.

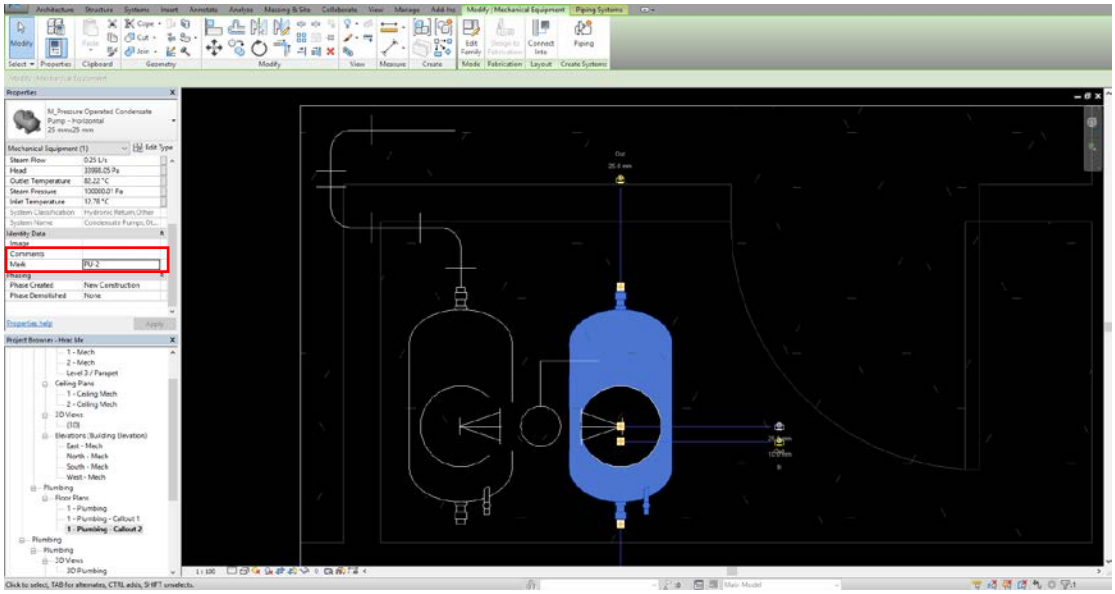


5. Check it in 3D view. Our ball valve have been placed properly.

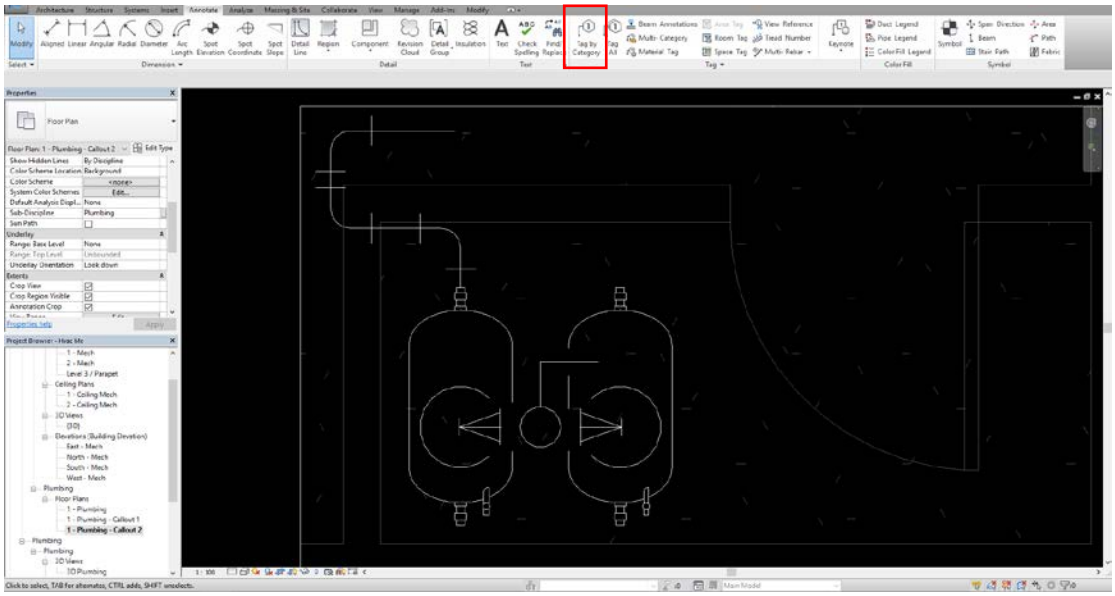


4.8 Tagging items

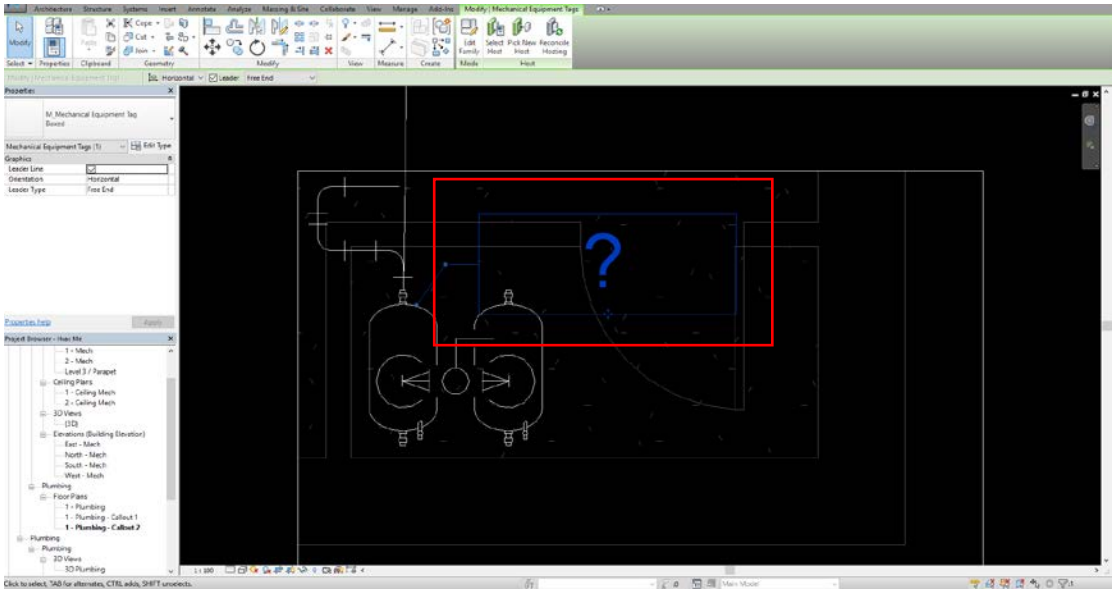
1. Make sure you're in call-out 2. Mark your pumps with PU-1 and PU-2 respectively in Properties window.



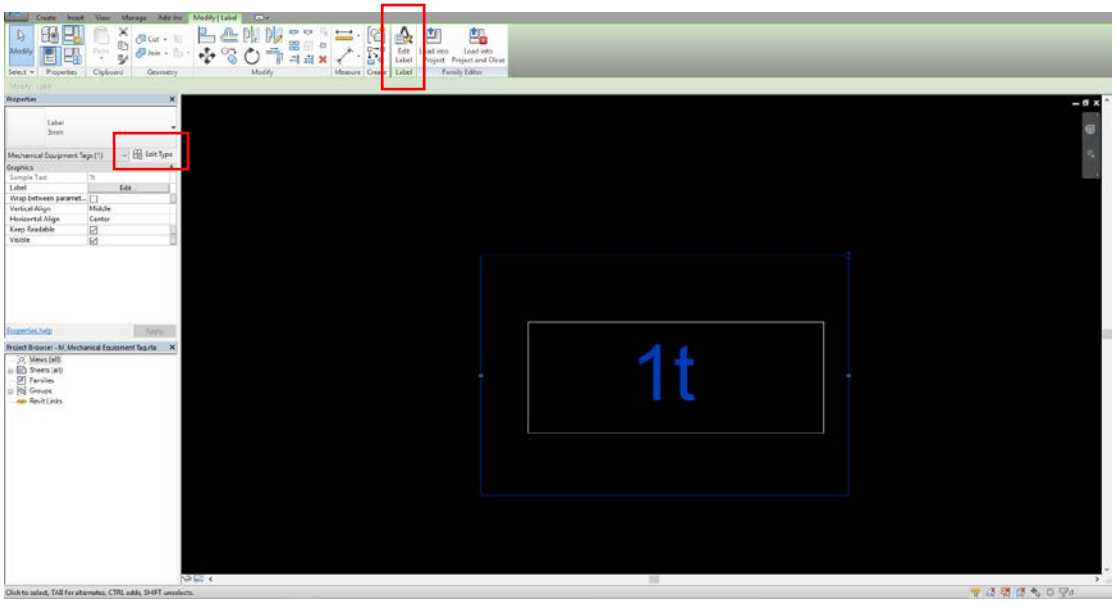
2. Tag our pumps.



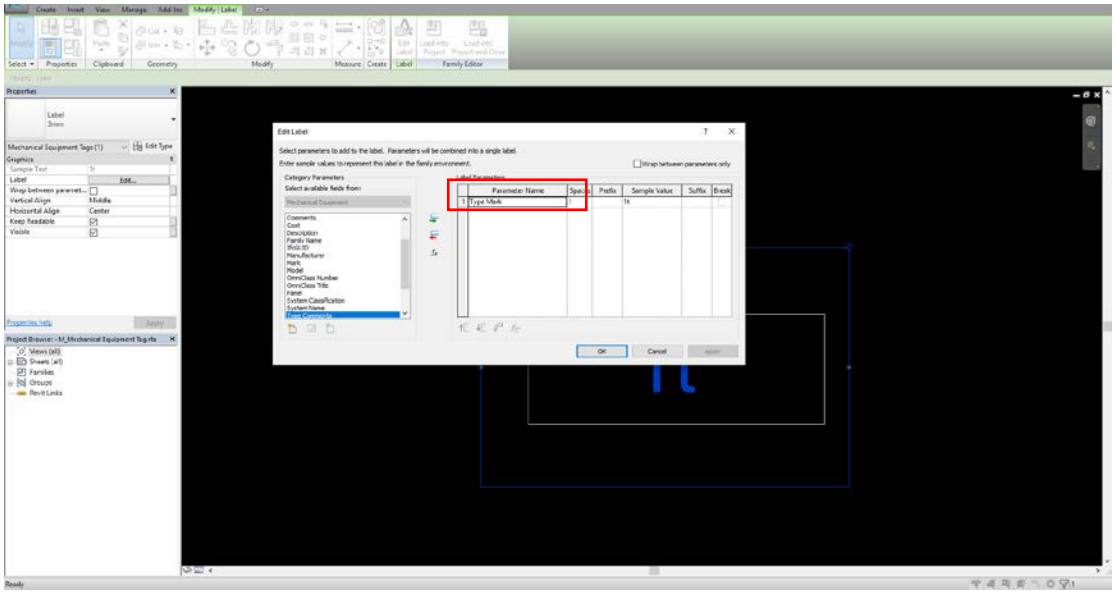
3. Use leader or not depends on your preference. Free End will help you position your tags.



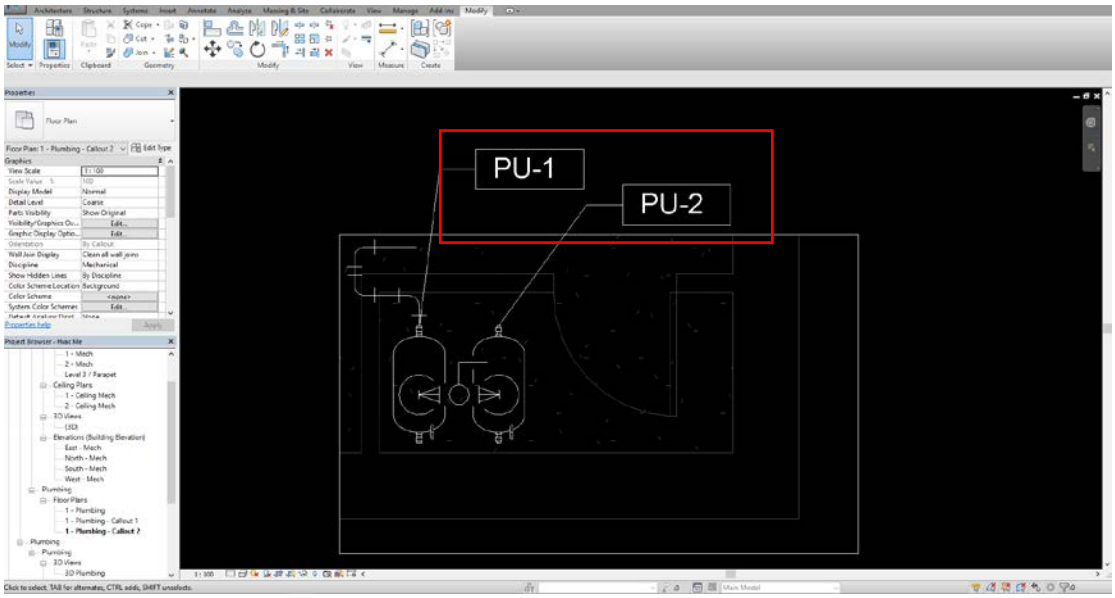
4. Edit your tags. Just like what we did in previous chapter, editing family is the way to go. Adjusting size, text, etc.



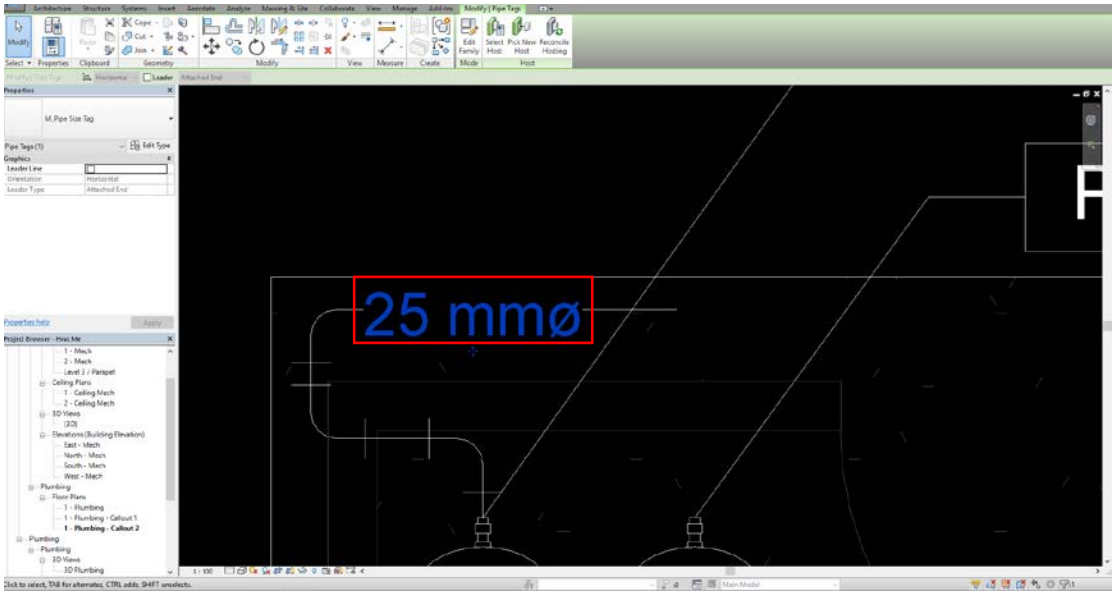
5. Replace Type Mark with Mark since we want our customized marks to be effective.



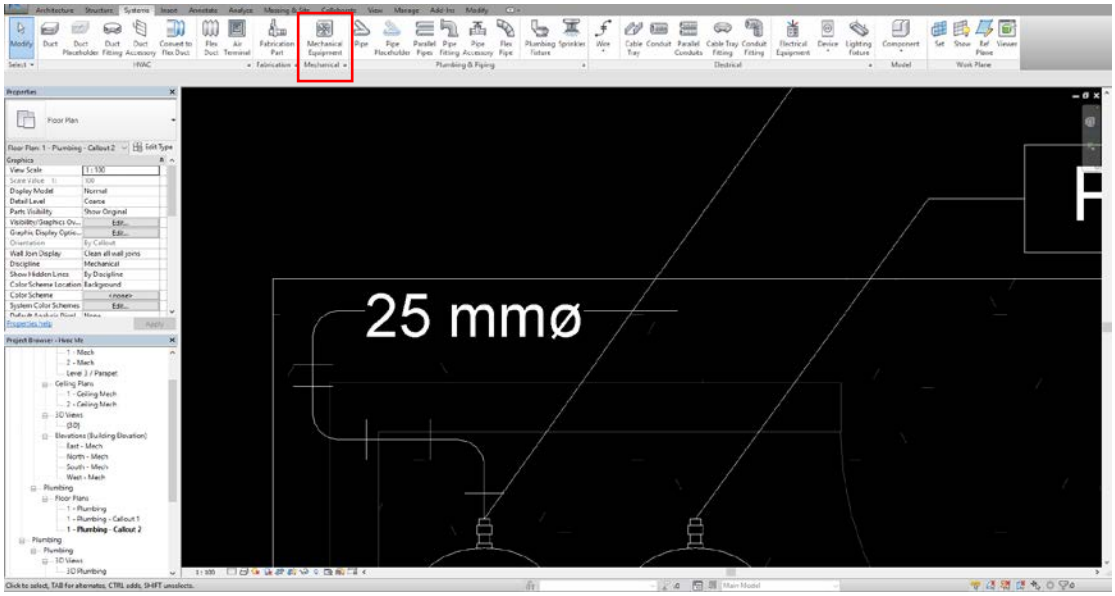
6. Load it back into project. Copy it to another pump. Notice Revit is smart enough to realize our second pump has been mark as PU-2 even though we just use a simple copy command.



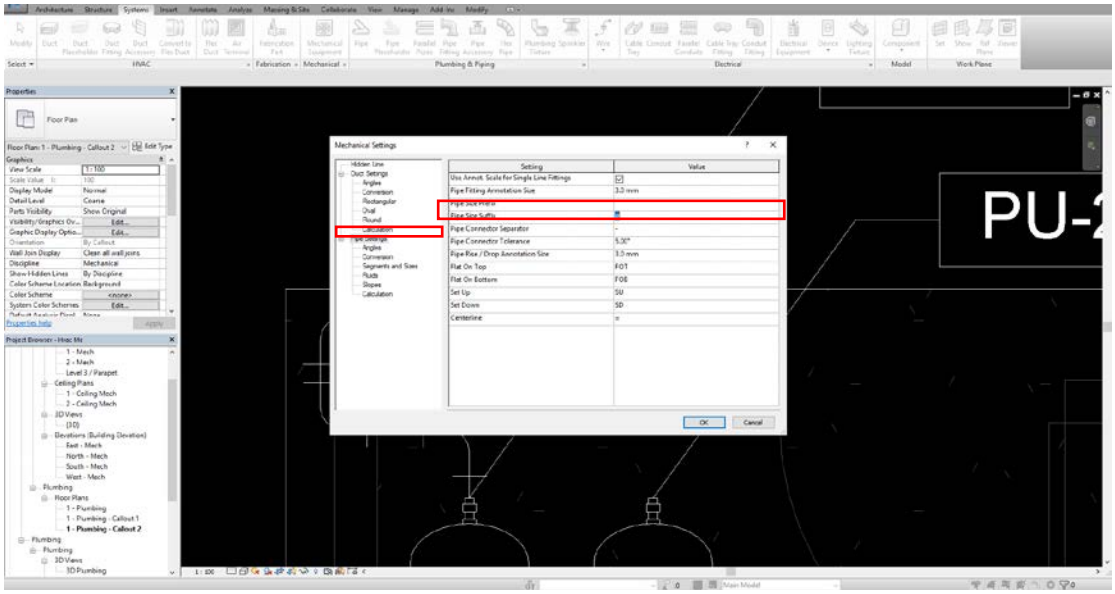
7. Tag your pipes in the same way.



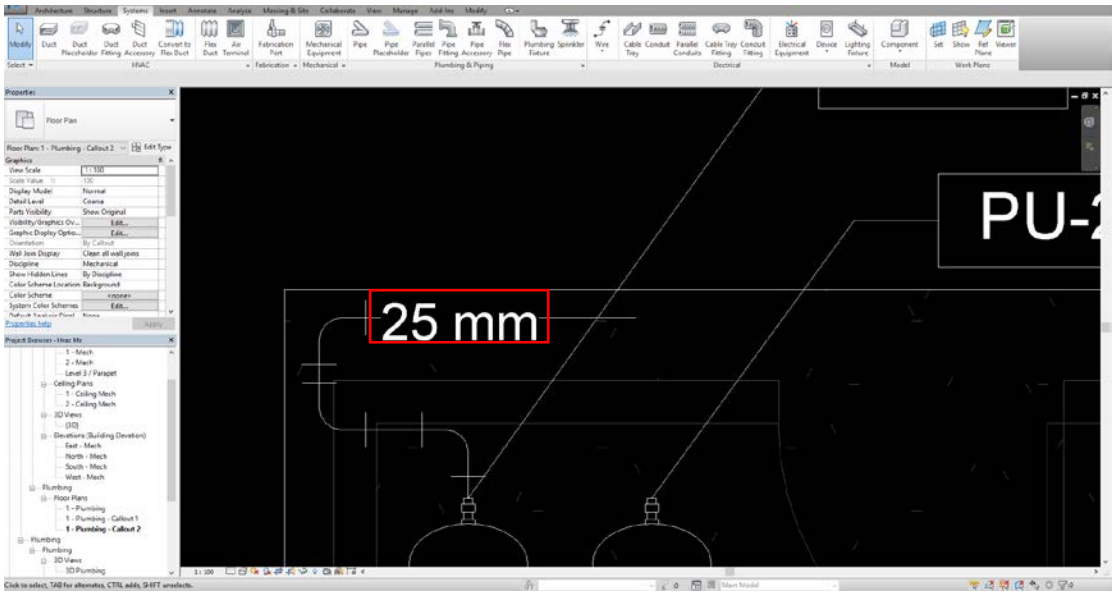
8. Generlly the diameter sign is unecessary unless you have square pipes in your model. To get rid of it. Under System tab, click on the arrow below Mechanical Equipment.



9. Go to Pipe Settings then get rid of Pipe Size Suffix. Click OK.

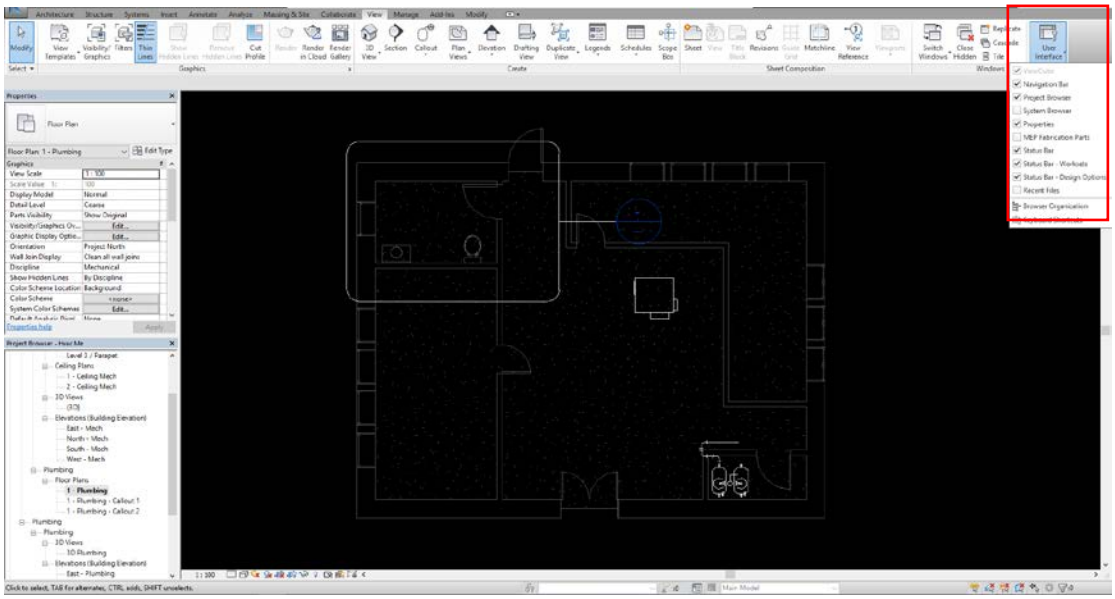


10. No more diameter sign.

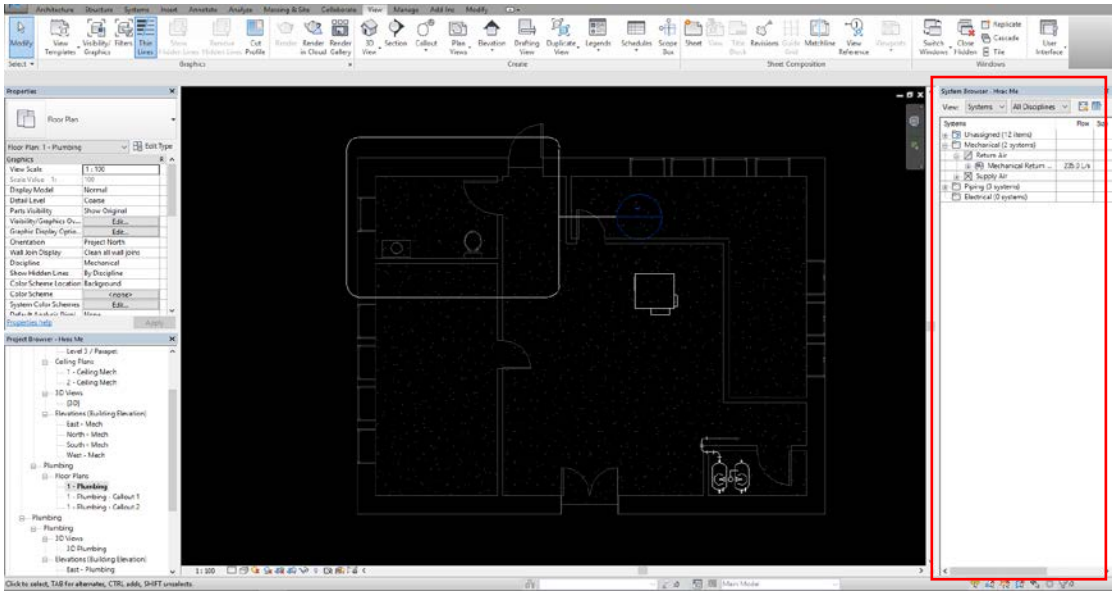


4.9 Looking at the System Browser

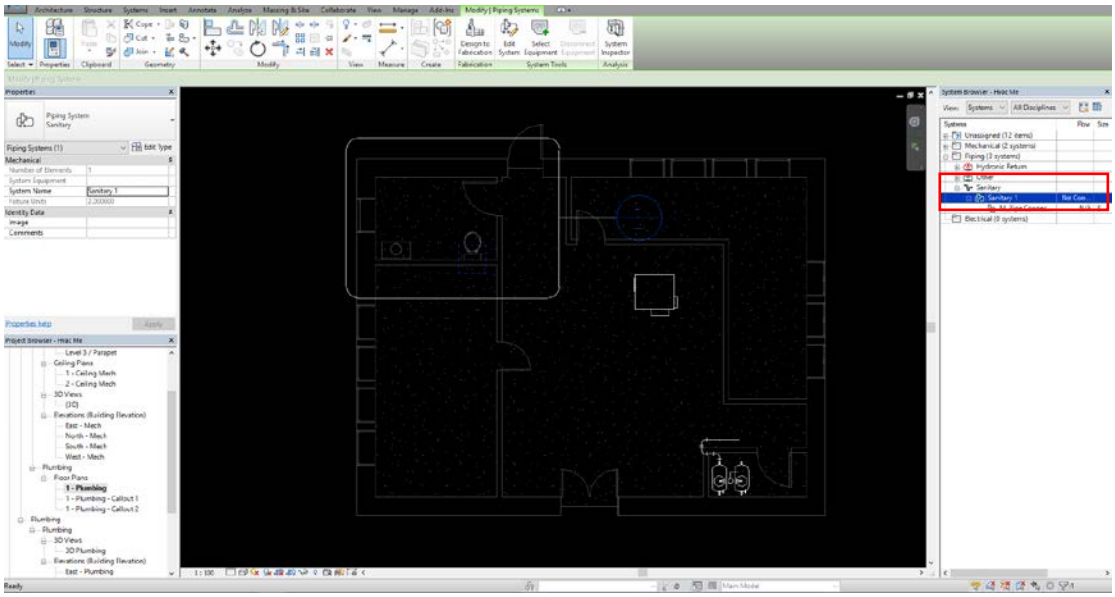
1. System browser is a tree view of all systems we've been created. To open it, go to View tab, User Interface.



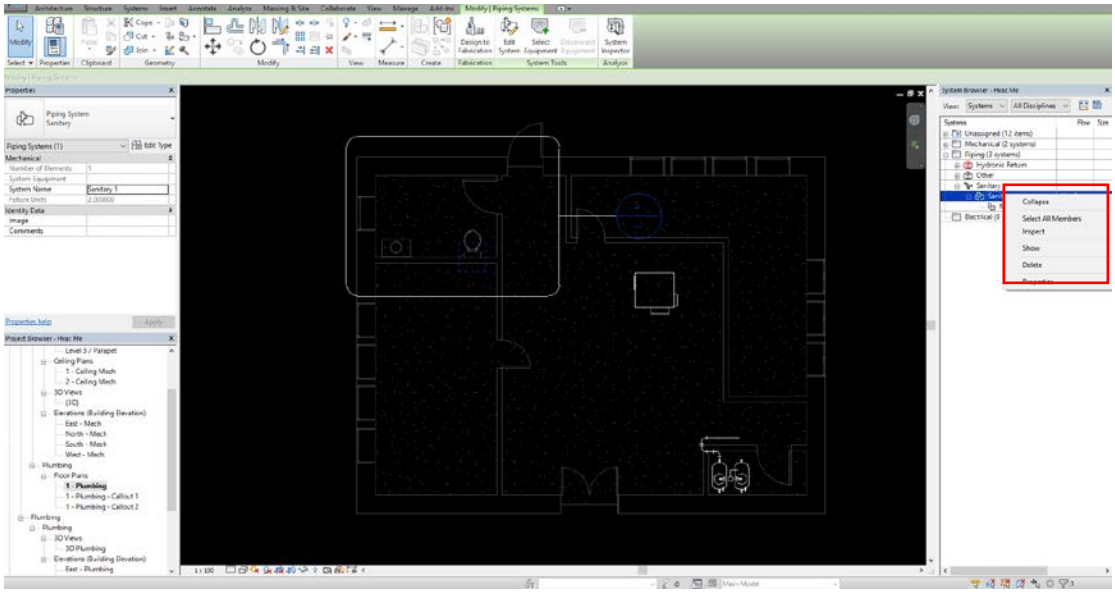
2. After ticking on the checkbox of System, notice we have System Brower situated on the left of our screen.



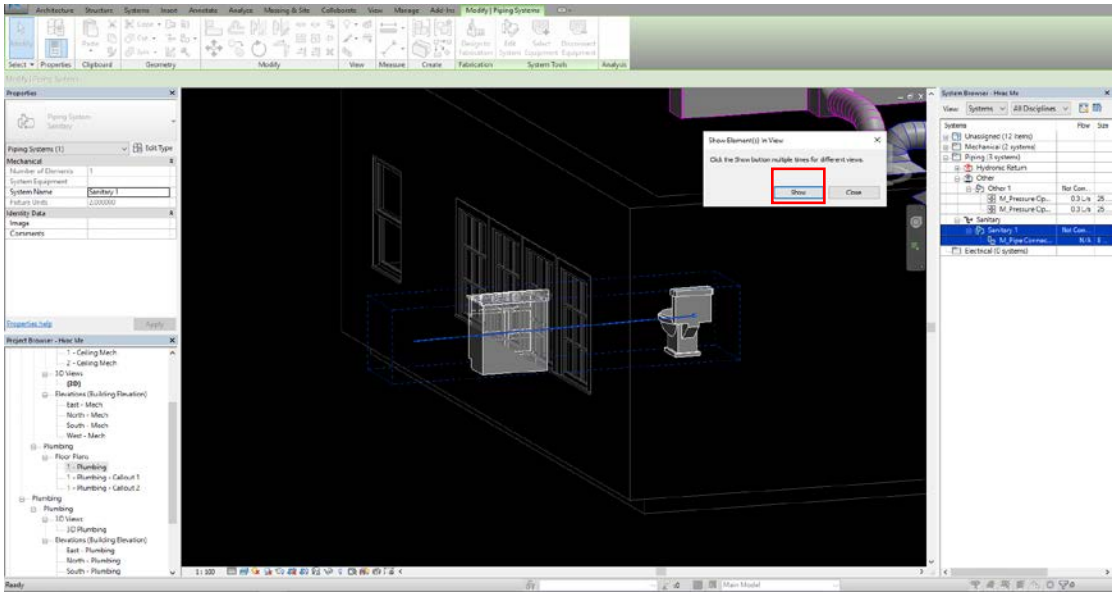
3. Seems like we’re running out of space on our screen. However, System Browser’s functionality is worth the effort. Navigate yourself to the Sanitary system we created before.



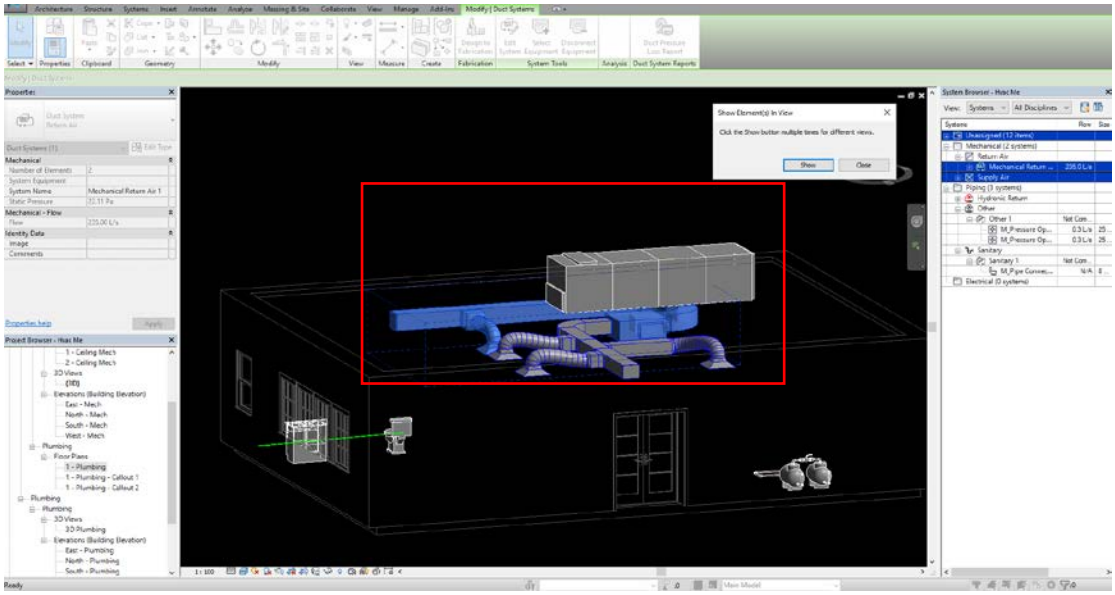
4. Right click on it then hit on Show. Notice we’ll be able to look through different views of selected.



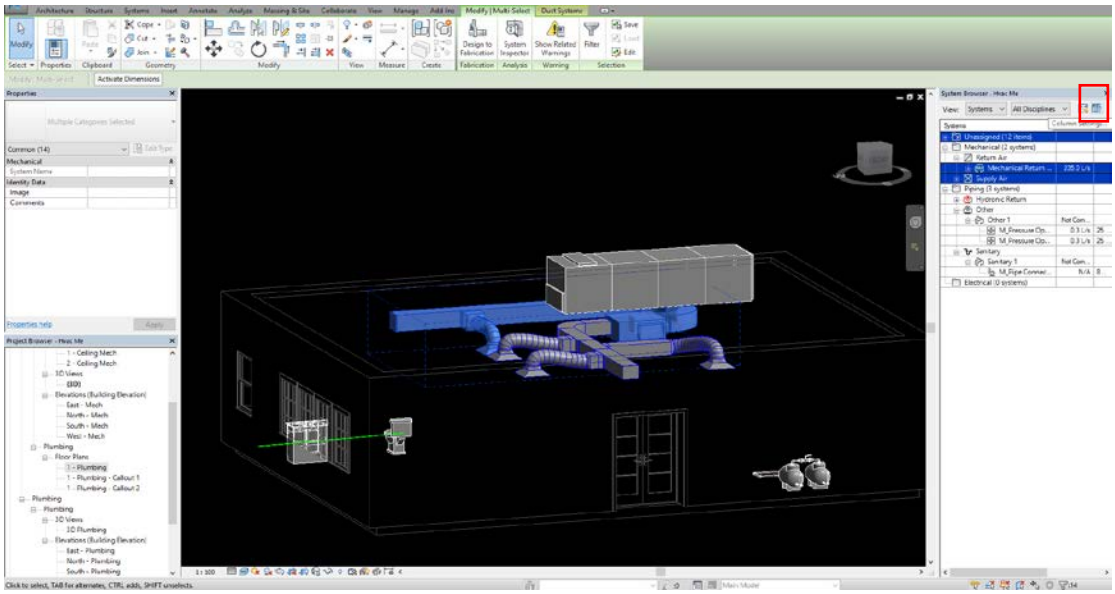
4. Choose a view that suits your need via keep clicking Show.



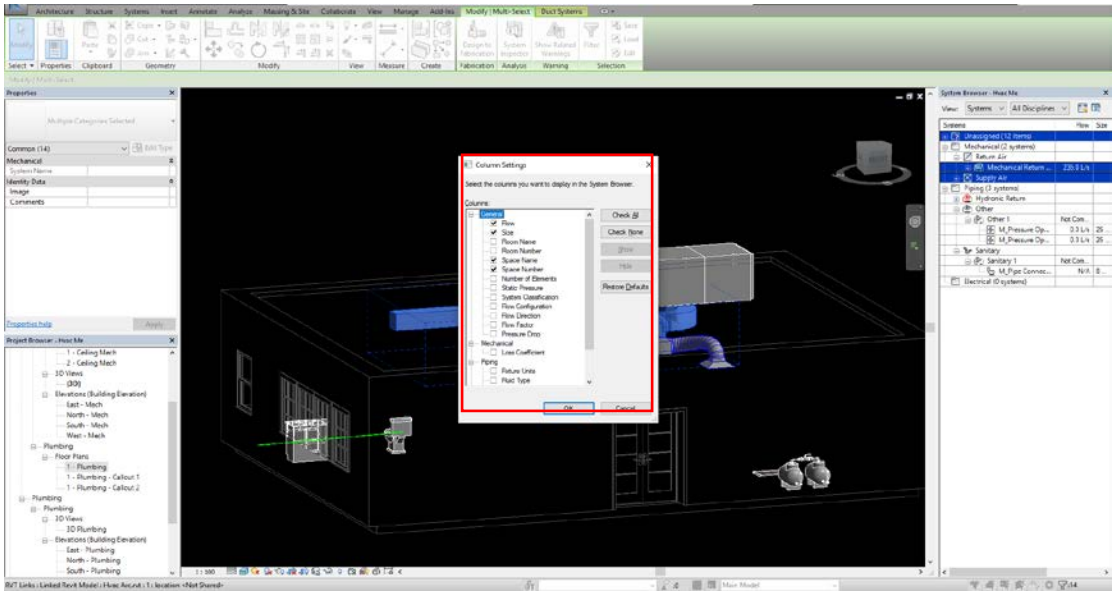
5. Likewise, open your System Browser.



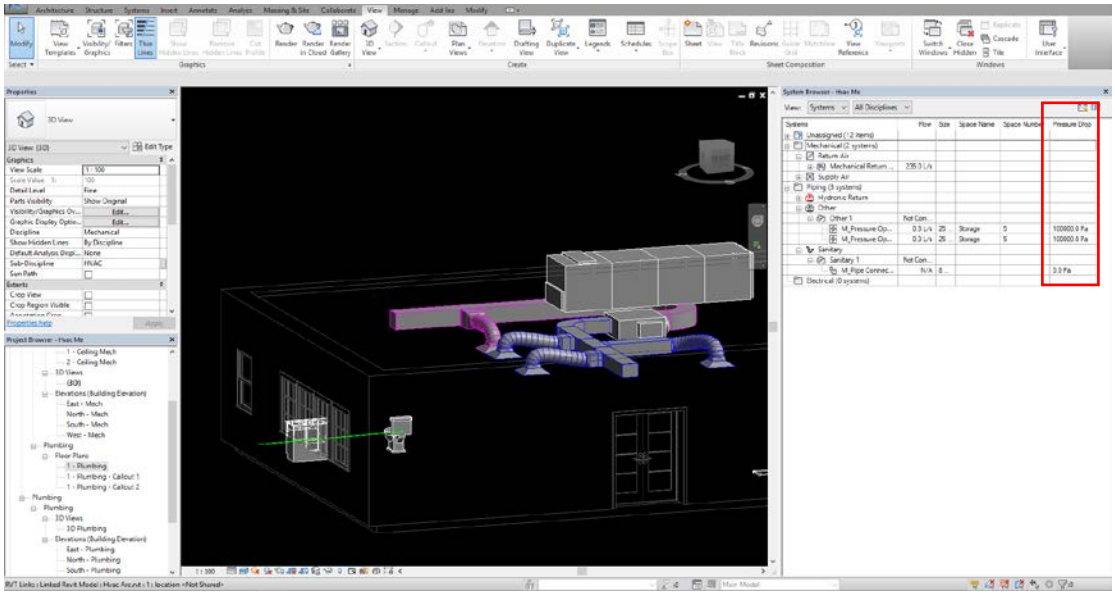
6. To show more details in System Browser, simply click on Column Settings on the right corner of System Browser.



7. There’re plenty of elements you can put on the System Browsr. For plumbing system, you may want to see pressure drop at different places…..



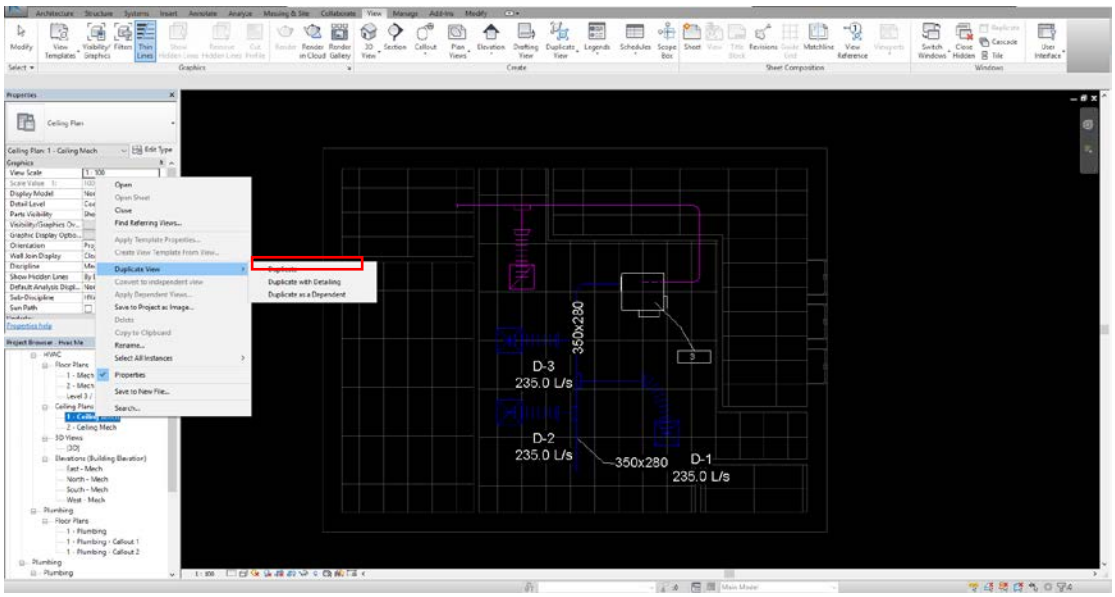
8. Now we have Press Drop at the far right of System Browser.



