

# Pesky Electrical Setting in Revit 2018

Mike Massey  
Senior AEC Specialist

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# Presenting Today...



**Mike Massey**  
Senior Technical Specialist



Autodesk Certified  
Instructor



Revit Architecture  
Certified Professional



Revit MEP: Electrical  
Certified Professional



Revit MEP: Mechanical  
Certified Professional



- Graduated from **Texas A&M University** with a degree in Architecture and has **27+ Years of AEC Experience**
- Experience includes various types of projects including residential, commercial, retail, educational, and healthcare
- Is an **Autodesk Certified Instructor** with Professional Certifications in Revit Architecture, Revit MEP (Electrical) and Revit MEP (Mechanical).
- Speaker for AIA functions on the benefits of BIM and repeated speaker at Autodesk University
- **Won top speaker award at Autodesk University 2016**
- **Contributing author for Autodesk Official Training Courseware** and has also been published in a number of industry magazines and newsletters
- Has been an AutoCAD user since Release 9 and AutoCAD Architecture since its debut
- Expertly assists firms in assessing, planning, and implementing new technology
- Provides valuable consulting on executive strategies which assist owners and principals in the deployment of BIM solutions

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# Class summary / Learning Objectives

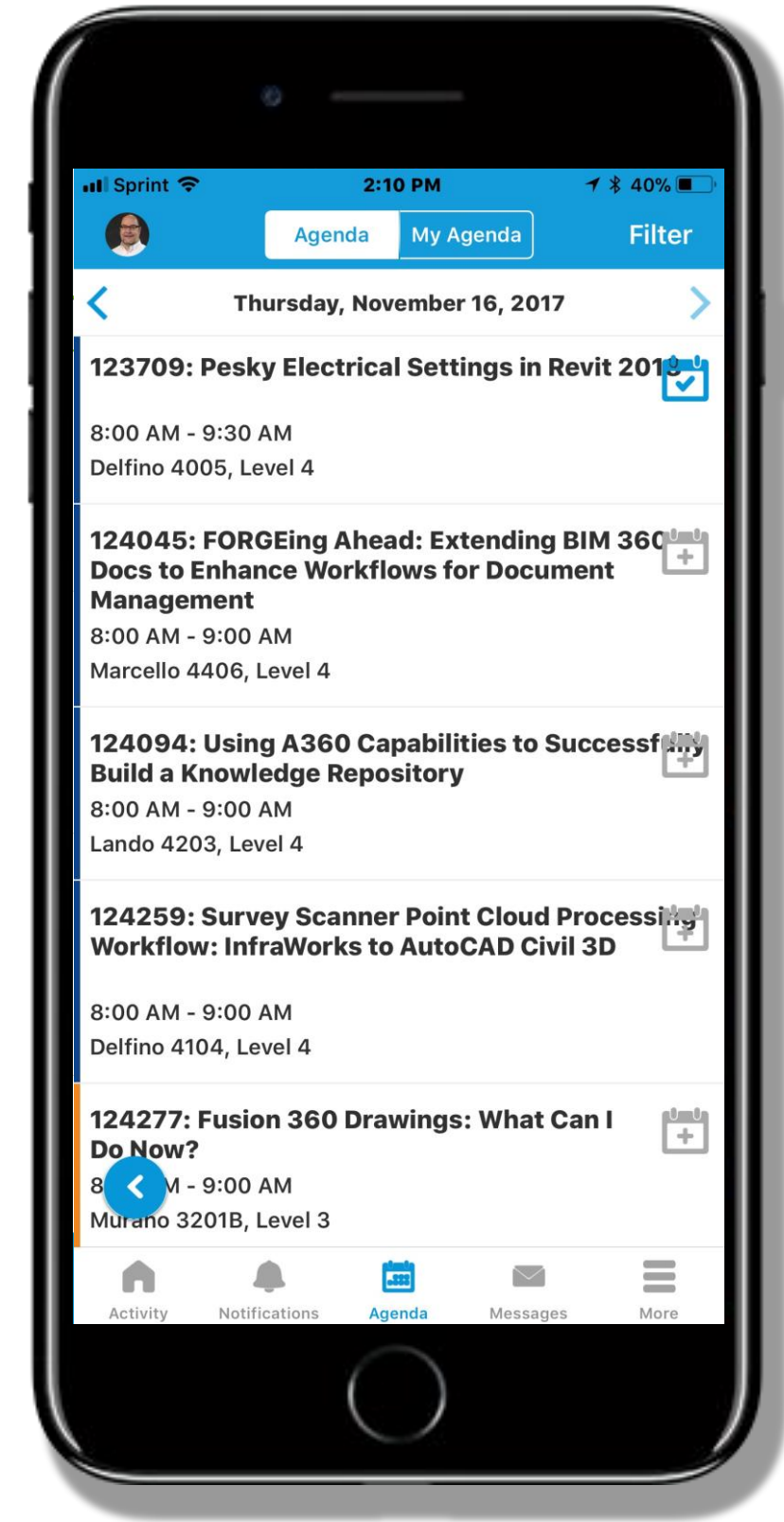
*Revit MEP software for electrical engineering is all about coordination. Yes, it does modeling in 3D; but the biggest benefit for electrical is not that it can model 3D lights. Rather, **it's that it produces a coordinated model with the assurance that everything is circuited and documented correctly.** 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 to this class to discuss the major items that keep electrical engineers up at night trying to configure Revit MEP to work the way they want it to. We'll tackle problems such as editing panel schedules, changing graphics of nested families, creating circuit paths, developing powerful electrical schedules, 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.*

