Pesky Electrical Settings That Drive You Crazy

Mike Massey – Applied Software

MP1272 - Autodesk® Revit® MEP software for electrical engineering is all about coordination. Yes, it does modeling in 3D, but the biggest benefit for electrical is not that it can model 3D lights. Rather, it is that it produces a coordinated model with the insurance that everything is circuited and documented correctly. Setting up Revit MEP for Electrical can be painful. There are many pesky settings and things that just do not work the way you want them to work. Come and join me as we discuss the major items that I have discovered that keep electrical engineers up at night trying to configure Revit MEP to work the way they want it to. We tackle problems such as editing panel schedules, changing graphics of nested families, working with homeruns, working with hosted fixtures, and working with load classifications. Don't let Revit MEP get the best of you. Learn how to fix these pesky settings before they drive you crazy!

Learning Objectives

At the end of this class, you will be able to:

- Control the graphics of nested symbol families
- Apply tips and tricks when creating electrical circuits
- Work with and configure electrical panel schedules
- Explain how Load Classifications and Demand Factors are applied

About the Speaker

Mike Massey graduated from Texas A&M University with a degree in Architecture. He has 15 plus years of experience working as an architect. He is currently Senior AEC Application Specialist for Applied Software. Since joining Applied Software, Mike specializes in BIM implementation for architects and MEP engineers. In addition, Mike has been responsible for providing customer demonstrations, implementation, training and support for the Autodesk AEC products for architects, engineers, and contractors. Mike has spoken at various AIA functions on the benefits of BIM (Building Information Modeling), conducted regional CAD Camp seminars, is a repeat speaker at Revit Technology Conference, and is a repeat speaker at Autodesk University. Mike is a contributing author for Autodesk Official Training Courseware and has also been published in a number of industry magazines and newsletters regarding BIM and other productivity topics related to the Autodesk Building Solutions

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Introduction

For an Electrical Engineer, Revit not only produces construction documents, it should also be used to assist as a design tool. Revit has many tools built into the program to assist in coordinating circuits, panels, and schedules to ensure that the entire project is coordinated. To begin using Revit effectively, certain steps must be taken to ensure that the program is using the correct graphics or standards to match the firm's standards. Most of the settings that will be discussed in this session can and should be set up in a Revit template file so each project is started with the correct settings.

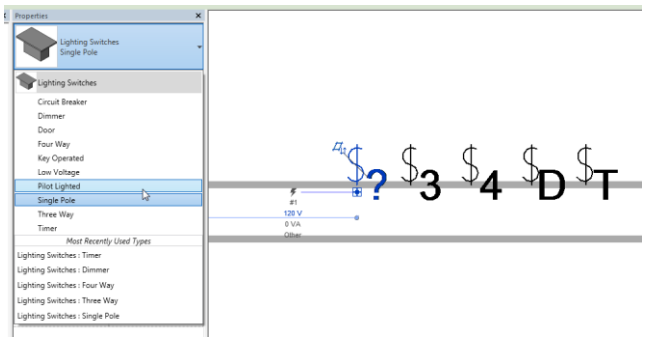
Though out my career, I have assisted many Electrical Engineers in setting up Revit to work effectively for their specific firm. I have come across many questions in this process that are essential in this process and that is what this class is all about. This class will discuss and show how to solve some of the many questions that I have been asked while I was assisting in setting up Revit for different firms.

Working with Nested Families

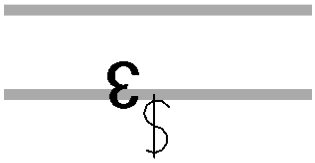
We will begin with looking at how nested families are used for many of the electrical devices in Revit. A nested family is simply a family that has another family inside of it. Many of the devices that are 'out of the box' are created this way. The nested family is usually a Symbol Family that shows the 2D graphic representation of the device that we see in a plan view. It is specifically a symbol family because symbol families will change scales based on the scale of the view that they are visible in. This allows our symbolic graphic to always be legible and not just a tiny dot, or too large as we change the scale.

Correcting Upside down Switch Labels

The most asked question that I have received is about the Lighting Device symbol. When using this symbol, there are multiple types to indicate what type of light switch is needed to be shown. Some of the types included with the family are: Single Pole, 3 way, 4 way, Dimmer, Timer, etc…

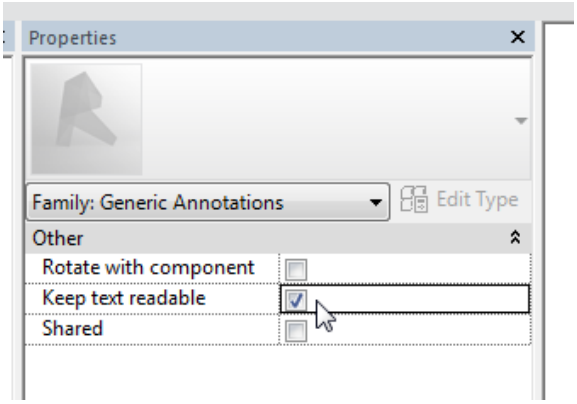


The family uses a label to indicate which type is being used. The question that I am typically asked is about the label when the family is inserted onto a wall, and the switch is facing down in a plan view. The label is upside down. How do you rotate the label so it is not upside down?



This is a simple fix once it is understood that the label is part of a nested symbol family. To correct this, simply click on the switch family and then select **Edit Family** from the **Modify tab**. This will open up the family in the family editor. Once inside the switch family, change your view to the **Ref. Level** plan view. In the plan view, the symbolic nested family will be visible. Select the nested symbolic family and the select **Edit Family** from the **Modify** tab again to open up the nested family.

Inside the nested symbolic family, all that needs to be changed to fix the problem is a check box in the properties. Check the box for the parameter "**Keep Text Readable**".

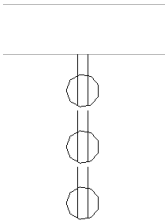


Once the check box is checked, all that is remaining is to load the families back into each other and then load the family back into your project. Since it is a nested family, be sure to first load it back into the Lighting Switch family first, and then load the Lighting Switch family back into your project.

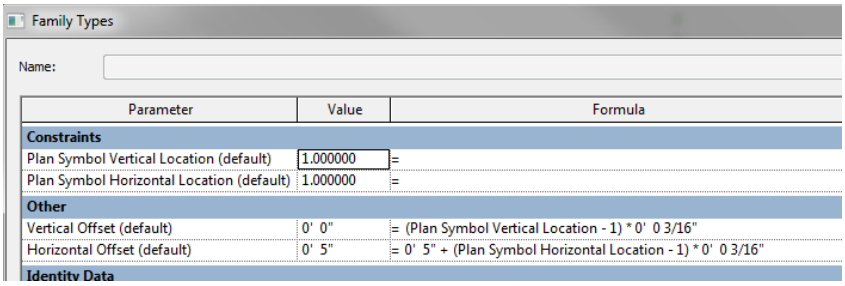
Control the Graphics of Nested Symbol Families

Another common question I receive concerning nested symbol families is how to show multiple devices that are in the same location in plan view but are stacked above or below other devices. For example, multiple receptacles that are at different elevations.