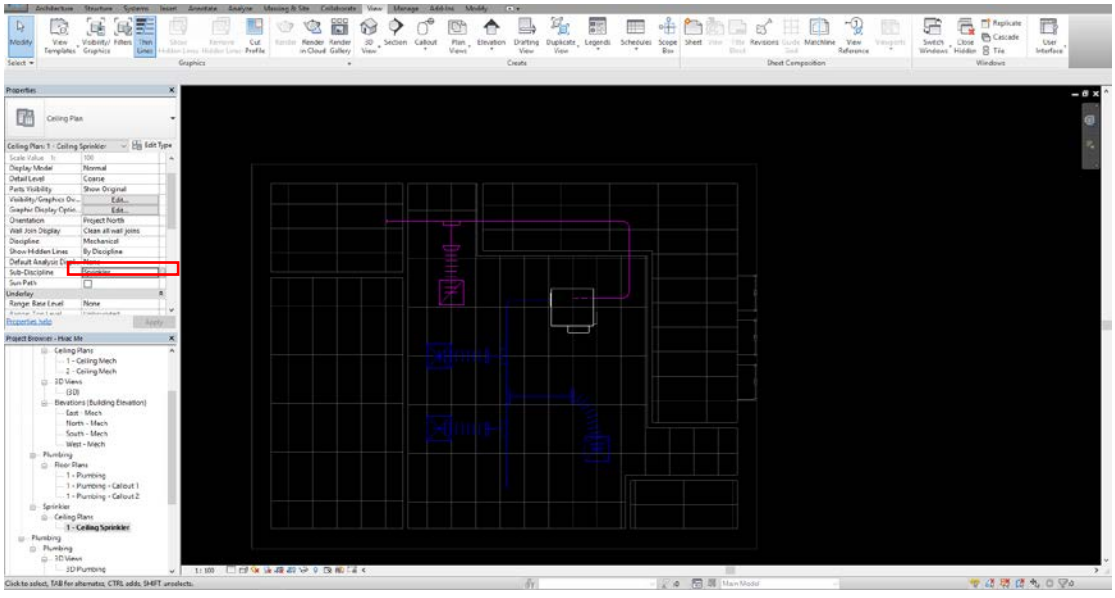
5. Revit Fire Protection

5.1 Creating a sprinkler view

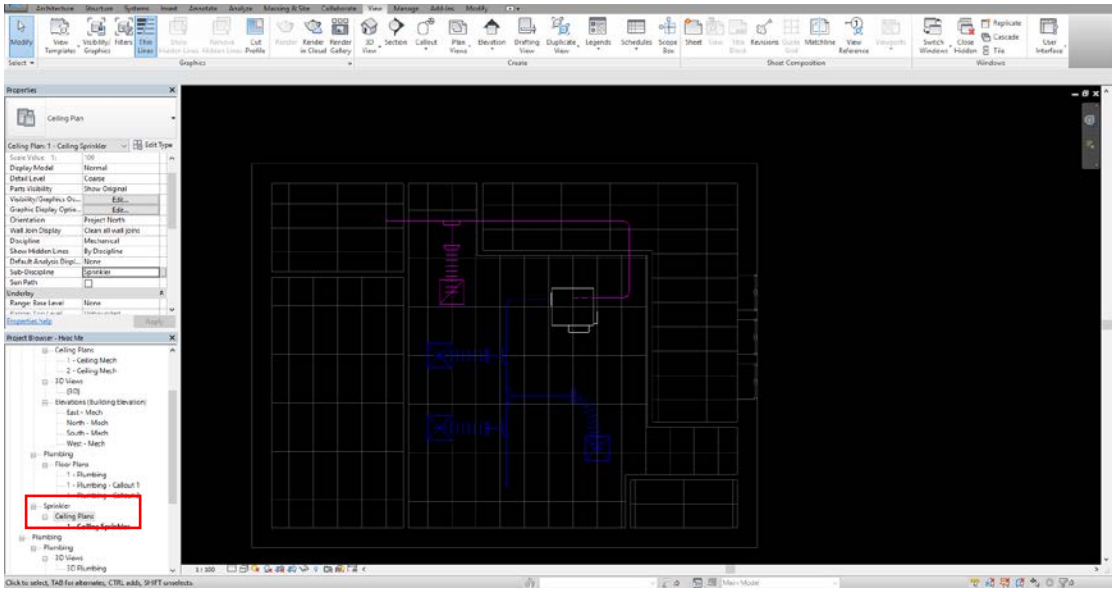
1. Duplicate our primary ceiling view. Rename it as 1 – Ceiling Sprinkler.



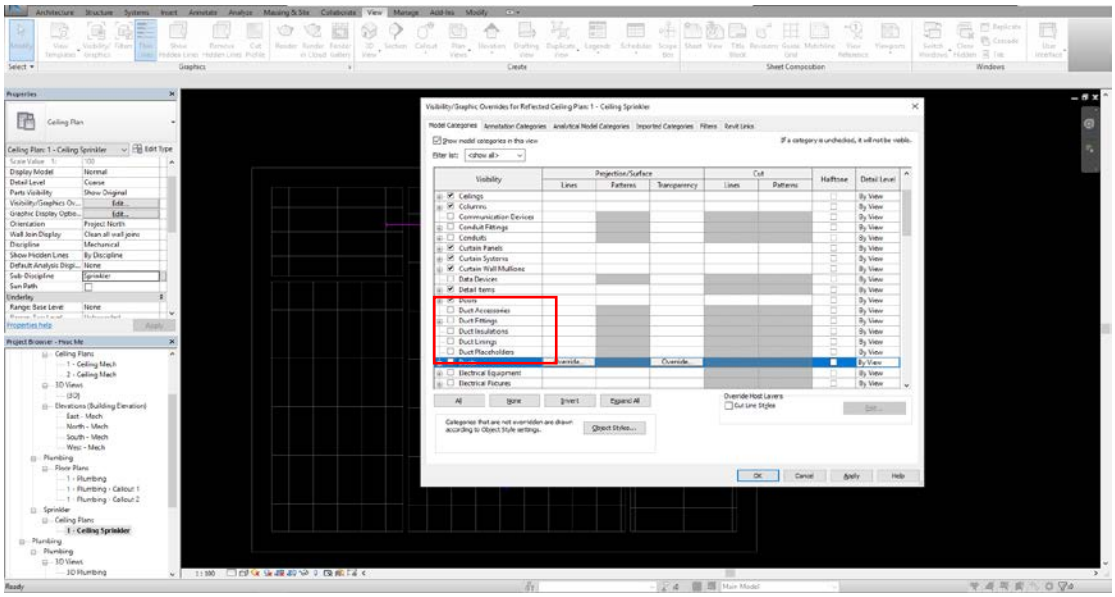
2. Change its sub-discipline to Sprinkler. (Create a new discipline and name it Sprinkler)



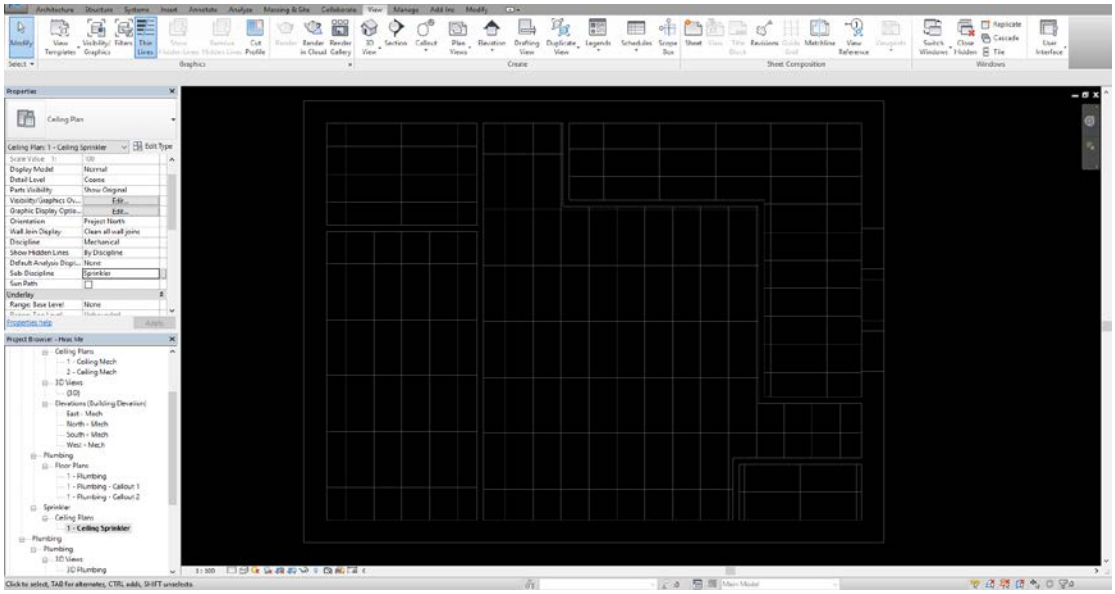
3. Now we have our Sprinkler view in Project Browser.



4. Customize VG settings for this view.

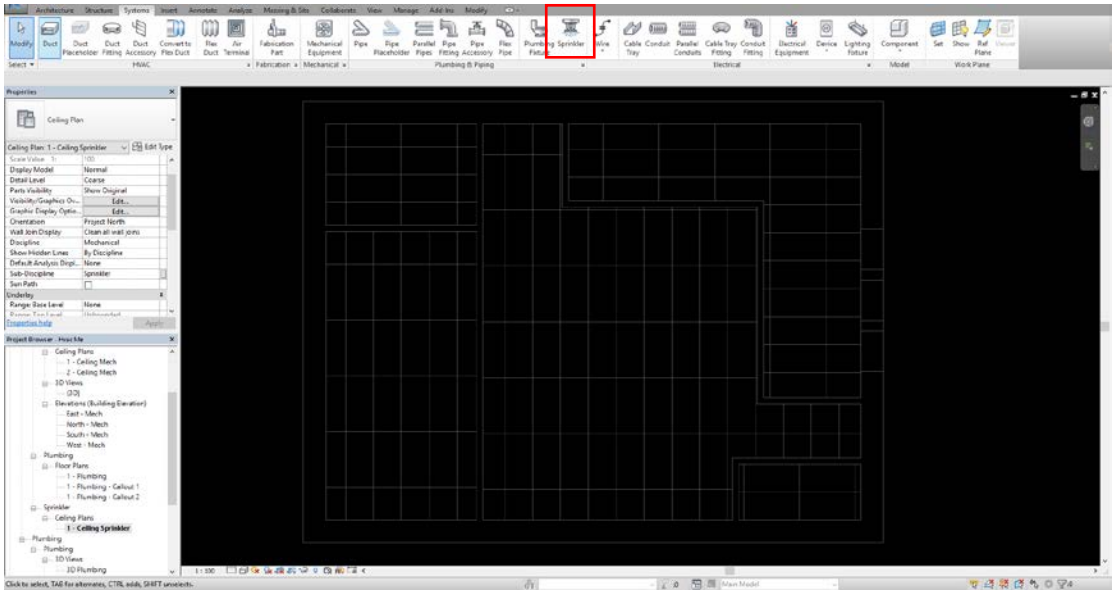


5. We’re ready to design our sprinkler system.

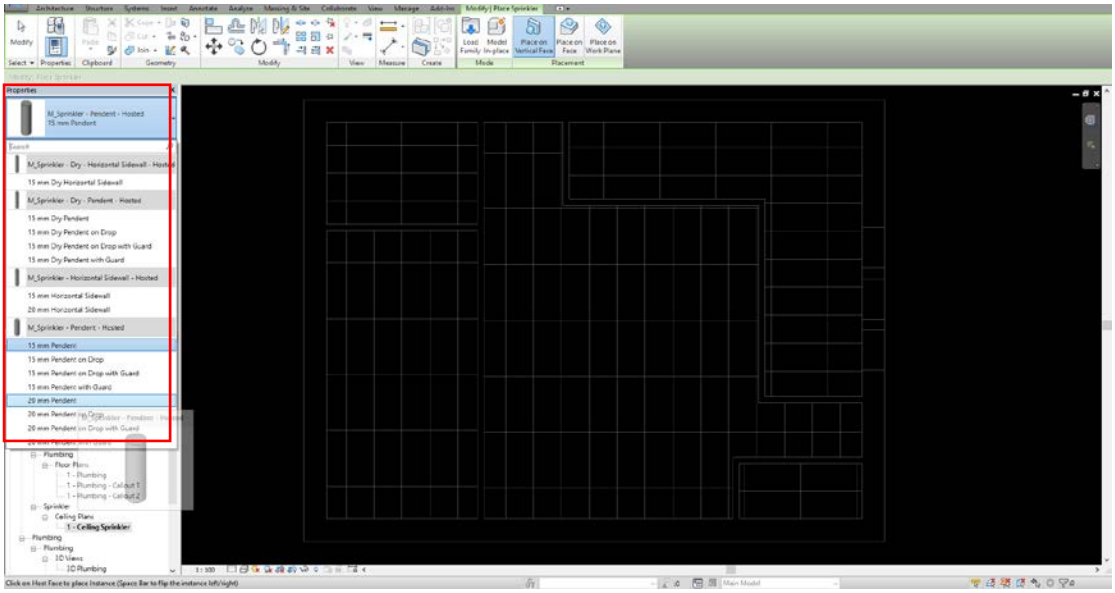


5.2 Adding sprinklers.

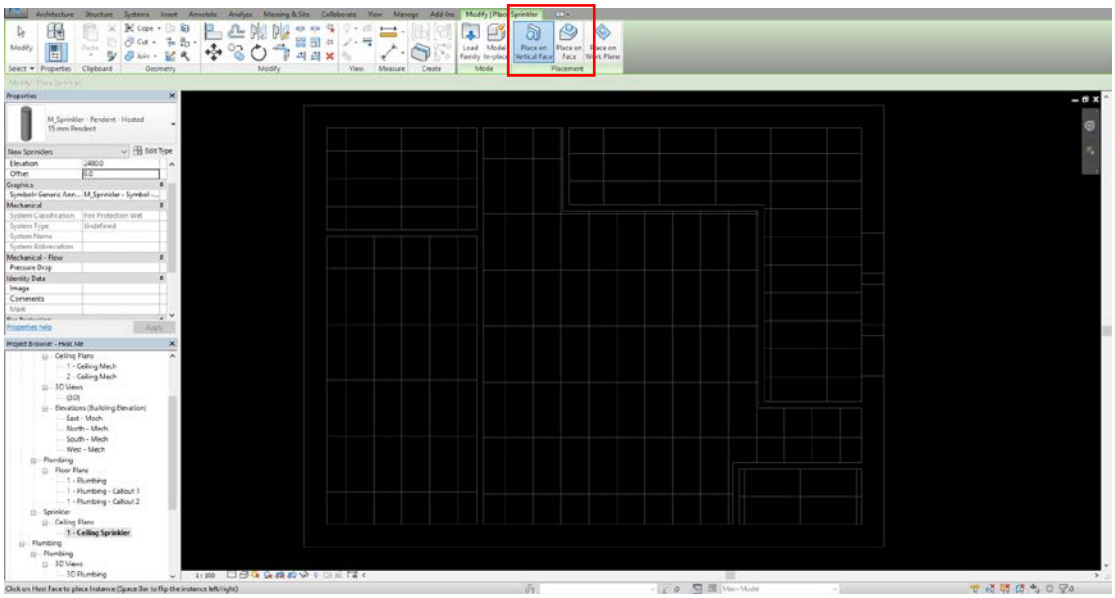
1. Go to System tab, hit on Sprinkler.



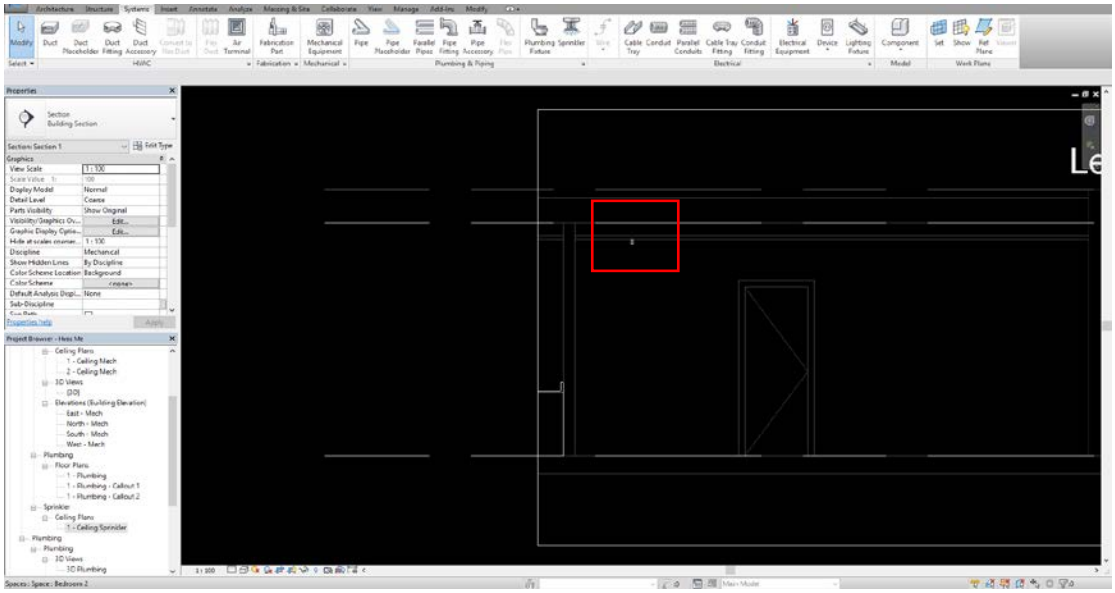
2. Find your sprinkler in Properties window.



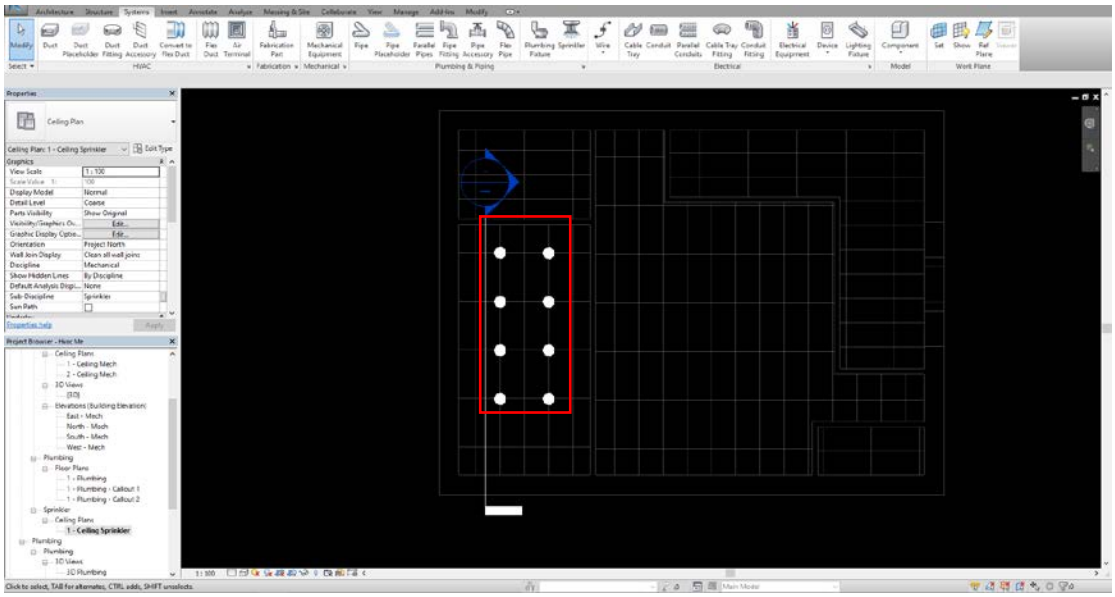
3. Notice that we cannot place it on our ceiling. It's because we're in a mode called **Place on Vertical Face**. Right next to it, hit on Place on Face then we'll be able to place sprinklers properly.



4. Place one sprinkler on ceiling. Create a section view to see if it's placed correctly.



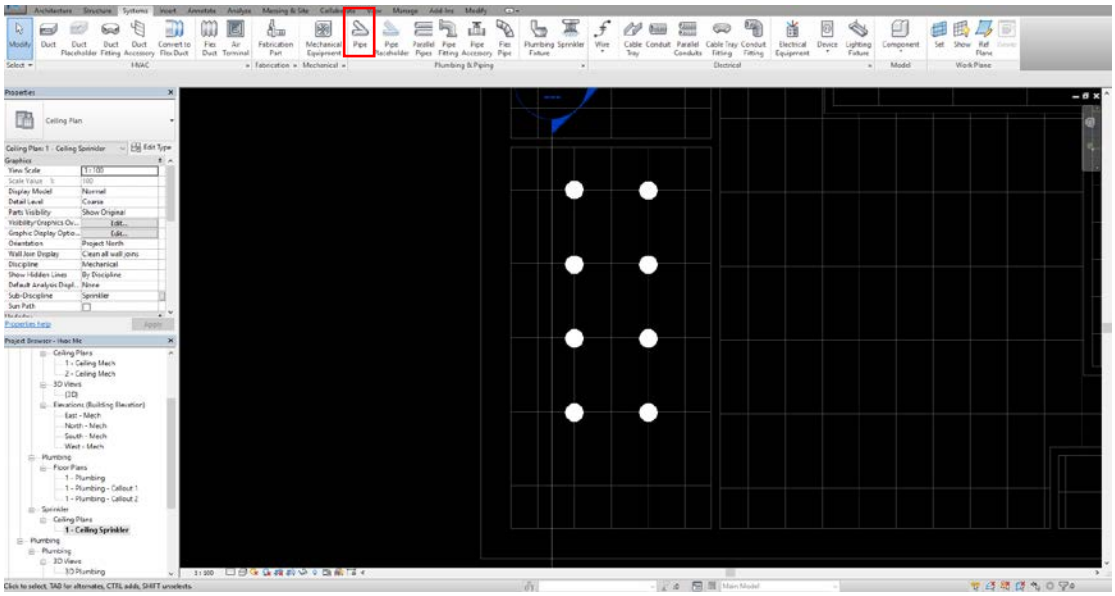
5. Once after we verify our sprinkler is in the right place, we can put more to suit our need.



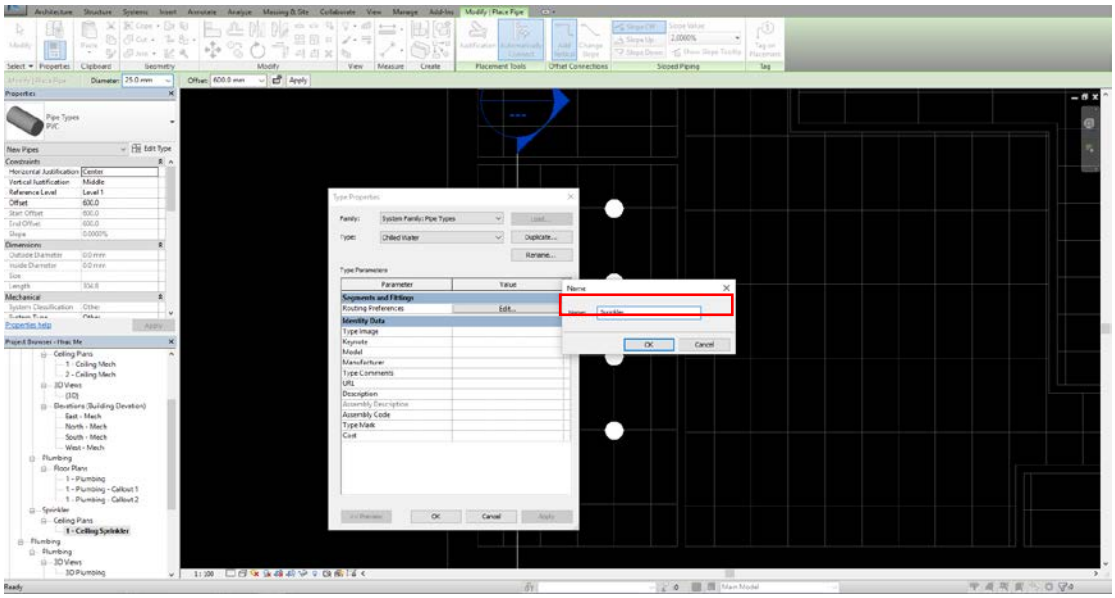
(Note: It's a good habit to use section view verifying whether our elements are positioned correctly. Check first before copy is a wise choice)

5.3 Creating sprinkler pipe types.

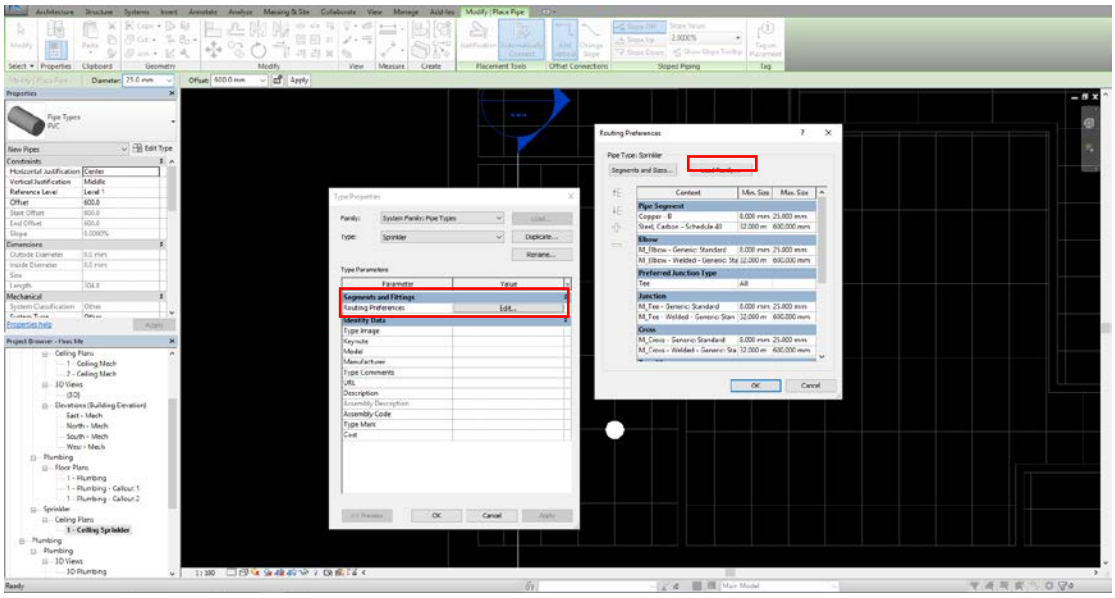
1. Just like what we did when we created PVC pipes. Now, go to System tab, hit on Pipe.



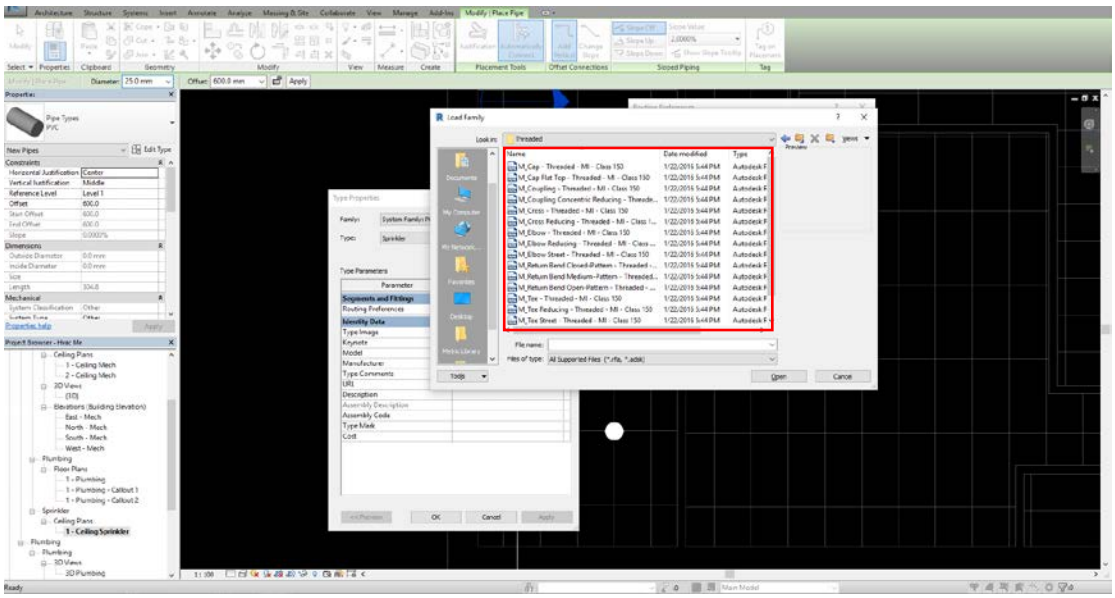
2. Edit types, duplicate Chilled Water then rename it as Sprinkler.



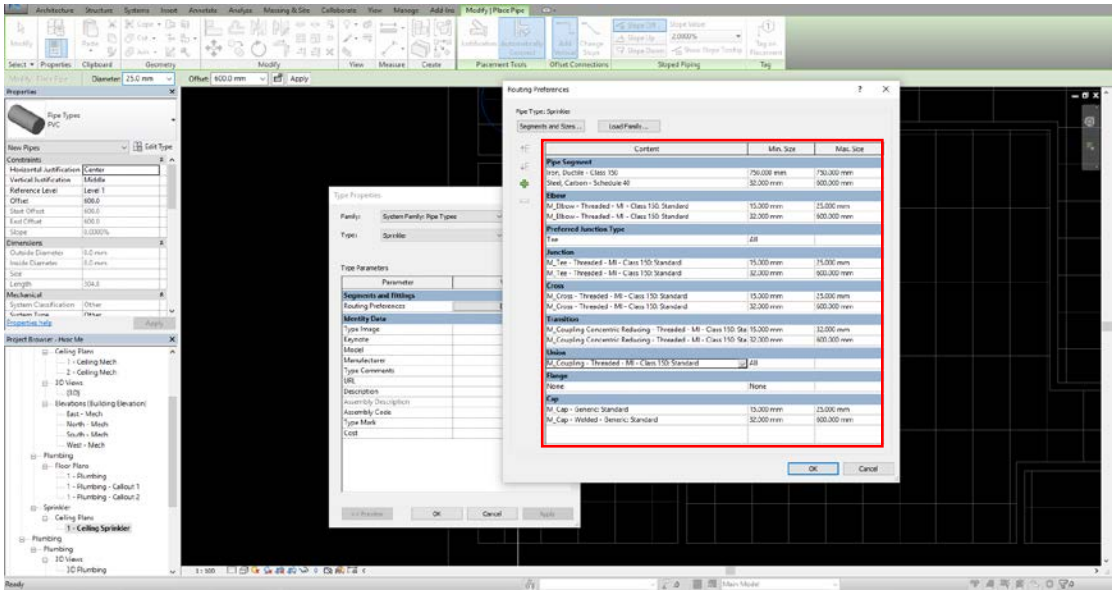
3. In Routing Preferences, we need to load in a whole pack of pipe fittings just to make sure our pipe will behave correctly. Edit Routing Preference, Load Fmaily.



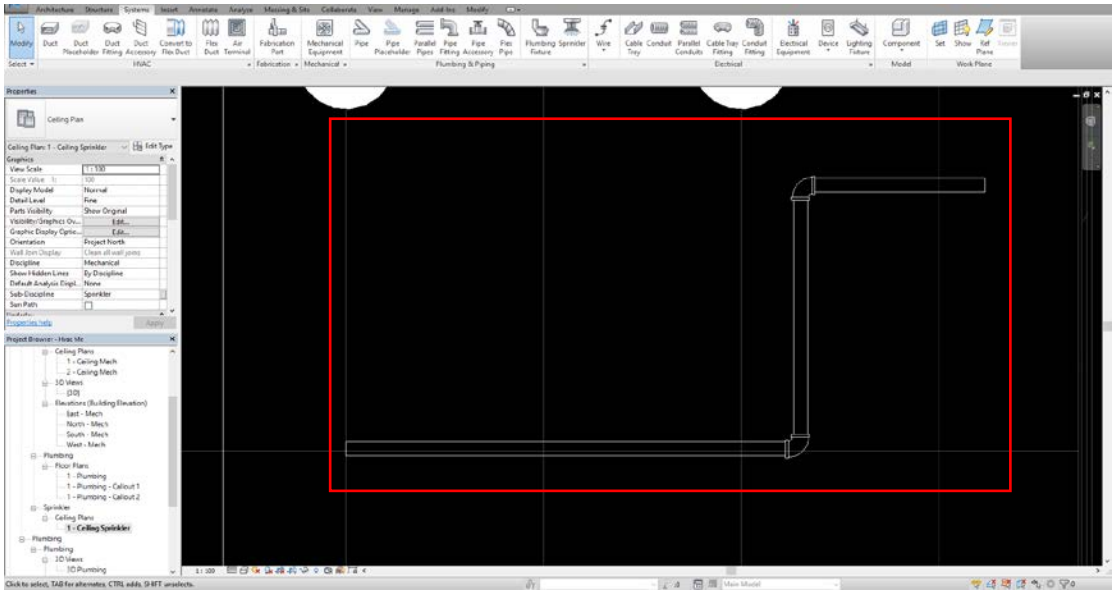
4. Find Malleable Iron folder, load in entire Threaded package. (Pipe – Fittings – Malleable Iron – Class 150)



5. Set your preferences according the pic below. (Basiclly, leave Cap, Flange, Tee as default, set Threaded on everything else)

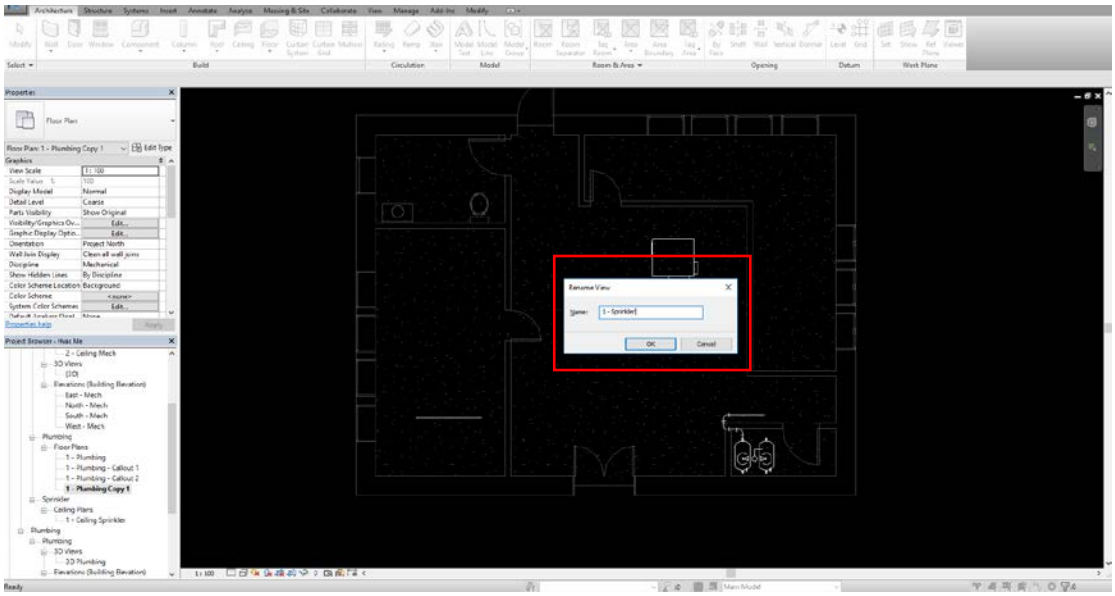


6. Draw some pipes of this type to see if it works properly.

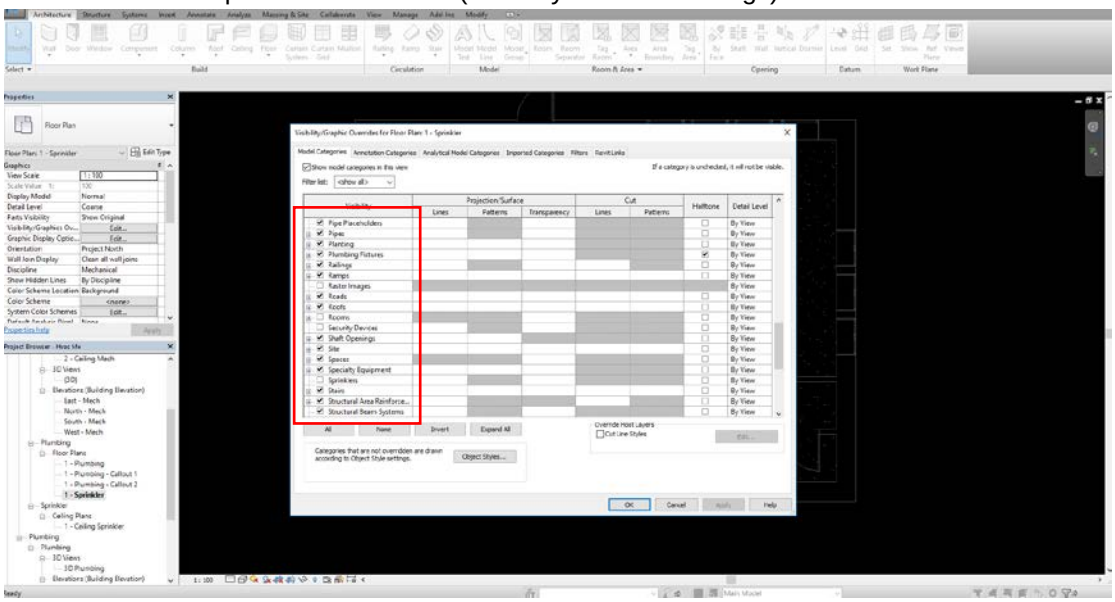


5.4 Modeling mains

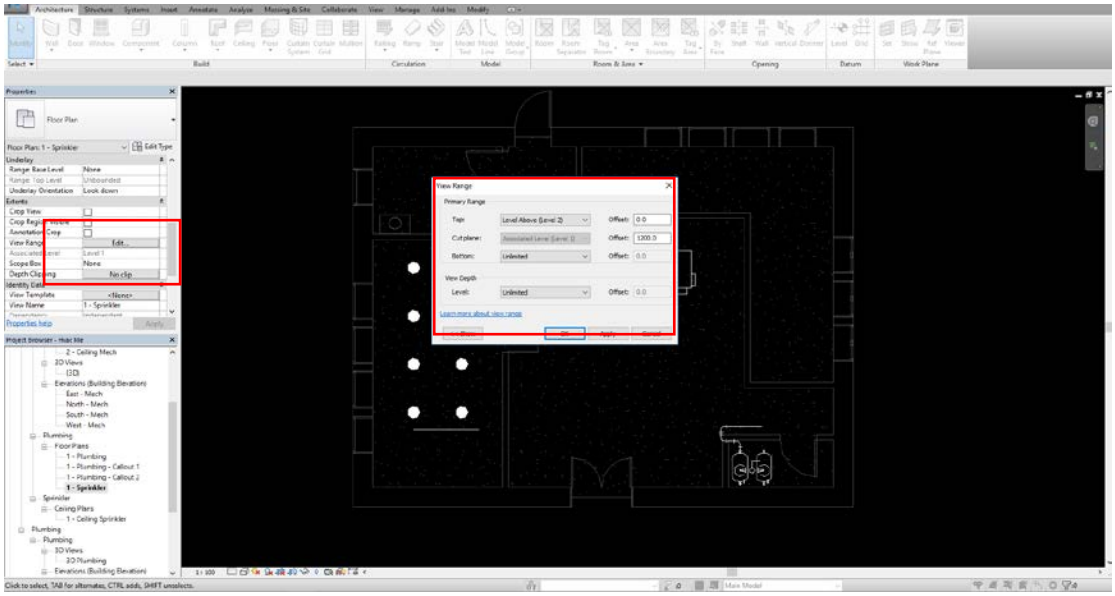
1. Simply duplicate our first floor plan. Rename it 1 – Sprinkler



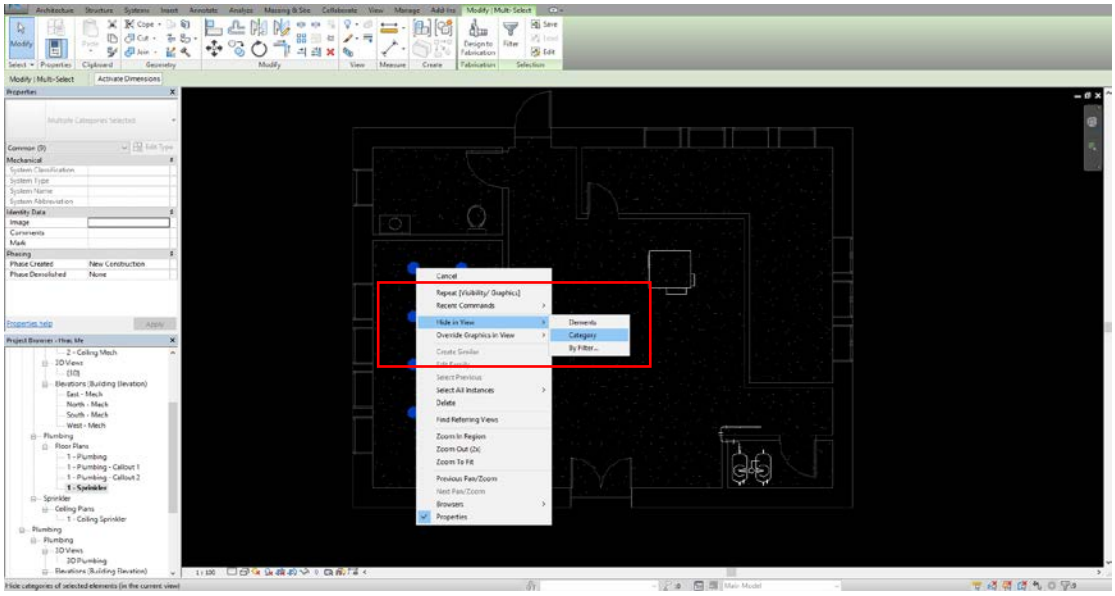
2. Make sure our spinklers are visible. (Check your V / G settings)



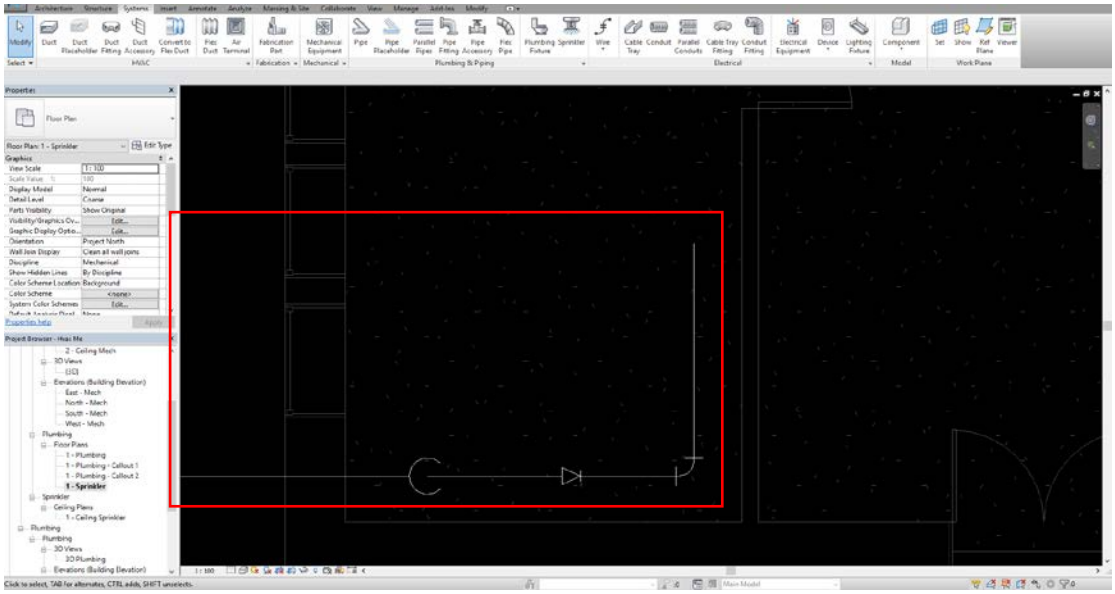
3. Since our pipes are below the floor, but we want to see them in the floor plan, setting proper view range is necessary. Set Bottom and View Depth Level to unlimited.