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

- Know how to create powerful electrical schedules
- Know how to define the circuit path in Revit 2018
- Know how to work and configure electrical panel schedules
- Know how load classifications and demand factors are applied

# Agenda

- Introductions
- Working with Lights
- Working with Equipment Families
- Creating Electrical Circuits
- Working with Panel Schedules
- Questions From YOU!
- Additional Topics (Time Permitting)
- Wrap Up





# Class Handout

ES123709

## Pesky Electrical Settings in Revit 2018

- Further Explanation
- Step-by-steps



Table of Contents	
Introduction .....	3
Working with Light Fixtures .....	3
Converting a ceiling hosted family to a face hosted family .....	5
Placing Hosted Lights without a Face (Ceiling) .....	7
Space not Calculating Foot Candles .....	9
Creating Key Schedules for Lighting Loads .....	12
Working with Equipment Families .....	12
Adding Panel Names to 3D Views .....	15
Creating Clearance Zones .....	20
Using Copy/Monitor on Mechanical Equipment .....	24
Creating Electrical Circuits .....	24
Using Filters to Show Un-Circuited Devices .....	26
Viewing and Modifying Circuit Paths .....	27
Working with Panel Schedules .....	27
Load Names in Panel Schedule .....	28
Getting Panels to Number down instead of across .....	29
Panel Schedule Templates .....	32
Load Classifications and Demand Factors .....	34
Creating Load Schedules with No Circuits .....	35
Using Schedules to check if Main is Sized Correctly .....	37
Working with Nested Families .....	37
Correcting Upside down Switch Labels .....	38
Control the Graphics of Nested Symbol Families .....	39
Additional Topics .....	39
Changing the Graphics of a Light Fixture .....	41
Changing the Origin of a Light Fixture .....	42
Double Homeruns .....	43
3 Most Important Parameters when Inserting Panels .....	45
Conclusion .....	

Page 2

# Agenda

- Introductions
- Working with Lights
  - Converting a ceiling hosted family to a surface hosted family
  - Placing Hosted Lights without a Face
  - Spaces not Calculating Foot Candles
  - **Key Schedules for Lighting Loads**
- Working with Equipment Families
  - Adding panel names to 3d Views
  - Creating Clearance zones
  - Use Copy/Monitor to copy Mech Equipment with Connector Families
- Creating Electrical Circuits
  - Use Filters to show un-circuited and not connected to panels
  - Viewing and modifying circuit Paths
- Working with Panel Schedules
  - Load Classification and Demand Factors
  - Load Names in Panel Schedules
  - Getting Panels to Number Down instead of across
  - Panel Schedule Templates
  - ~~Load Schedules (No circuits)~~
  - Using schedules to determine if main is sized correctly on panels
- Questions From You
  - One-Line Diagrams
  - Creating a Family with multiple connectors
  - Load Summaries in KVA
  - Load Names in Upper Case
  - Simplified Wire Size Callout
  - Changing Watts/SF Settings
  - Multiple Circuits through J-Box
  - Calculating Watts/SF on 2-story spaces
- Additional Topics
  - Correcting Upside Down Switch Labels
  - Creating Stacked Devices
  - Changing the Origin of a Light Fixture
  - Double Homeruns
  - Changing the Graphics of a Light Fixture
  - 3 Most important parameters when inserting panels
- Wrap Up