In the CAD world, this would be indicated by moving the receptacle symbol out from the wall with a height adjacent to the symbol to call out the elevation height. The big difference between CAD and BIM is that in BIM you need to model the receptacle in the correct location to allow for clash detection, so you cannot just move the symbol.



This can be accomplished by modifying the nested symbol family to allow for the graphics of the symbol to be moved while keeping the 3D geometry of the receptacle in the correct location. To do this you will need to add a location parameter that is associated with a dimensional parameter to move the graphical symbol away from the wall.

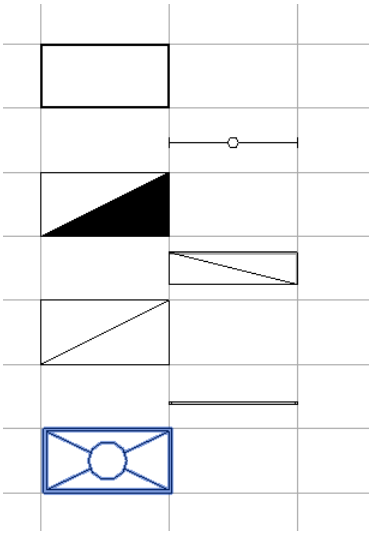


The label on the symbol family can be used to indicate the height of the receptacle. This will keep your receptacle family readable and allow stacked devices.

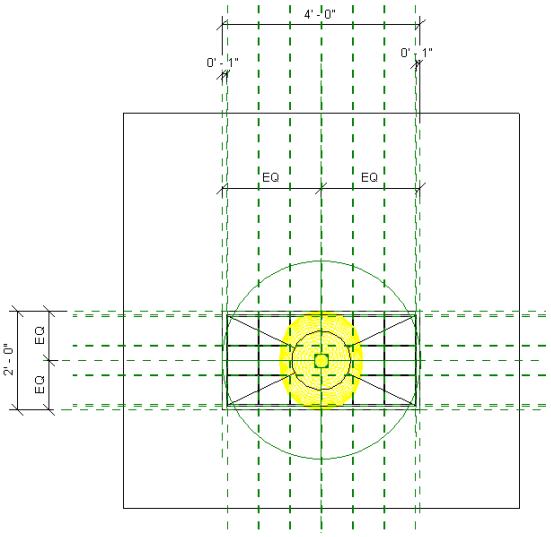
Working with Light Fixtures

Changing the Graphics of a Light Fixture

Light fixtures are indicated on plans by using a symbol in plan view to distinguish them from other light fixtures. The graphics that represent the light fixture often need to be customized to match office or project standards. To change the graphics of a light fixture, it is important to understand that the light fixture families are created with four main parts.



All light fixture families consist of 3D geometry, a light source, an electrical connector, and 2D line work. The 3D geometry is what is seen if you are viewing the fixture in 3D, section, or elevation. It is typically parametric in that it allows the dimensions to be modified to create multiple types and sizes.



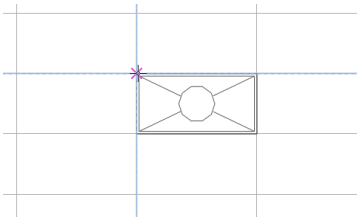
The light source is the intelligent information that is used to indicate the type of lamp and the photometric of the fixture. Manufacturers can typically supply a photometric file in the form of an .ies file. All light fixture families and point to the appropriate photometric file to indicate the correct light source information.

The electrical connector contains the information that is needed to circuit the light fixture. The electrical connector will have both load information and voltage. The load and voltage can be changed to meet your project needs.

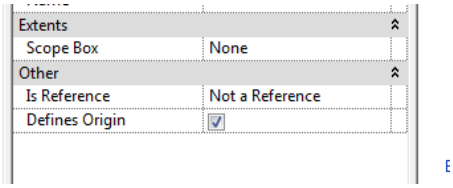
Finally, the 2D geometry is the linework that is indicated on plans and reflected ceiling plans. If the 2D geometry needs to be changed to meet office standards, this can be done without having to change the 3D geometry. If the family is edited, the 2D linework can be seen in either the plan view or the ceiling view. The linework can be deleted and/or new linework can be added. When modifying the 2D linework it will not affect the 3D geometry. The 2D linework will probably need to be locked to the reference planes so it will flex with the family when new sizes are required.

Changing the Origin of a Light Fixture

Going back to my CAD days, I always taught my users to make the insertion point for blocks in the lower left corner of the block. This would keep consistency when inserting the blocks and allow you to snap to intersections to locate them correctly. Moving to the BIM world, the same logic applies. It is important to create consistency when creating families, by making the insertion point in the lower left corner of the family.



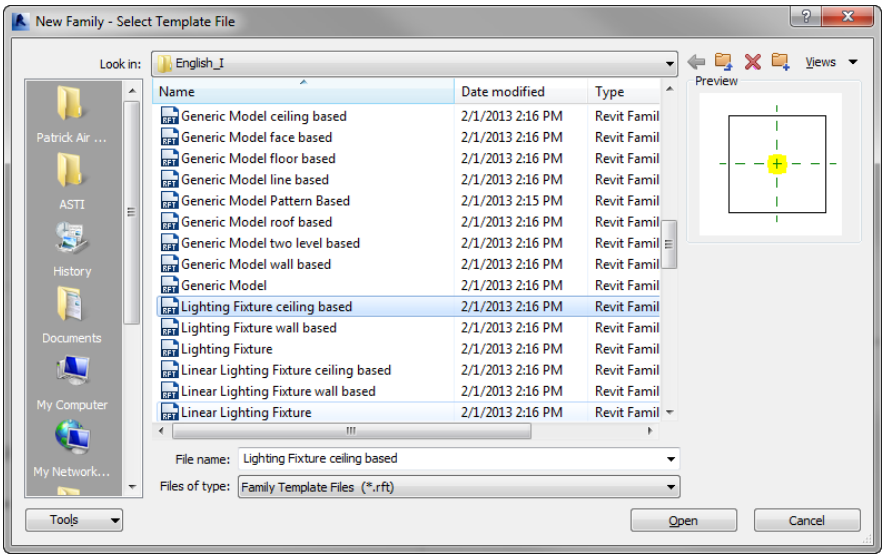
The insertion point of families is defined by defining the origin of the family. When a family is started from using a family template, the family will start with two reference planes. The intersection of these two reference planes defines the origin, or the insertion point. If the family is created with the intersection of the reference planes in the center of the family, then the insertion point will be in the center of the family. If the family is created using the reference planes as the lower left corner, then the insertion point will be the lower left corner.



Existing families can be modified to change the origin by modifying the family. Reference planes can be selected. When they are, one of the parameters in the properties is **Defines Origin**. If a reference plane does not exist where the desired origin needs to be defined, then a new reference plane can be drawn, and the **Defines Origin** parameter can be checked to define the new reference plane as the origin. If reference planes do exist where the desired origin is required, then the reference plane can be selected and the **Defines Origin** check box can be checked to change to origin to the new plane. Both the horizontal and the vertical reference plane need to have the **Defines Origin** check box check to define the intersection of the two reference planes as the origin. Reference planes should be dimensioned or locked to the geometry so the planes will move if the family is modified to a new size.