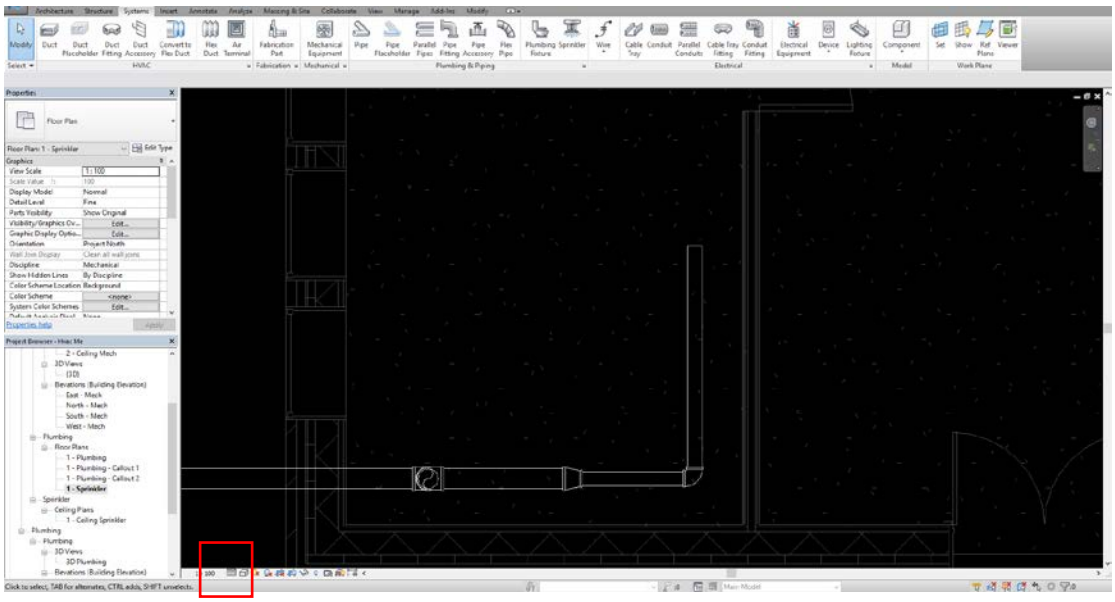
4. Hide elements we don’t want to see in this view. Select sprinklers, right click, hide in view, elements.



5. Start to draw our mains. (Make sure you are drawing sprinkler pipes) Change offset and diameter that suit your need.

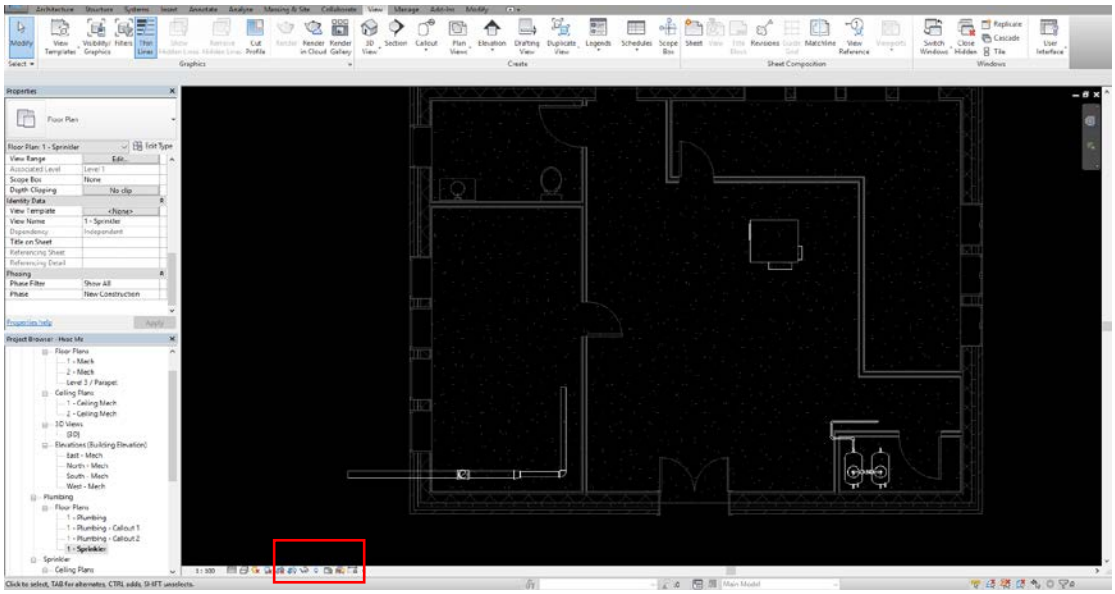


6. To see more details of your pipes. Set our detail level to Fine.

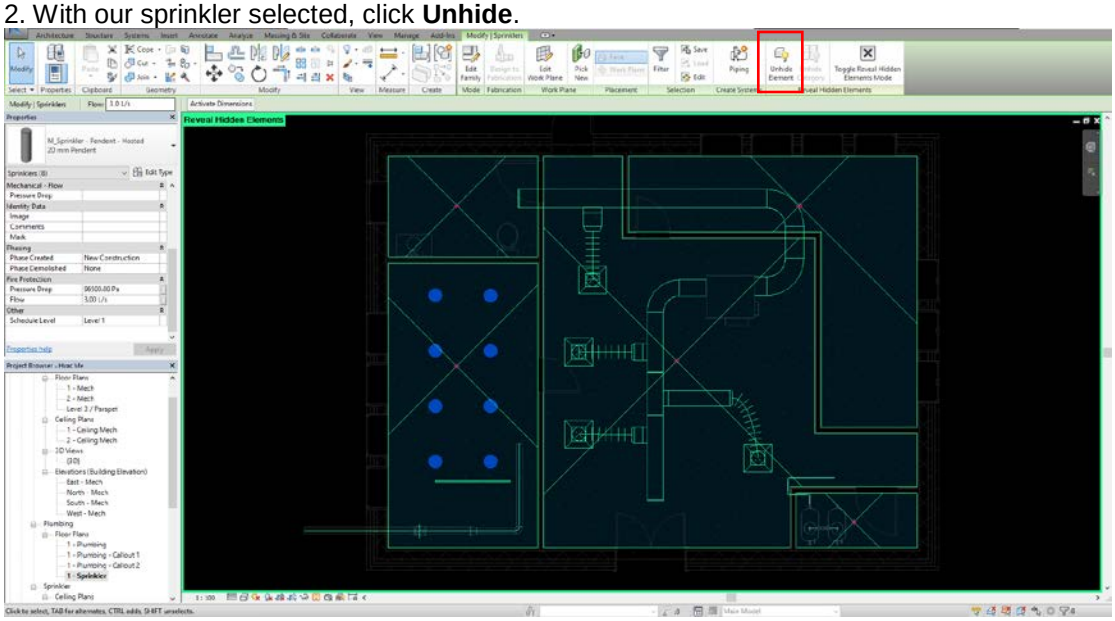


5.5 Modeling branch lines

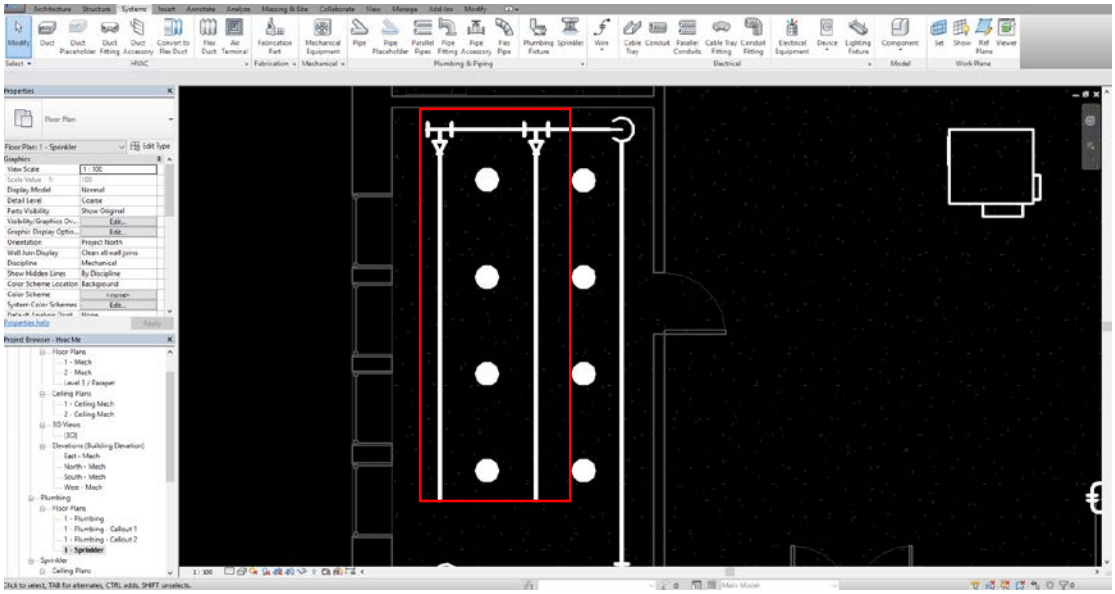
1. Make sure your sprinklers are visible. Go to View Control Bar, reveal hidden elements.



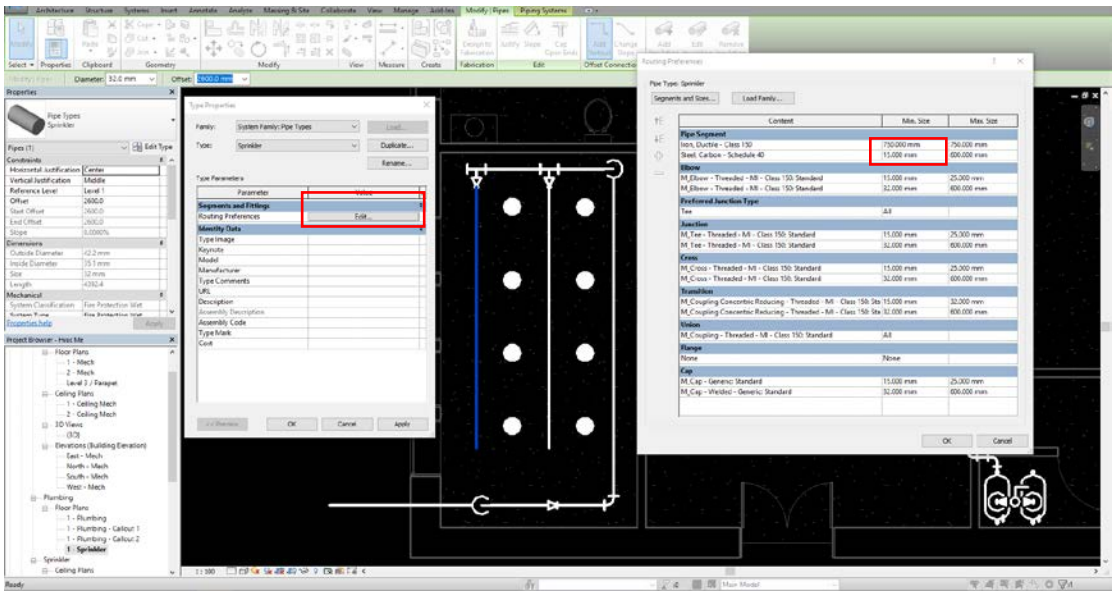
2. With our sprinkler selected, click **Unhide**.



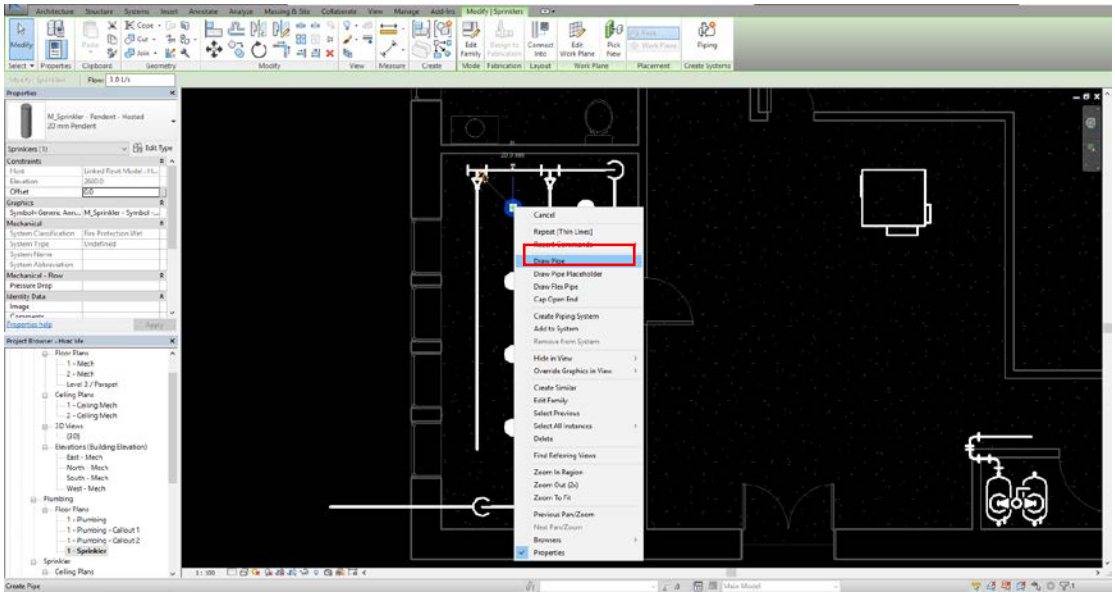
3. Draw your branches.



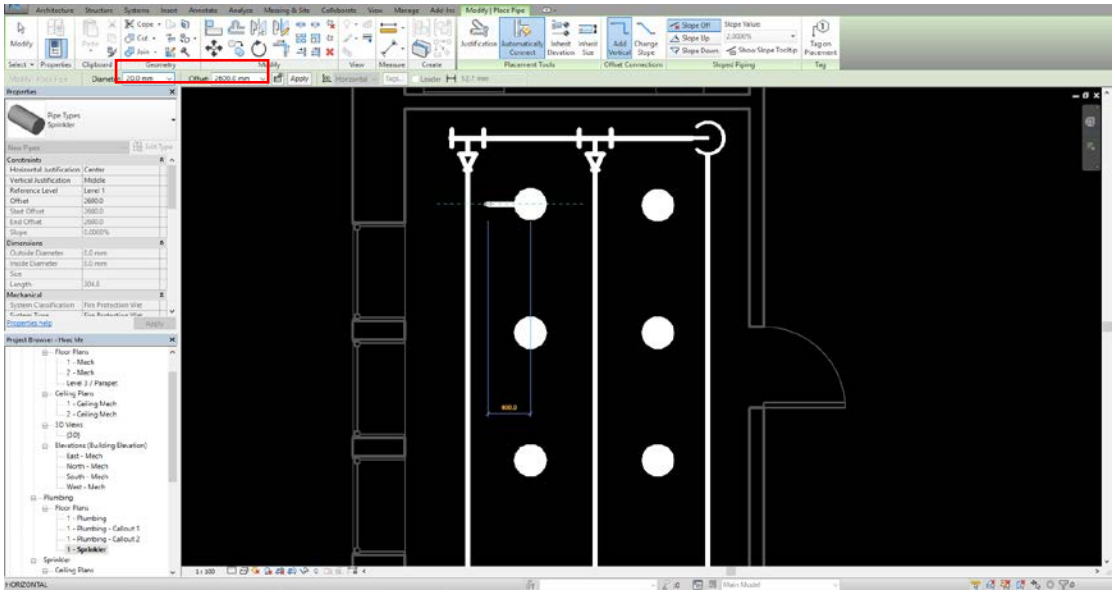
4. Select one of branches, go to edit type, make sure our Schedule 40 pipe allow for 15mm.



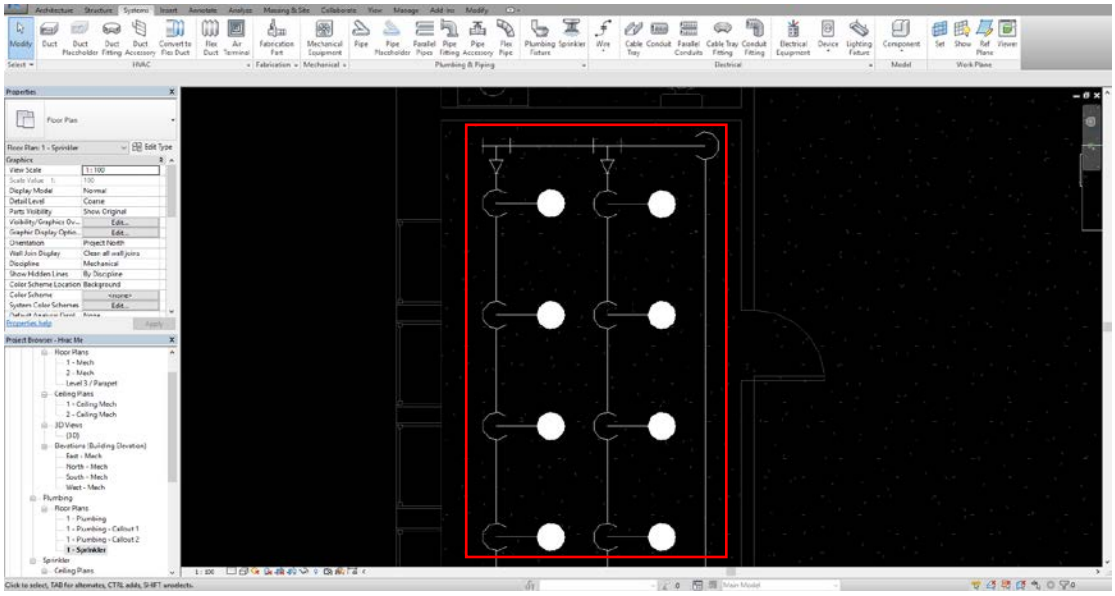
5. Connect our sprinklers to branches.



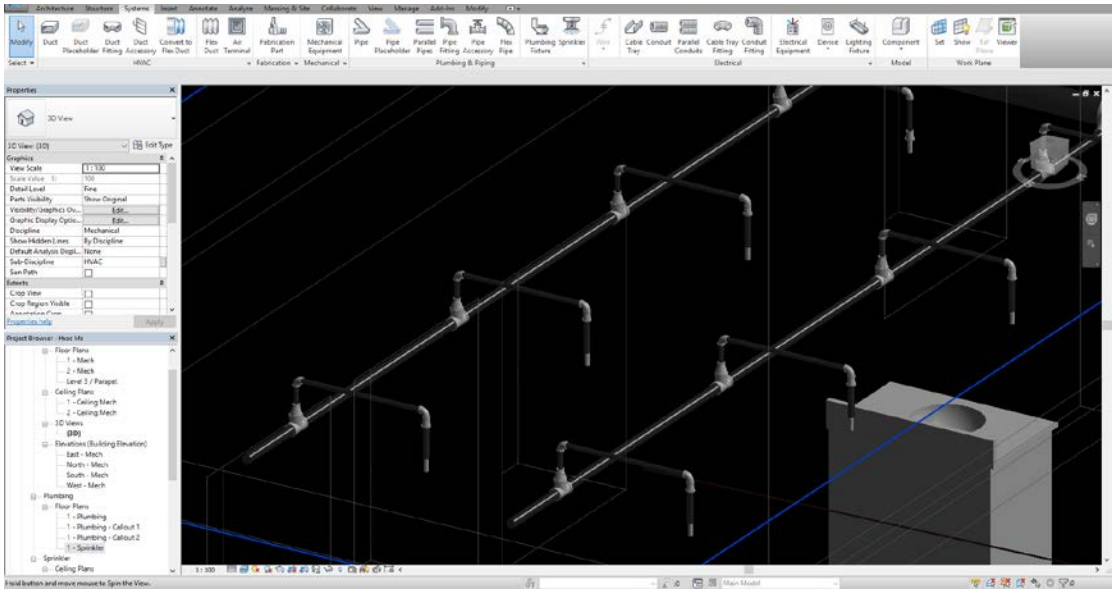
6. We want our pipe start going up from the sprinkler then drop down to main. Remember to set offset and diameter properly.



7. Finish the rest.

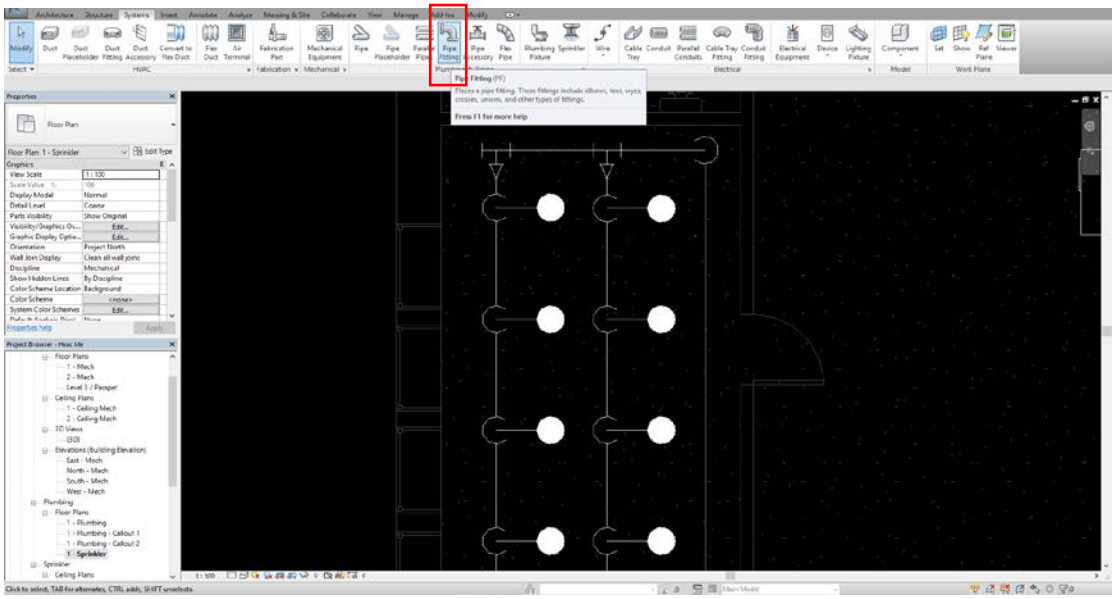


8. Check our system in 3D view.

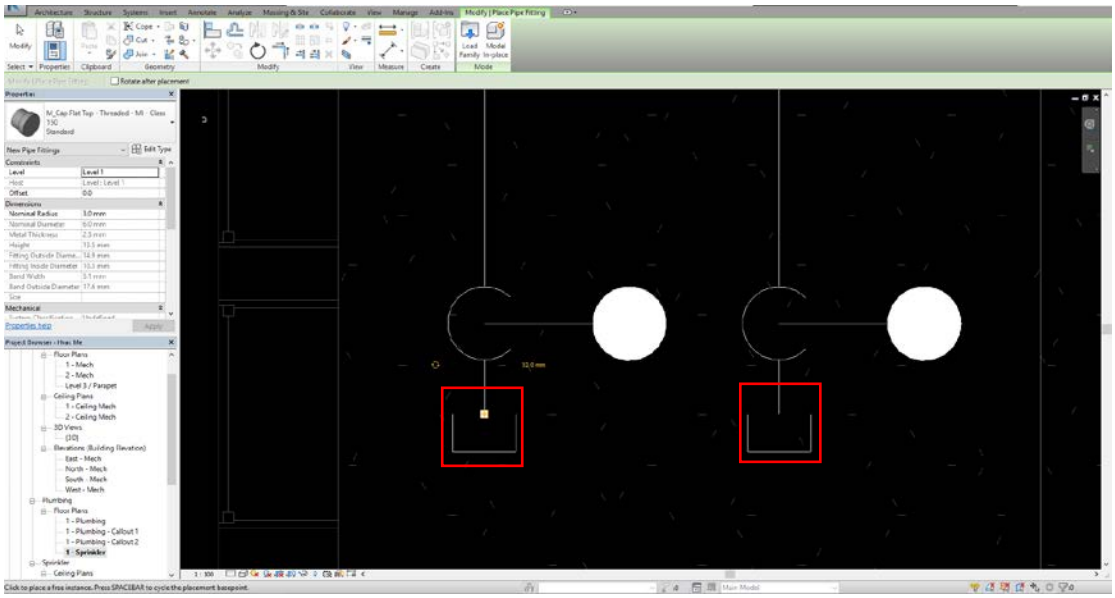


5.6 Adding pipe accessories

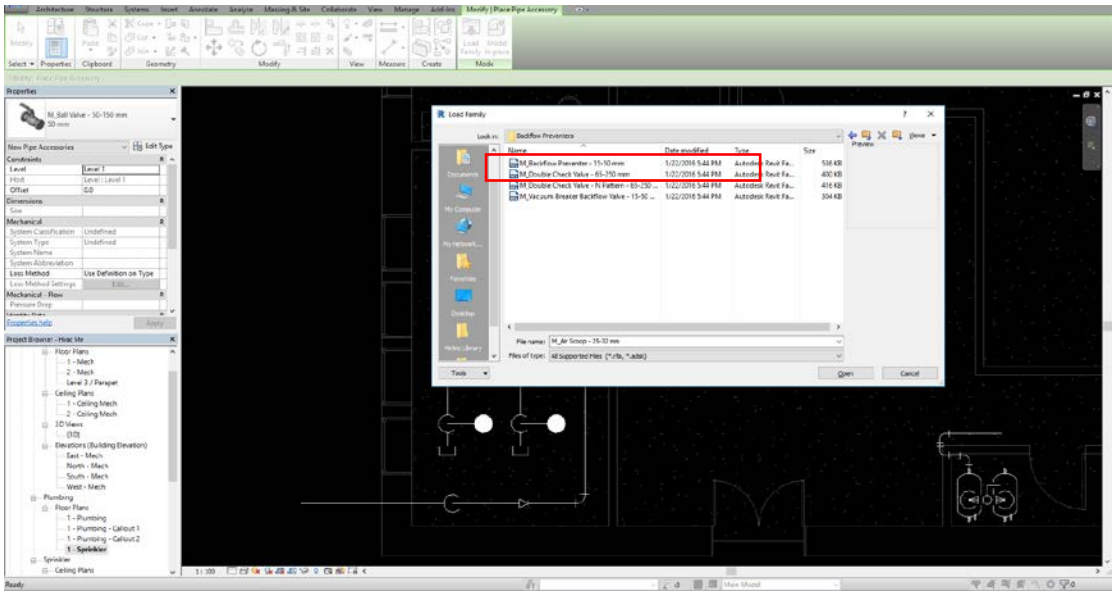
1. Go to System tab, find Pipe Fitting icon.



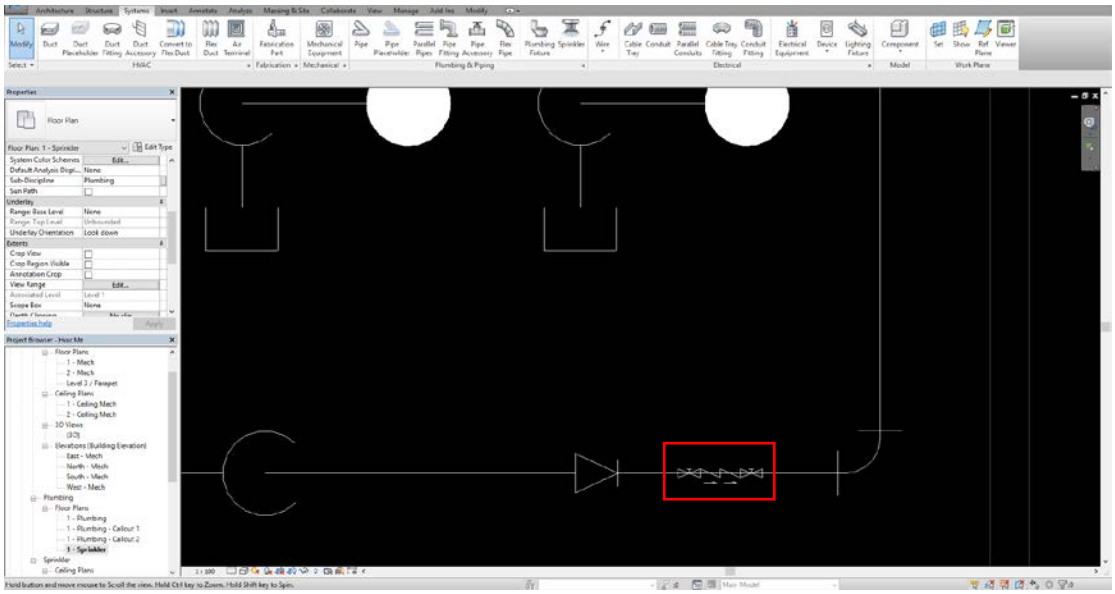
2. Navigate yourself in the drop down list, till you find Cap Flat Top – Thread – MI – Class 150. Cap your pipe ends.



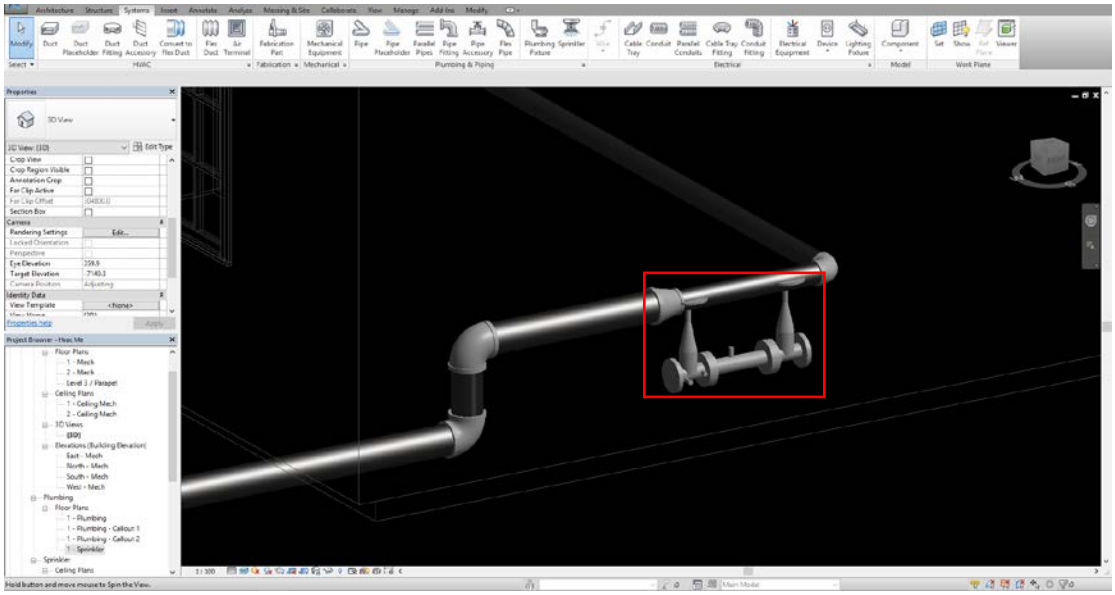
3. Under System tab, go to Pipe Accessory. Load in Double Check Valve. (Pipe – Valves – Backflow preventer)



4. Place it on your main.

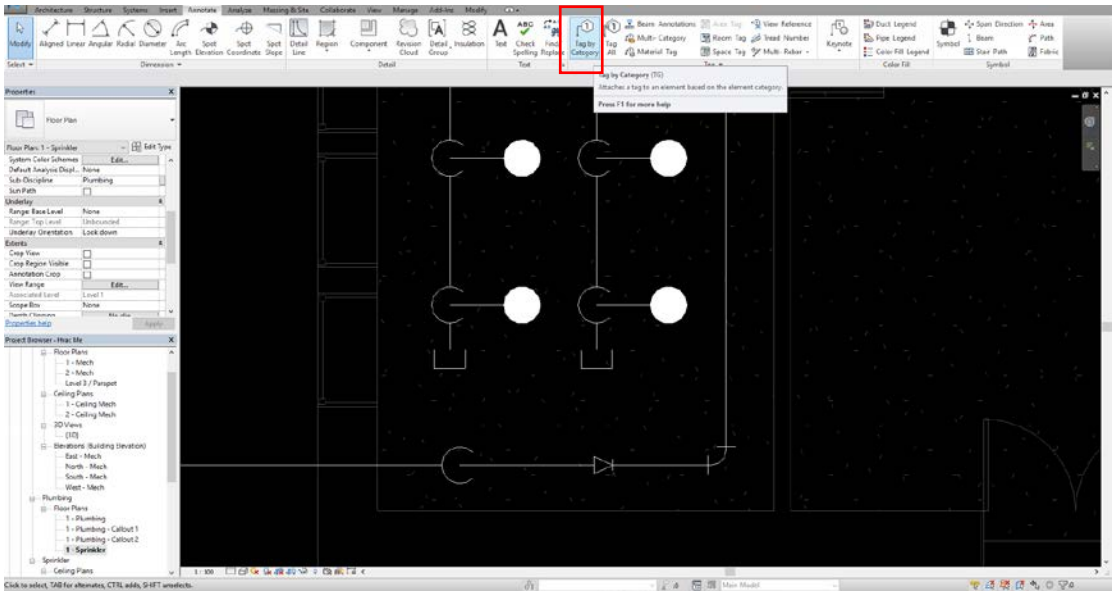


5. Check them in 3D view.

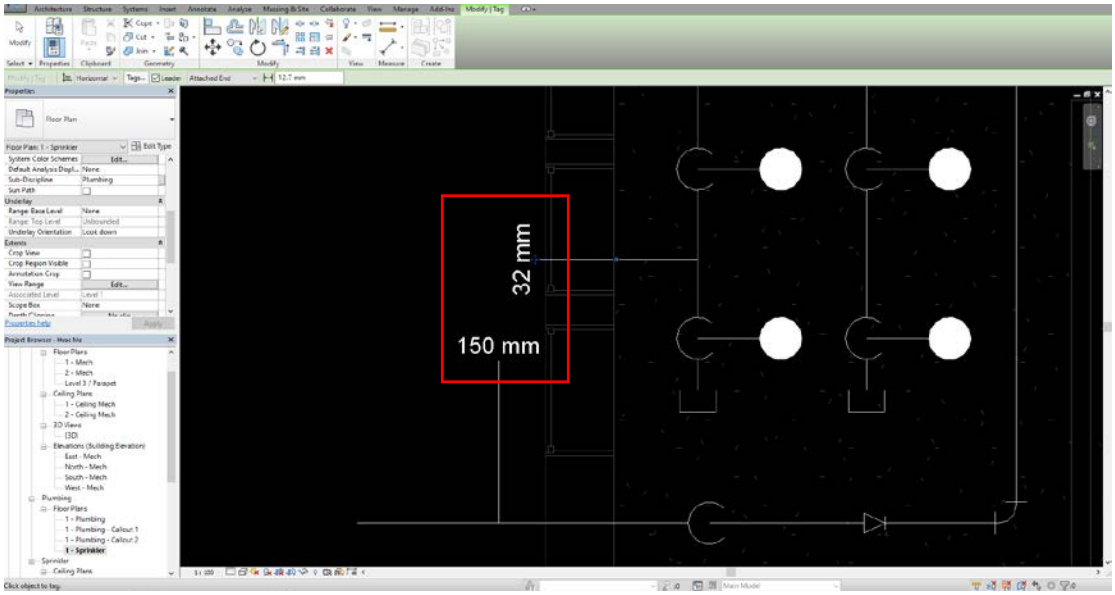


5.7 Tagging items

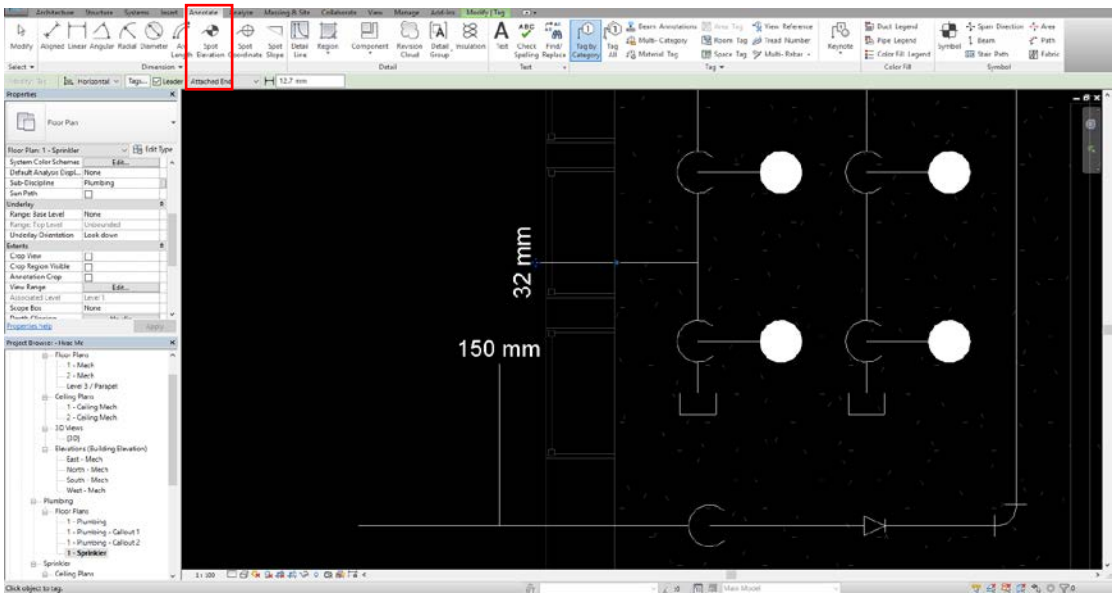
1. Simliar to what we did in previous chapters. Tag By Categories will come in handy.



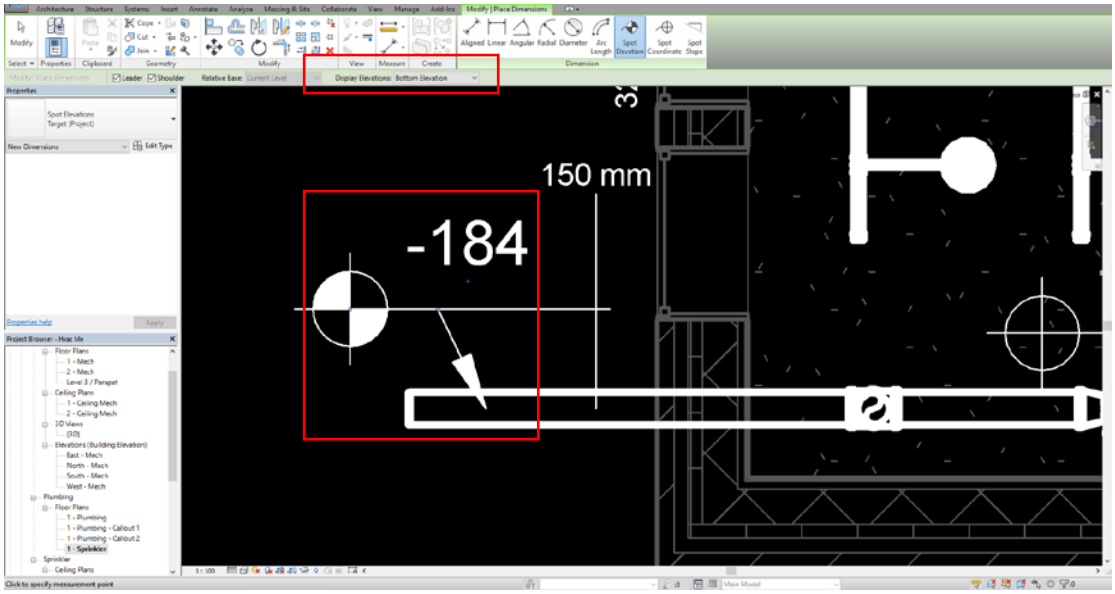
2. Tag your pipes.



3. If you wish to add in some elevation tag, go to Spot Elevation. Go to Annotate, then click on Spot Elevation.

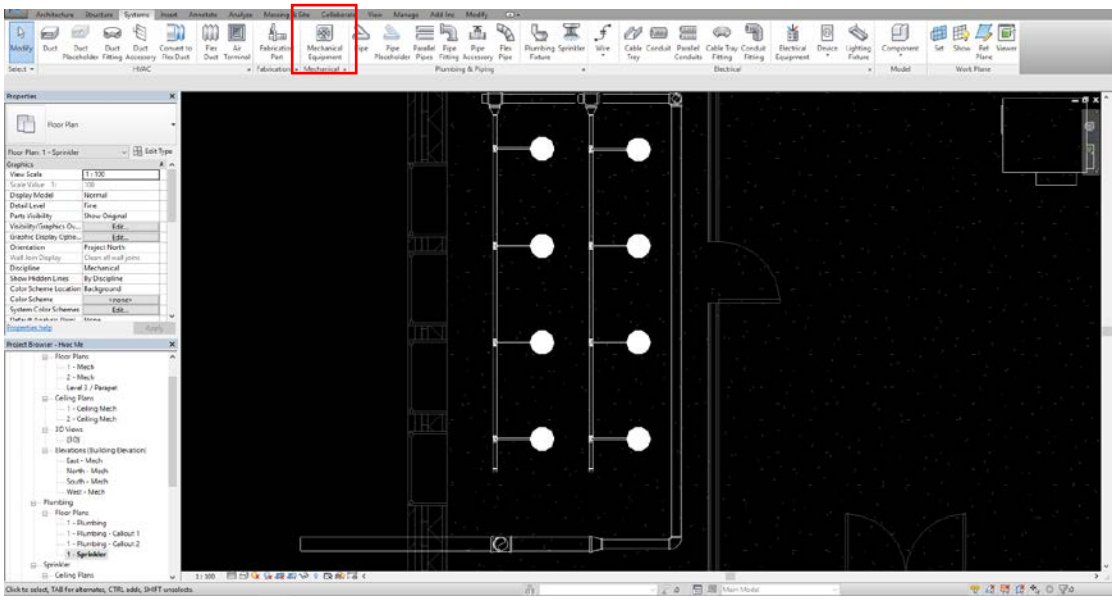


4. Display elevation set to Bottom Elevation. Tag it as you need.

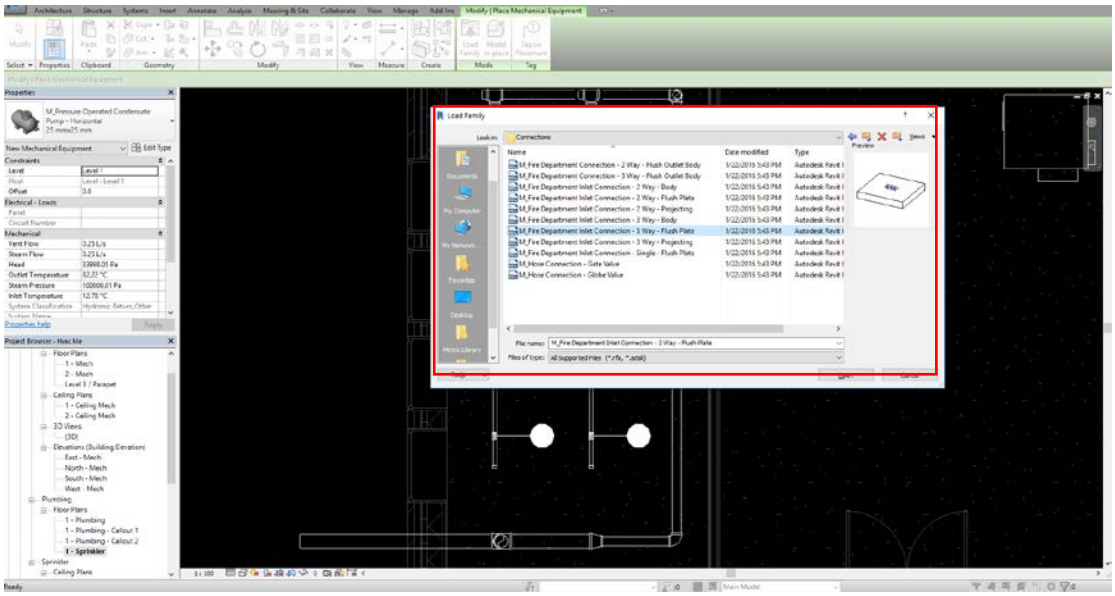


5.8 Adding specialty item

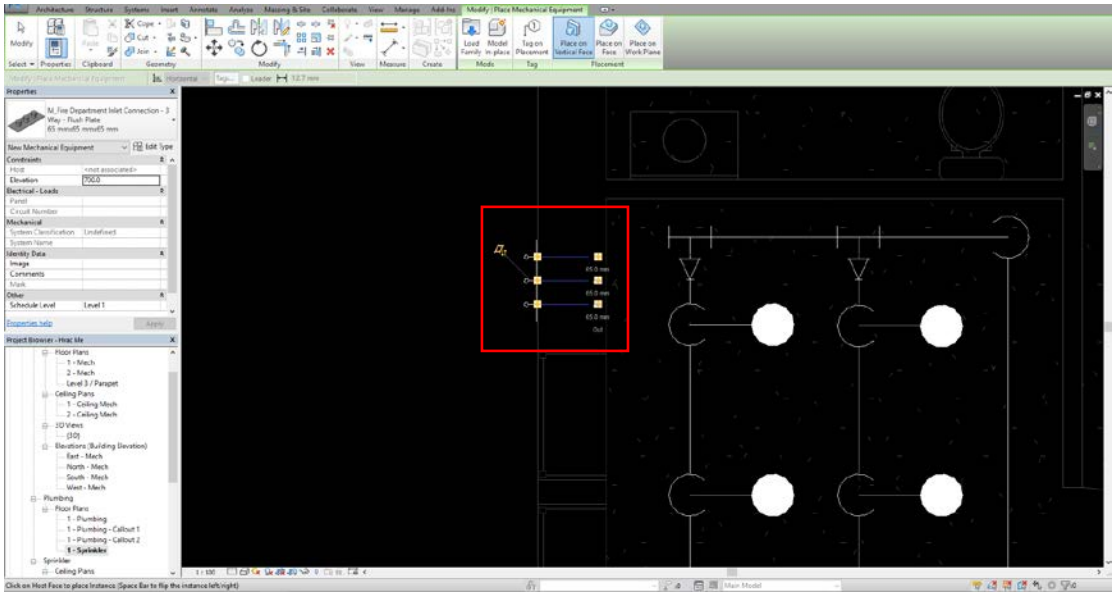
1. Go to System tab, Mechanical Equipment.



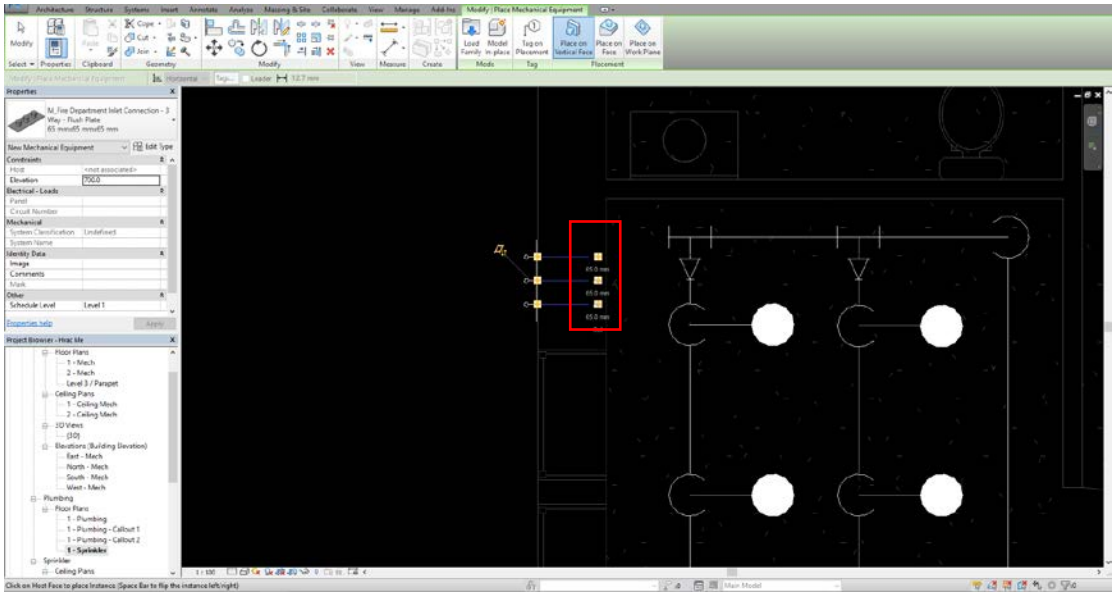
2. Load in your Inlet Connection.



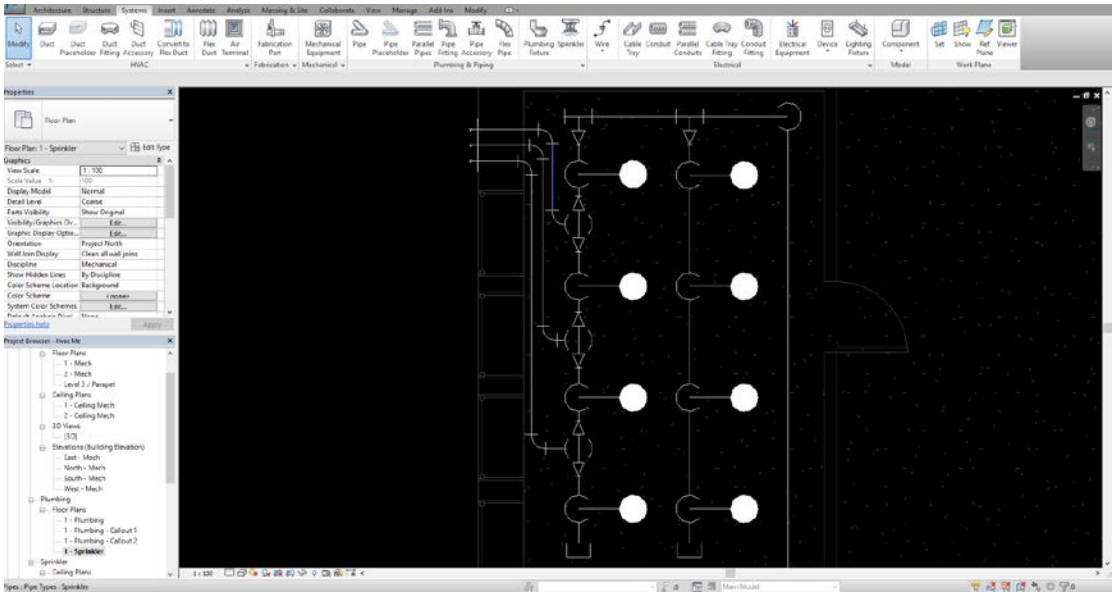
3. Notice that it's a hosted family which should be place it on outside of your wall.



4. Select your connection and start to draw your pipes.

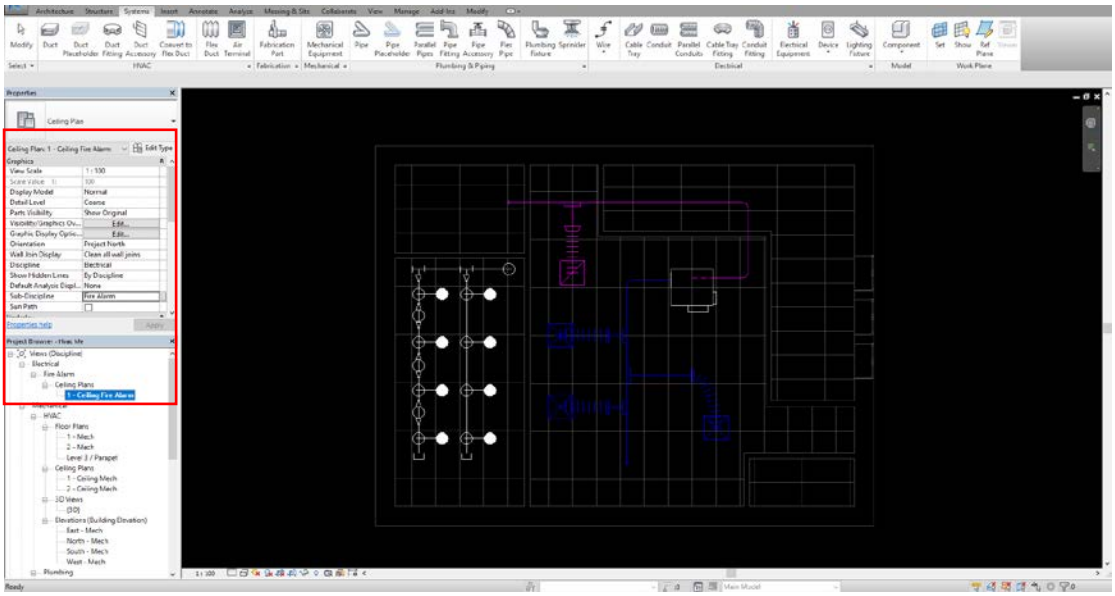


5. Finish editting your system.

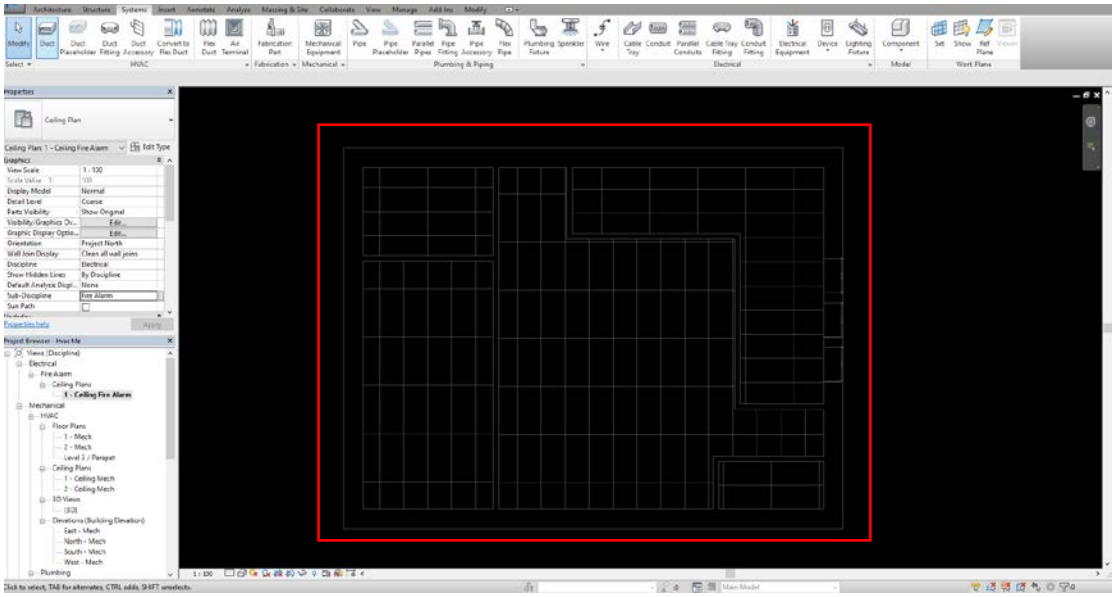


5.9 Creating a fire alarm circuit

1. Quickly duplicate one of your views, rename it 1 – Ceiling Fire Alarm, set Discipline to Electrical, Sub-Discipline to Fire Alarm.

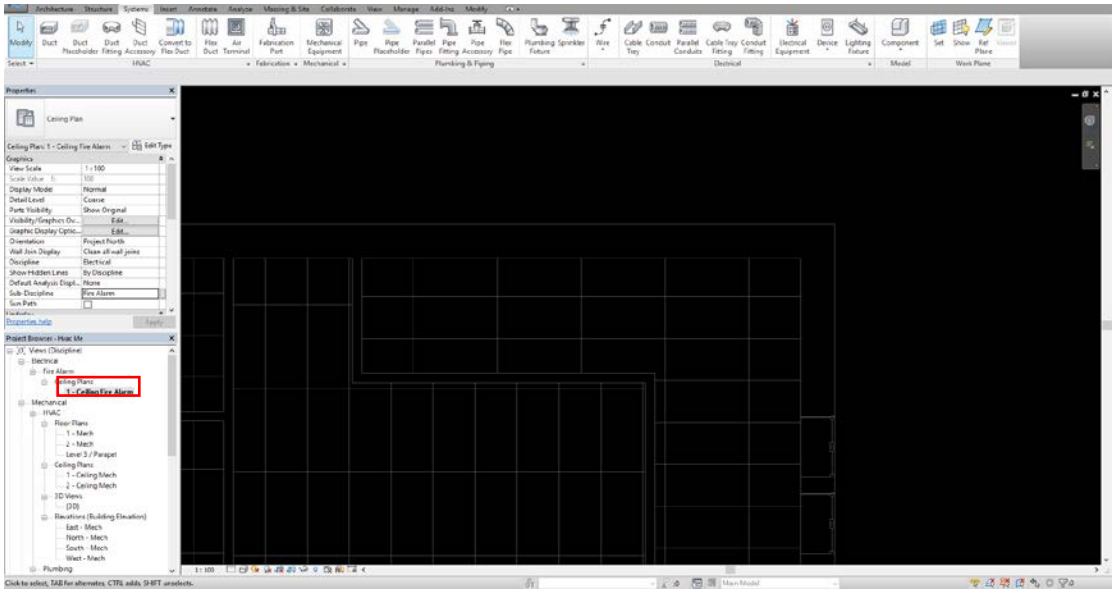


2. Properly set your V / G.

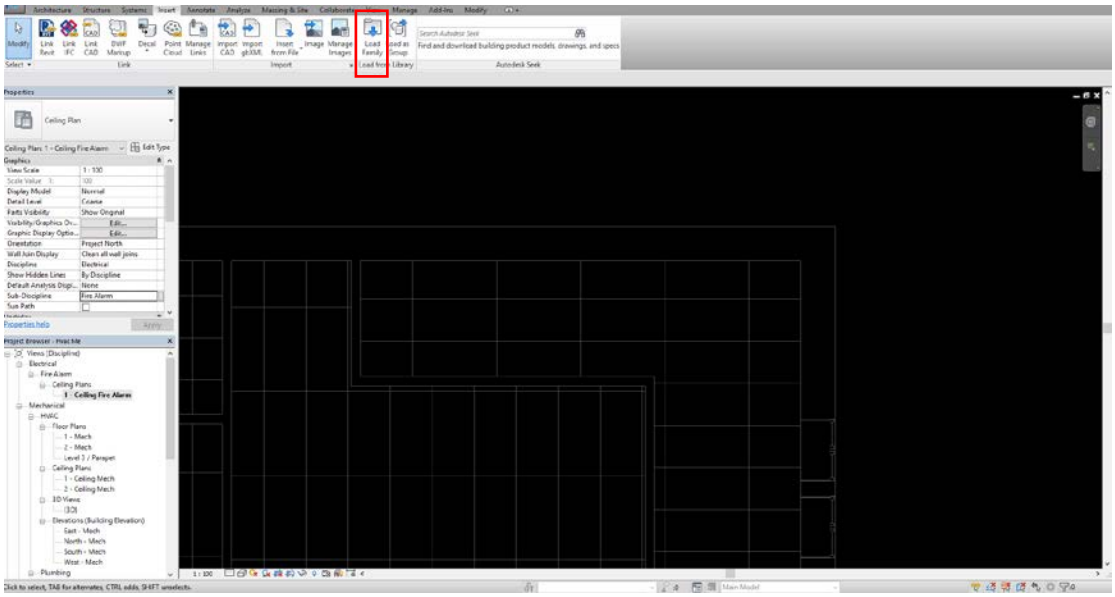


5.10 Adding fire alarm devices

1. Fire Alarm plan is basically a electrical plan. Firstly, make sure you are in the right view, 1-Ceiling Fire Alarm.

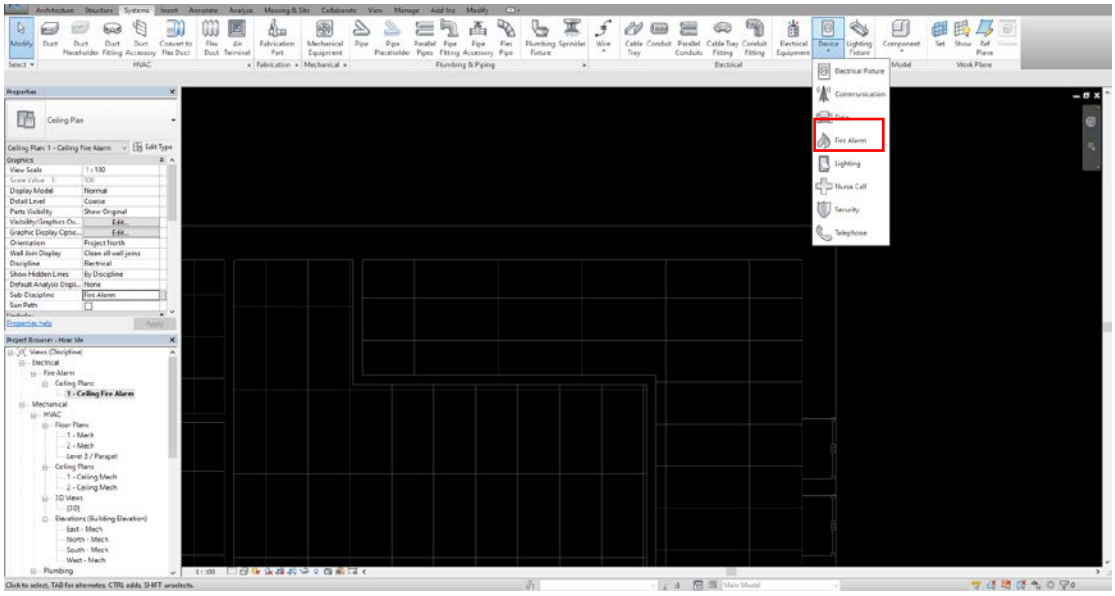


2. Go to Insert tab, insert your families.

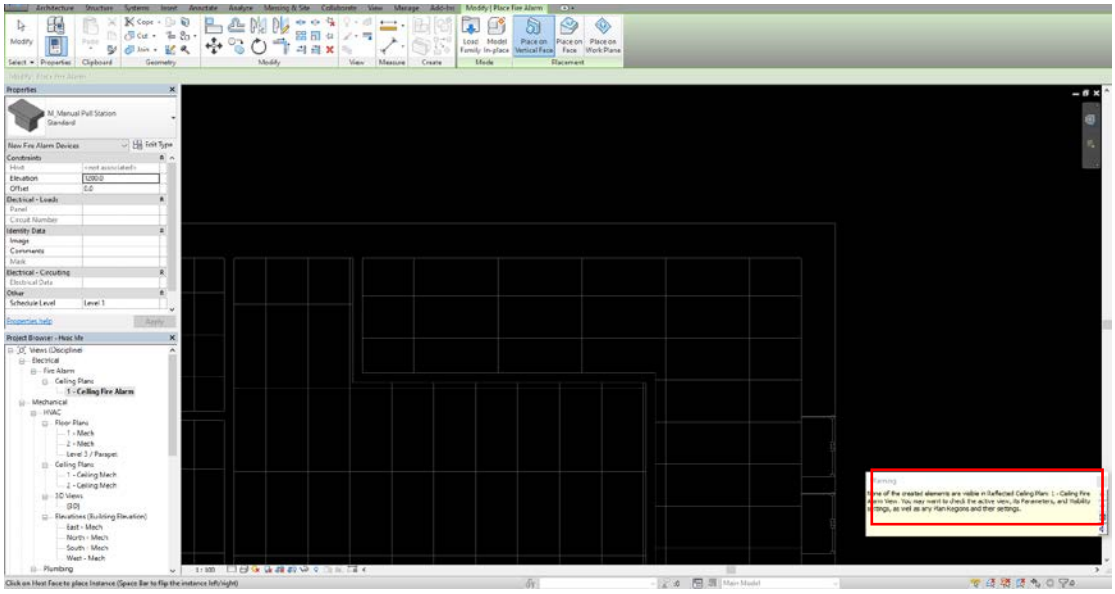


(Electrical – MEP – Information and Communication – Fire Alarm, find Fire Alarm Control Panel, Fire Alarm Horn Strobe - Ceiling Mounted, Manual Pull Station, Smoke Detector)

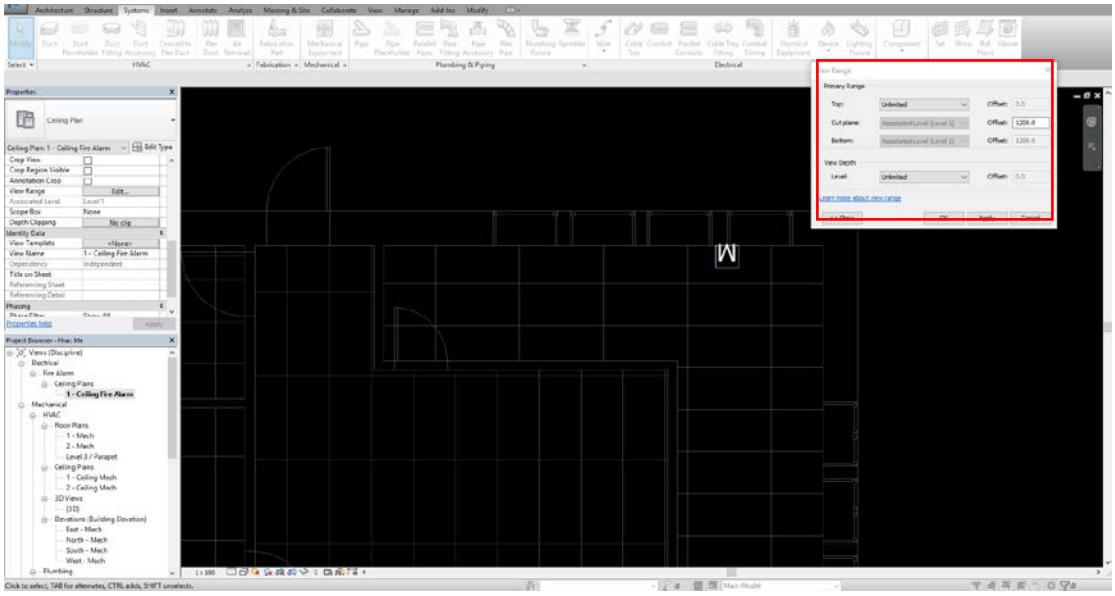
3. Find Device in System tab, click on Fire Alarm in the drop-down menu.



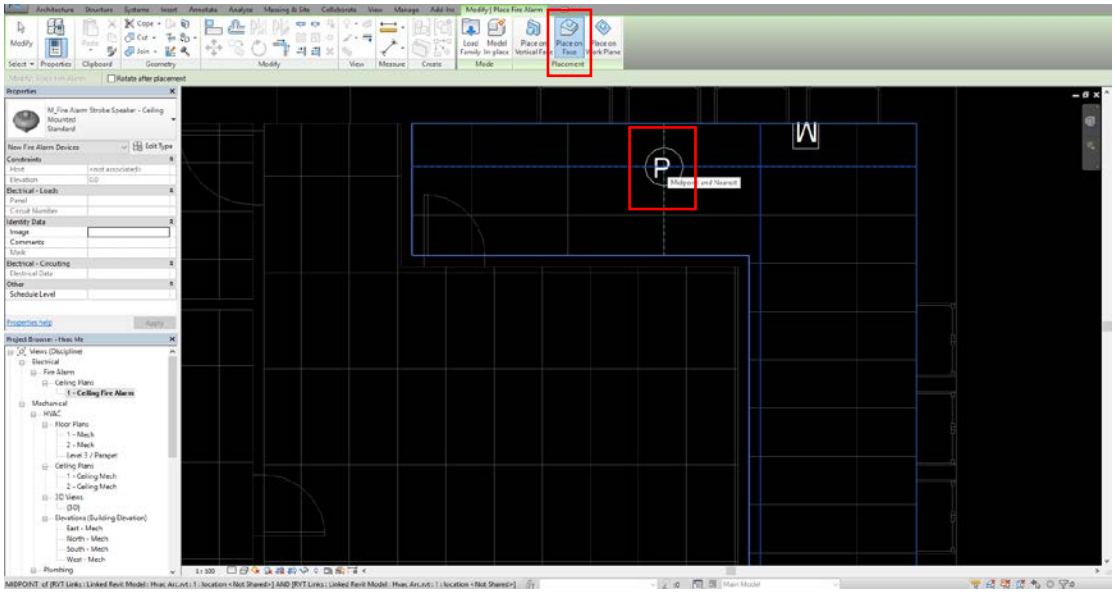
4. Put our Manual Pull Station on wall. Notice Revit warn us that we cannot see it in current view.



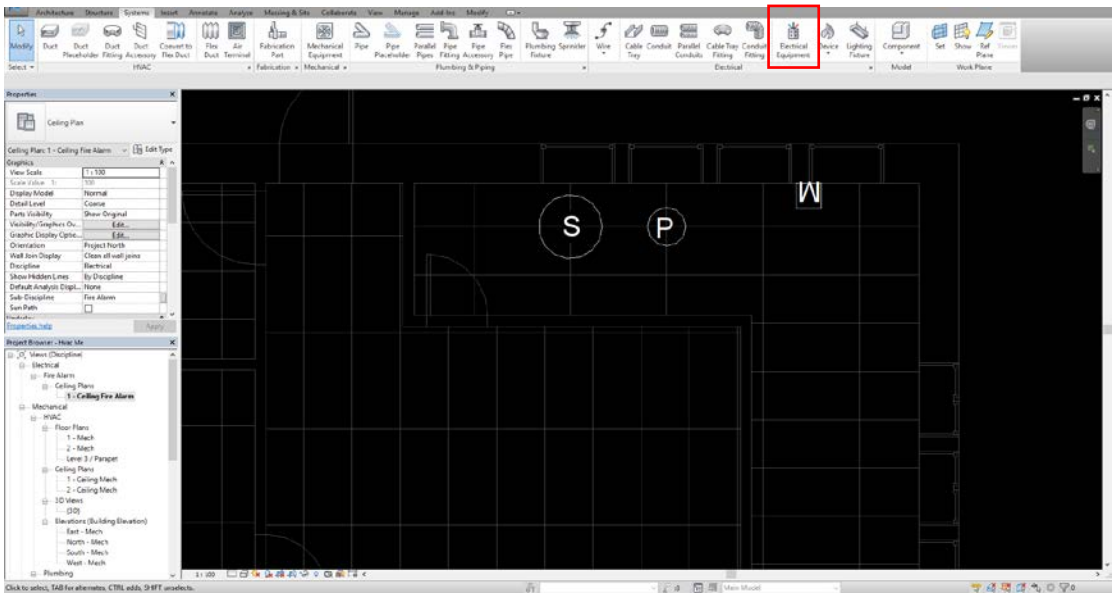
5. Adjust View Range to see our elements.



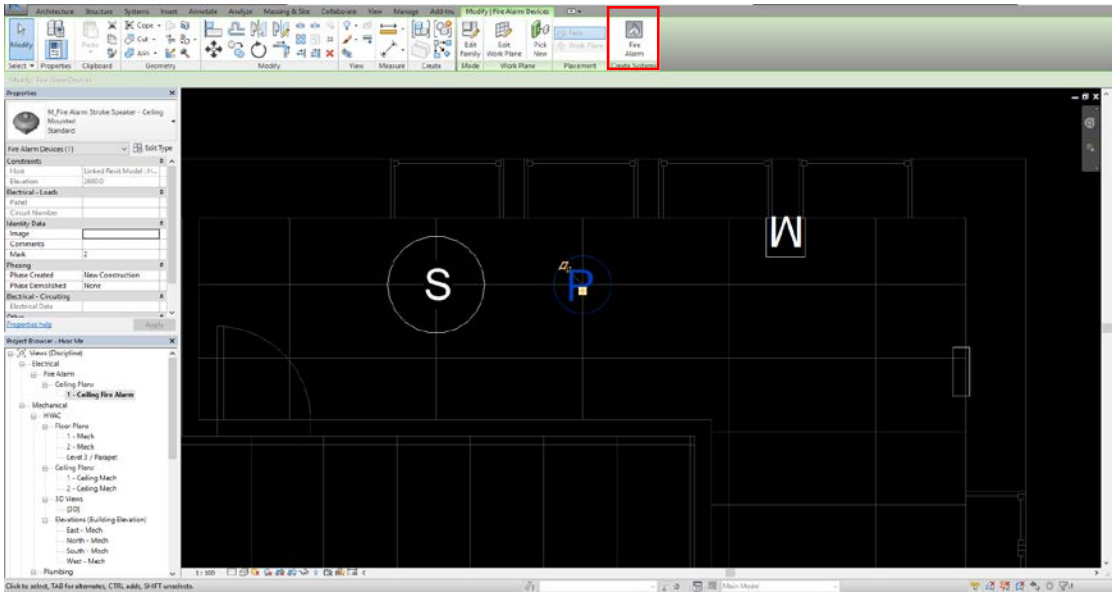
6. Place our Fire Alarm on ceiling. Click Place on Face.



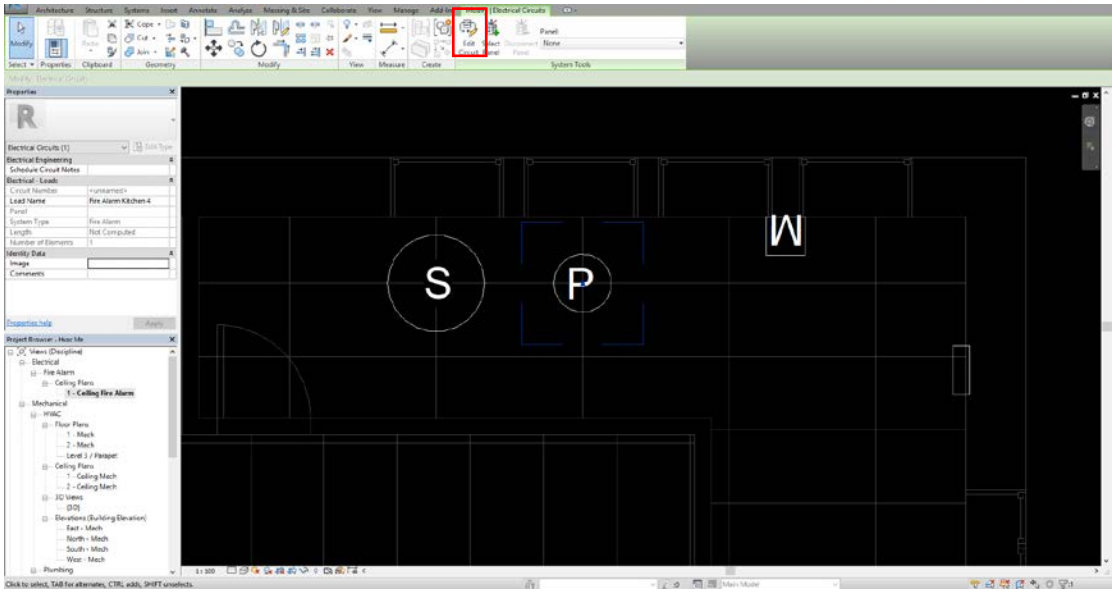
7. Go to Electrical Equipment, put in your Fire Alarm Control Panel.



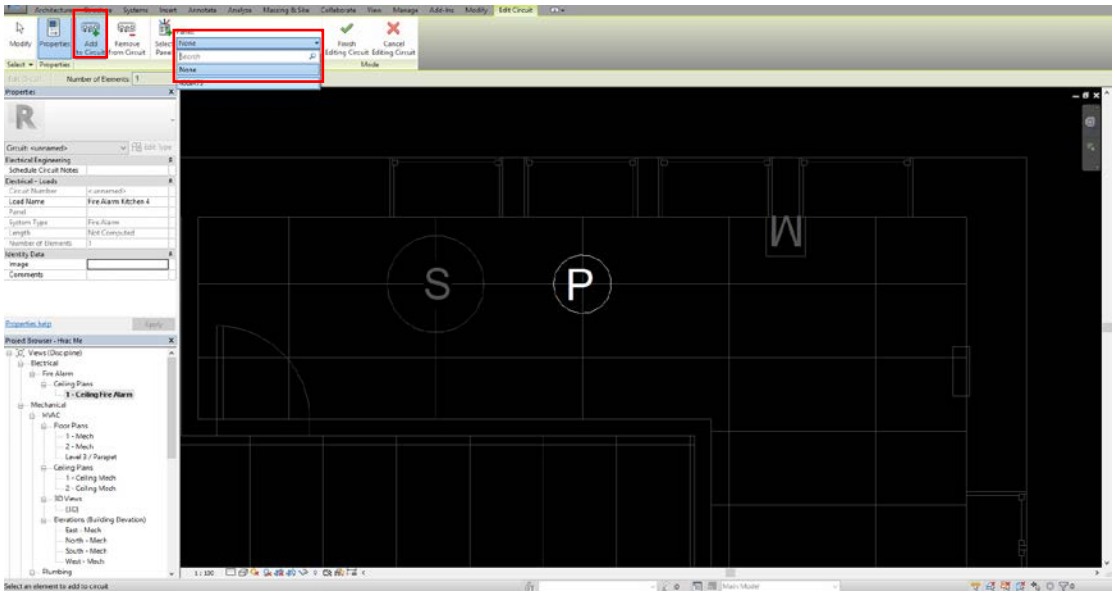
8. Connect them into a circuit. Click on any of these devices. Click on Fire Alarm.



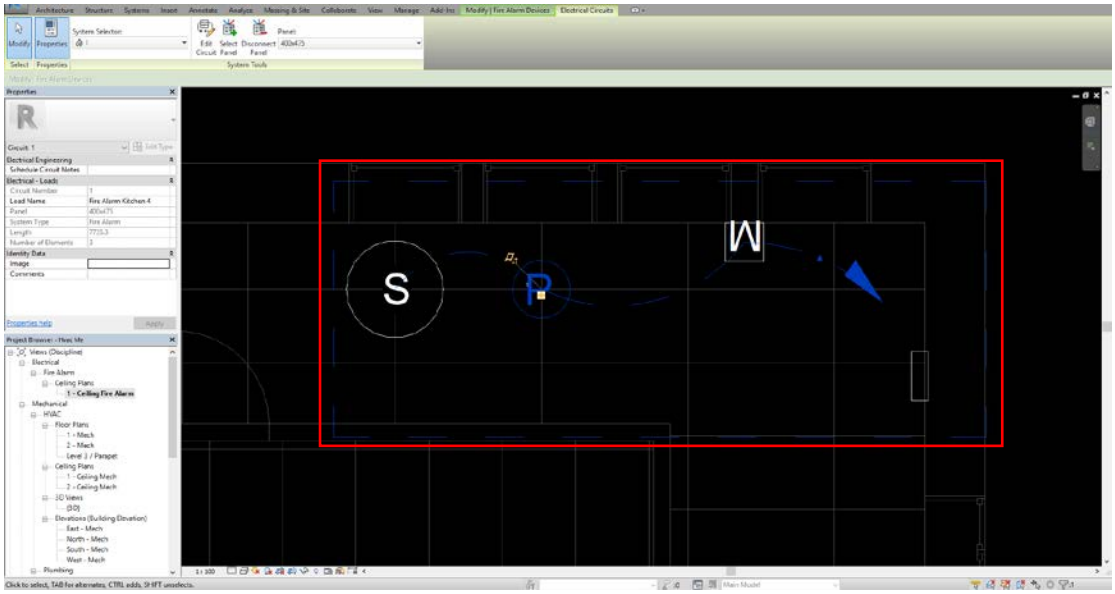
9. Edit circuit. Add in devices.



10. For panel, select 400 x 475. Add in the rest of devices.



11. Fire alarm system complete.

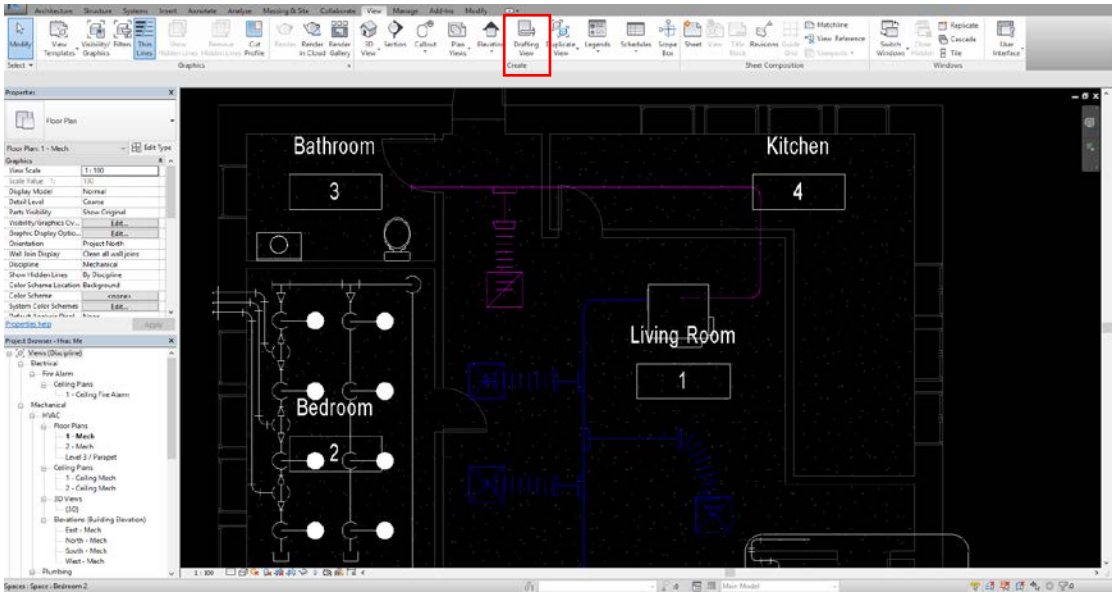


6. Revit Workflow

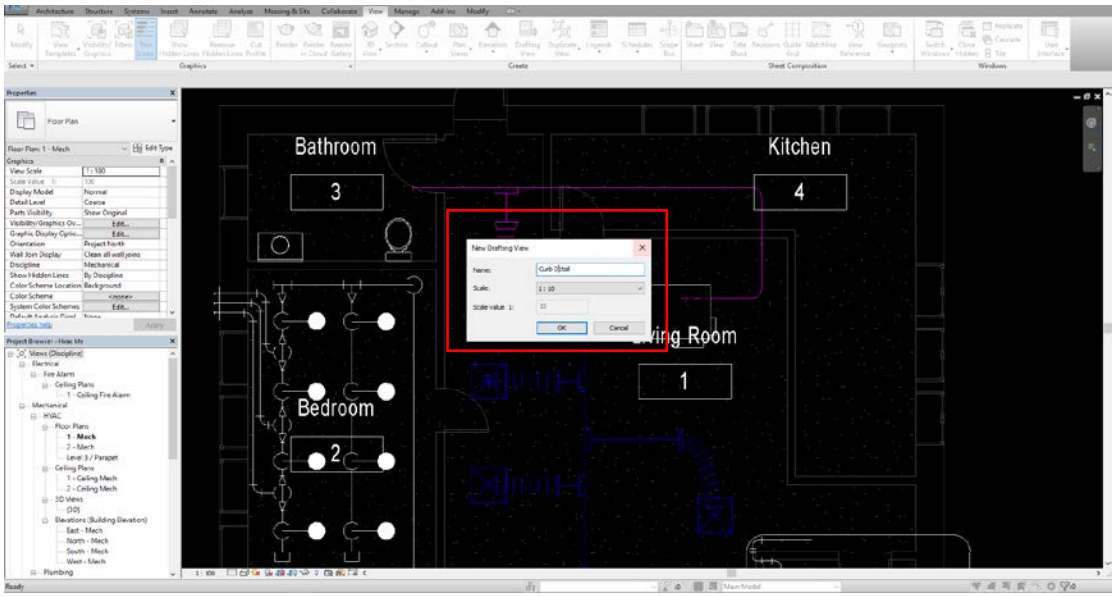
6.1 Creating detail views.

Revit is powerful in 3D modeling while it also has functionalities for 2D drafting.

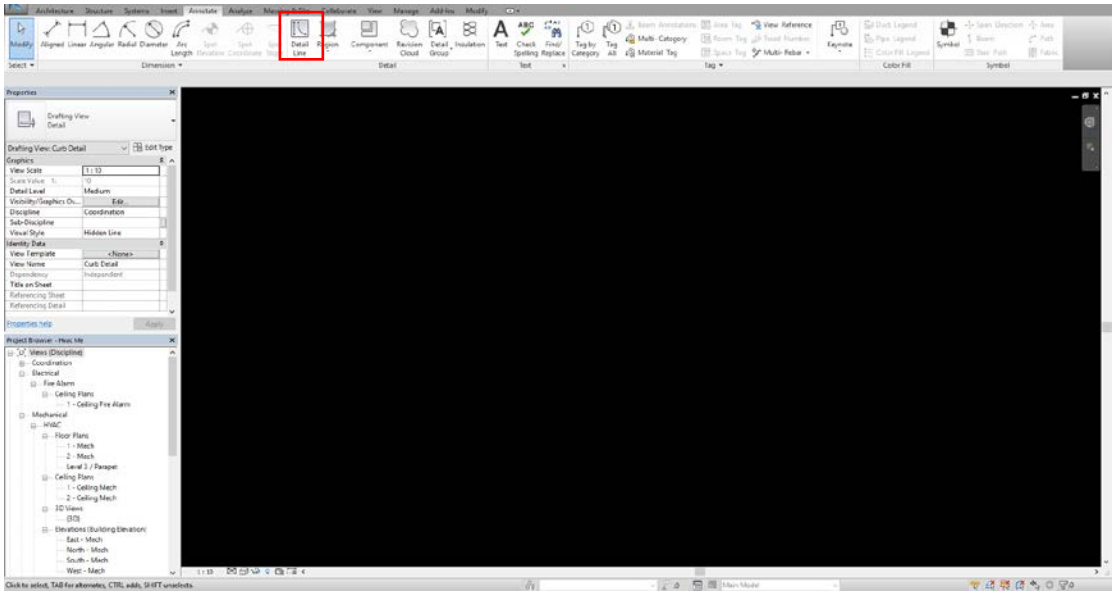
1. Creating a Drafting View. Go to View tab, click on Drafting View.



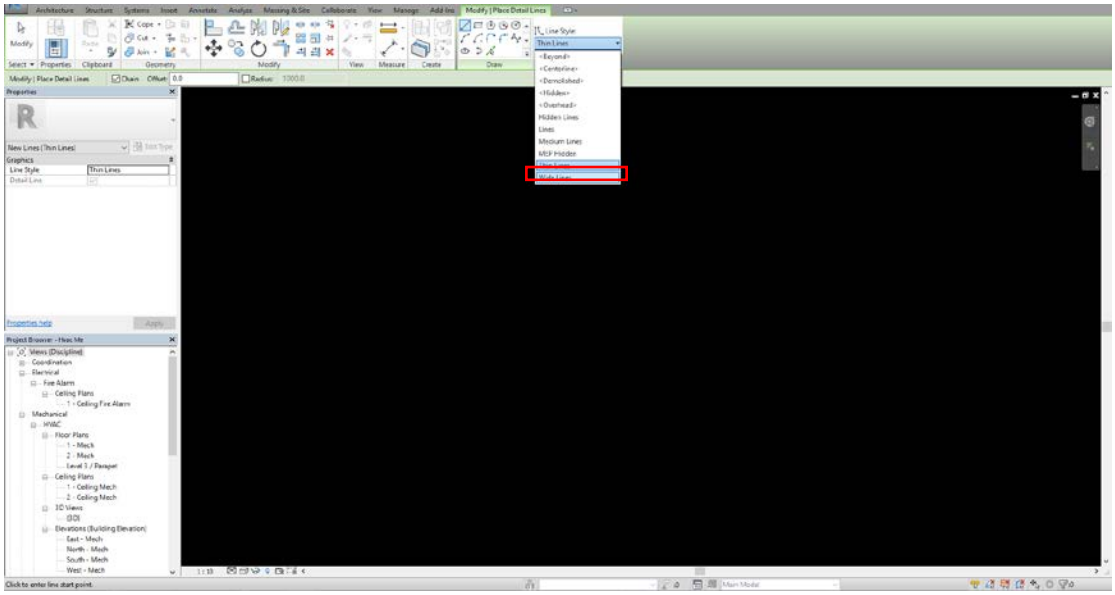
2. Simply rename your drafting view.