Converting a ceiling hosted family to a face hosted family

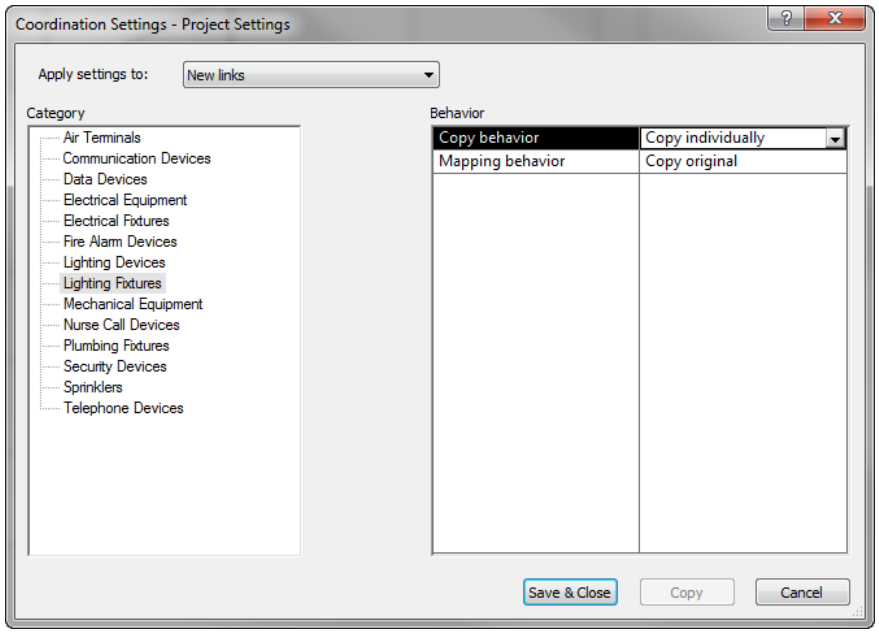
When families are created, a family template is chosen to begin the family. There are multiple family templates that can be chosen when the family is started. The family templates are either hosted or non-hosted. If the family is hosted, then the family must be attached to another object in the model. The hosted family templates can be Wall, Floor, Ceiling, Roof, or Face hosted. If a wall, floor, ceiling, or roof is used then the family must be attached to a live wall, floor, ceiling, or roof. The family will not recognize a linked wall, ceiling, floor or roof. Most of the time Electrical Engineers will be attaching families to faces inside a linked architectural model. Typically Electrical Engineers will not have live walls, ceilings, floors, or roofs; they simply use the linked architectural model to represent the walls, floors and roofs.



The face hosted family templates allow the family to be inserted onto any face. A face is simply a surface. A surface could be live in the MEP model or could be inside the architectural linked model. This allows families to be attached to any surface. It is preferable to have all hosted MEP families to be face hosted as opposed to wall, ceiling, floor or roof hosted.

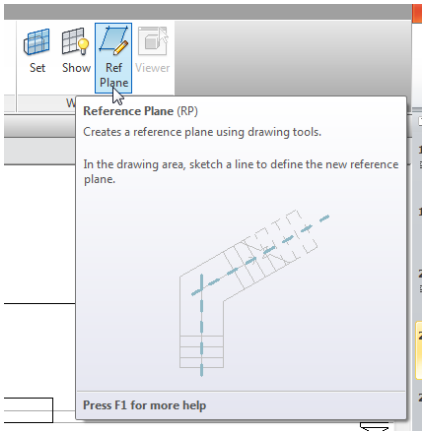
Most of the out of the box hosted families that come with Revit are created using a face as the host, so they can be hosted to linked surfaces. When content is downloaded from the internet, this is not always the case. It is not an easy change if a hosted family needs to be changed from being hosted from a wall, ceiling, floor or roof to a face based host. The recommend fix is to recreate the family using a face based template.

There is an easier fix, one that I actually discovered by accident. If the family is copied into your project by using the **Copy/Monitor** command, it will change the host to a face based hosted family. This can be done by creating a file and inserting the family hosted to a wall, ceiling, floor or roof and then linking that file into another project using the **Link Revit** command. Once the file is linked, perform a **Copy/Monitor** command and copy the desired family. Once the family is copied, it becomes a face base hosted family. The family can then be saved out as a new family.

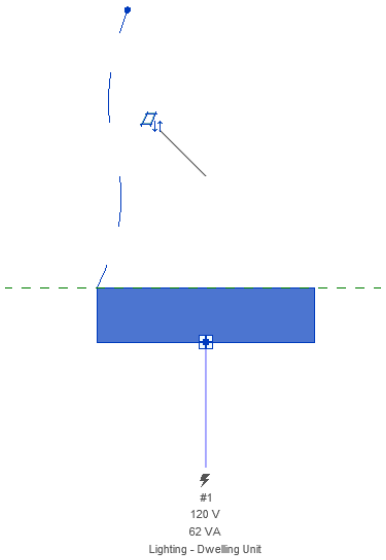


Placing Hosted Lights without a Face (Ceiling)

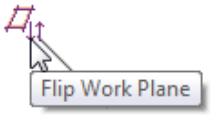
Even with Face hosted fixtures, a surface is required. If the need arises where a fixture needs to be placed prior to the surface being modeled, or if a fixture needs to go into an area without a surface (as in an exposed structure ceiling), this can be accomplished by using the place on a **Work Plane** option. A **Work Plane** is created by either a **Level Line** or a **Reference Plane**. A **Reference Plane** can be added by going into a Section or Elevation View and using the **Ref Plane** command.



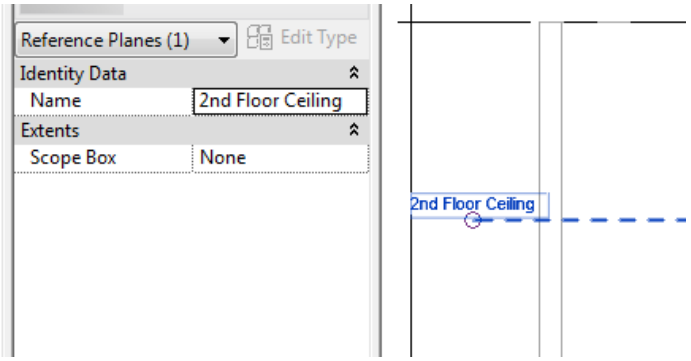
The **Ref Planes** inside of Revit have a top and a bottom associated with them, although it is not called out as you create it. If a Reference Plane is created by drawing the plane from left to right, the top will be on the bottom. The correct procedure is to draw the **Reference Plane** from right to left. This will put the top on the top. If the plane is drawn incorrectly the lights that are hosted to the **Reference Plane** will be attached upside down.