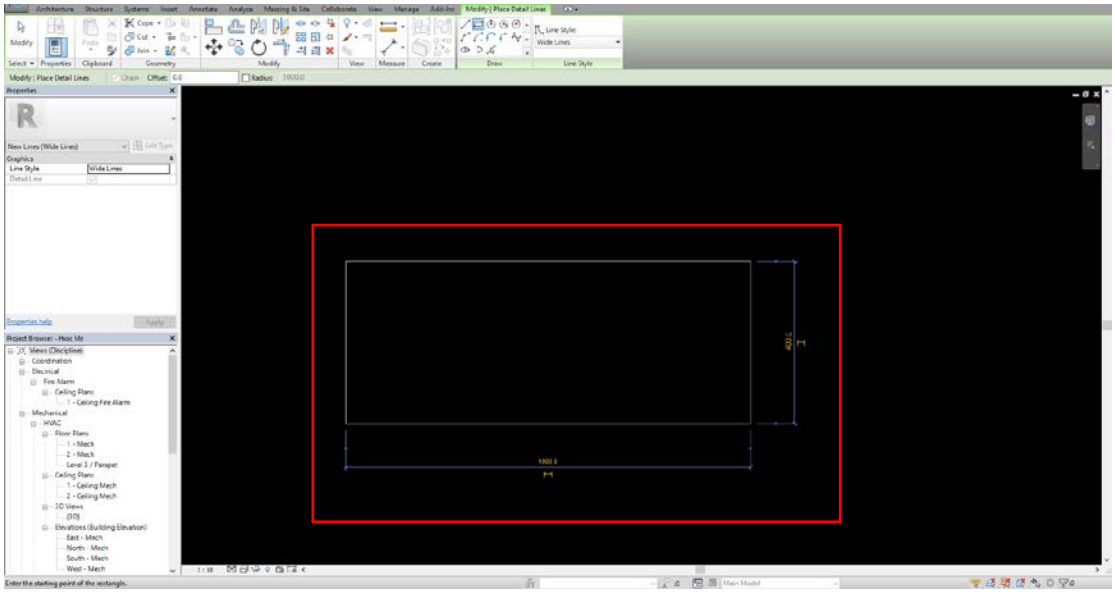


3. Go to Annotate tab, click on Detail Line.

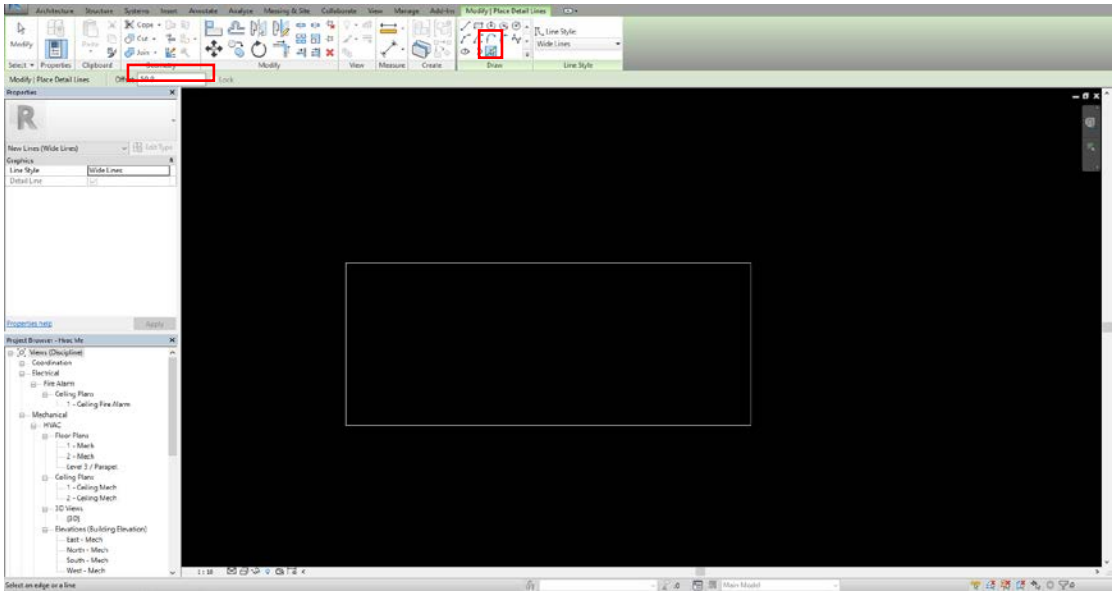


4. Set Line Style to Wide lines. Draw a rectangle.

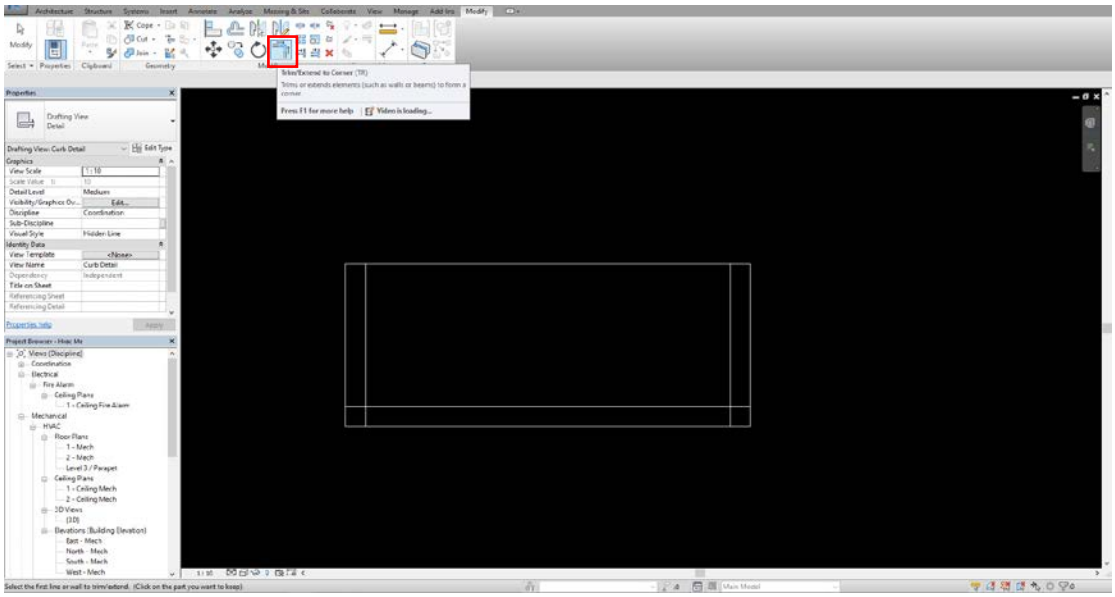




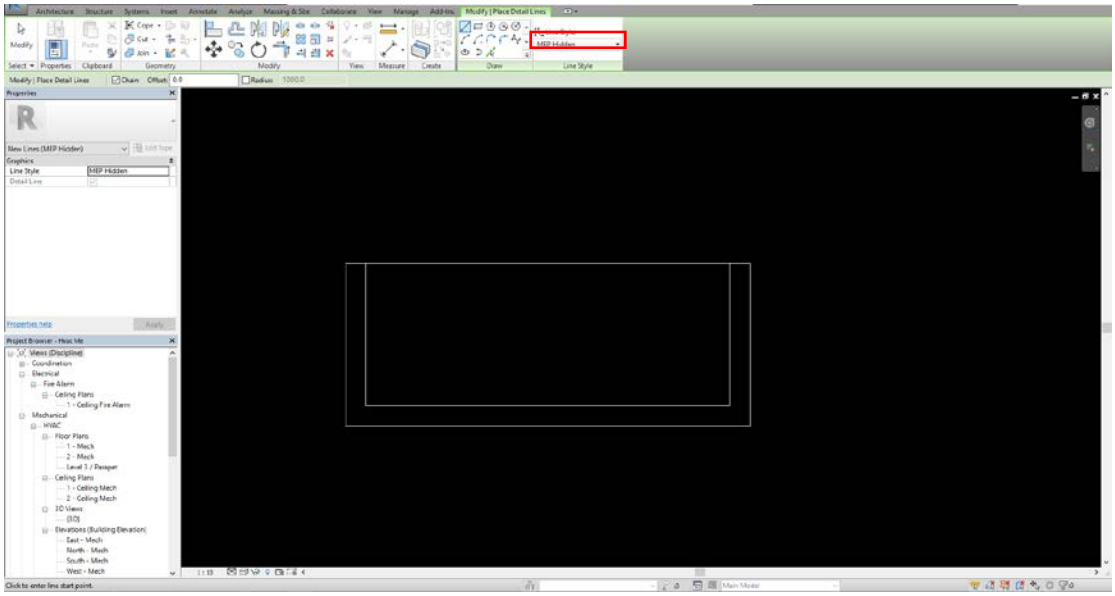
5. Offset your Wide Lines to create some Thin Lines. Use Pick Line tool, set your offset value.

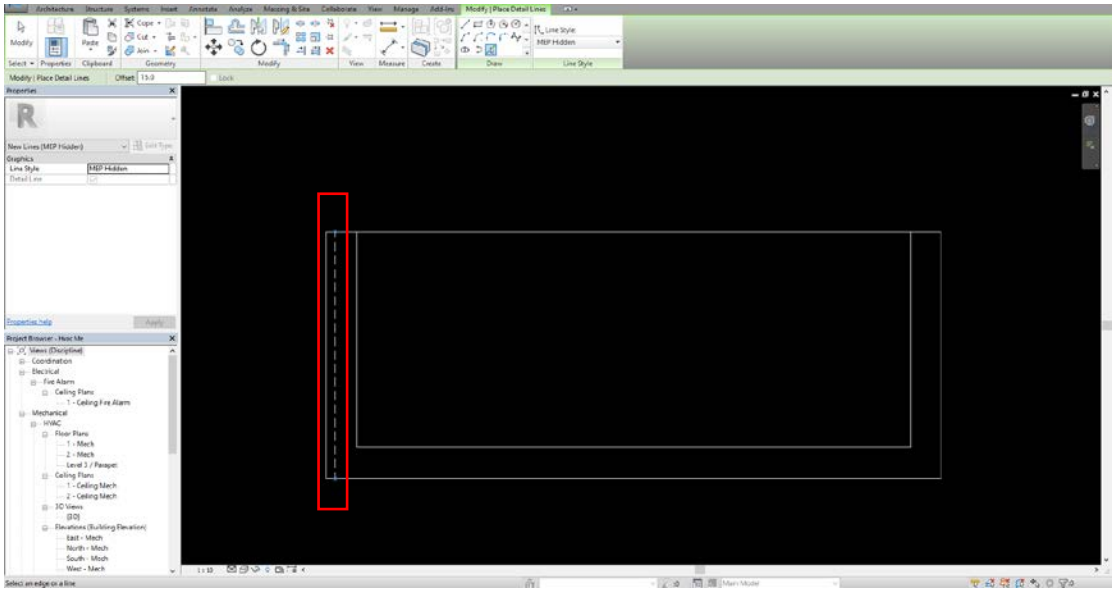


6. Clean up corners. (Always select the line segment you want to keep, the rest will be trim off)

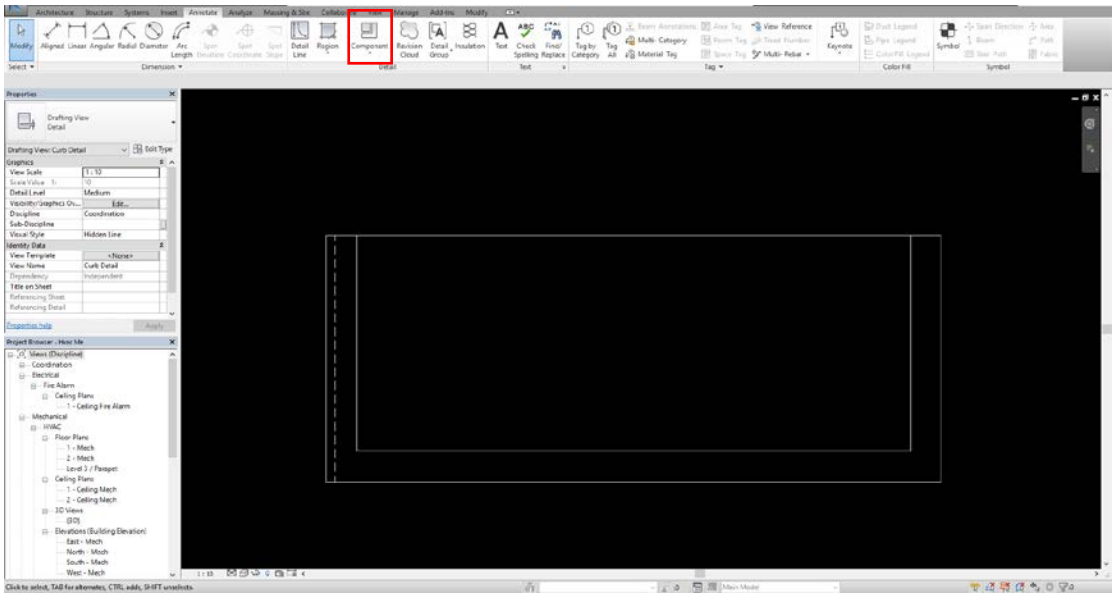


7. Draw MEP Hidden with Pick Lines command.

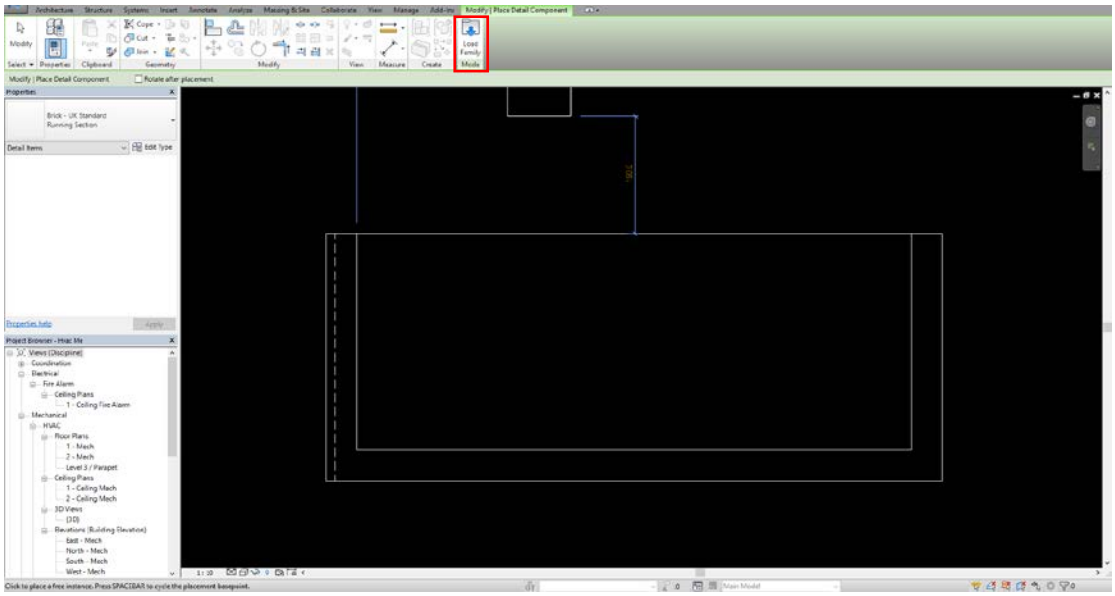




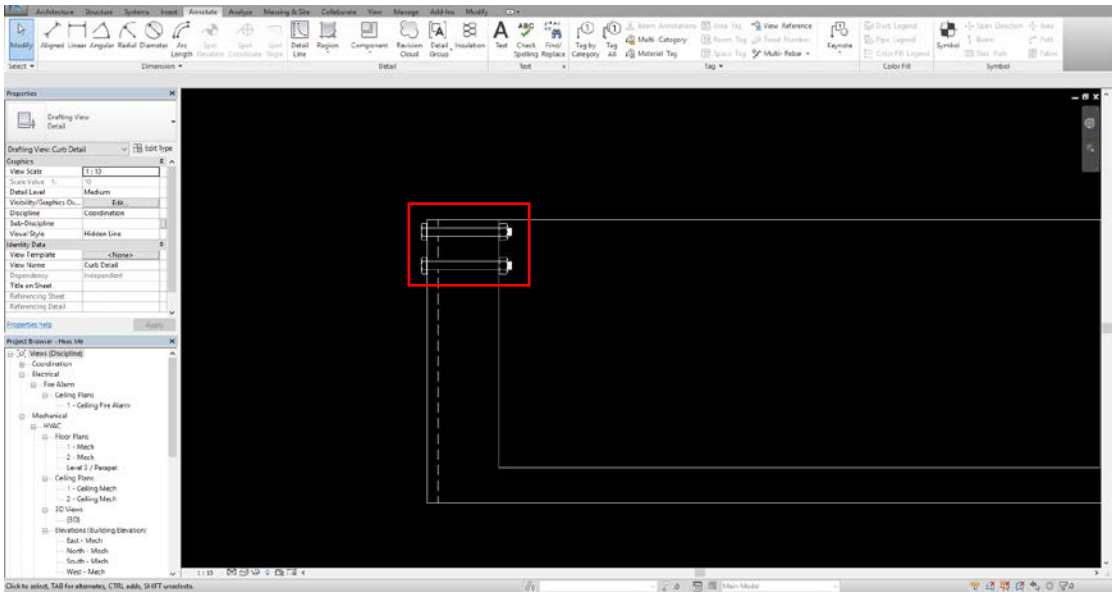
8. On Detail panel, click on Component button.



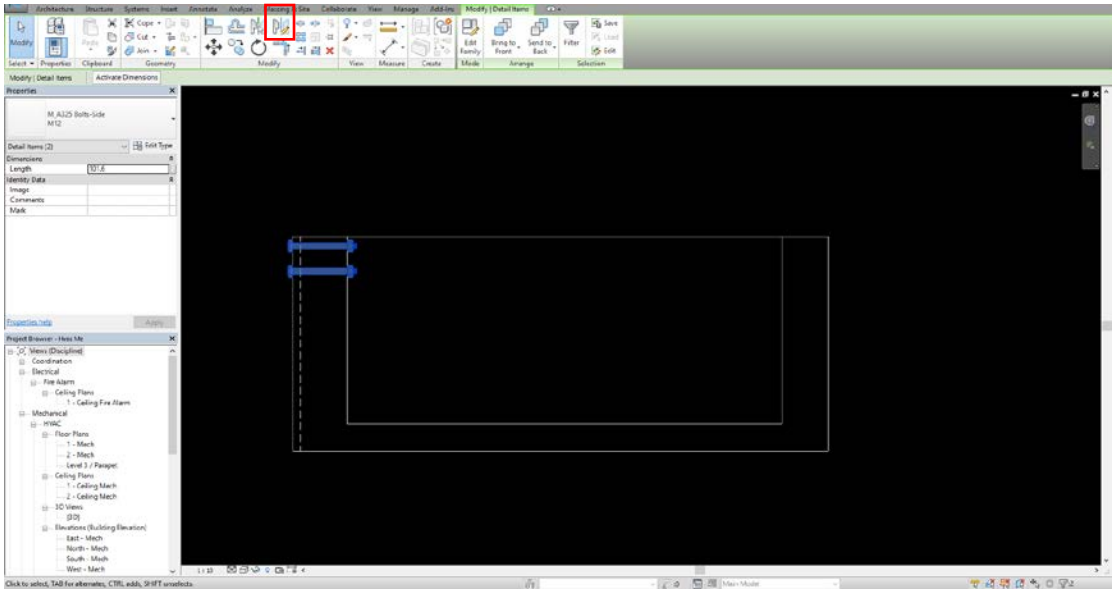
9. Load in your Detail Item. (Detail Items – Div 05-Metals – Common Works Results for Metals – Metal Fastenings – A325 Bolts-Side)



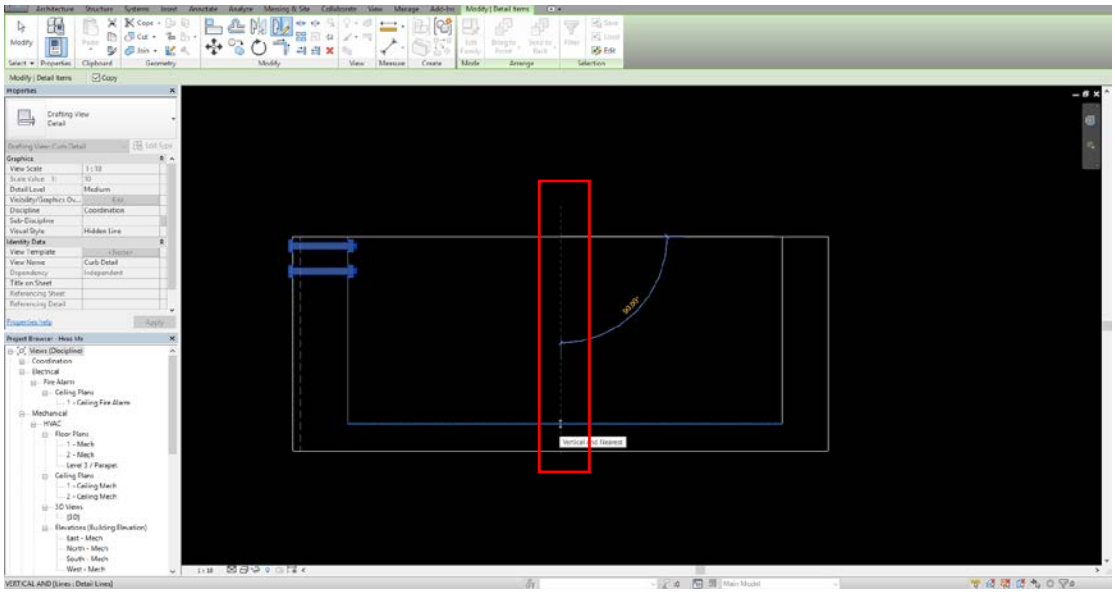
10. Place it in. (Adjust your thin lines properly)



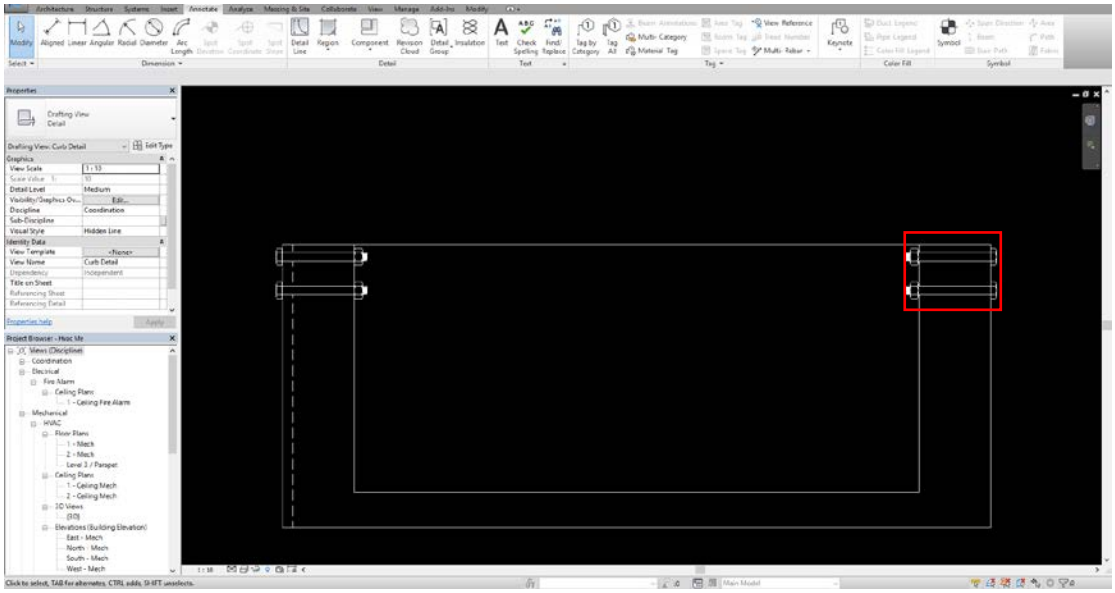
11. Mirror them to the other side.



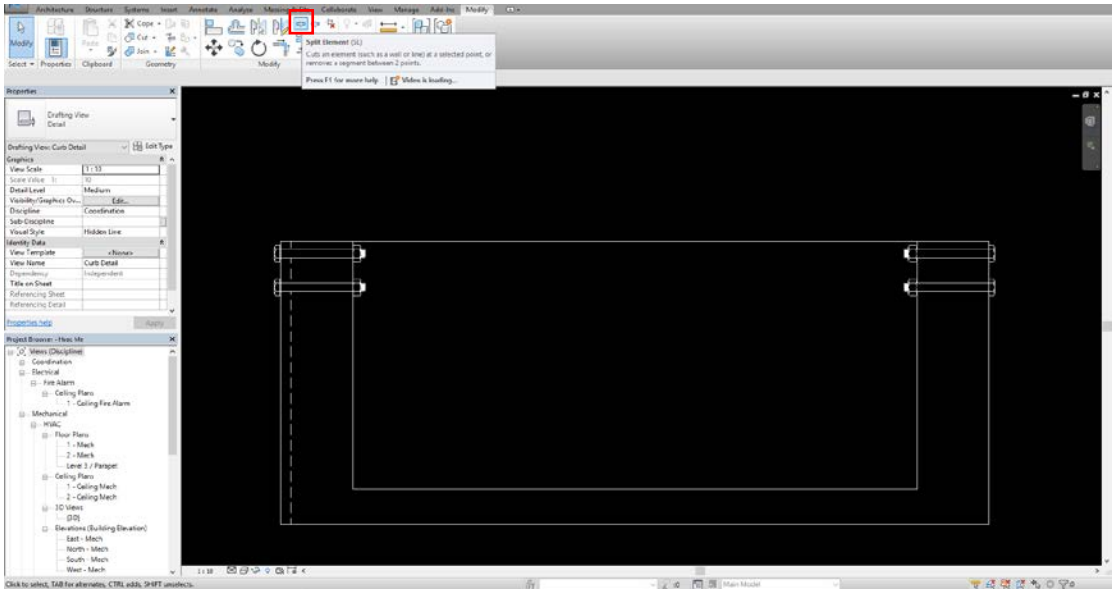
12. Draw your mirror line.



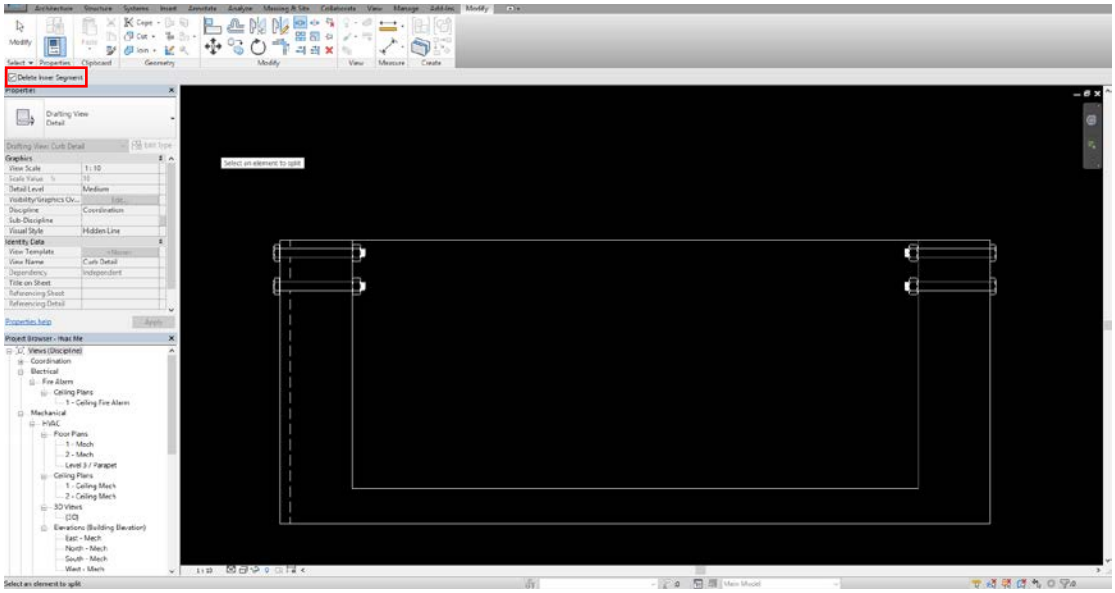
13. Finish mirroring.



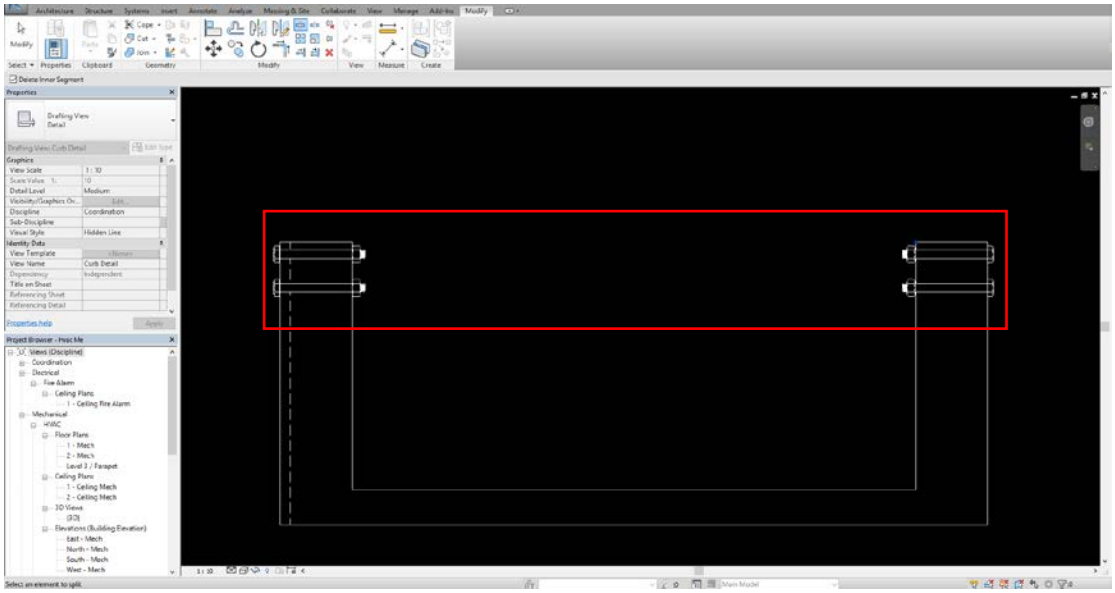
14. Trim off the line in the middle. Click on Split command.



15. Make sure Delete Inner Segment is checked.

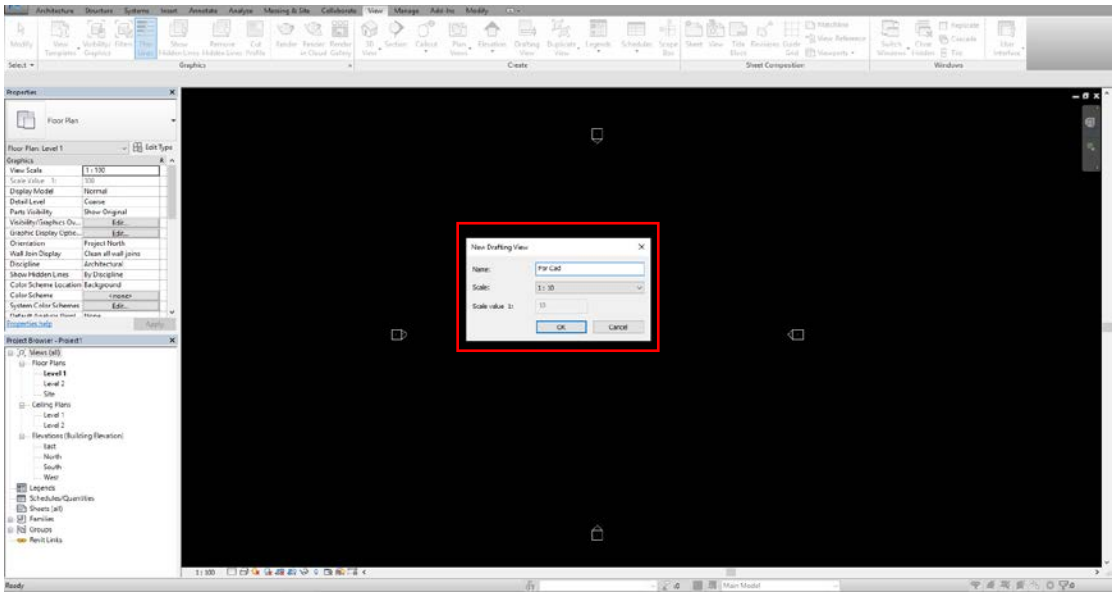


16. Hover over intersections. Then get rid of the inner segment.

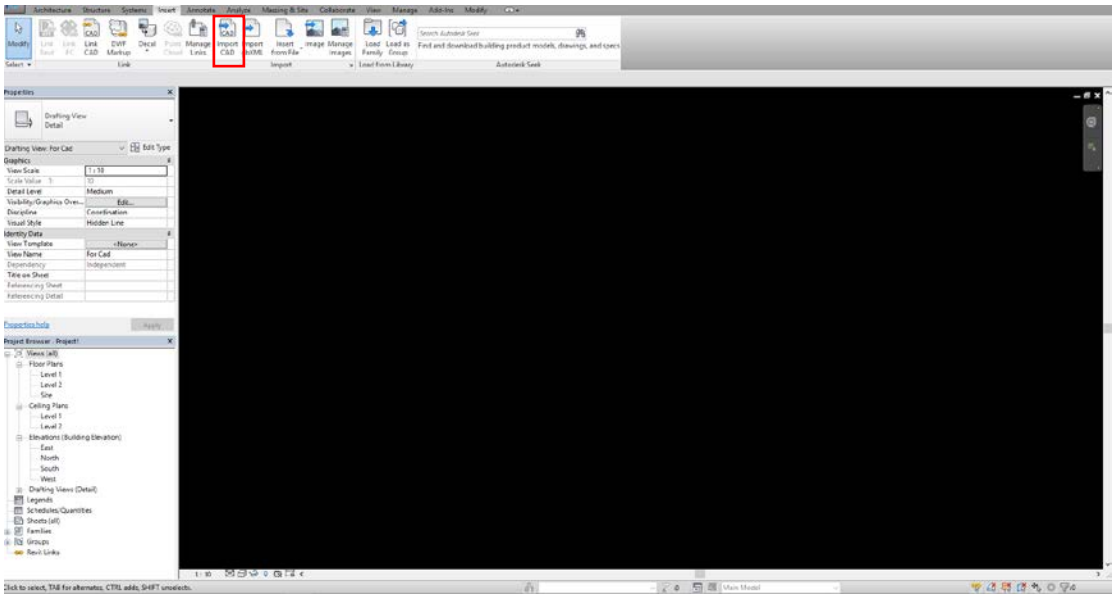


6.2 Importing CAD

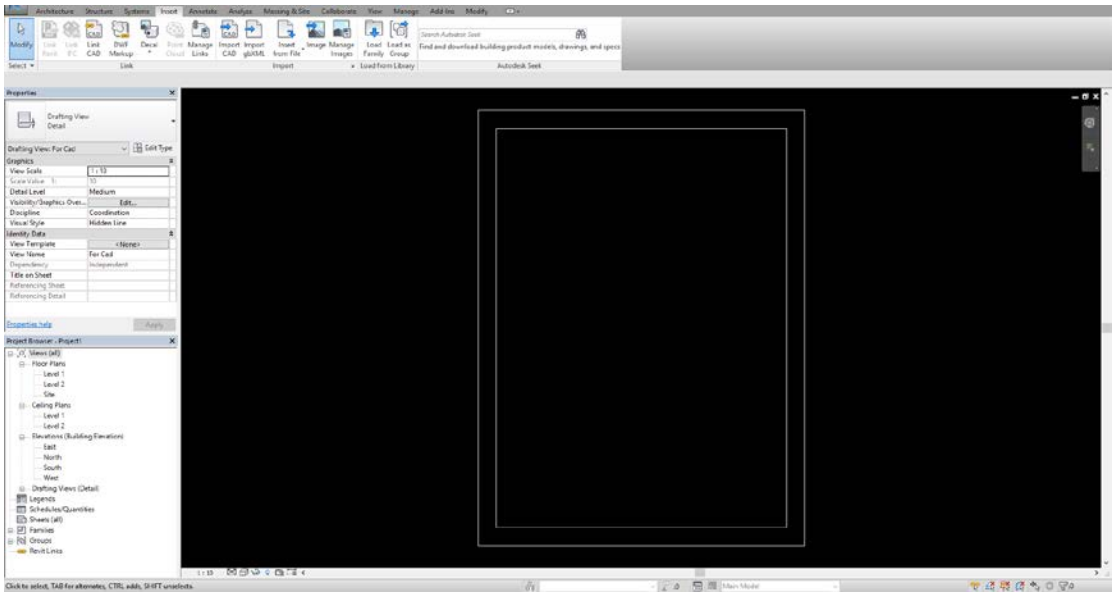
1. Create a draft view for our CAD file.



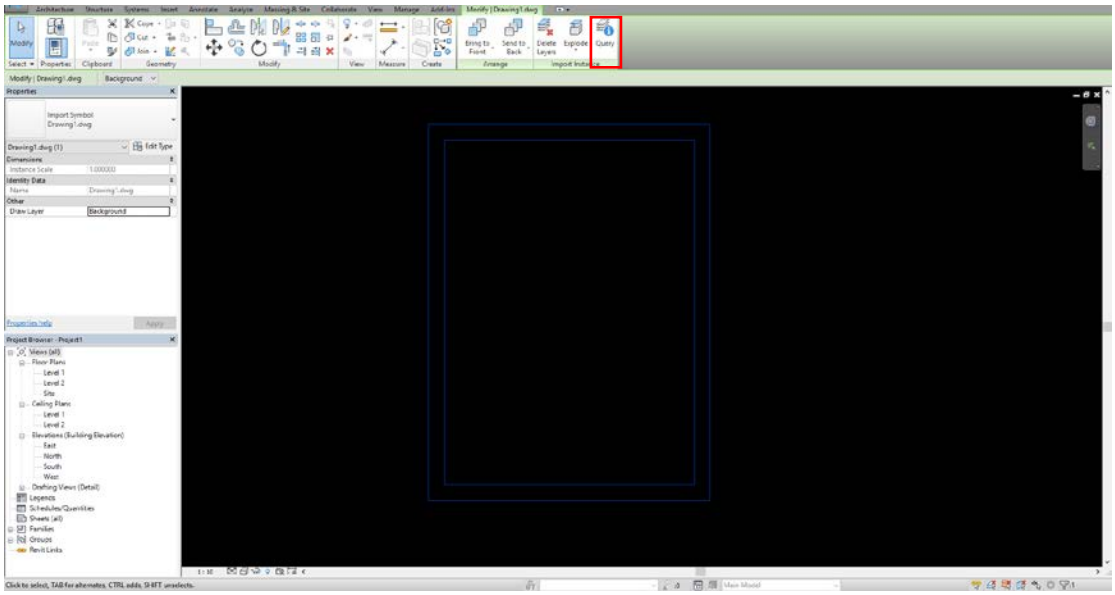
2. Go to Insert tab, import our CAD file.



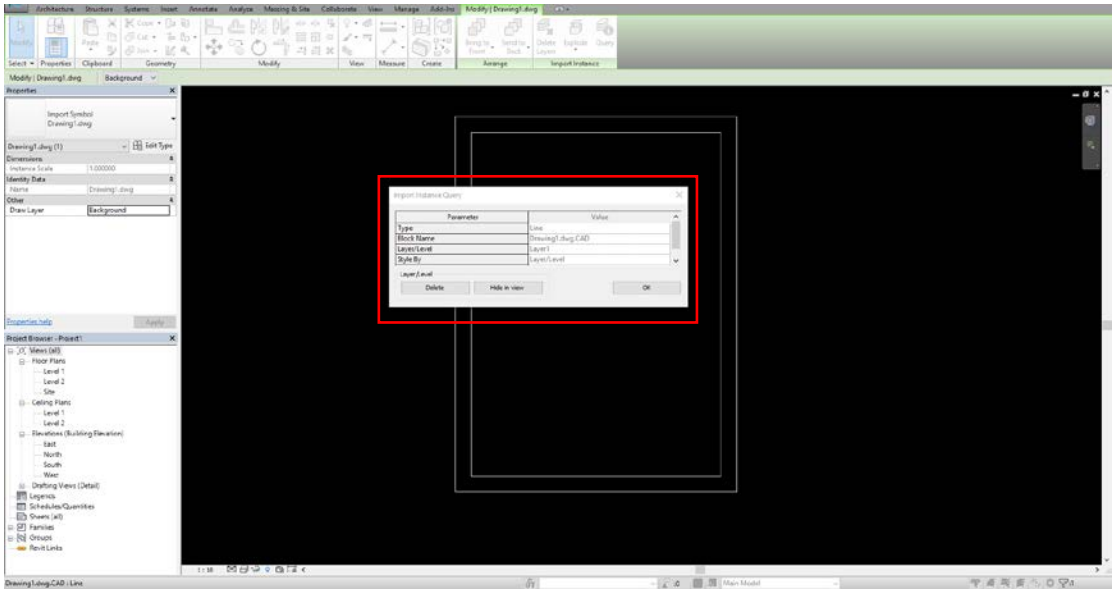
3. In Import Settings, set Colors to Black and White, Positioning to Center to Center. After importing file, type in Z + A to zoom out.



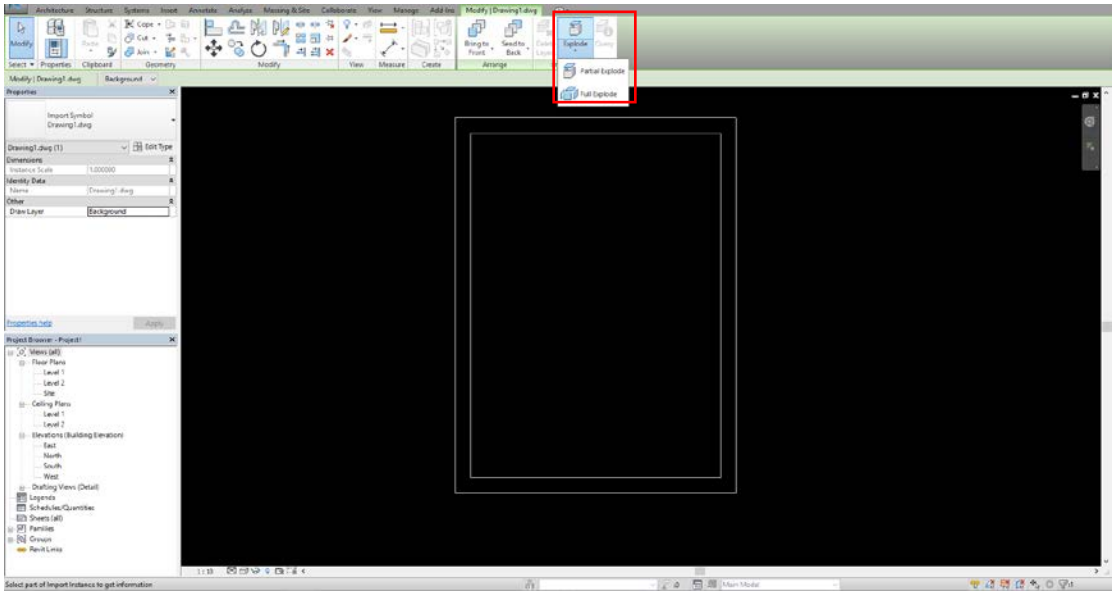
4. Select our file. Go to Query then click on any elements you wish to inspect.



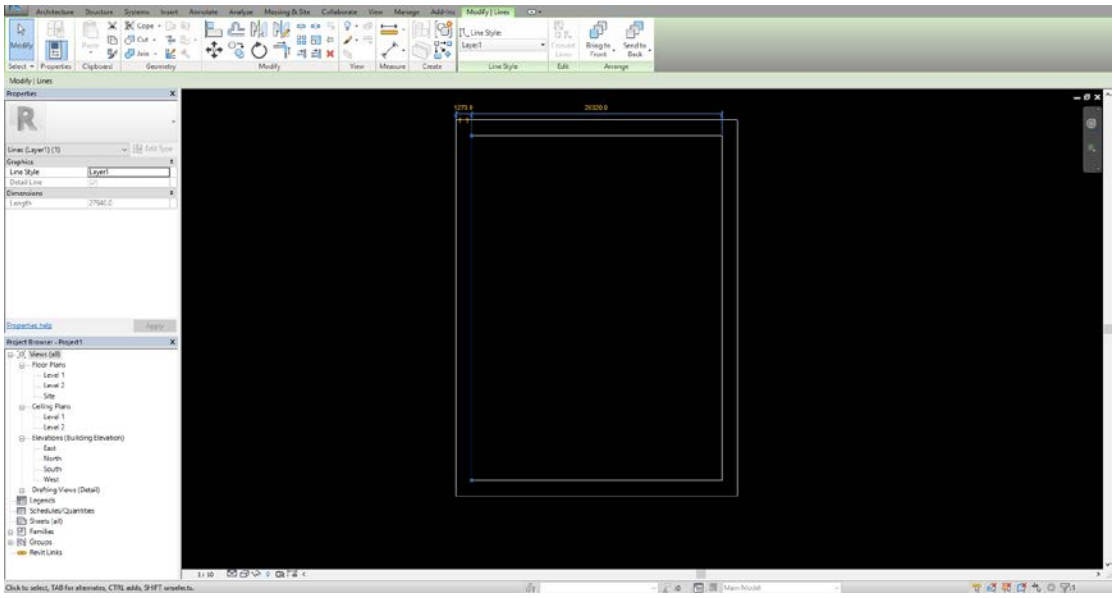
5. Notice that Query contains all essential information of our CAD elements.



6. Go to Explode command, notice that we have two options.

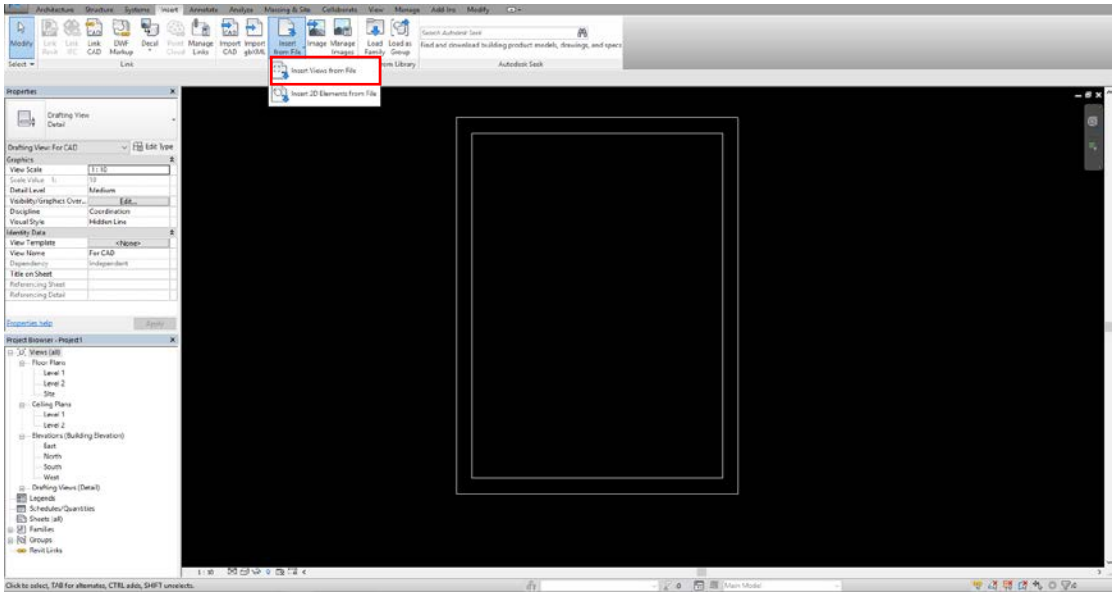


7. Partial Explode keeps blocks intact while Full Explode will explode everything into line segments. Click on Full Explode. Notice our polyline become independent lines.



6.3 Importing details

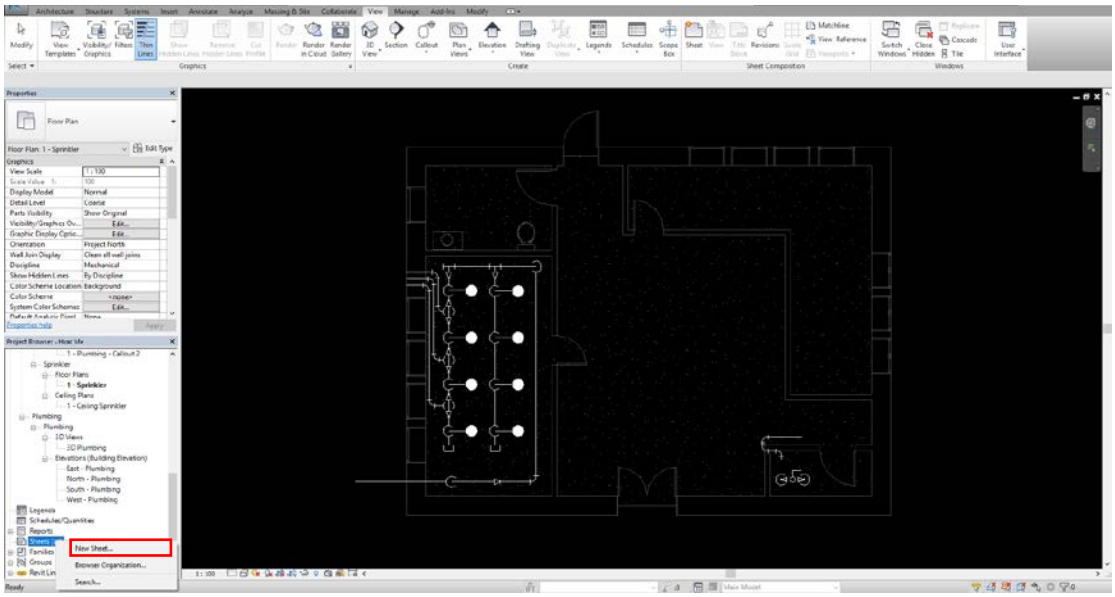
Instead of creating 2D details in Revit, we can import fully developed details into Revit directly. Go to Insert tab, click on Insert from File, then Insert Views from File.



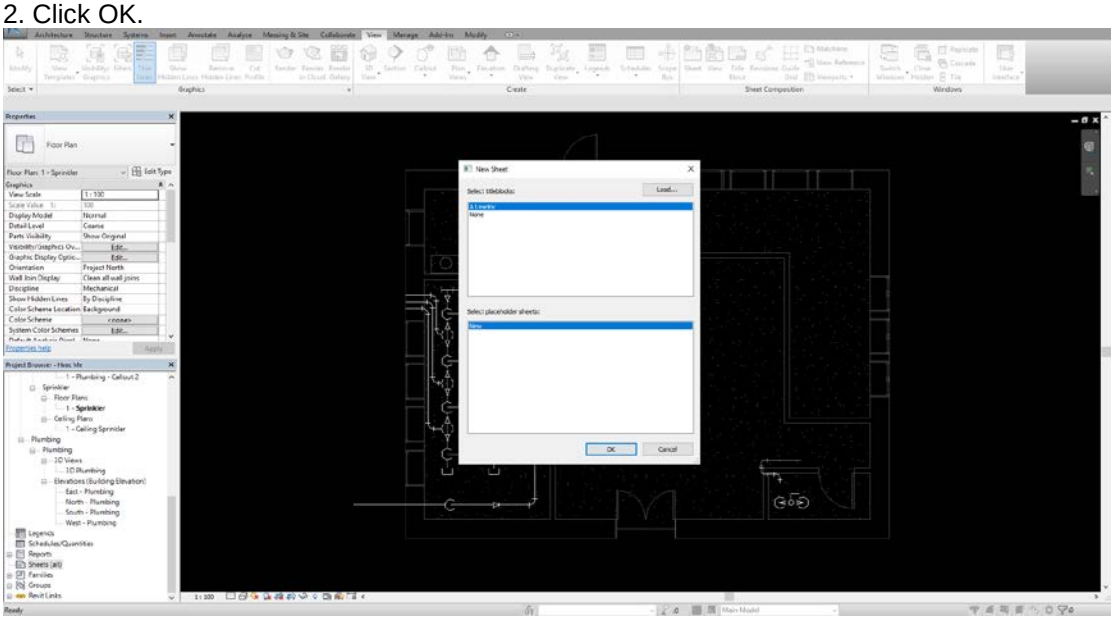
It will create associated views for your details. Categorizing your detail views as you wish.

6.4 Importing details

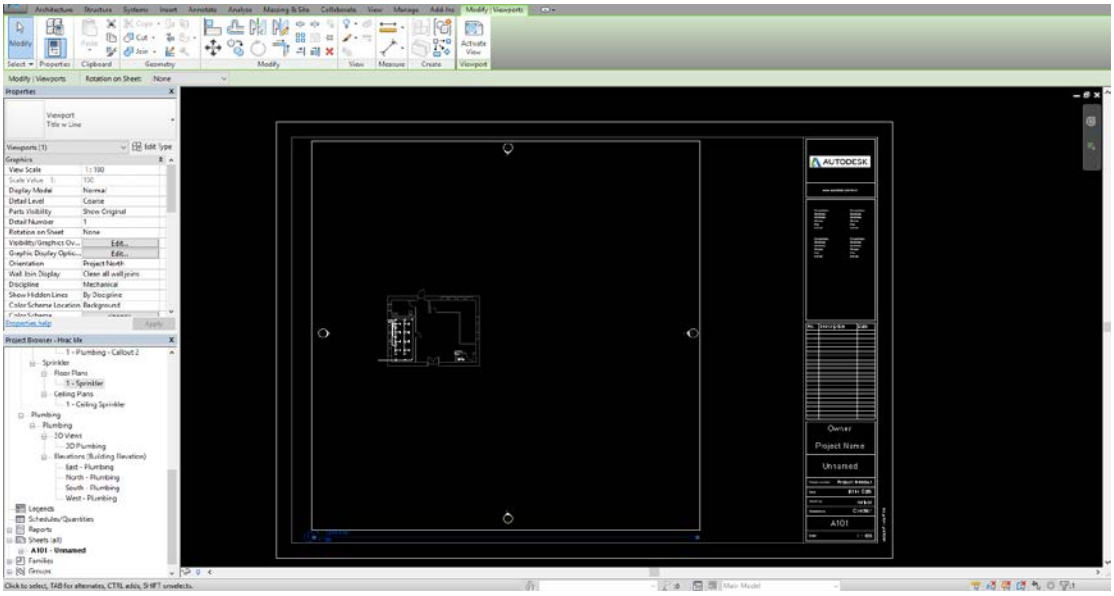
1. In Project Browser, find Sheet. Right Click on it to create new sheet.



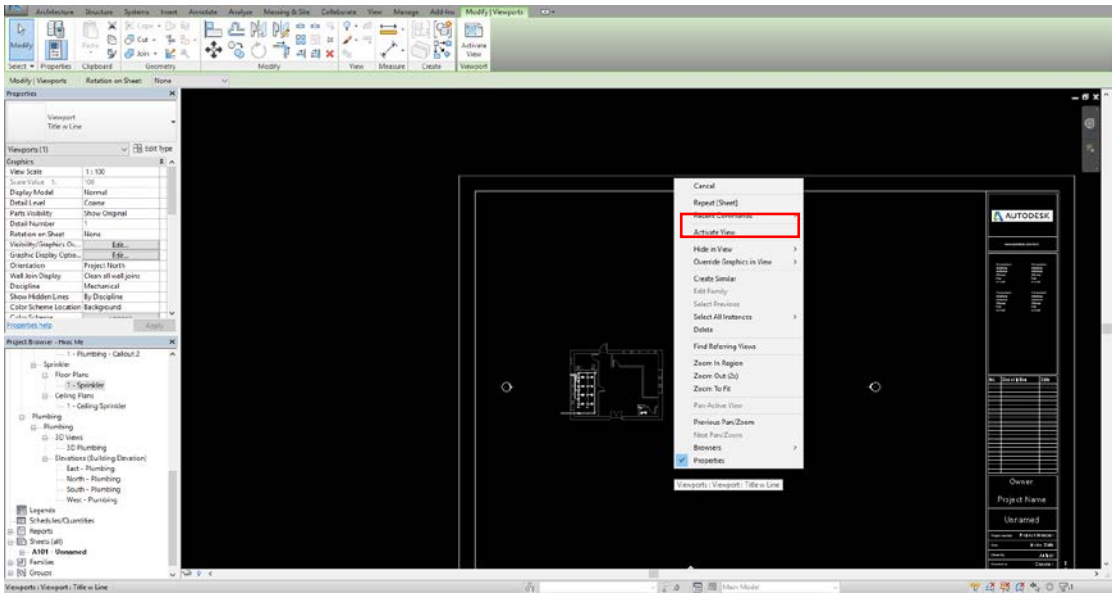
2. Click OK.



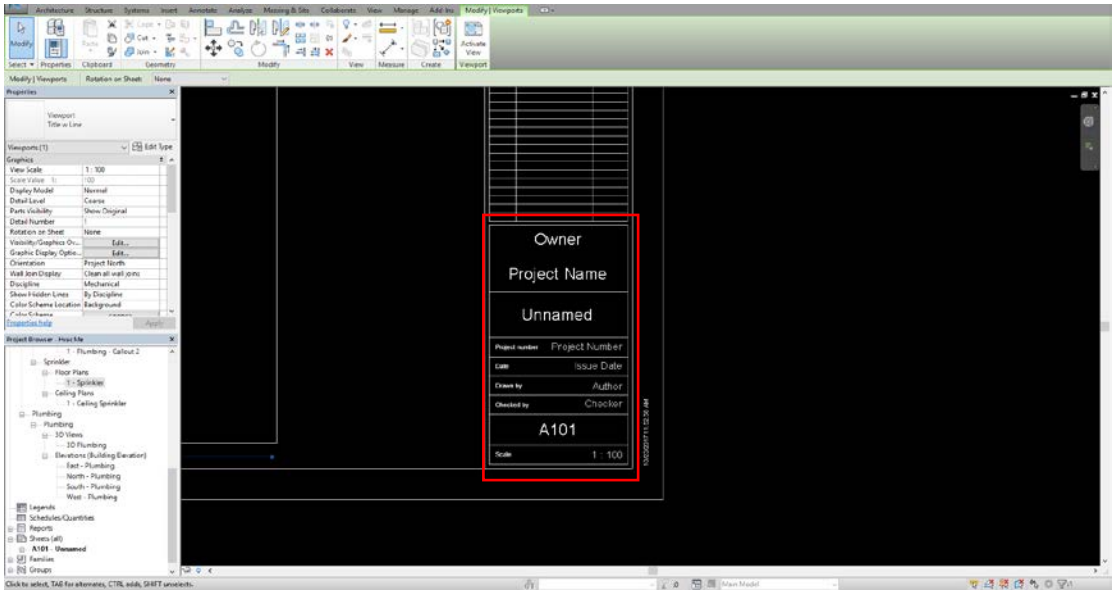
3. Simply drag in any views you want into the sheet.



4. Don’t worry about its scale since we can change it anytime. If you right click on the view, then hit on Activate View, you’ll be able to edit your view in the sheet.

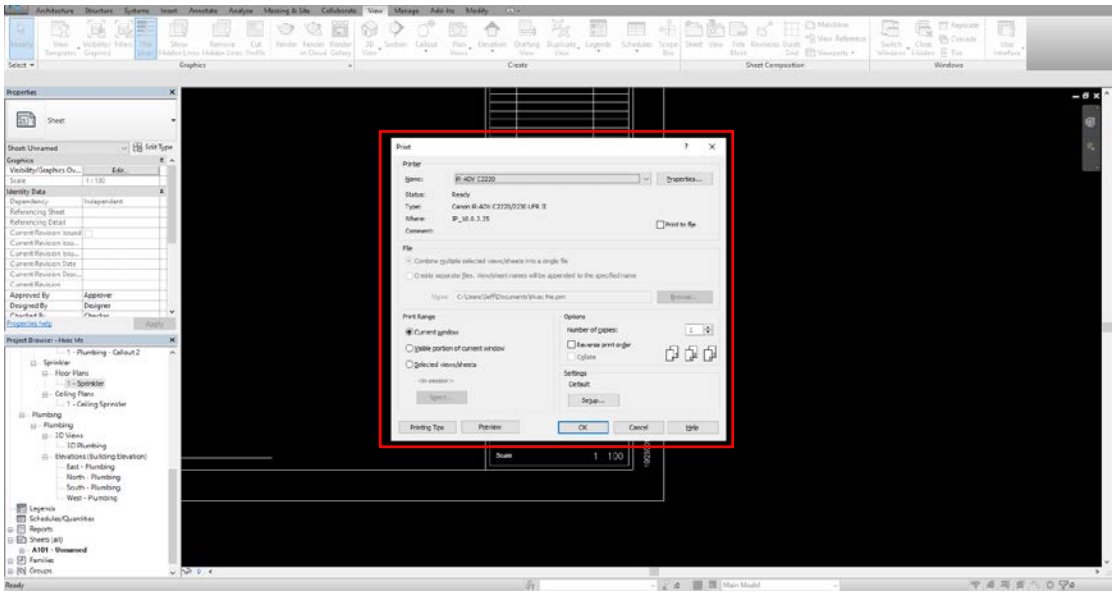


5. Lower-right corner we have many text labels which are convenient to us. Edit them as you want.

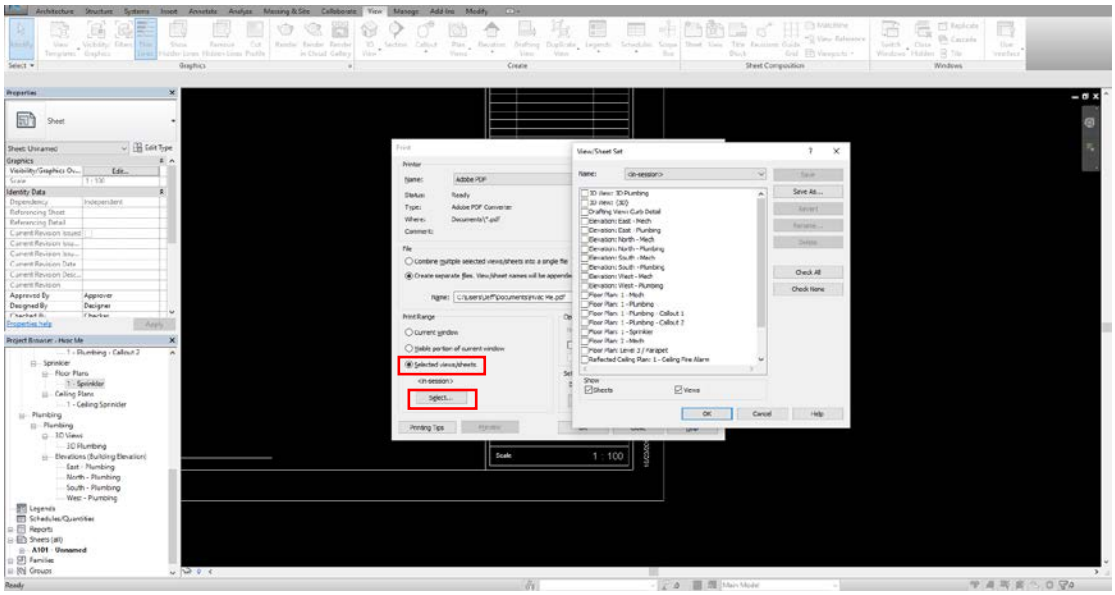


6.5 Printing sheets

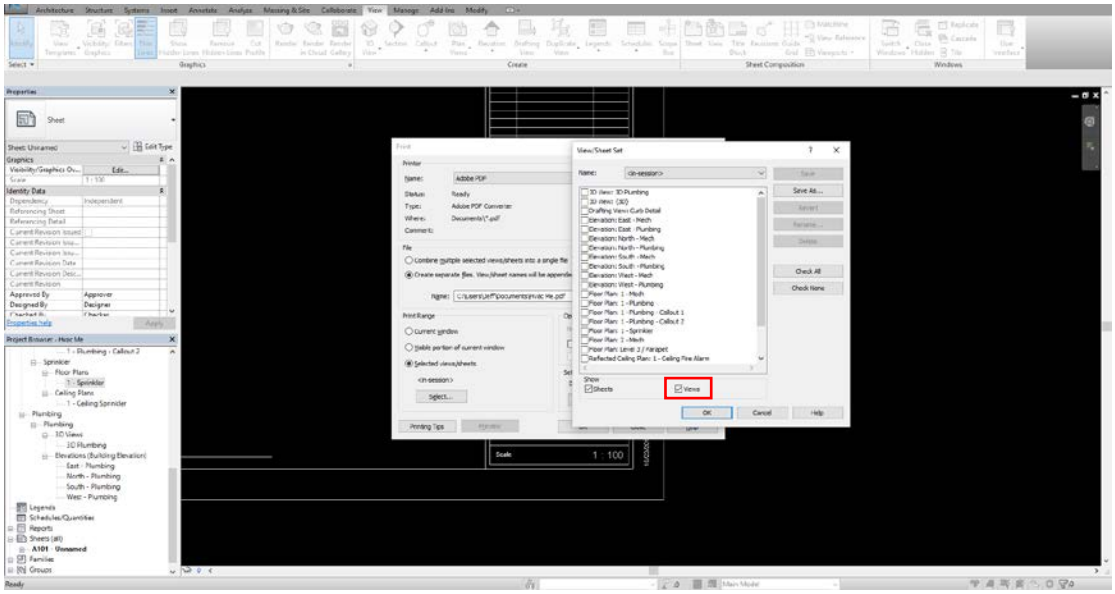
1. Ctrl + P to open Print dialogue.



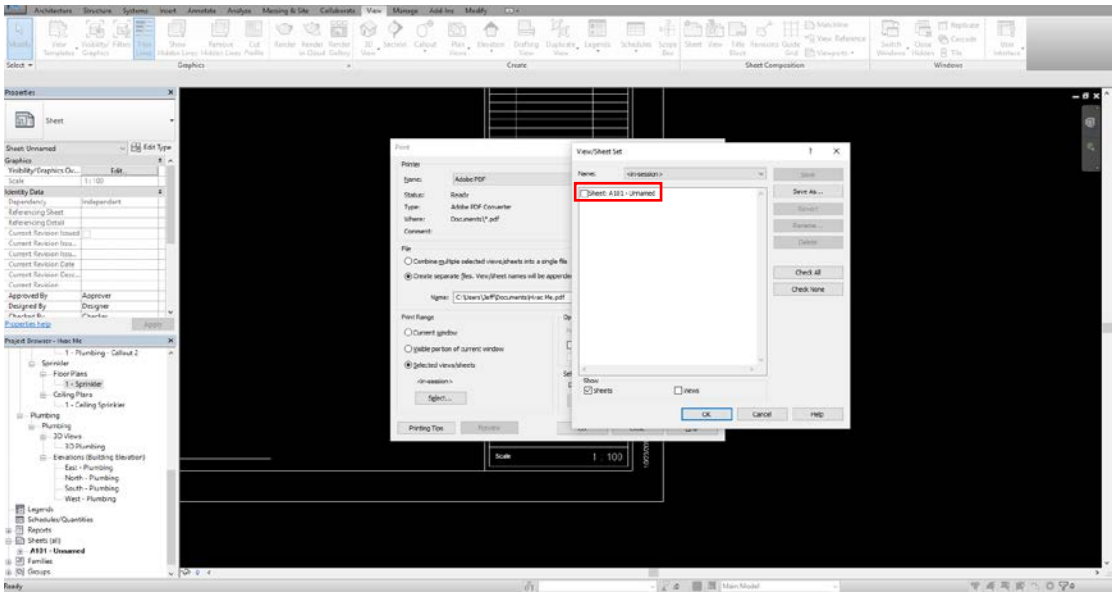
2. Make sure Selected views/sheets is checked. Then click Select.



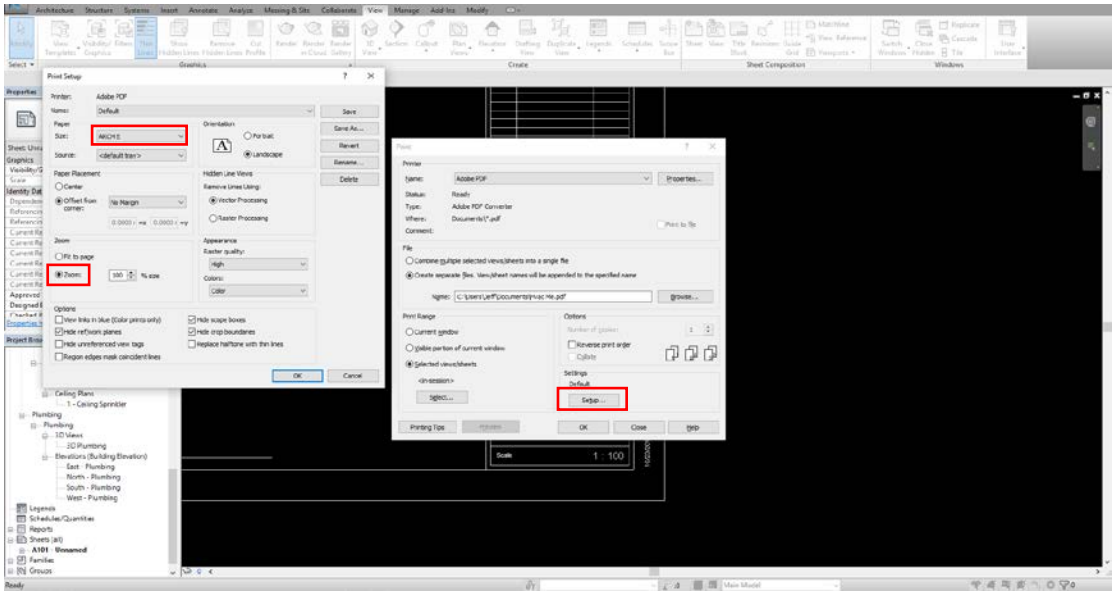
3. Uncheck Views.



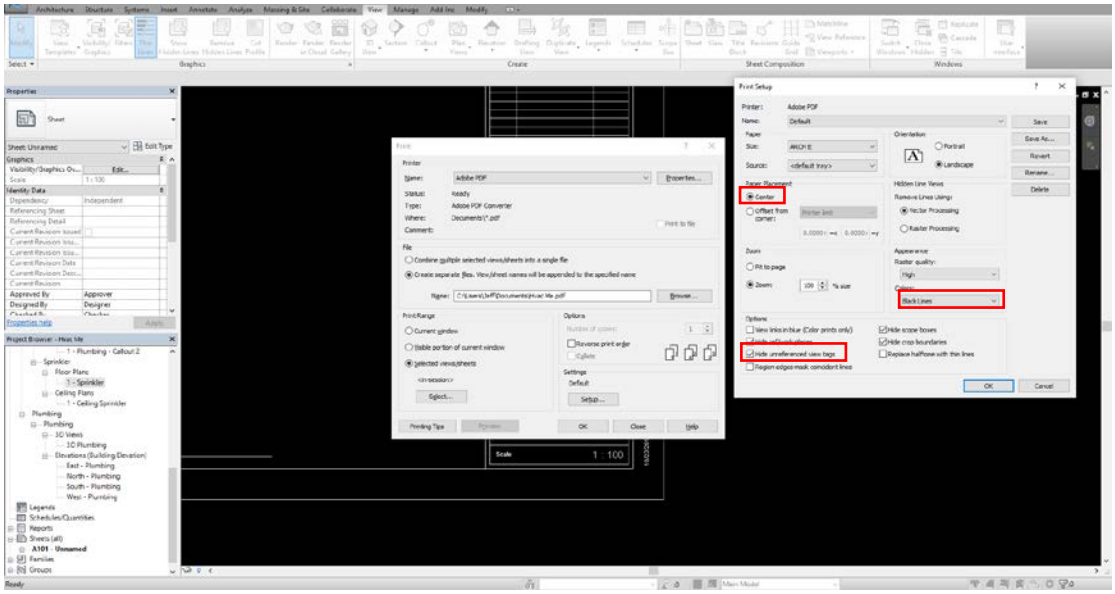
4. Select your sheets.



5. In Print Setup, set Size to ARCH E. Make sure Zoom is checked.



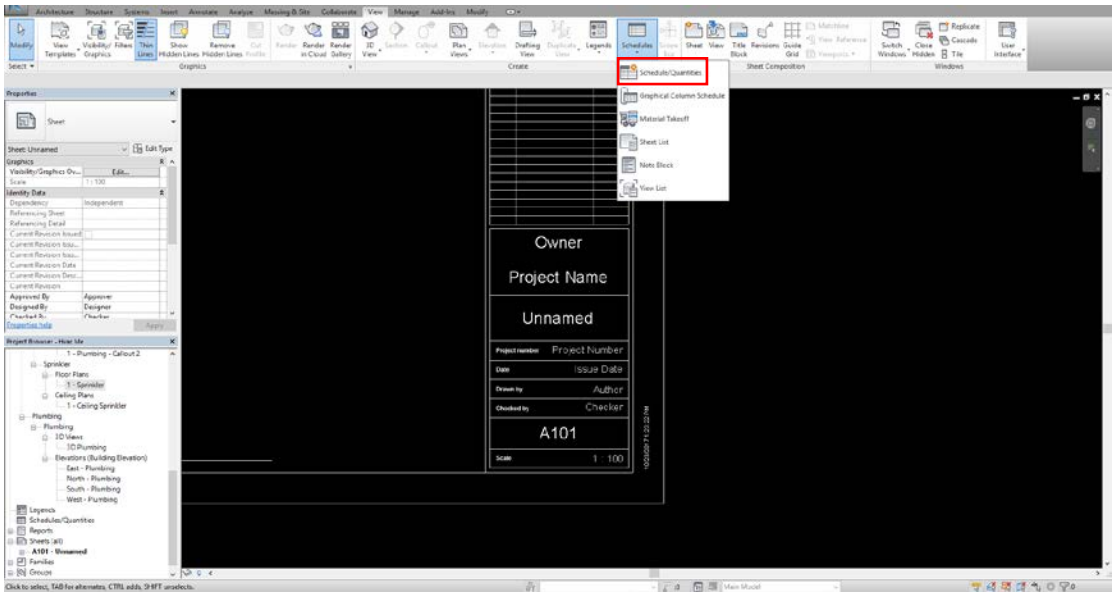
6. Once we click Zoom, our Paper Placement may change, just simply check Center. Make sure colors set to Black Lines, Hide unreferenced view tags checked.



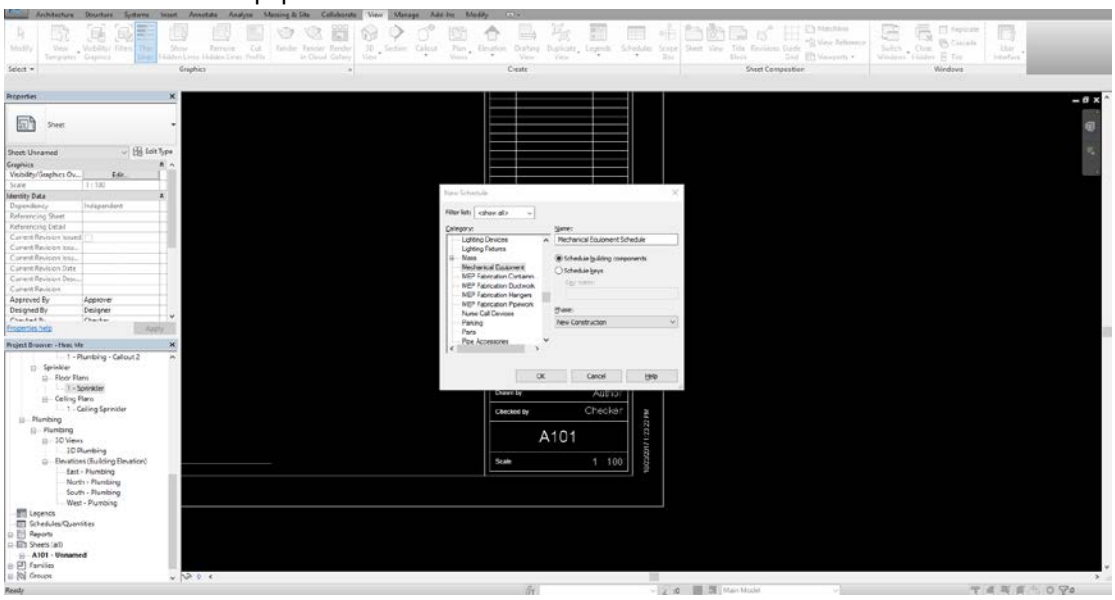
7. Printing setup finished. Hit OK if we want to print it right away.

6.6 Printing schedules

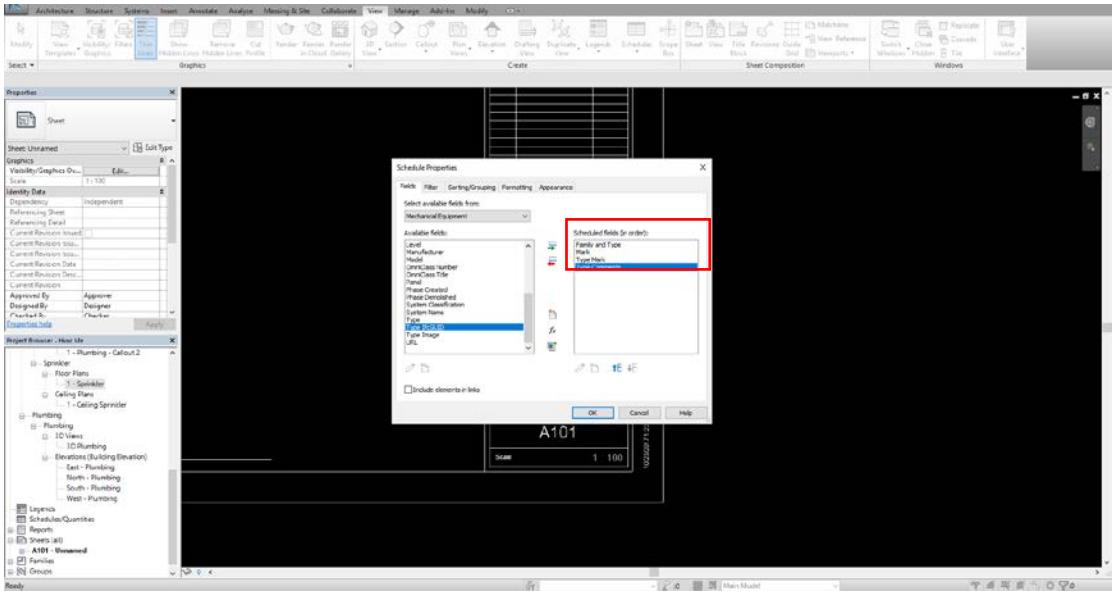
1. Go to View tab, click on Schedules then hit on Schedules/Quantities.



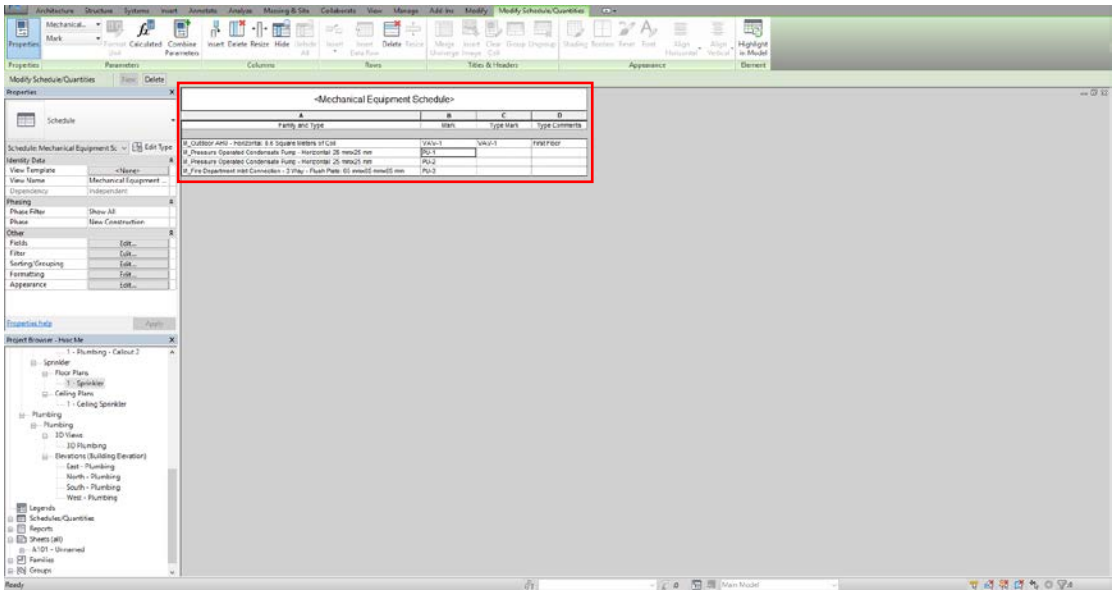
2.Find Mechanical Equipment.



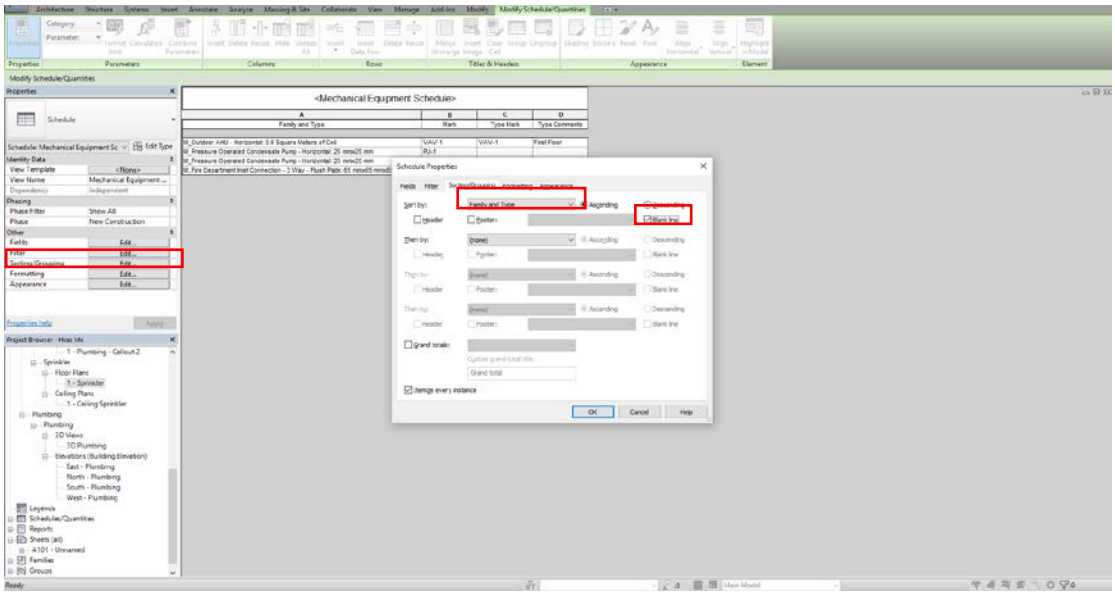
3. Add in Family and Type, Mark, Type Mark, Type Comments.



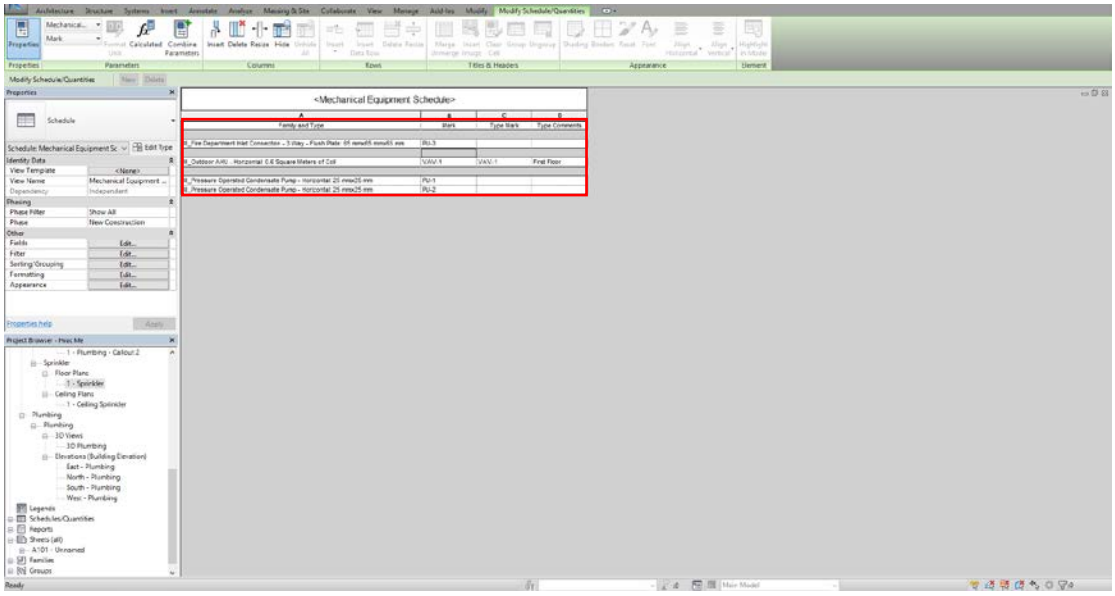
4. Be aware of that changes you made in Schedule will be effective in any views too.



5. Go to Properties panel, sort our Schedule. Sort it by Family and Type, separate it with blank lines.

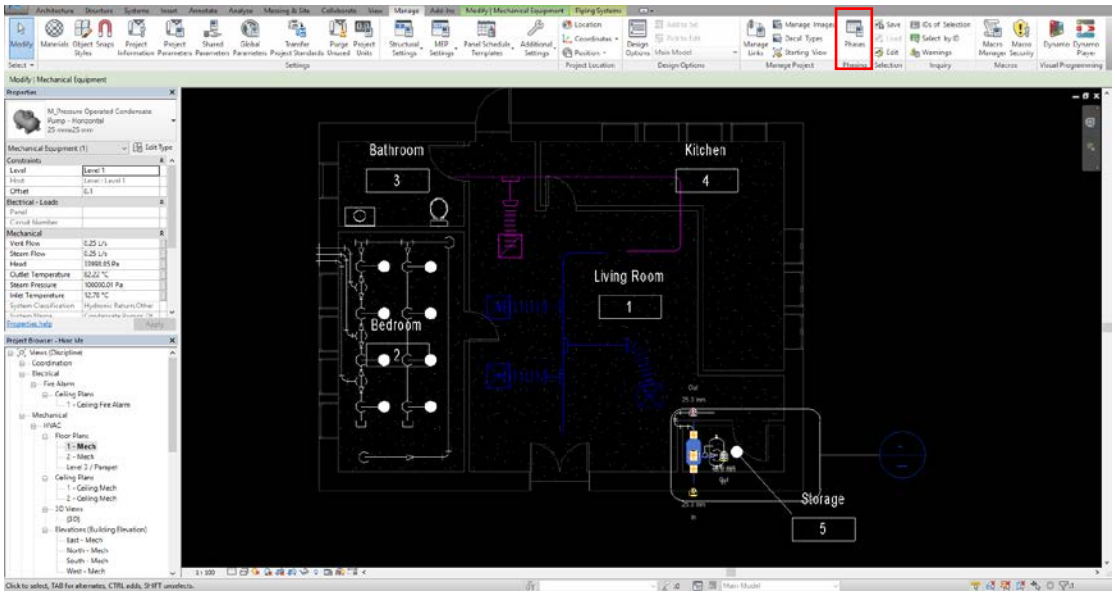


6. We have our Schedule for Mechanical Equipment. Feel free to explore more functions such as Formatting, Filter, Fields etc.