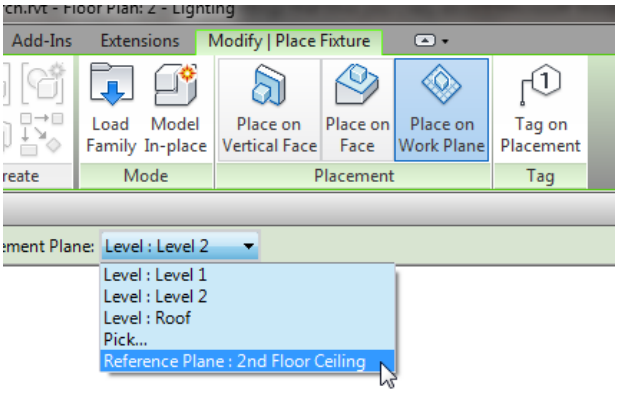
If the lights are upside down, the light fixture family has a flip grip that can be clicked to flip the light to be right side up. It is important to ensure that the lights are right side up so the light shines into the space below.



Reference Planes can be named as well. It is important to name the Reference Plane so it can be identified when trying to select it when the light fixture is being placed.



To use the place on **Work Plan** option for a hosted fixture family, you can select it off of the ribbon once the Light Fixture command is started. Once you pick **Place on Work Plane**, you can then use the drop down on the **Options Bar** to select the Reference Plan by name.

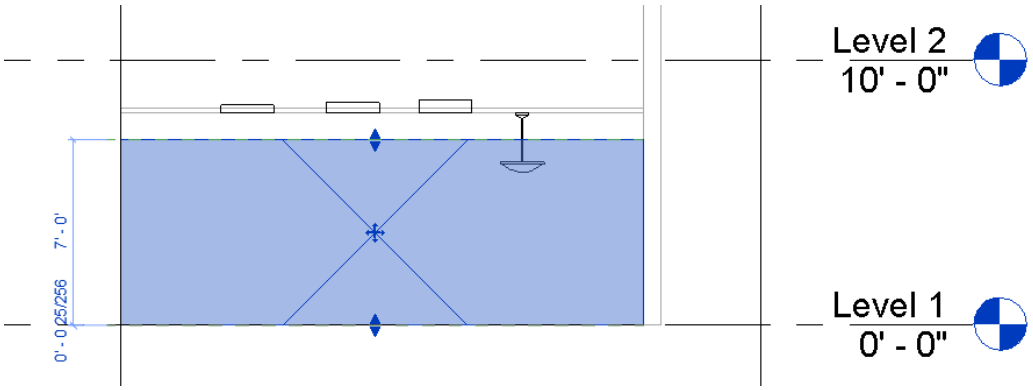


The light fixture will then be hosted to the **Reference Plane** and will have the same elevation as the Reference Plane.

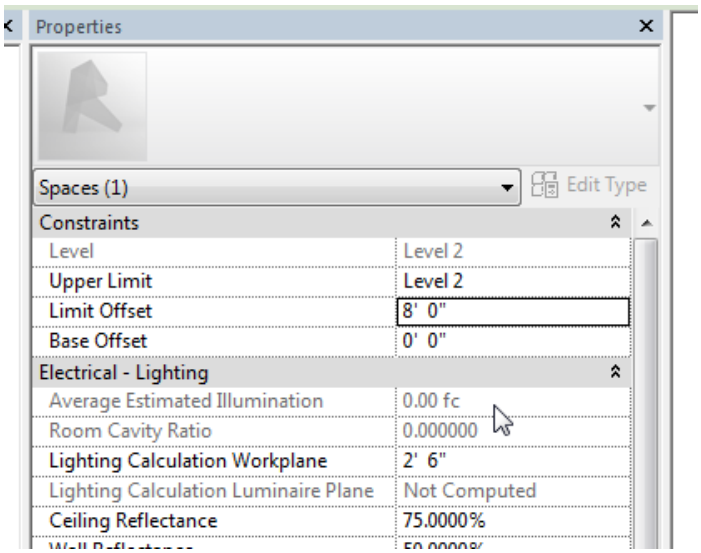
Space not Calculating Foot Candles

When light fixtures are placed into spaces, the space will calculate the average Foot candles for the space based on the lights in the space. The calculation is automatically done as long as the lights are in the space. The space will not calculate the Foot Candles if the lights are outside the Space or if the lights are linked into the Revit model.

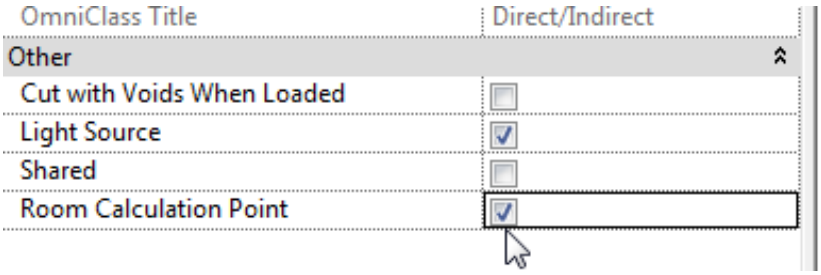
It is important to understand that Spaces are 3-dimensional spaces. The heights of Spaces are set by assigning a height to the **Limit Offset** parameter. The default height for spaces is 8'-0". If the ceiling is higher than 8'-0", this should be changed to match the ceiling height. To determine the height of the ceiling, a section can be cut through the space.



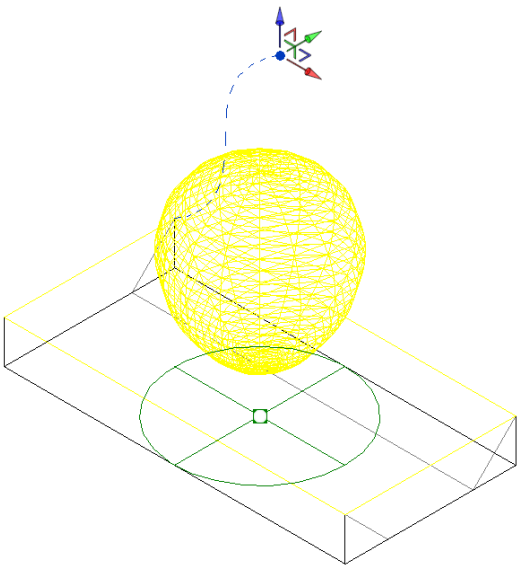
Once the ceiling height is determined, the **Limit Offset** can be assigned, or the top grip of the space can be dragged above the ceiling to raise the height of the space up. The ceiling is a **Room Bounding** object, so the space will stop at the ceiling even if the top grip is raised higher than the ceiling. Once the space height is changed, the Foot Candle load should be indicated in the properties of the space.



Another way to ensure that all lights are in the space is to use the **Room Calculation Point** in the family of the light fixture. The **Room Calculation Point** is now in all families (which is a new feature) but is turned off by default. To turn on the **Room Calculation Point**, the family needs to be opened and then the check box checked in the **Properties** for **Room Calculation Point**.



Once the **Room Calculation Point** is turned on, a movable point will be indicated in the family. This point can be moved to the underside of the light fixture so that when loaded into the project it is in a space. When the light fixture is loaded back into the project with the **Room Calculation Point** turned on, the space will calculate the Foot Candles as long as the **Room Calculation** Point is inside of the space. This will allow lights to be outside of the space, but have the Foot Candles be calculated.