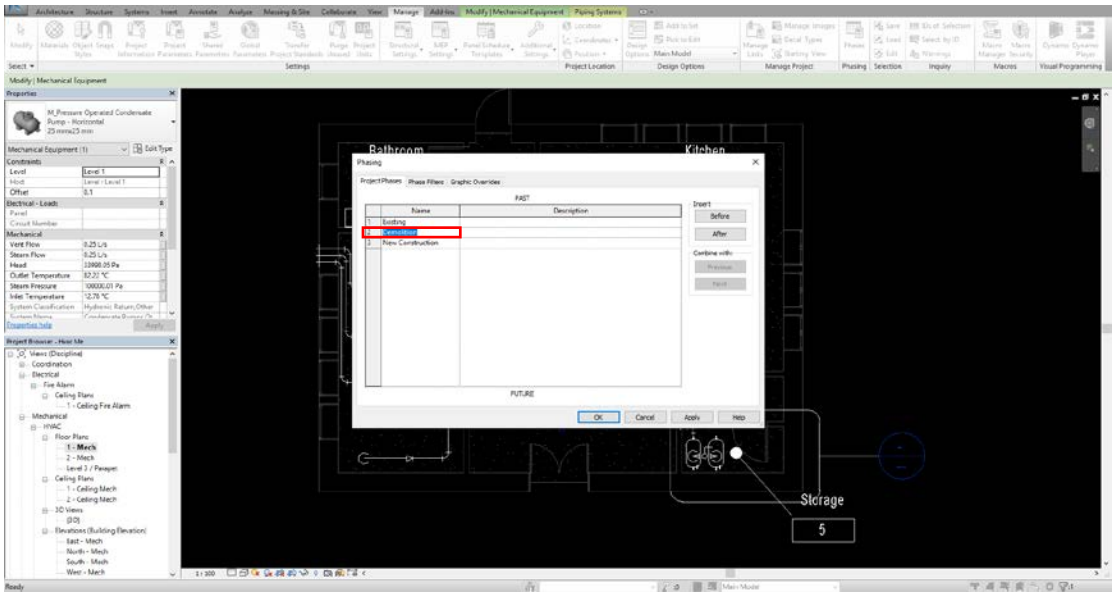


6.7 Using phasing

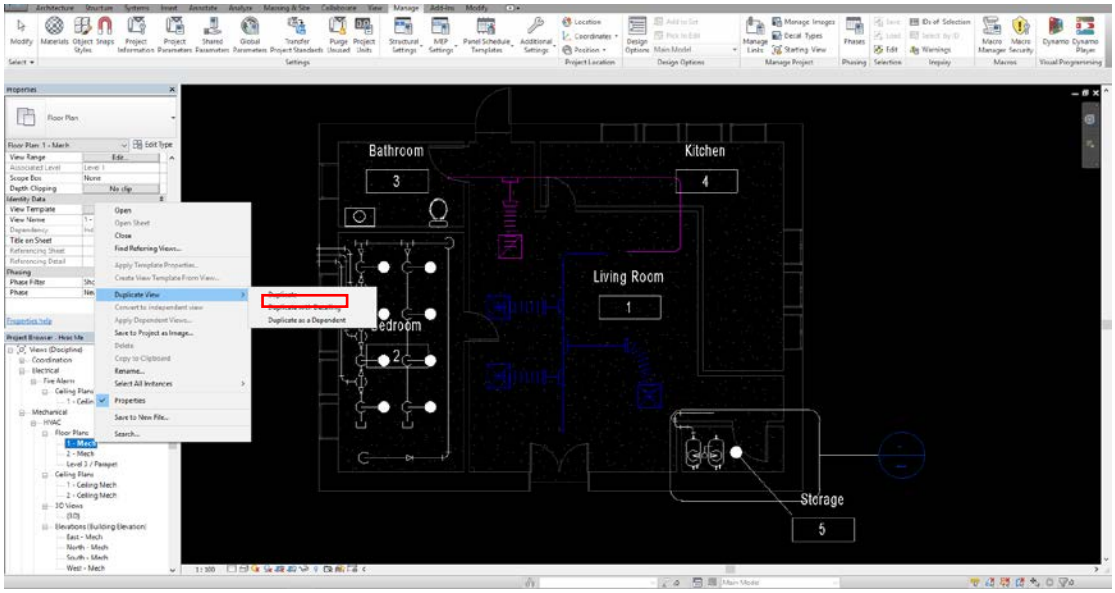
1. Go to Manage tab, click on Phases. Notice two default phases, Existing



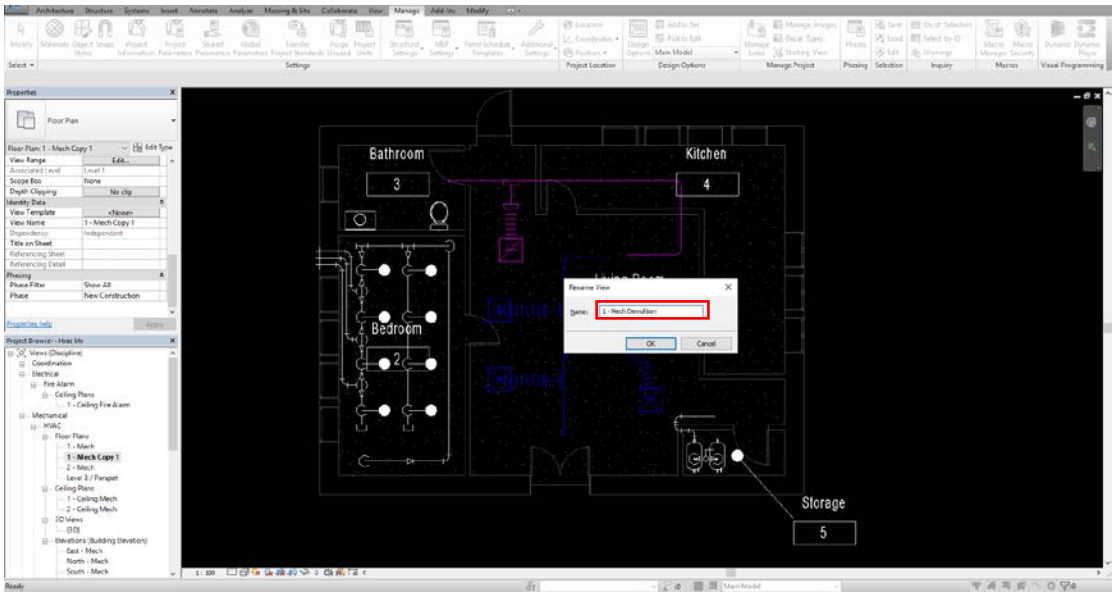
2. Insert new phase between them and name it Demolition. Then hit OK.



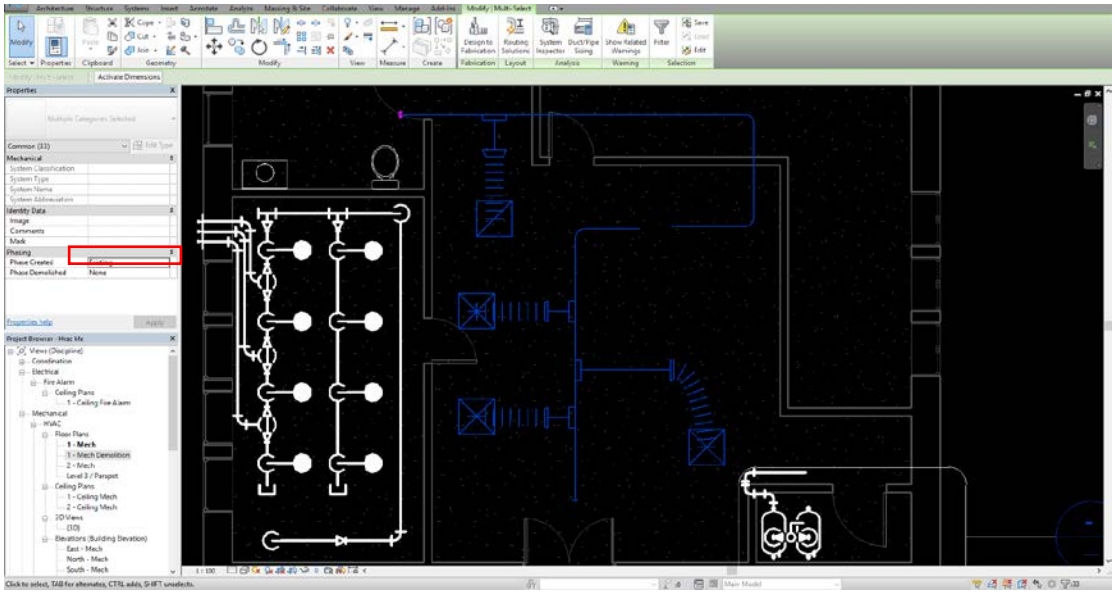
3. Duplicate our floor plan. Make sure **Duplicate it with Detailing**.



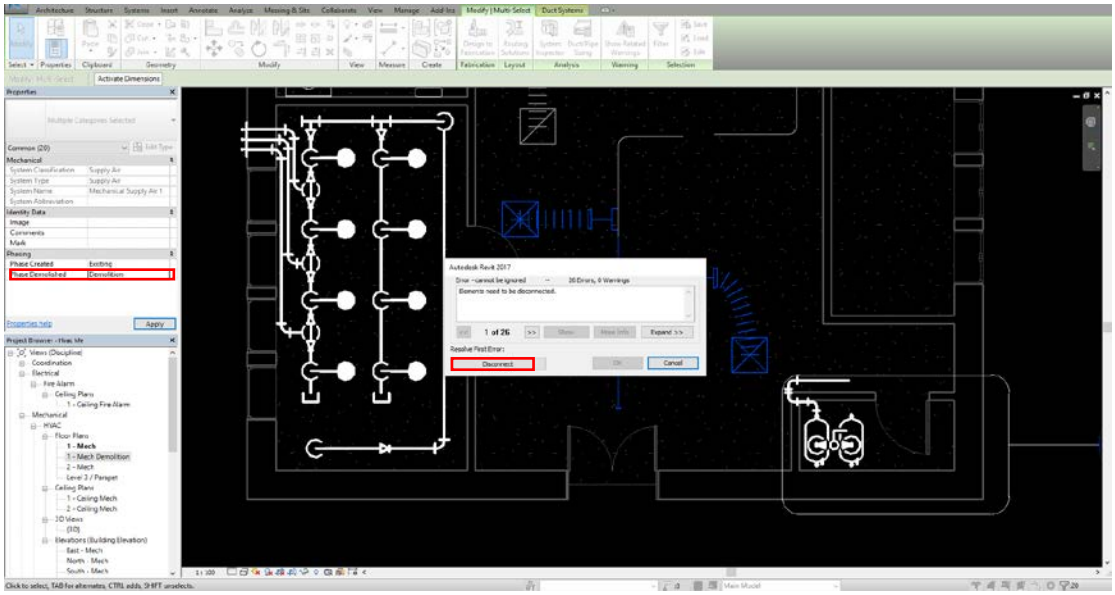
3. Name it properly.



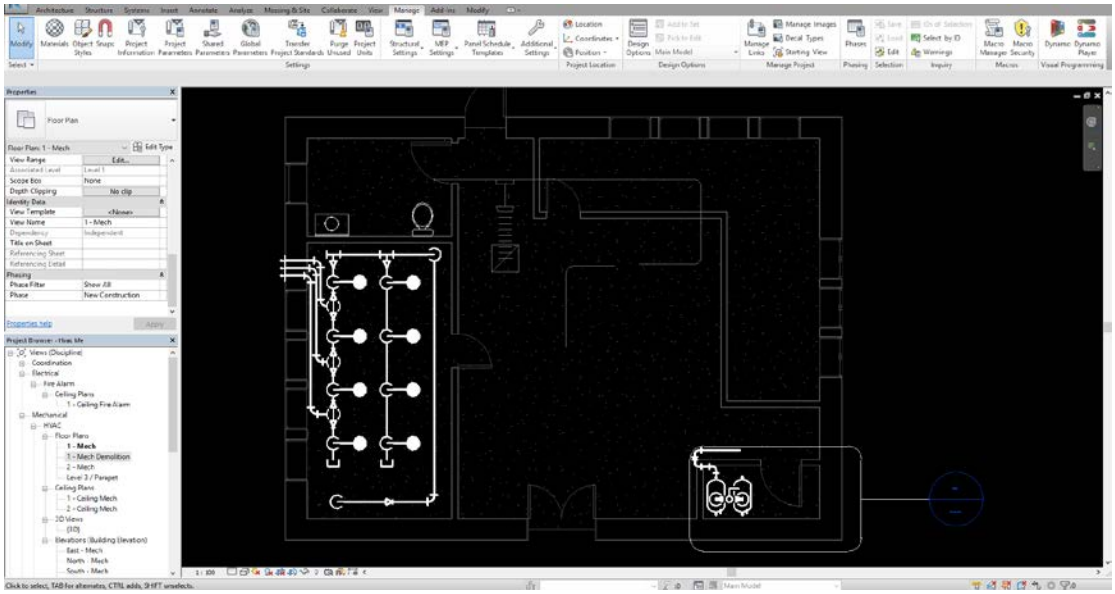
4. With air duct system selected, change its phase to Existing in Properties window.



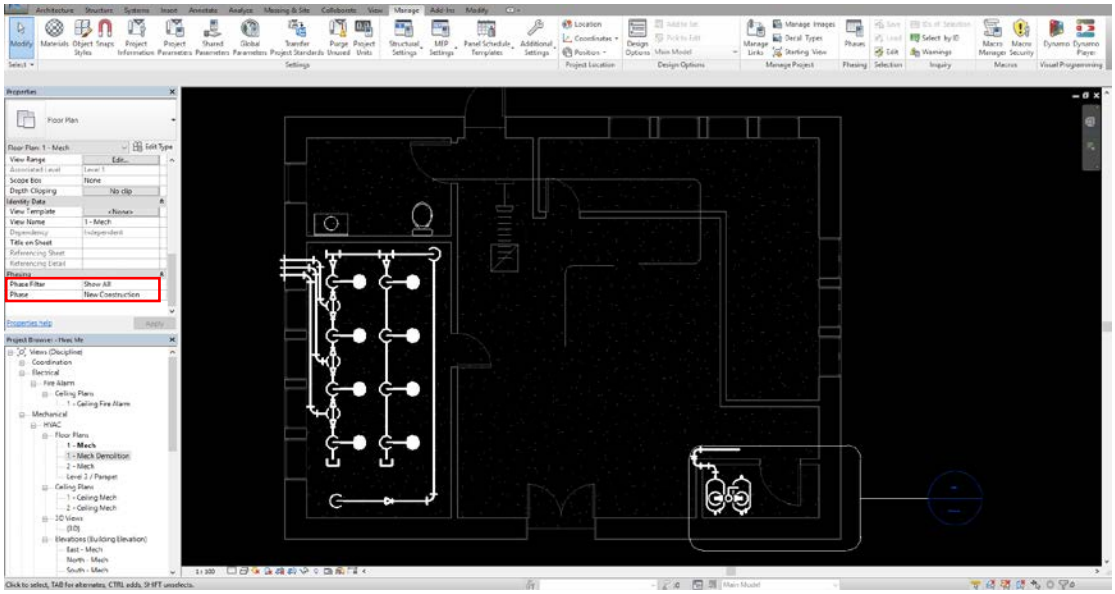
5. Select part of the system, change its Phase Demolished to Demolition. Hit on Disconnect.



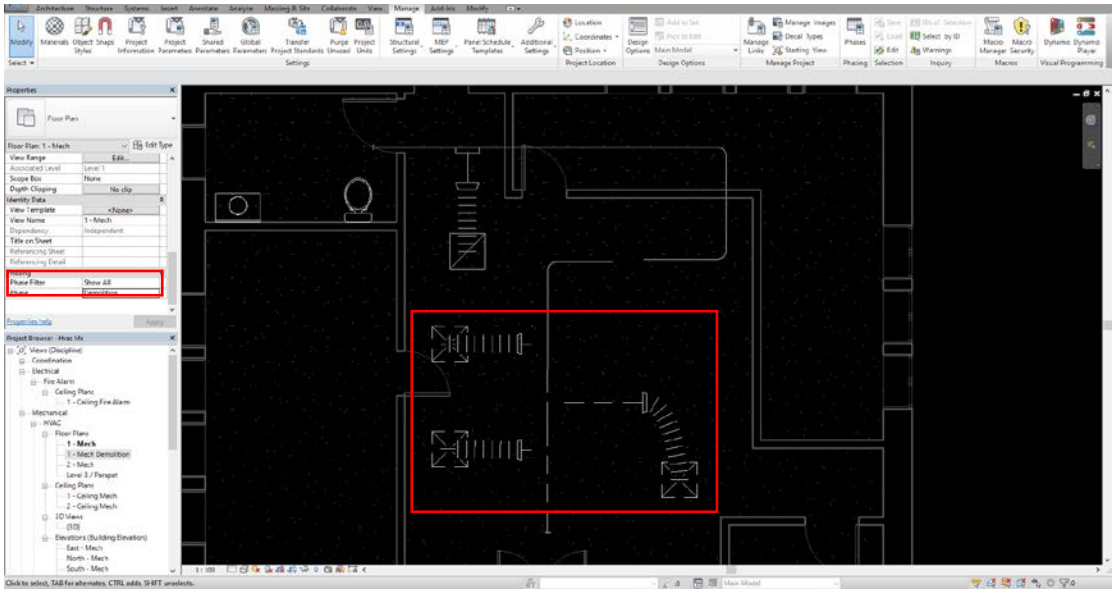
6. Selected parts are gone.



7. Now if we click on blank space to see the view's properties, it starts make sense. Since our view's phase is set to New Construction, any demolished elements should be gone because they have been demolished in the past which we gave it a very descriptive name, Demolition Phase.

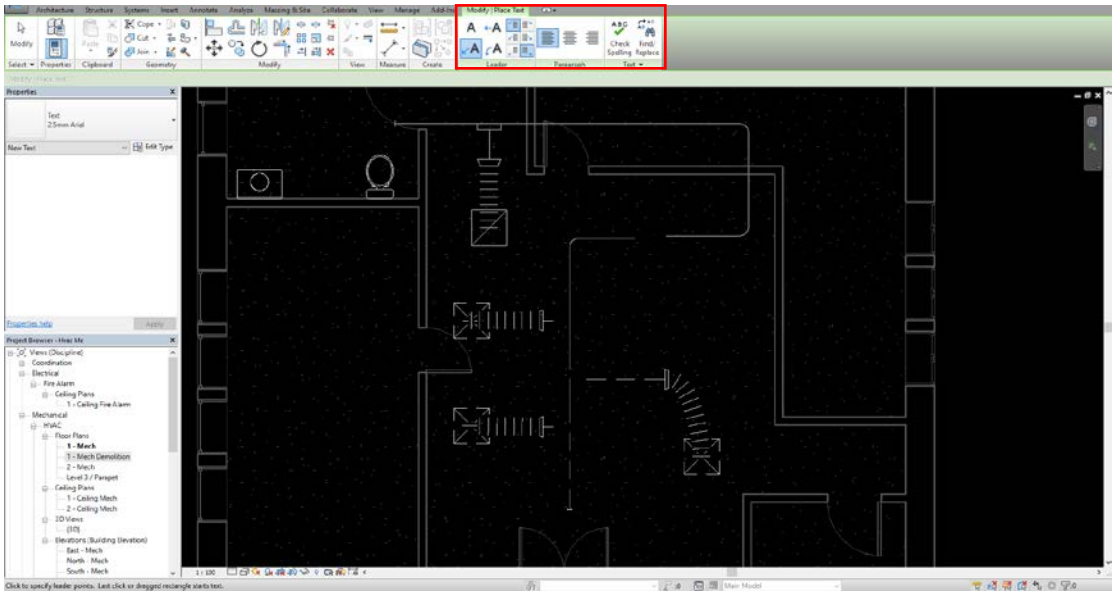


8. If we change it to demolition. Demolished part shows up with distinguishable line style.

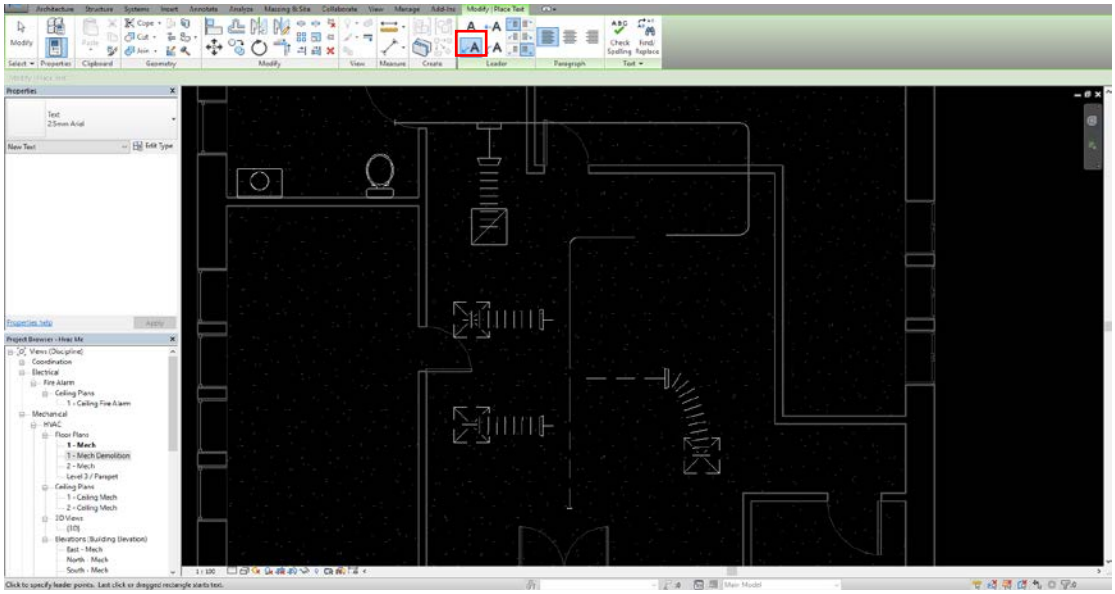


6.8 Working with text

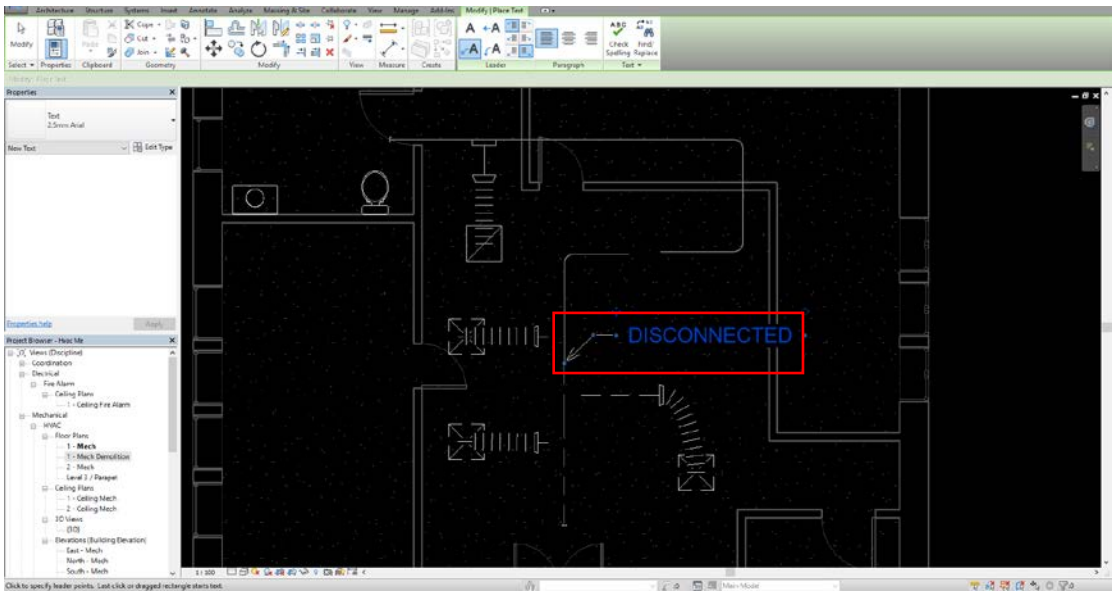
1. T + X to open text editor.



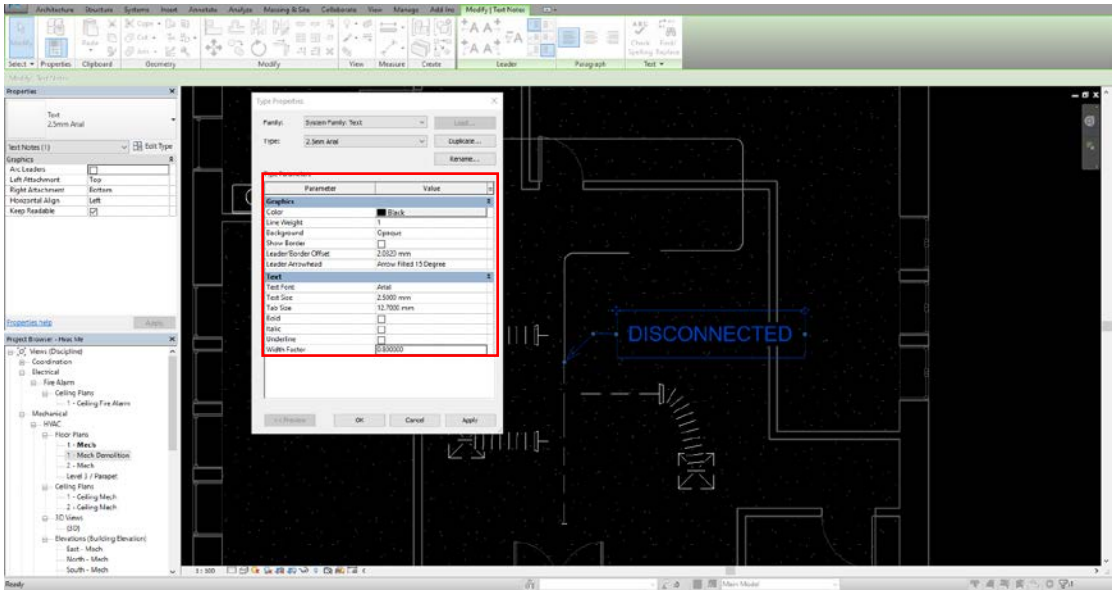
2. Click on Two Segment Text.



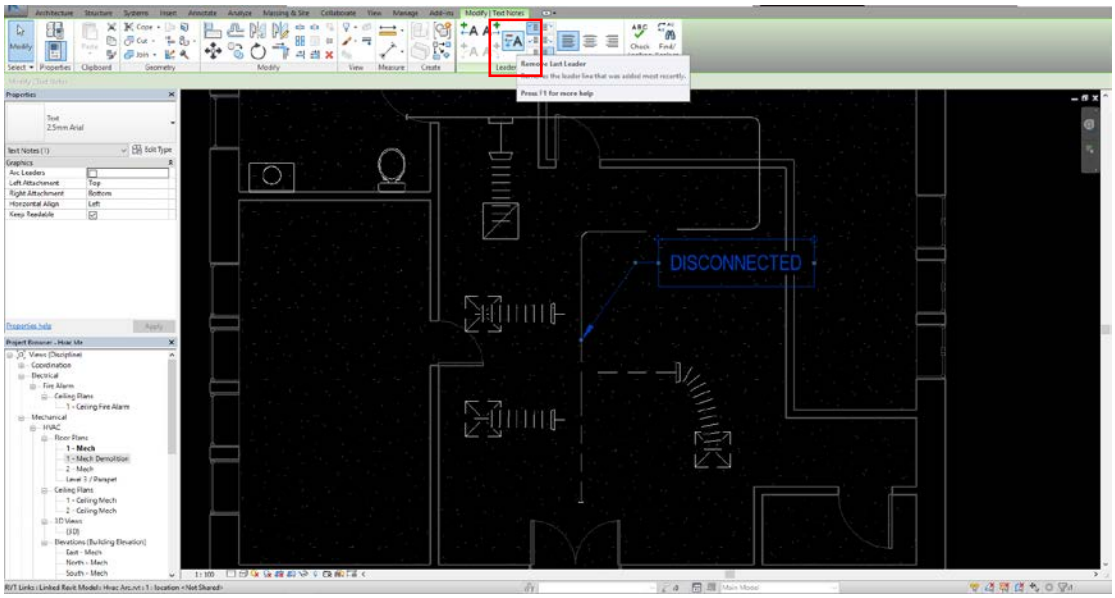
3. Add your text on disconnected point.



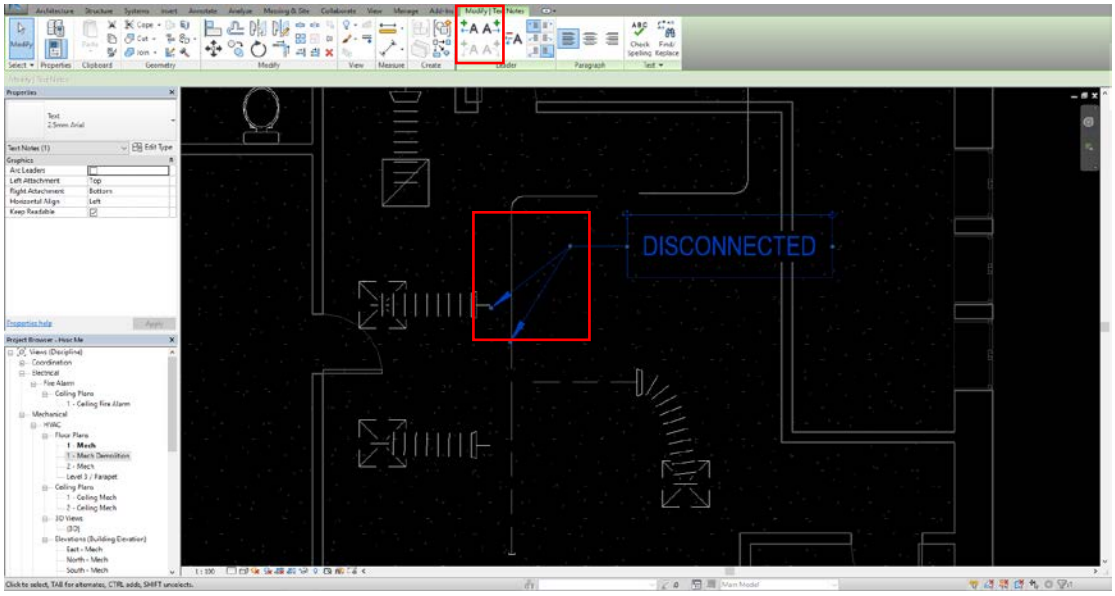
4. Go to Edit Type. Edit your text according to your preference.



5. Once you move the text, leader may not be positioned correctly. Simply remove the leader then recreate it properly.

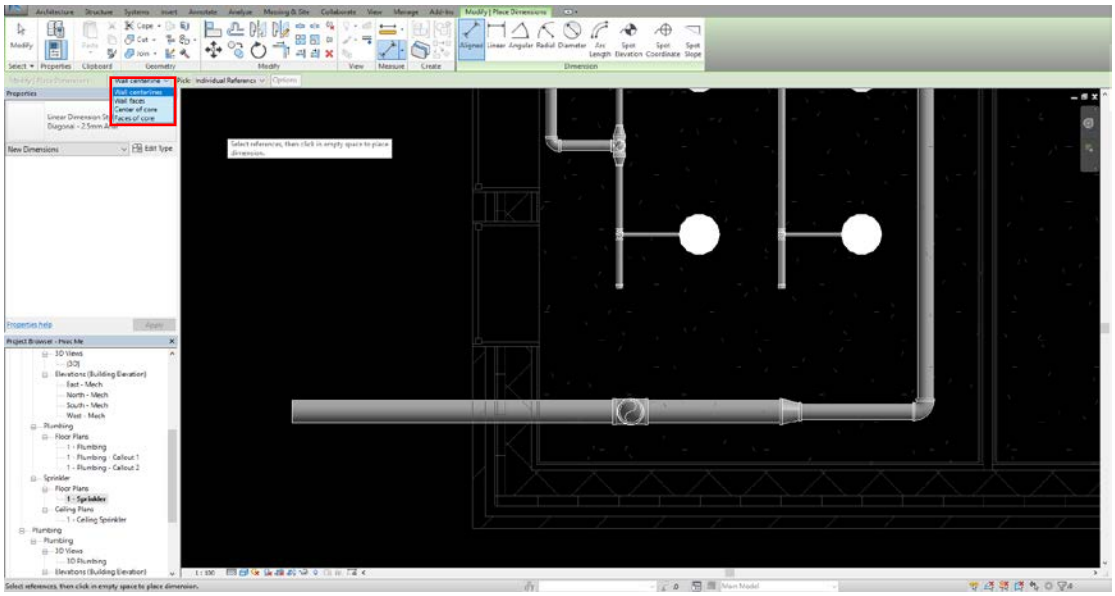


6. Recreate leaders.

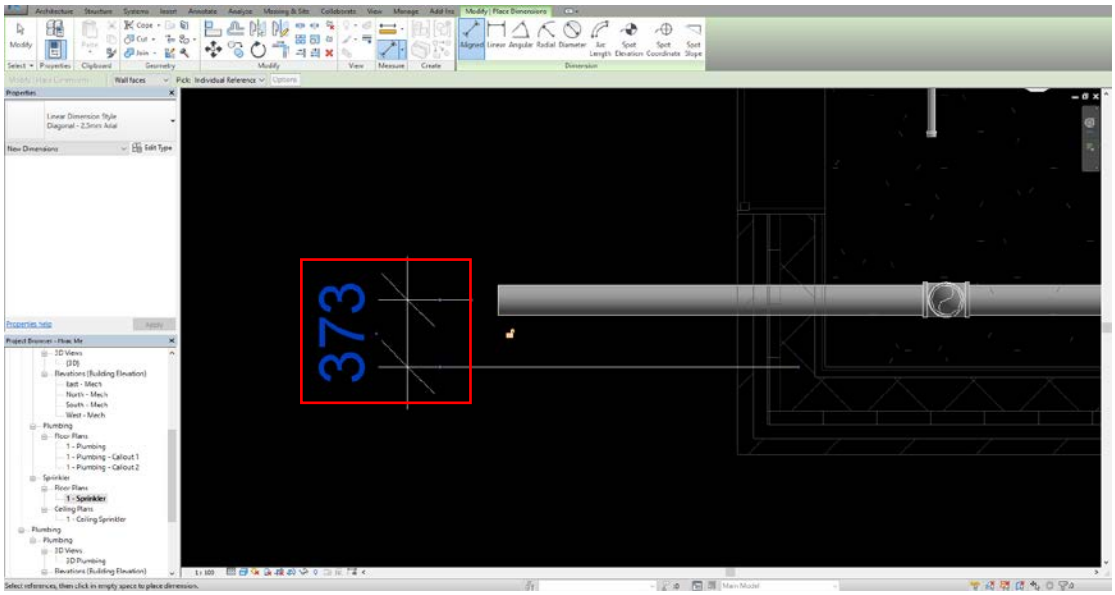


6.9 Working with dimensions

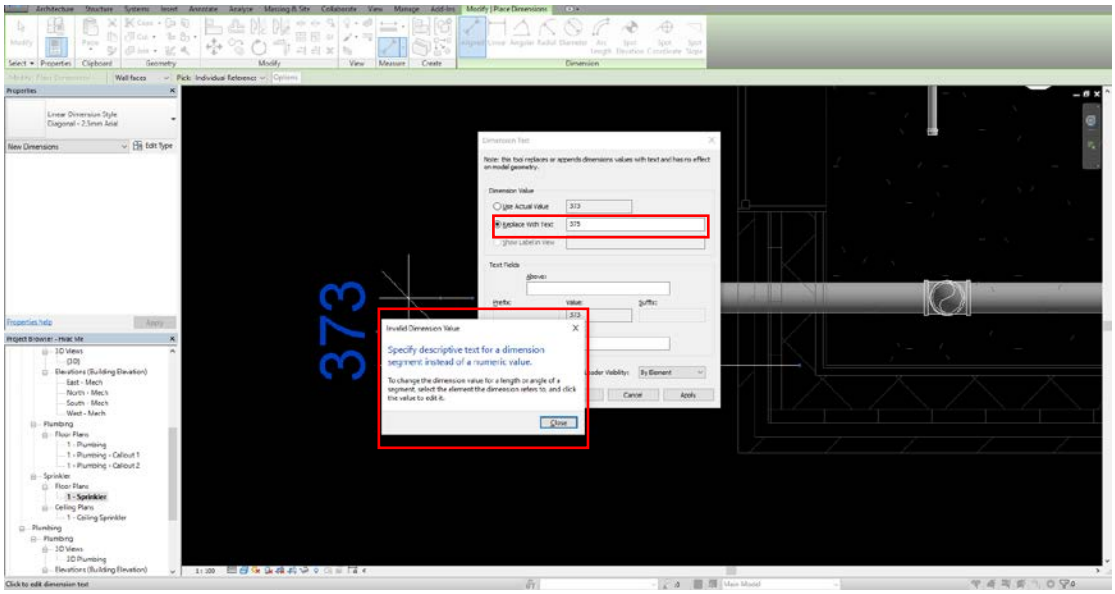
1. Go to Annotate tab, click on Aligned. Change Wall center to Wall faces.



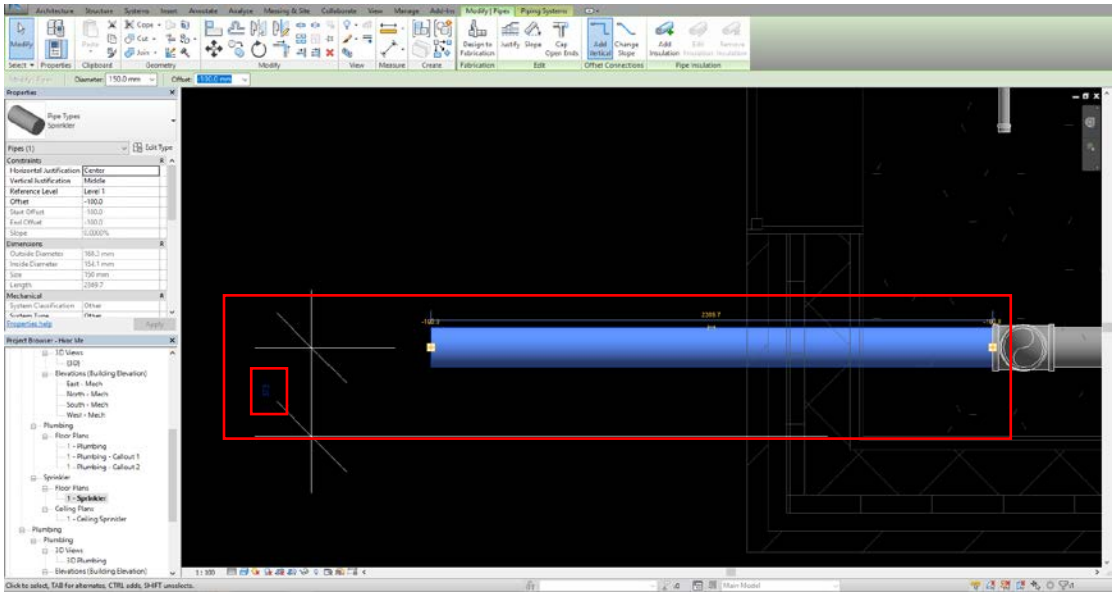
2. Click on the inner face of the wall and centerline of the pipe. Place your dimension.



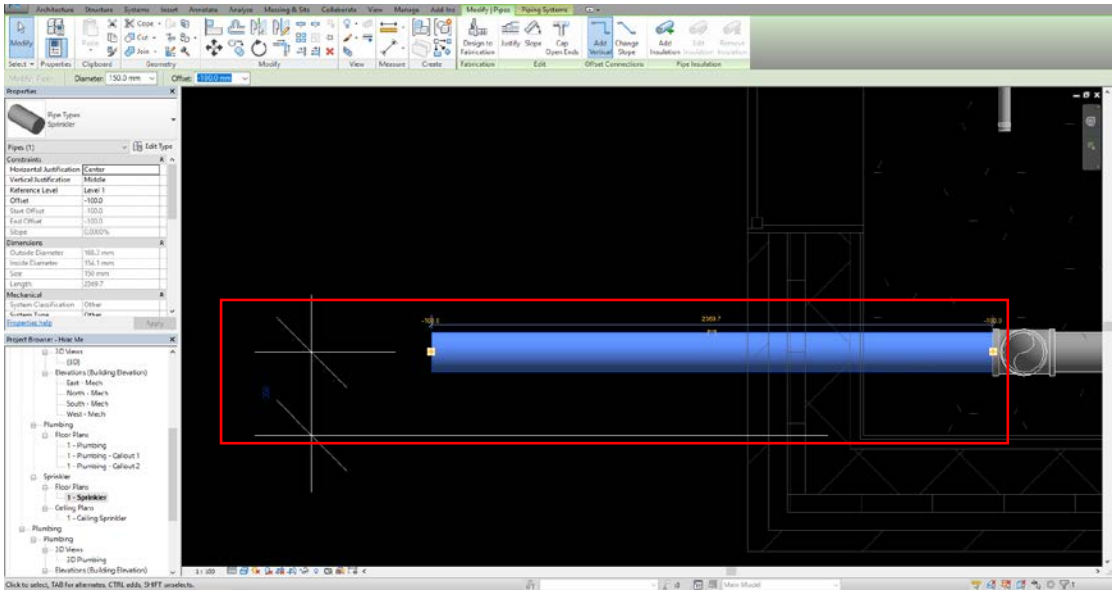
3. If you want to change the dimension by click on the text. Replace with Text. Notice that Revit won't allow us to do so. Zero tolerance to wrong dimension is a great feature of Revit.



4. So we can click on the object that dimension belongs to. Then click on the dimension, change it to suit our need.

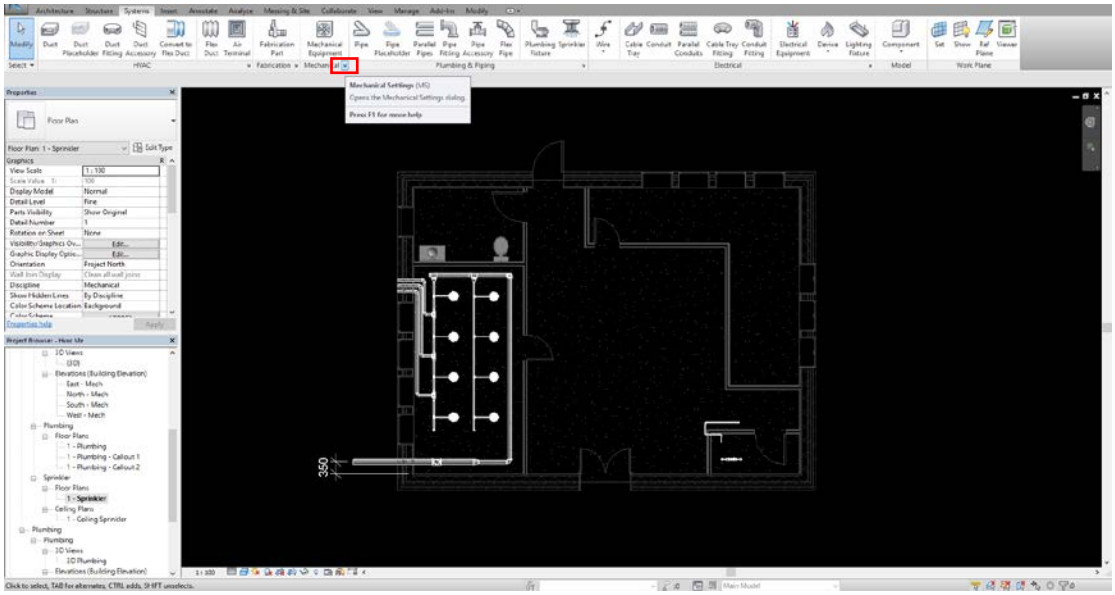


5. Once you change it, relative elements position will be automatically adjusted as well.

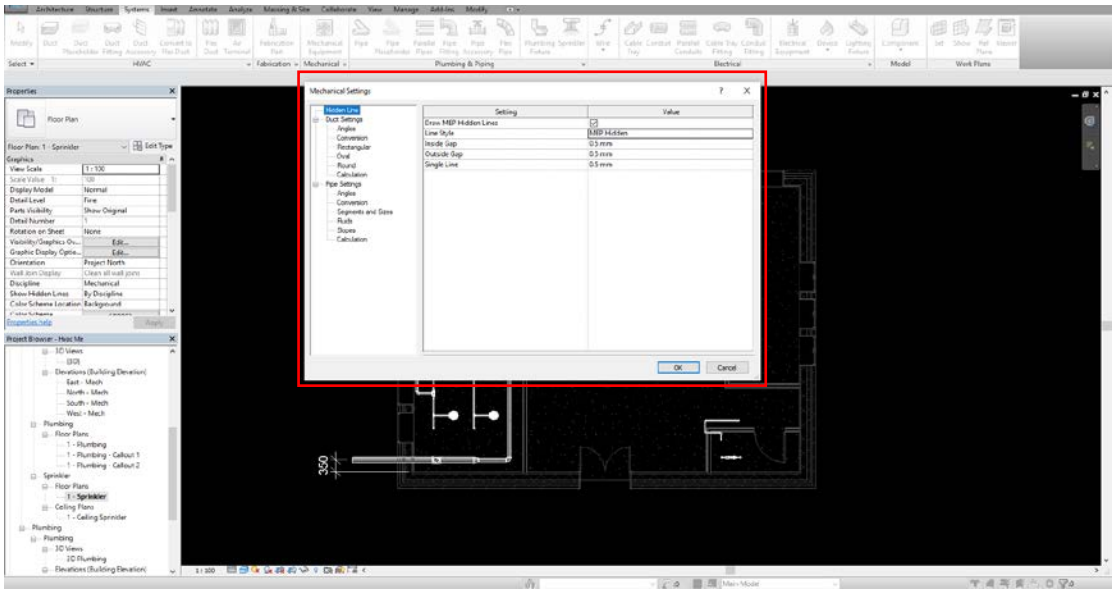


6.10 Looking at mechanical settings

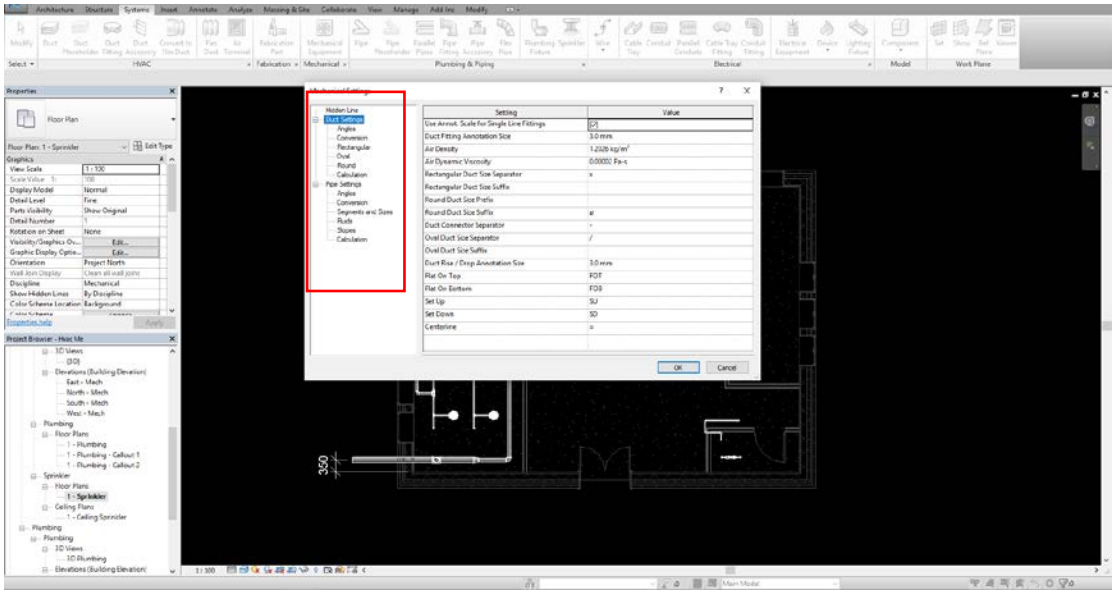
1. To see our mechanical settings, go to System tab, Mechanical Equipment, click on the arrow at lower-right corner.