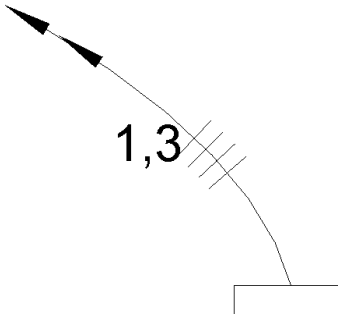


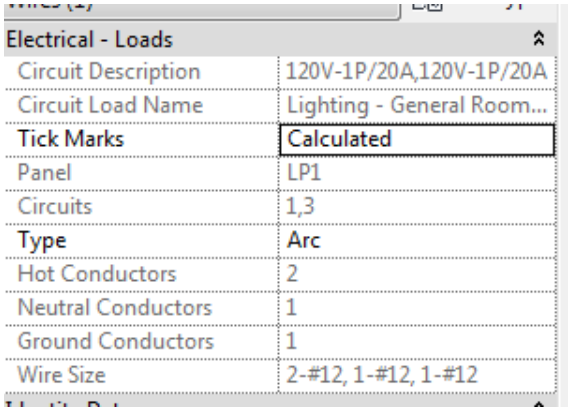
Tips and tricks when creating electrical circuits

Double Homeruns

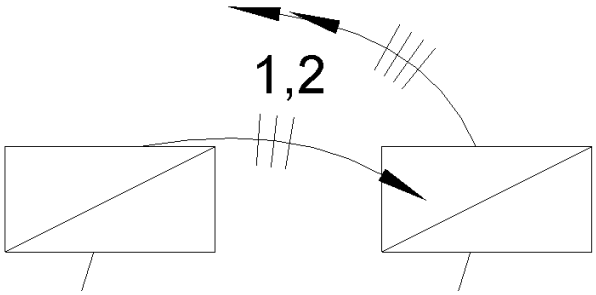
Circuits are created by creating a **Power System** for the electrical devices or fixtures, and then selecting the electrical panel that will host the circuit. Once the circuit is created, wires can be drawn to indicate the wiring layout for the circuit. The wires do not make the circuit. The circuit is made by creating the **Power System**. Wires do not have to be drawn if they are not needed. If wires are drawn, **Homeruns** can be indicated for the circuit by drawing a wire from a circuited device or fixture and then picking a point other than another device or fixture. **Homeruns** can also be tagged to indicate the circuit number and/or the electrical panel name.

If a **Double Homerun** needs to be indicated, this can be done by dragging a homerun from one circuit to a fixture or device on a different circuit. As soon as the home run has been dragged to the other fixture or device, the home run on the second circuit will change and indicate the double home run by adding an additional arrow head to the home run, and adding an additional tick mark. If the home run is tagged, the tag will be updated to call out both circuits.

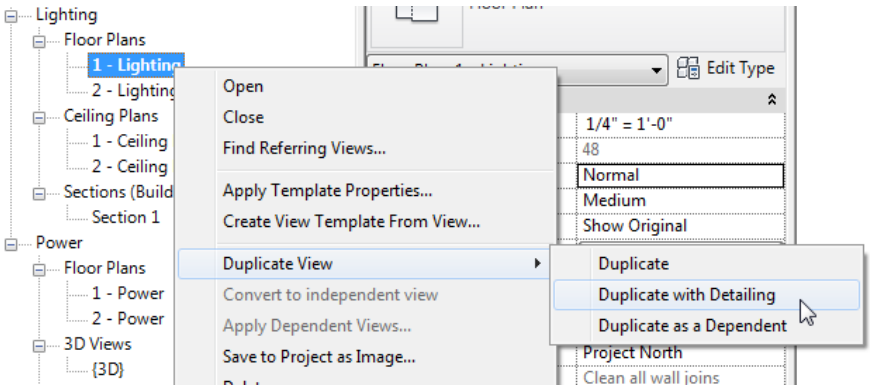




In previous releases of Revit, there was a graphical error that bothered many users. The homerun that was dragged to the fixture or device on the other circuit would keep the initial arrow head as opposed to removing the arrow head.



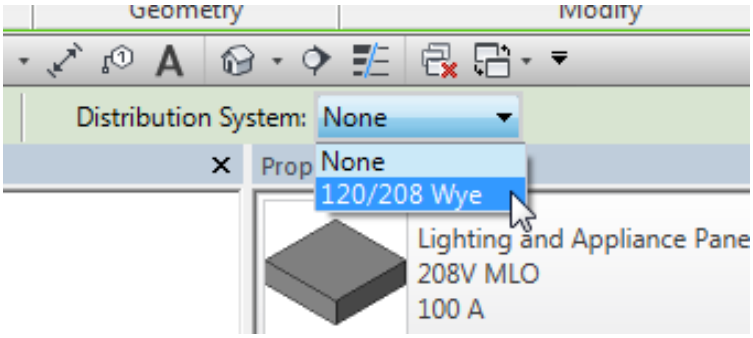
This graphical error could be fixed by duplicating the view with detailing. Once the view is duplicated, the extra arrow head on the first circuit is deleted. This workaround works for releases prior to 2014.



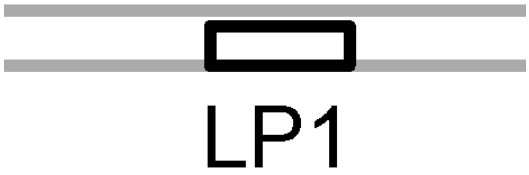
In 2014, it appears that this has been fixed. Performing the same steps in 2014, the extra arrow head is not indicated on the first circuit. This fix is undocumented and occasionally does not work. So if, you need to delete the unwanted arrow head, you can fix it by duplicating the view with detail.

3 Most Important Parameters when Inserting Panels

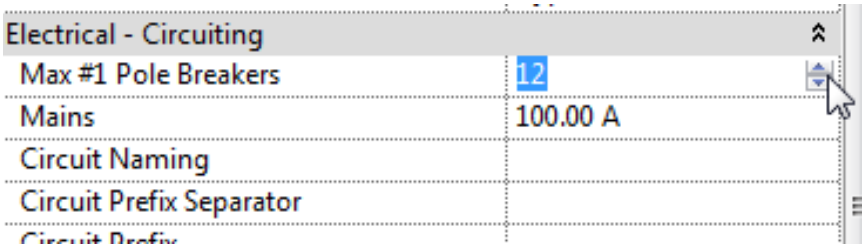
There are three important parameters that should be checked or changed when inserting an electrical panel. One of these is mandatory prior to creating circuits on the panel. After inserting a panel, the **Distribution System** must be assigned. Revit will not allow anything to be connected to the panel until the **Distribution System** has been assigned. The **Distribution Systems** are defined in the **Electrical Settings**. The **Distribution System** is assigned by using the drop down on the **Options Bar**. By default it is initially set to **None**.



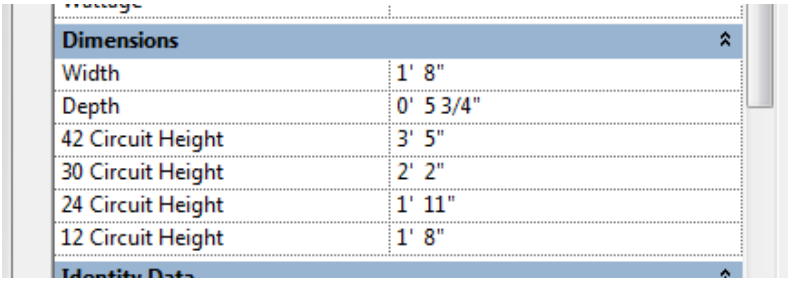
The second parameter that should be changed is the **Panel Name**. This parameter is found in the properties of the panel. Once the **Panel Name** is added, the panel can be tagged to indicate the Panel Name.



The third parameter that is recommended to change is the **Max #1 Pole Breakers**. The initial value is set to 12. If this is left alone, the panel can only hold 12 circuits. When the 13th circuit is created, the panel will not be able to be selected for the circuit.



The **Max #1 Pole Breakers** also defines the height of the panel box. As the number of circuits is changed, the height of the panel is changed. This is indicated in the **Type Properties** of the panel.



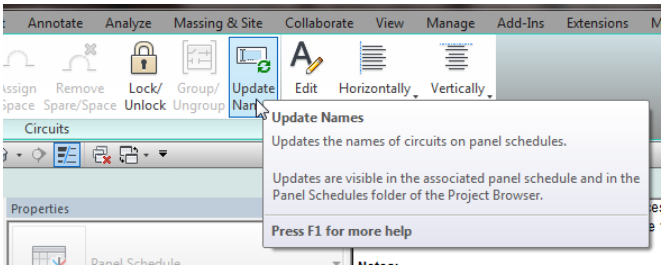
Working with Panel Schedules

Load Names in Panel Schedule

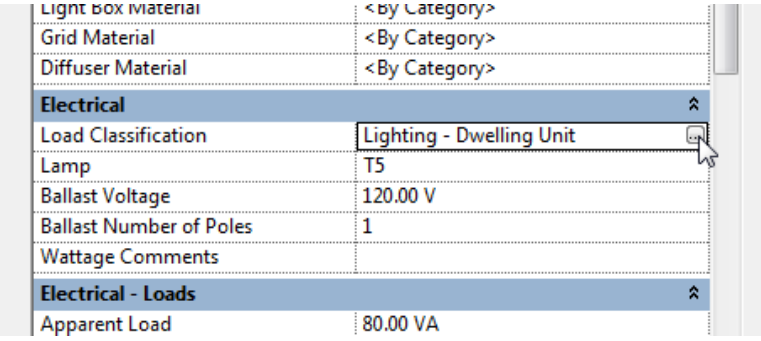
When creating circuits in Revit, Revit will automatically give the circuit a **Load Name** in the panel schedule in the **Circuit Description**. The default load name is defined by the **Load Classification**, the **Space Name** and the **Space Number**.

CKT	Circuit Description	Tri
1	Lighting Space 1	20
3	Lighting Space 1	20
5	Receptacle Space 1	20
7		
9		

If the space name or number is changed after the circuit has been made, the **Load Name** can be updated by using the **Update Names** button on the ribbon when in the **Panel Schedule** view. If the circuit spans across multiple spaces, the **Load Name** will use the **Load Classification** and the **Space Numbers**. If the rooms have the same name, then the **Space Name** will be included in the **Load Name**. If desired, the entire **Load Name** can be typed over to use the name of your choice.



The **Load Classification** is assigned in the **Type Properties** of the fixture or device. Revit comes with many **Load Classifications** to choose from. Additional **Load Classifications** can be added by adding them to the settings in the **MEP Settings**.

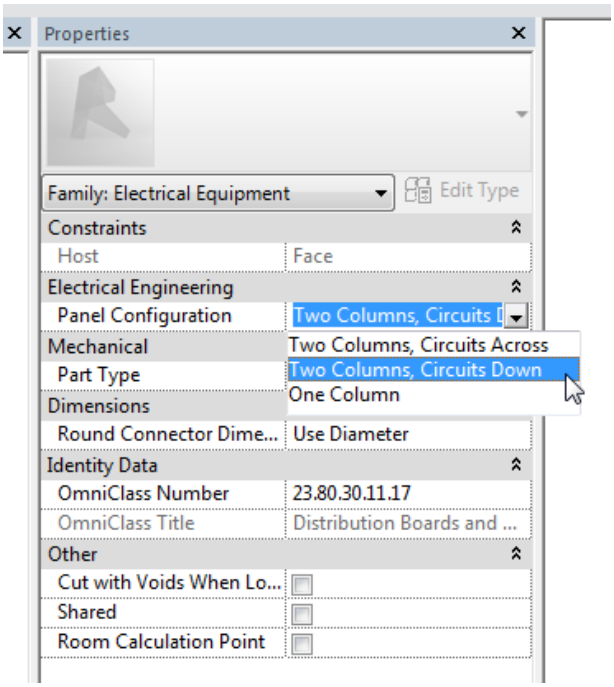


Getting Panels to Number down instead of across

By default the electrical panel numbers the circuits across as opposed to down. This method is acceptable by many but some would prefer have the circuit numbers go down. If you look at the electrical settings and examine the Panel Templates you will not find a way to change the numbering system.

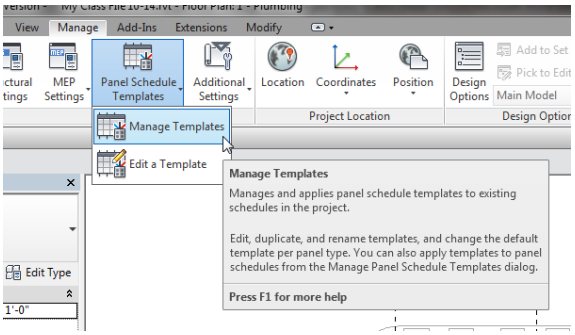
CKT	Circuit Description	Trip	Poles
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

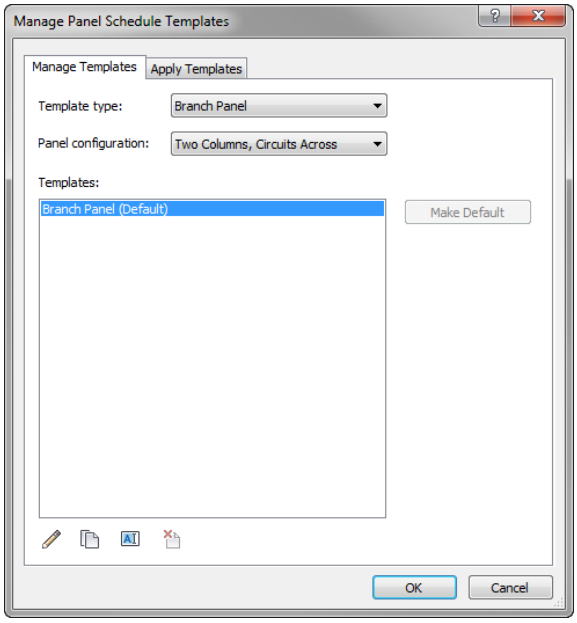
It is a very simple change once you know how. To change the numbering system you need to open the family of the electrical panel. Once the family is opened, you will see **a Panel Configuration** parameter in the properties. Use the drop down next to this parameter and change it to **Two Columns, Circuits Down** and reload the family back into your project. It will automatically change the numbering system for the panel schedule. If this is your preferred method, you should modify the electrical panel and load this panel back into your **Project Template** so every project is set up to number the circuits down.