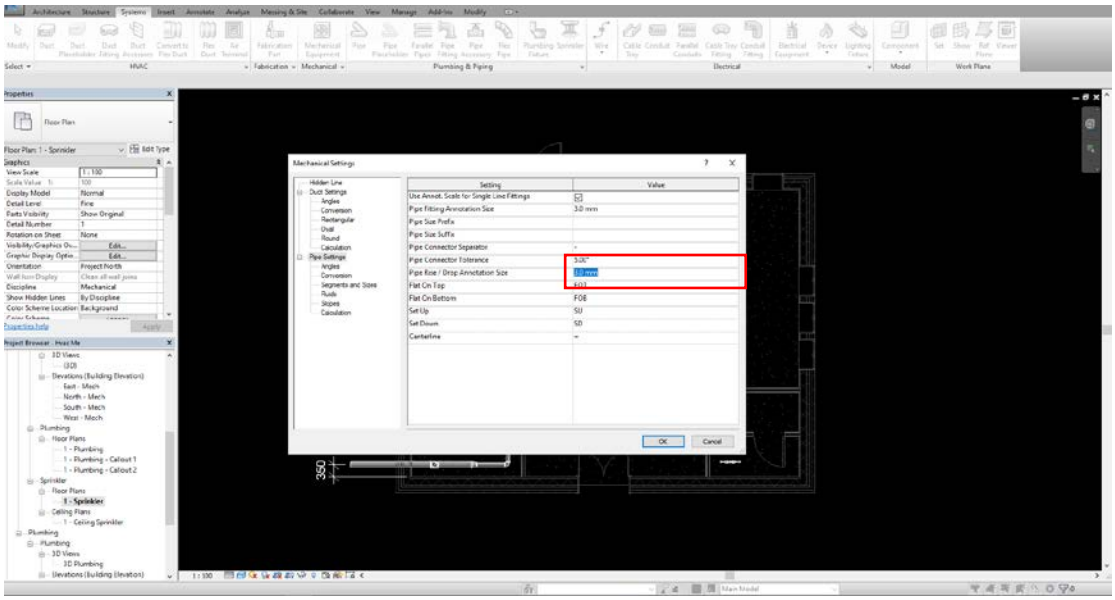
2. Any elements cross each other or locate in obscure area, lines will be drawn in this manner.



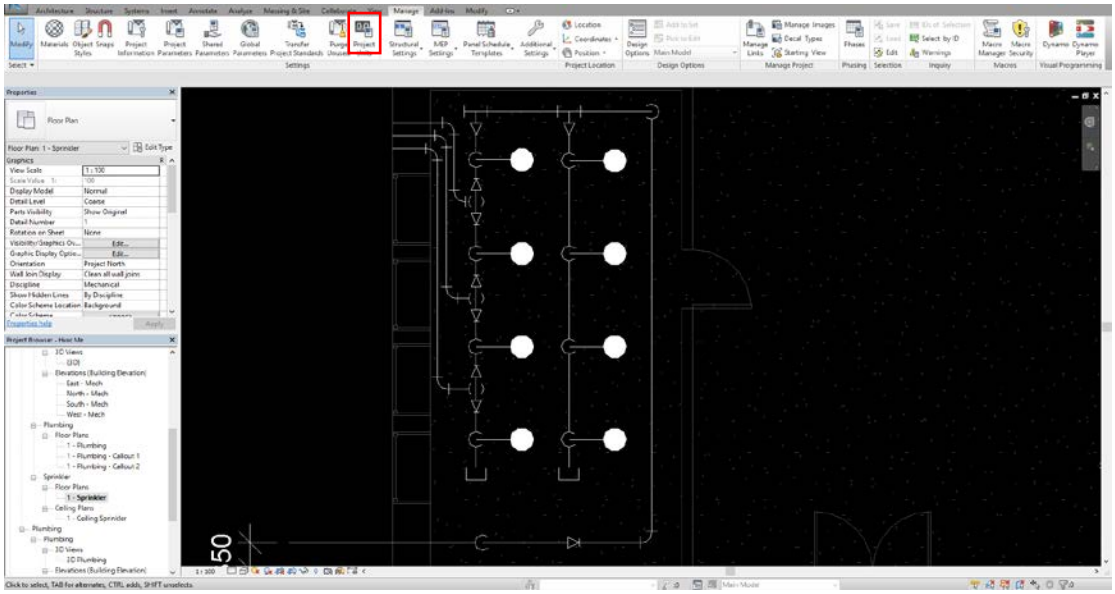
3. More additional settings can be customized in the style you prefer.



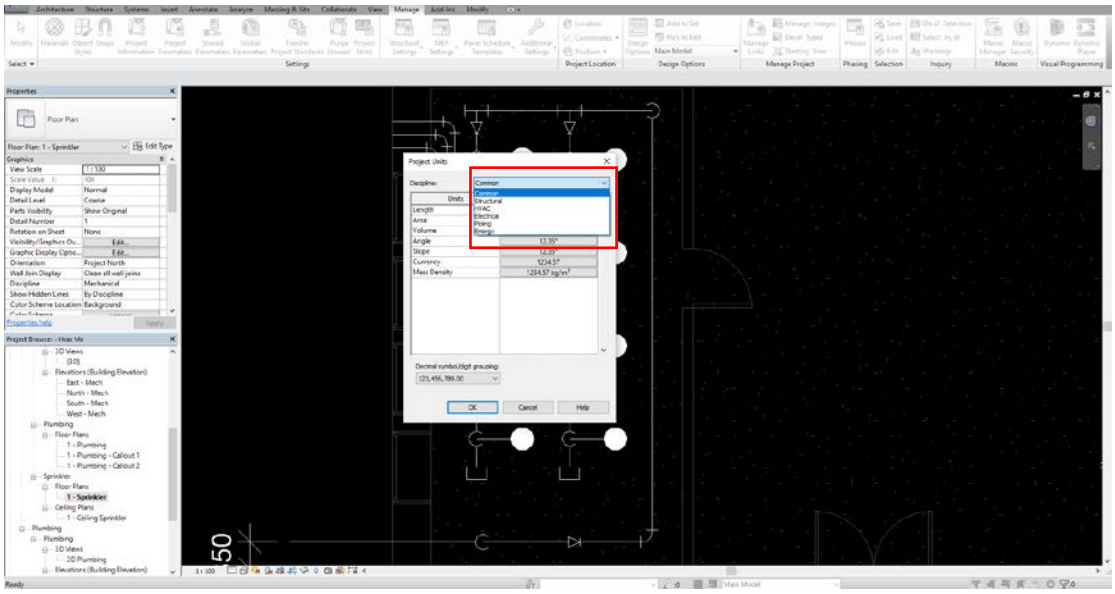
4. You might have noticed that our pipe rise/drop annotation size is too big. To adjust it, go to Pipe settings, Pipe Rise / Drop Annotation Size, simply reduce it to the size you prefer.



5. Go to Manage tab, find Project Units.

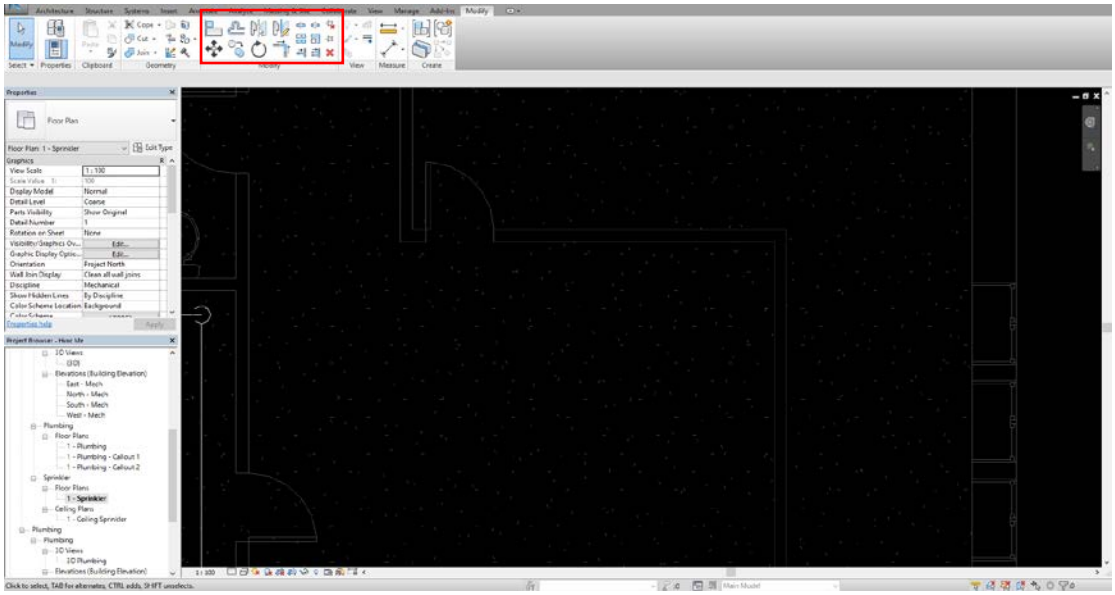


6. Notice that units can be edited based on disciplines.

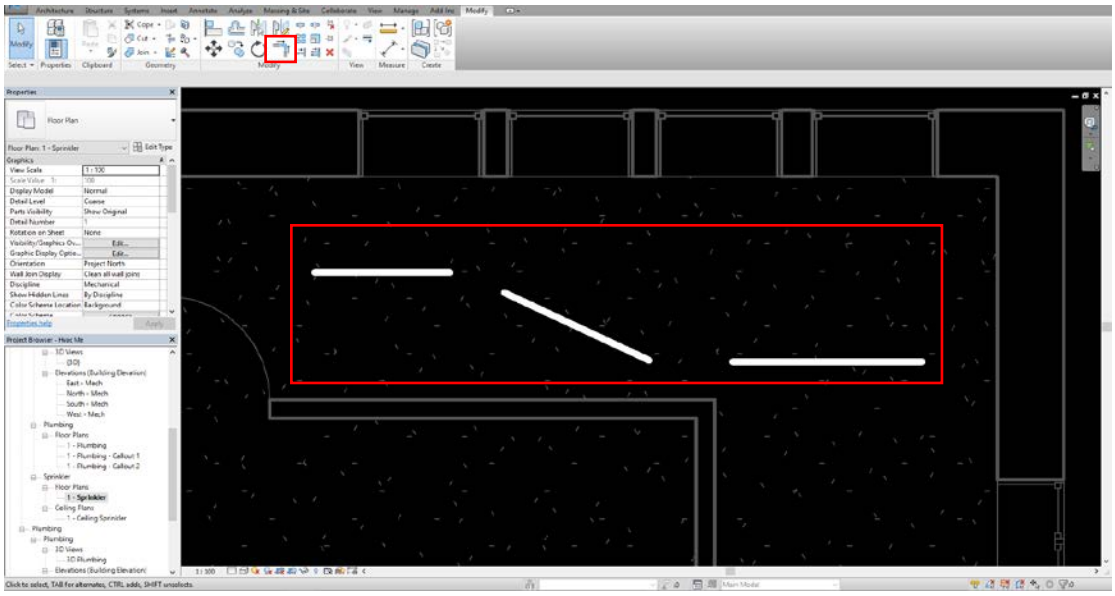


6.11 Simple Modify techniques

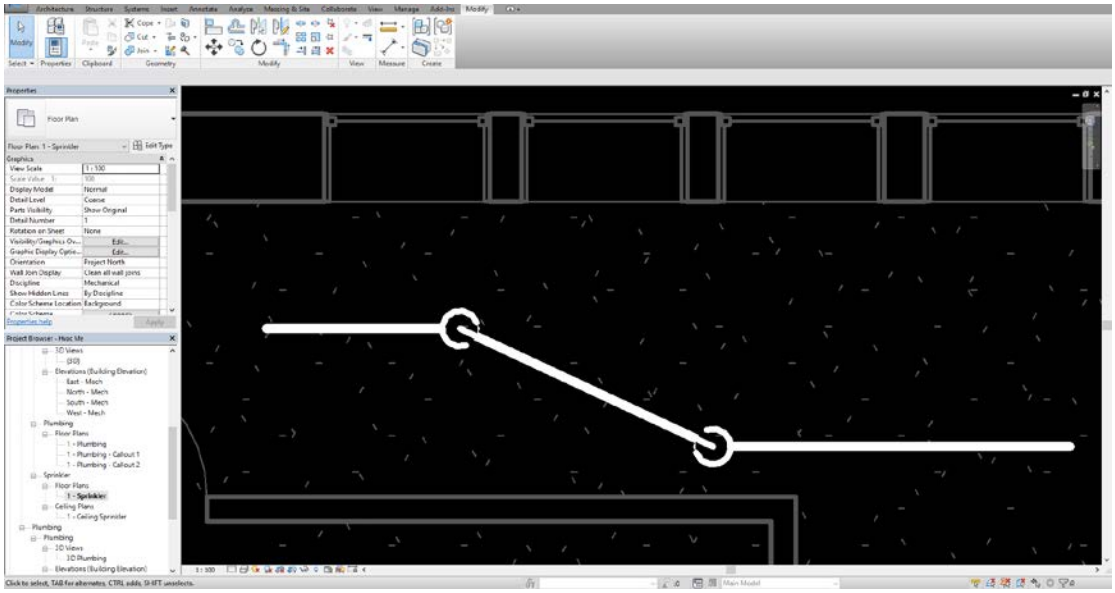
1. Modify panel is a colllection of very powerful commands. Go to Modify tab, explore its functions.



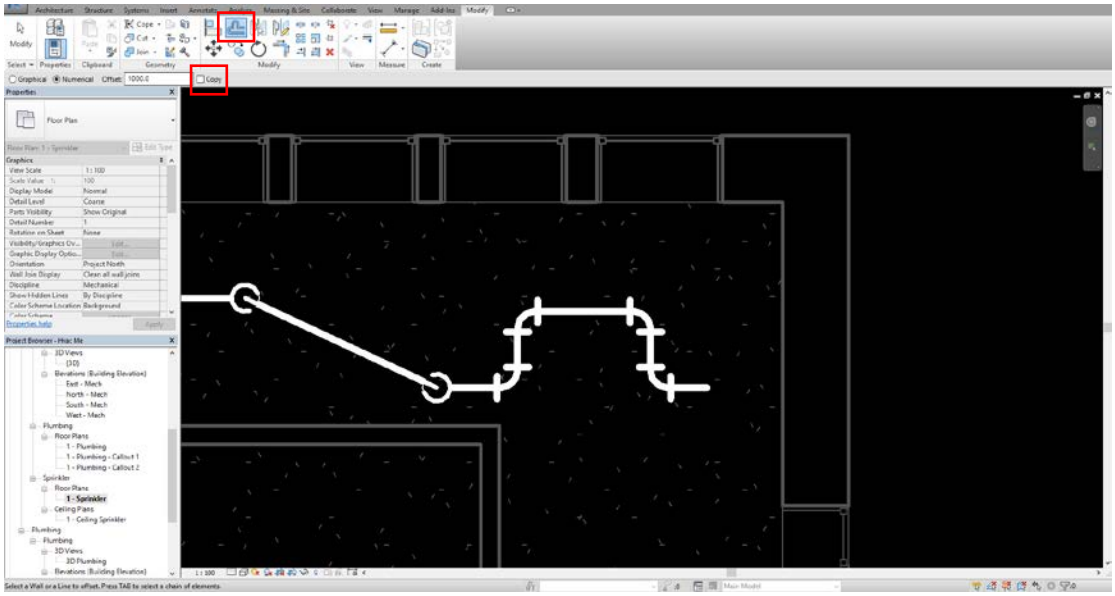
2. Suppose we want to connect three pipes with different angles and elevations. Trim function can help us accomplish it efficiently.



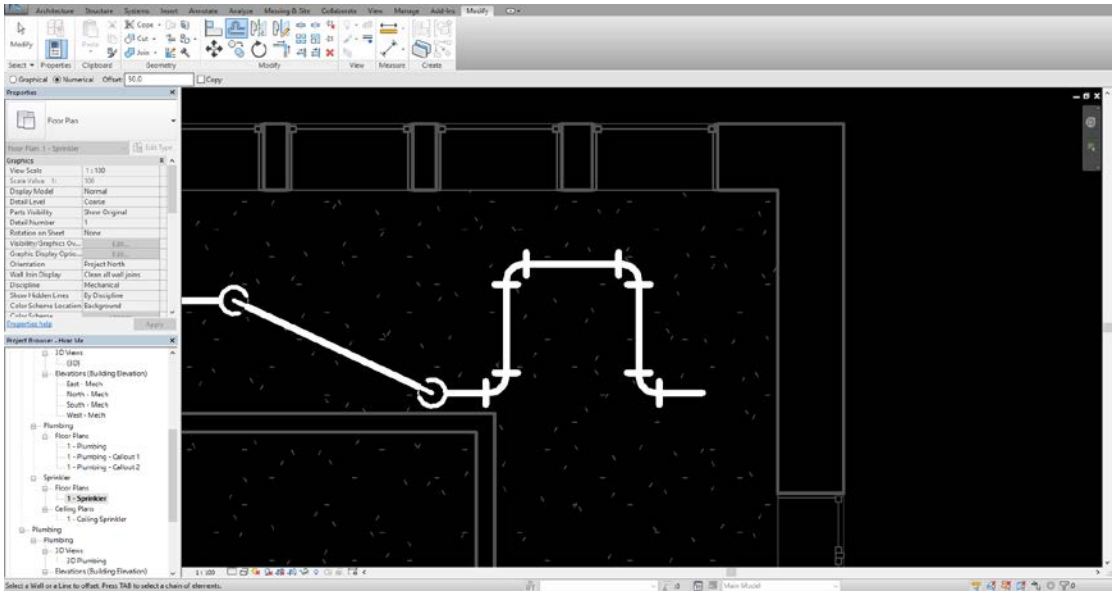
3.Not only they will be connected but also fittings will be added in too.



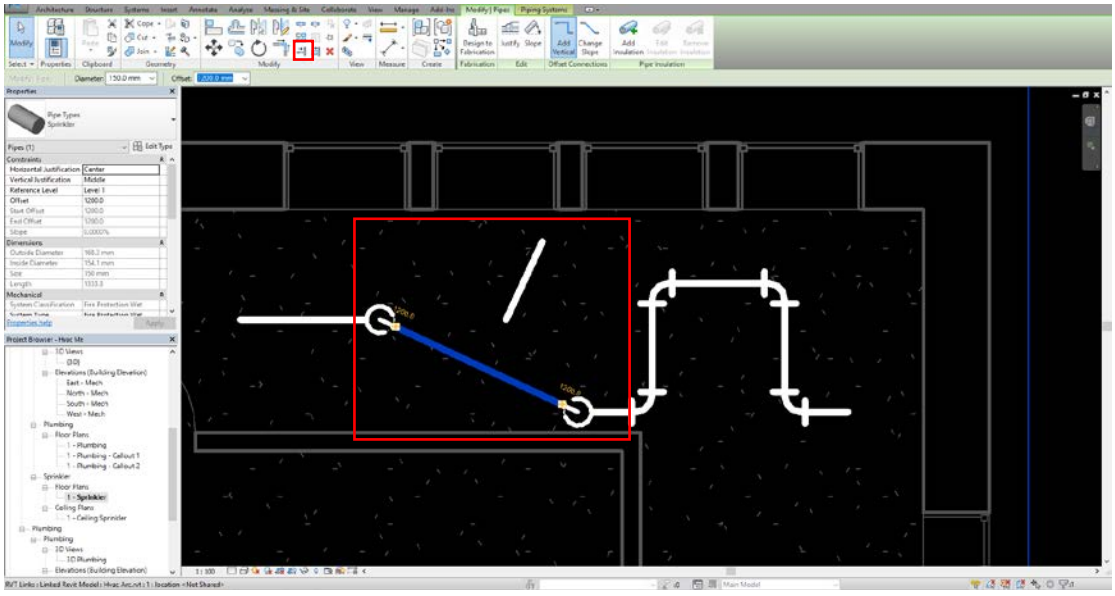
4. Click on Offset command, uncheck Copy.



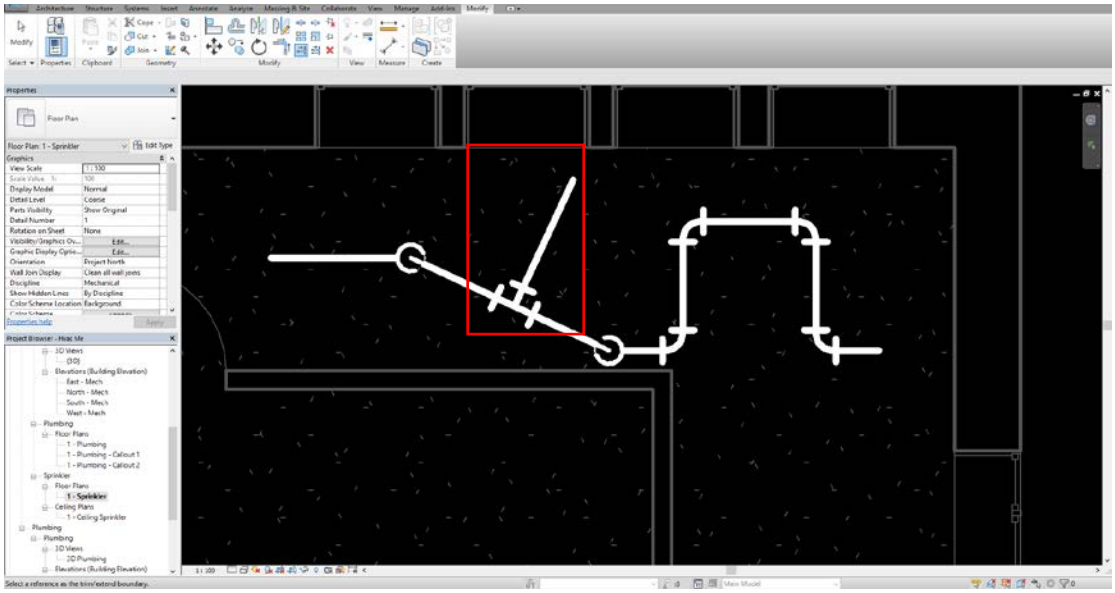
5. Offset our pipes.



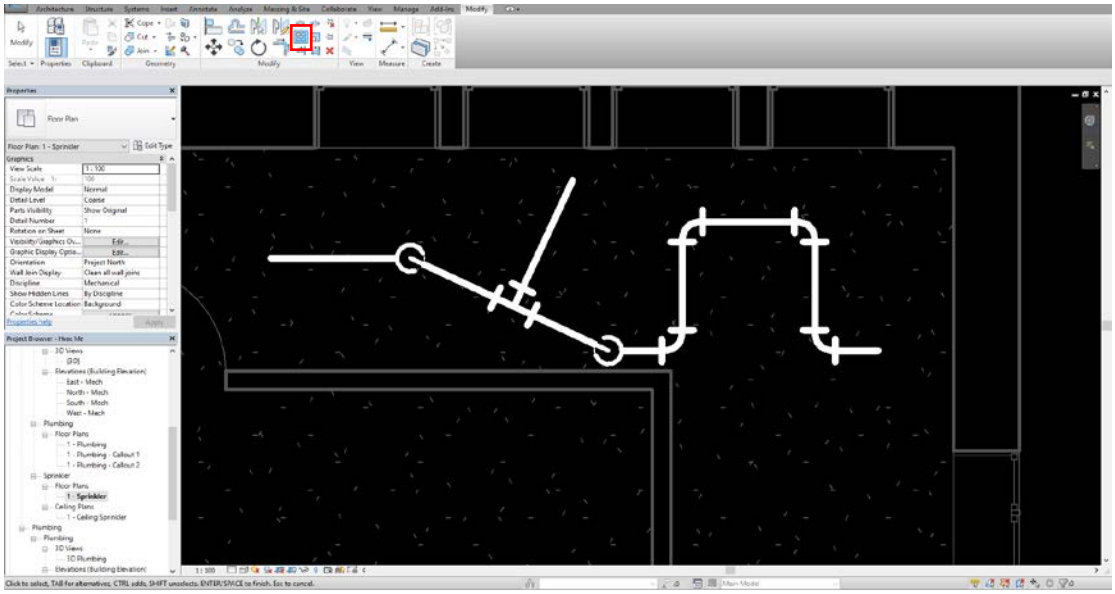
6. If we want to extend a pipe to connect itself with other pipes. Go to Trim / Extend single element. Remember to select the elment you want to extend to then click on the element you want to be extened.



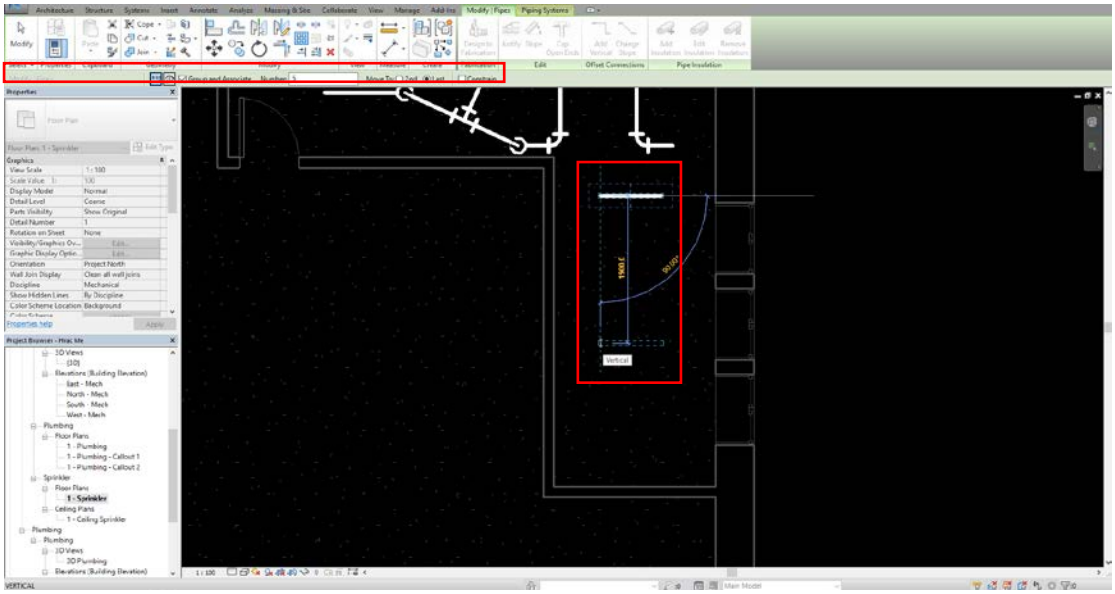
7. Finish extension.



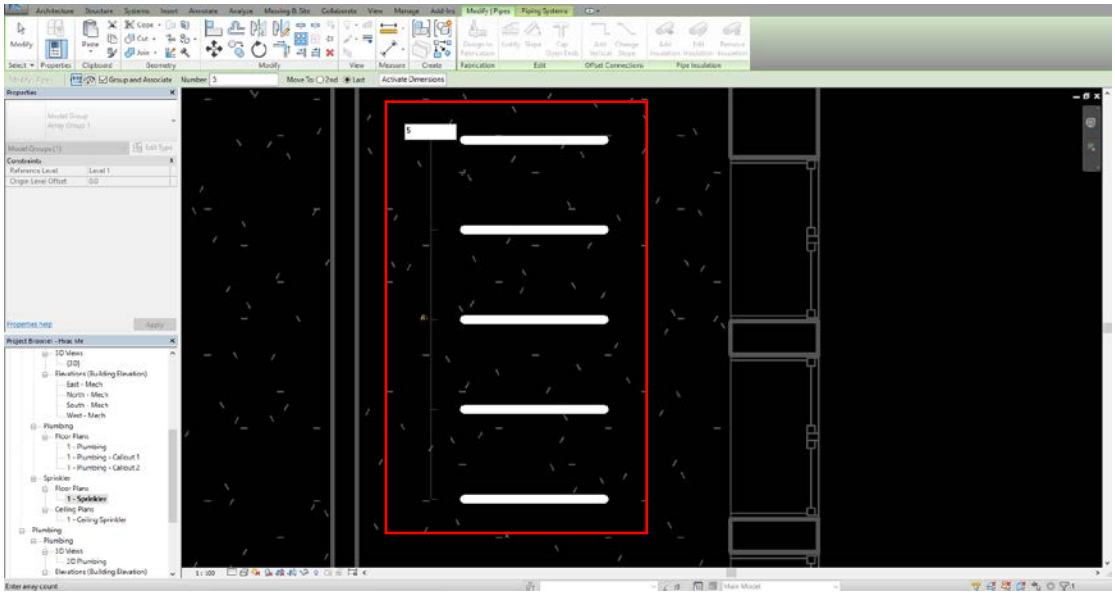
8. Array command helps us quickly duplicate our elements. Go to Array command, select the element you want to copy.



9. Make sure linear array is selected. Move to 2nd means click on the position at which your second duplicated element will be. Last means click on the positon at which your last copy will be. With Group and Associate, all copys including souce element will be grouped together. Pick appropriate base point then duplicate.

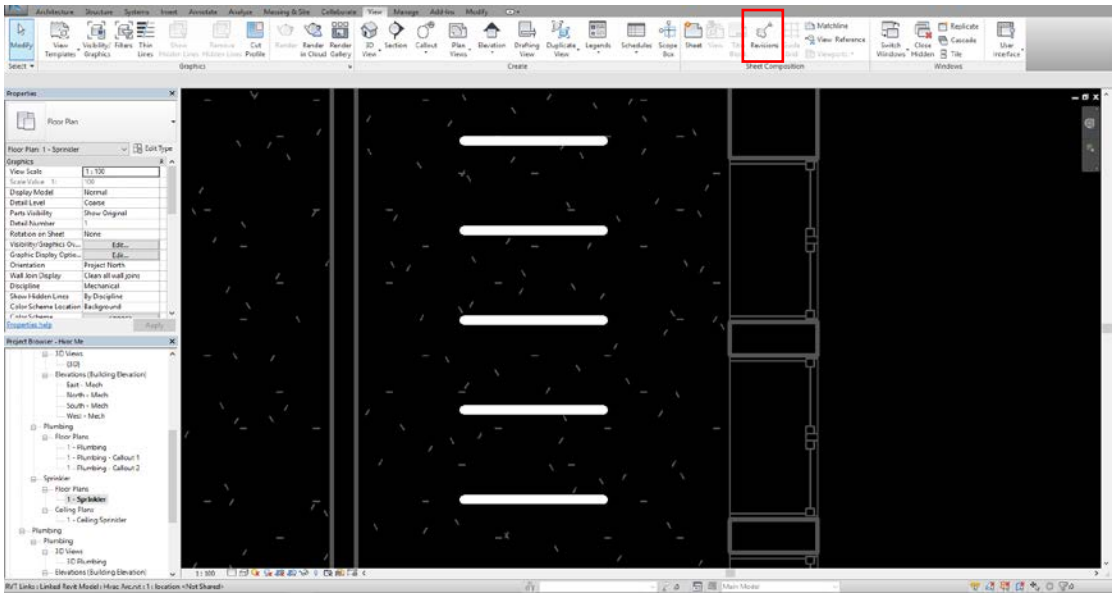


10. Duplication completed. Notice that our elements are grouped.

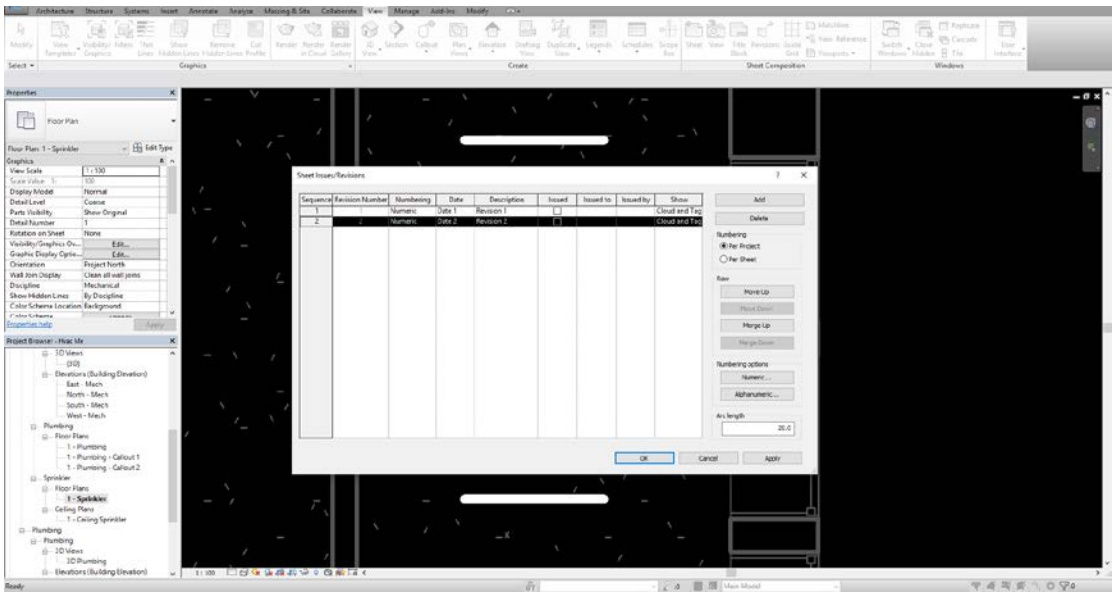


6.12 Making and controlling revisions

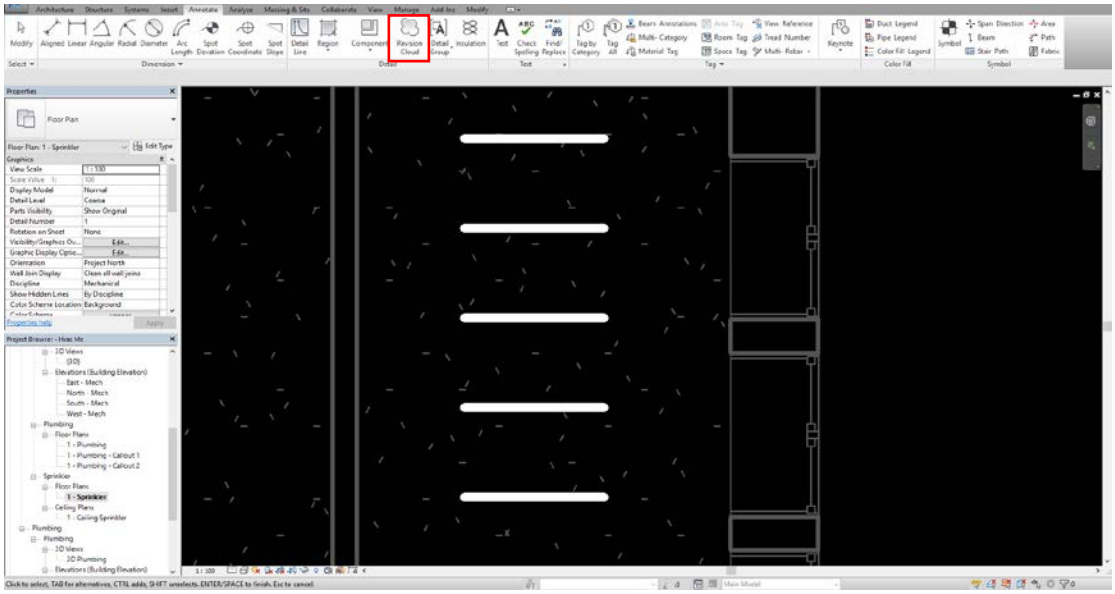
1. Go to View tab, click on Revision button.



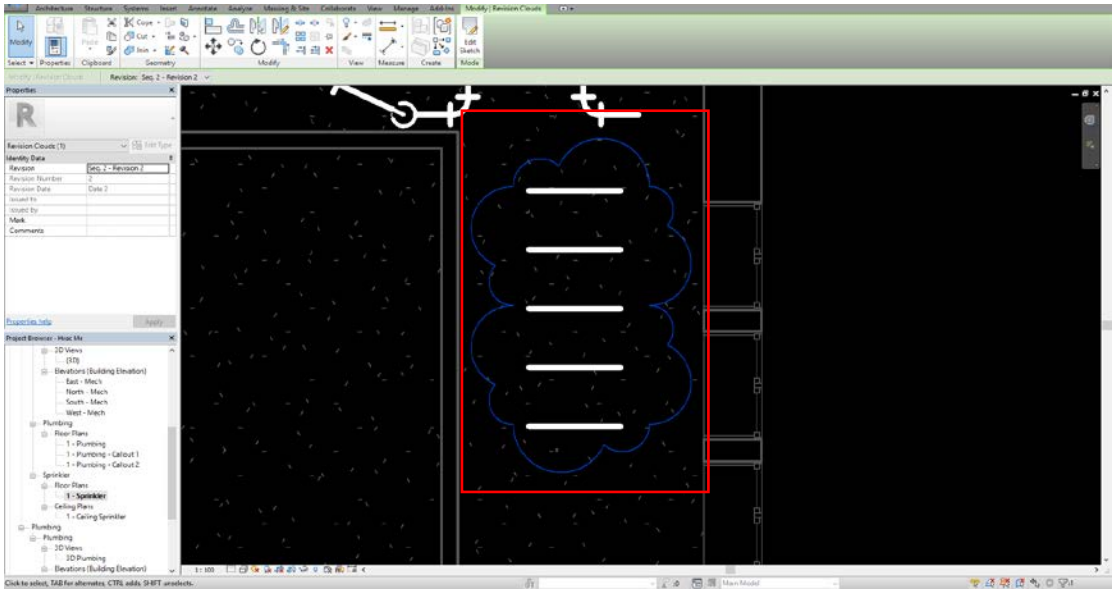
2. Add in revisions as you need.



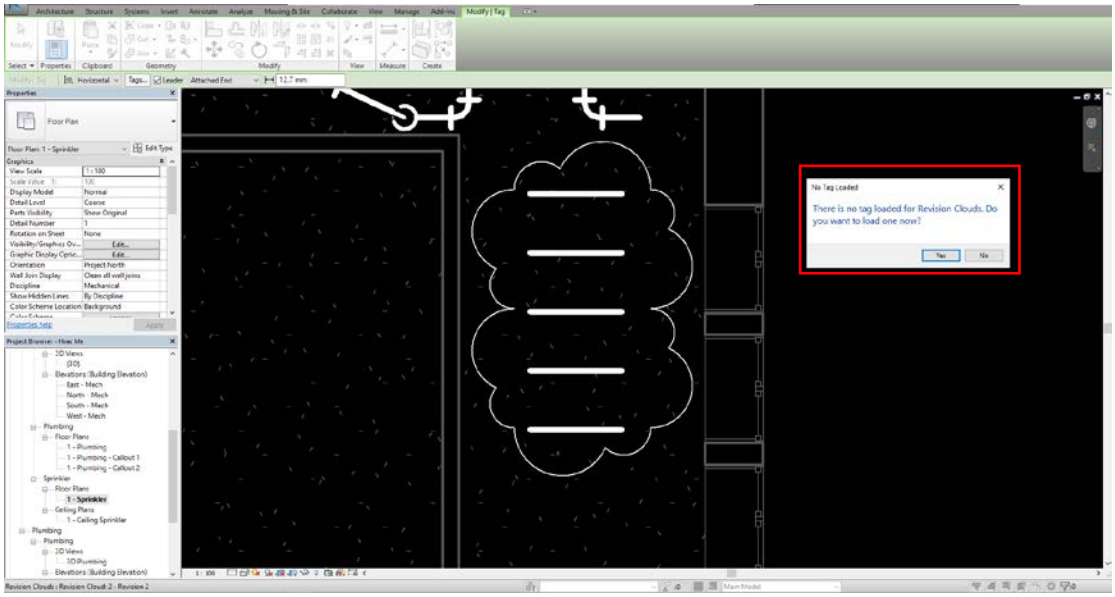
3. Go to Annotate tab, find Revision Cloud.

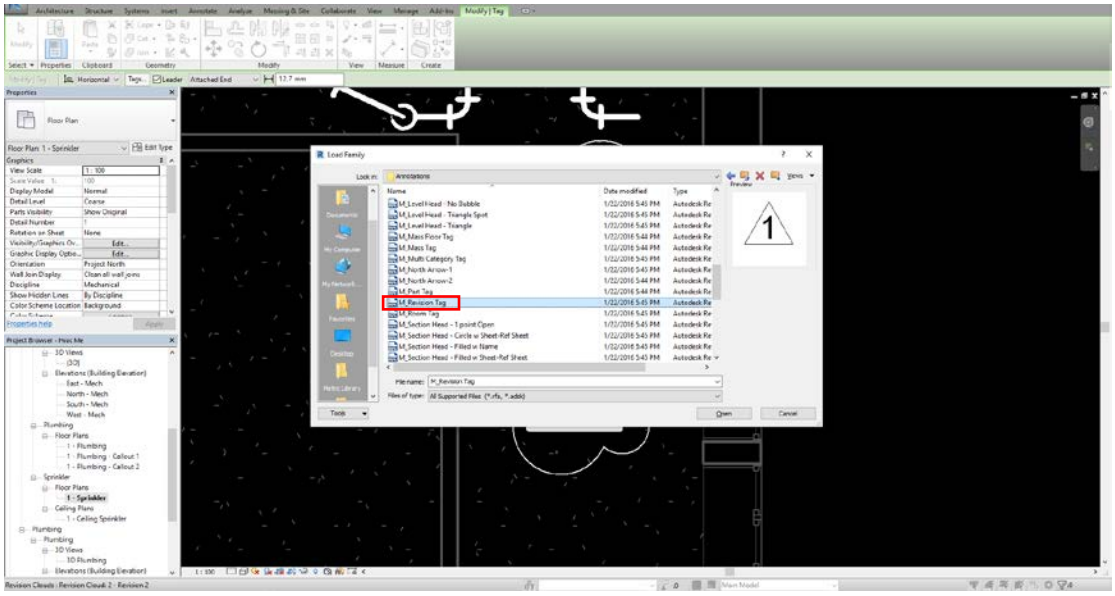


4. Suround your revisd areas with revision cloud.



5. Tag your revison cloud. Notice that we didn't load any revison tags so we have to find it in our library first. (Annotations – Revision Tag)


No Tag Loaded
There is no tag loaded for Revision Clouds. Do you want to load one now?
Yes
No


Load Family
Annotations
M_Revision Tag
Open
Cancel

6. Tag it properly.