Panel Schedule Templates

When creating an electrical panel you can use the default template select from the list of templates, or a customized template. The templates in your project are managed by the **Template manager**. This is where you can define which template is your current default. You can also create new templates or copy an existing template to make a new one.

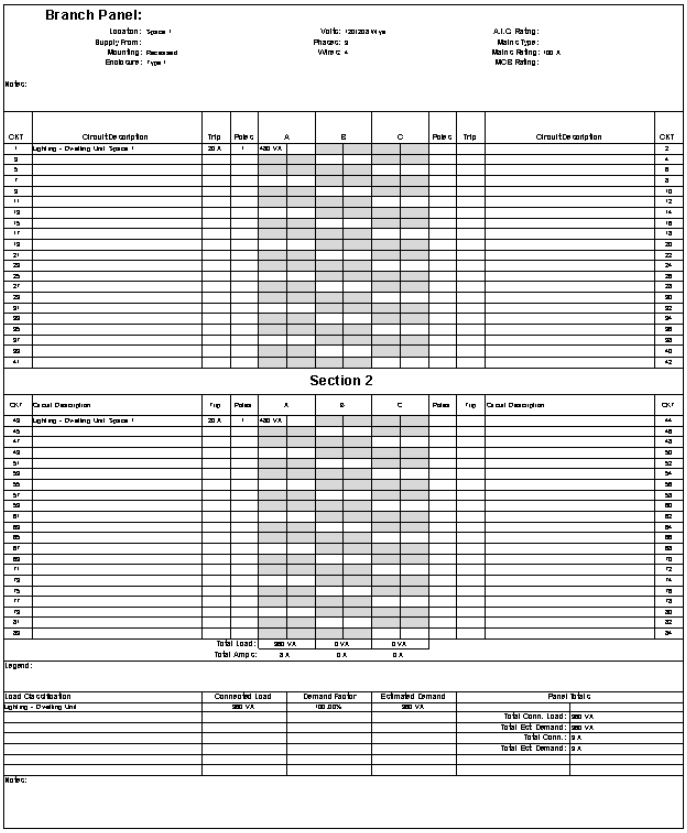




If you need to edit a template you can select **Edit** and it will open up the **Panel Schedule Template**. Modifying the template is similar to working in Excel. You can create new columns or rows, and assign them to use certain parameters. You also have complete control over the graphics, fonts, and spacing of the cells. There are a multitude of items that can be changed to meet your company standards.

CKT	Circuit Description	Trip	Poles	A	
1	<Load Name>	<Ratin	<Numb	<Val>	<Val>
3	<Load Name>	<Ratin	<Numb		
5	<Load Name>	<Ratin	<Numb		
7	<Load Name>	<Ratin	<Numb	<Val>	<Val>
9	<Load Name>	<Ratin	<Numb		
11	<Load Name>	<Ratin	<Numb		
13	<Load Name>	<Ratin	<Numb	<Val>	<Val>
15	<Load Name>	<Ratin	<Numb		
17	<Load Name>	<Ratin	<Numb		

One of the common questions I have been asked is "how do you create a double panel for an 84 circuit panel?" The simple answer is Revit cannot do that, but... like other limitations in the program, there are workarounds to make Revit do what you want it to do. Revit will allow you to have as many circuits as you desire. The problem is that many people want to create the second panel schedule with the numbers starting at 43 (having the first 42 on the first panel). Revit will not allow you to begin the numbering system with anything other than 1.



Branch Panel:

Location: Space 1
Supply From:
Mounting: Recessed
Enclosure: Type 1

Volts: 120/208 V 4 wire
Phases: 3
Wires: 4

A.I.C. Rating:
Mains type:
Mains Rating: 100 A
MCB Rating:

Notes:

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
1	Lighting - Dwelling Unit Space 1	20 A	1	480 VA									2
3													4
5													6
7													8
9													10
11													12
13													14
15													16
17													18
19													20
21													22
23													24
25													26
27													28
29													30
31													32
33													34
35													36
37													38
39													40
41													42

Section 2

CKT	Circuit Description	Trip	Poles	A		B		C		Poles	Trip	Circuit Description	CKT
43	Lighting - Dwelling Unit Space 1	20 A	1	480 VA									44
45													46
47													48
49													50
51													52
53													54
55													56
57													58
59													60
61													62
63													64
65													66
67													68
69													70
71													72
73													74
75													76
77													78
79													80
81													82
83													84
		Total Load:		960 VA		0 VA		0 VA					
		Total Amps:		8 A		0 A		0 A					

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting - Dwelling Unit	960 VA	100.00%	960 VA		
				Total Conn. Load:	960 VA
				Total Est. Demand:	960 VA
				Total Conn.:	8 A
				Total Est. Demand:	8 A

Notes:

There may be other workarounds, but the one that I have found to work the best is to create two customized panel templates and then when the panels are placed onto the sheet, one panel would be place inside of the other panel.

The first custom panel needs to be set so that the number of slots shown is variable. This can be set in the template settings. You then need to add 3 blank rows between the last circuit and the branch totals. The first blank row will be used to place text indicating the second panel. The second blank row will be used to call out the column headers for the second panel. The third blank row will be used to as a place holder for the second panel when the panels are placed onto the sheets. The third row needs to be modified to change the height of the row. The height needs to set to the height of the 24 circuit rows. You can do the math to multiple the height of 1 row times 24 to get the height.

The second custom panel needs to be set to a constant value of 84 circuits. This panel will require more changes than the first panel. You will need to delete the bottom rows that are defining the Load Calculations. You will then need to change the graphics of the first 42 circuit rows to be white in color. The headers of the rows can be changed to use a ghost font. A ghost font is a font that is not visible. You can download a ghost font off of the internet if you do not have one available. Essentially we are trying to create a schedule that calls out only the circuit rows of the last 42 circuits and nothing else.

You can now go ahead and create the panel schedule for the first panel using the first template. Prior to creating the schedule you need to select the panel and change the **Max #1 Pole Breakers** to 48. This will allow you to create a three circuit connection of the second panel on circuits following 42. A circuit needs to be created from the second panel to the first. This circuit needs to be moved to circuits 42, 45 and 47. Once it is moved, the circuits should be locked so they do not move.

The second panel schedule is created using **Default** template. We will change this to use the second template after we lock down the first 42 circuits. To lock the first 42 circuits you will need to assign spares to the first 42 circuits. This will make the first available circuit be 43. Once the spares have been assigned, you will apply the second template to this schedule. When the second template is assigned the first 42 circuits become ghosted.

The panels are now ready to be placed onto the sheets. You will place the first panel and then place the second panel. The second panel will need to be moved to occupy the blank space in the first panel. Panels do not have snaps, so this will have to be done by zooming up and nudging the panel into place.

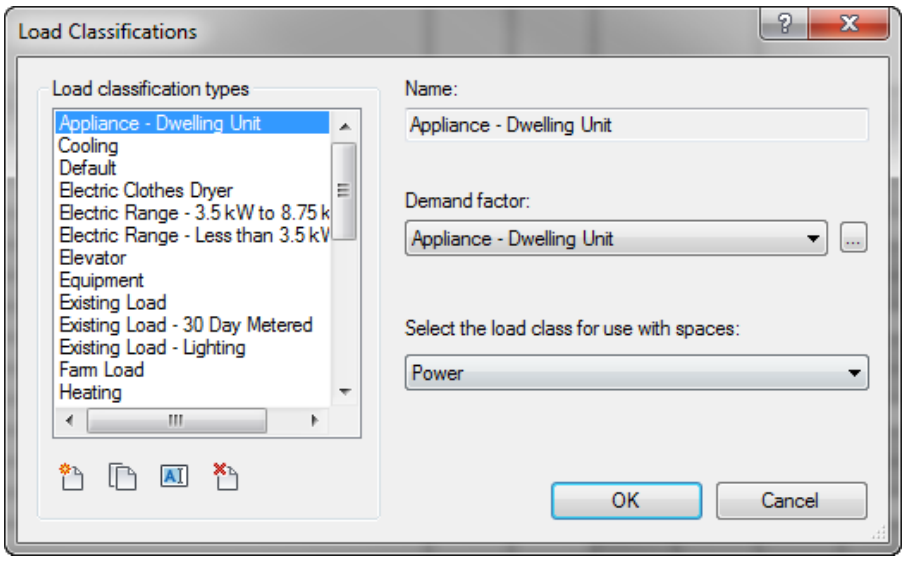
The first panel is picking up the loads from the second panel. The first panel is adding the loads and giving the total demand from both circuits. This is a 'workaround' but it works nicely once it is set up. As with most custom configurations, I recommend that this is done inside of your Project Template so it is set up and ready to be used on all projects.

Load Classifications and Demand Factors

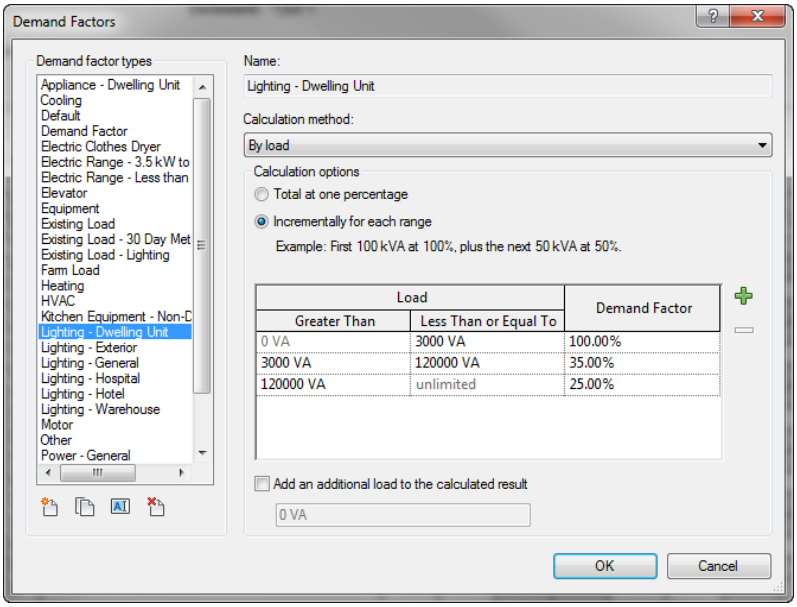
Panel schedules will calculate the **Total Est. Demand** for the panel based on **Load Classifications** and **Demand Factors**. The load is calculated automatically on the default template. It is important to understand how this is calculated to ensure that the load is correct.

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting - Dwelling Unit	960 VA	100.00%	960 VA		
Receptacle	1440 VA	100.00%	1440 VA	**Total Conn. Load:**	20400 VA
Power	18000 VA	100.00%	18000 VA	**Total Est. Demand:**	20400 VA
				Total Conn.:	57 A
				Total Est. Demand:	57 A

To understand how Revit calculates the **Total Est. Demand**, there are two settings that need to be reviewed. These are the **Demand Factors** and the **Load Classifications**. Both of these settings can be found on the Manage tab in the **MEP Settings** drop down. Let's first look at the **Demand Factors** and then we will look at the **Load Classifications**.

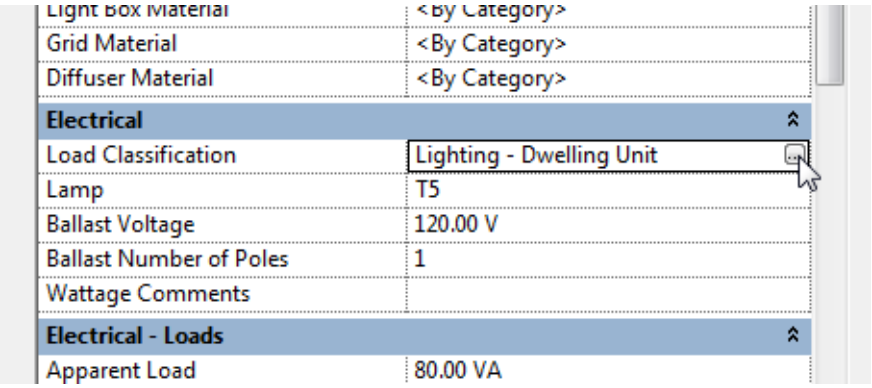


The **Demand factors** allows you to add, delete, or rename demand factors. The factors that are in the template initially are based off of the NEC. Each of the demand factors can calculate the demand based on **Constant**, **By quantity**, or **By load**. These can be modified to meet your specific project needs.



The **Load Classifications** are similar in name to the **Demand Factors**. **Each Load Classification** can be modified to point to use a particular **Demand Factor**. The **Load Classification** also assigns whether the load is a lighting load or a power load. The **Load Classifications** can be renamed, deleted, or new ones can be created.

The **Load Classifications** are then assigned to electrical devices or fixtures. All electrical devices or fixtures will have a **Type Parameter** that will allow you to specify which **Load Classification** that type is assigned to. Once the **Load Classification** is assigned to the device or family, the default schedule will automatically begin calling out the loads and calculating the loads based on the **Demand Factor**.



Conclusion

Using Revit for electrical is extremely powerful. As I stated in the beginning, it is not the fact that it is modeling in 3D that is important to electrical, it is the coordination that it does to ensure that our documents are picking up everything.

Can you use Revit right out of the box? The answer to this would be determined if you are able to accept the default graphics, settings, and content. Many engineers do use it without any customization, but knowing how to customize it to fit your company standards makes Revit even more powerful.

Most everything that has been discussed in this class can and should be set up in your project template so it is available in all projects that are started. The Project Template is never finished. I have heard some companies hesitant to start using Revit until their Project Template is complete. New settings, standards, and content always need to be added to your template. The Project Template is a work in progress.

I hope you have picked up a new tip, trick, or idea from this class. Revit is a powerful tool and knowing how to use it correctly is important.