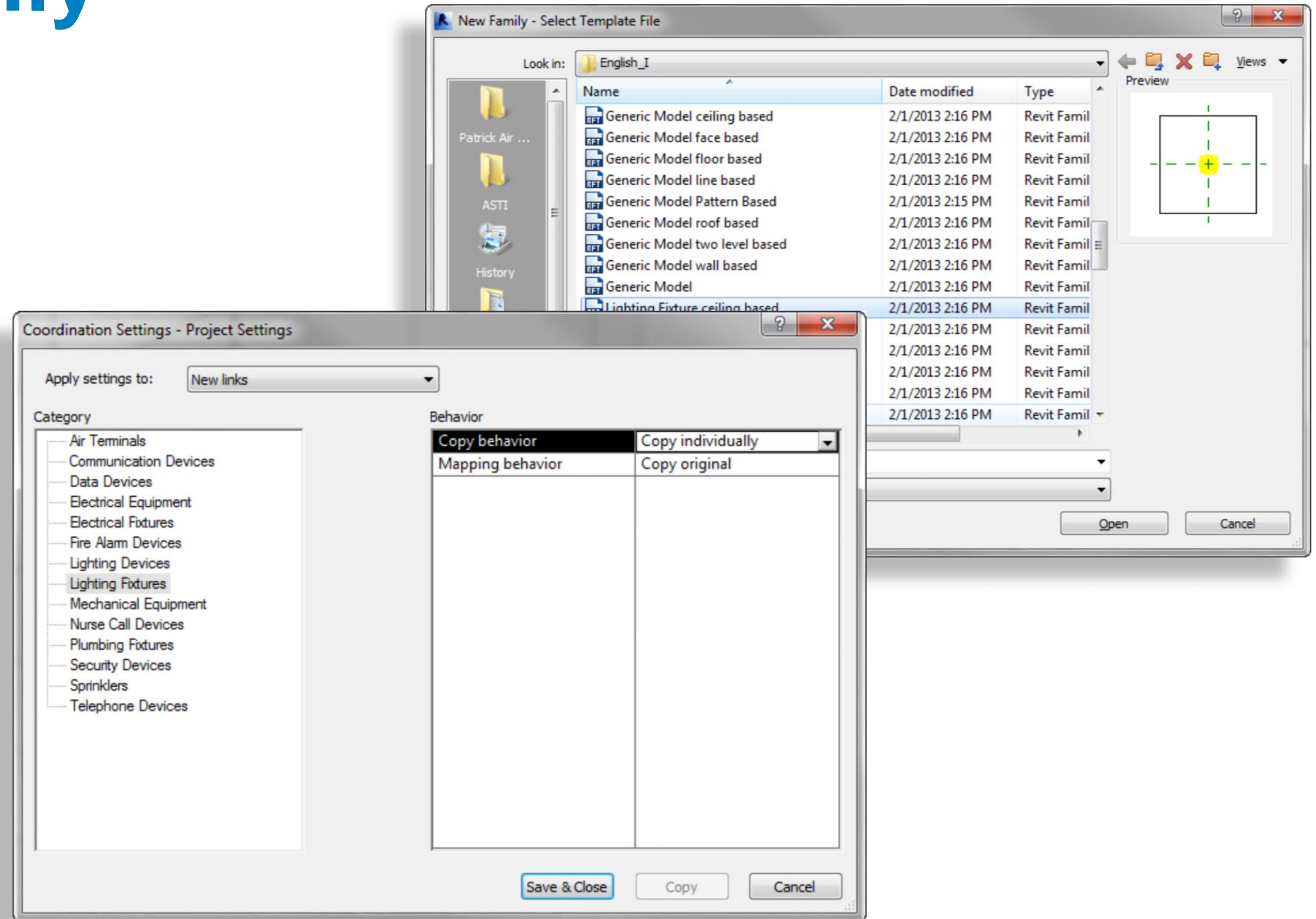


# Working with Lights



# Converting a Ceiling Hosted Family to a Non-hosted Family

- Link in Family
- Use Copy/Monitor
- Save as New Family

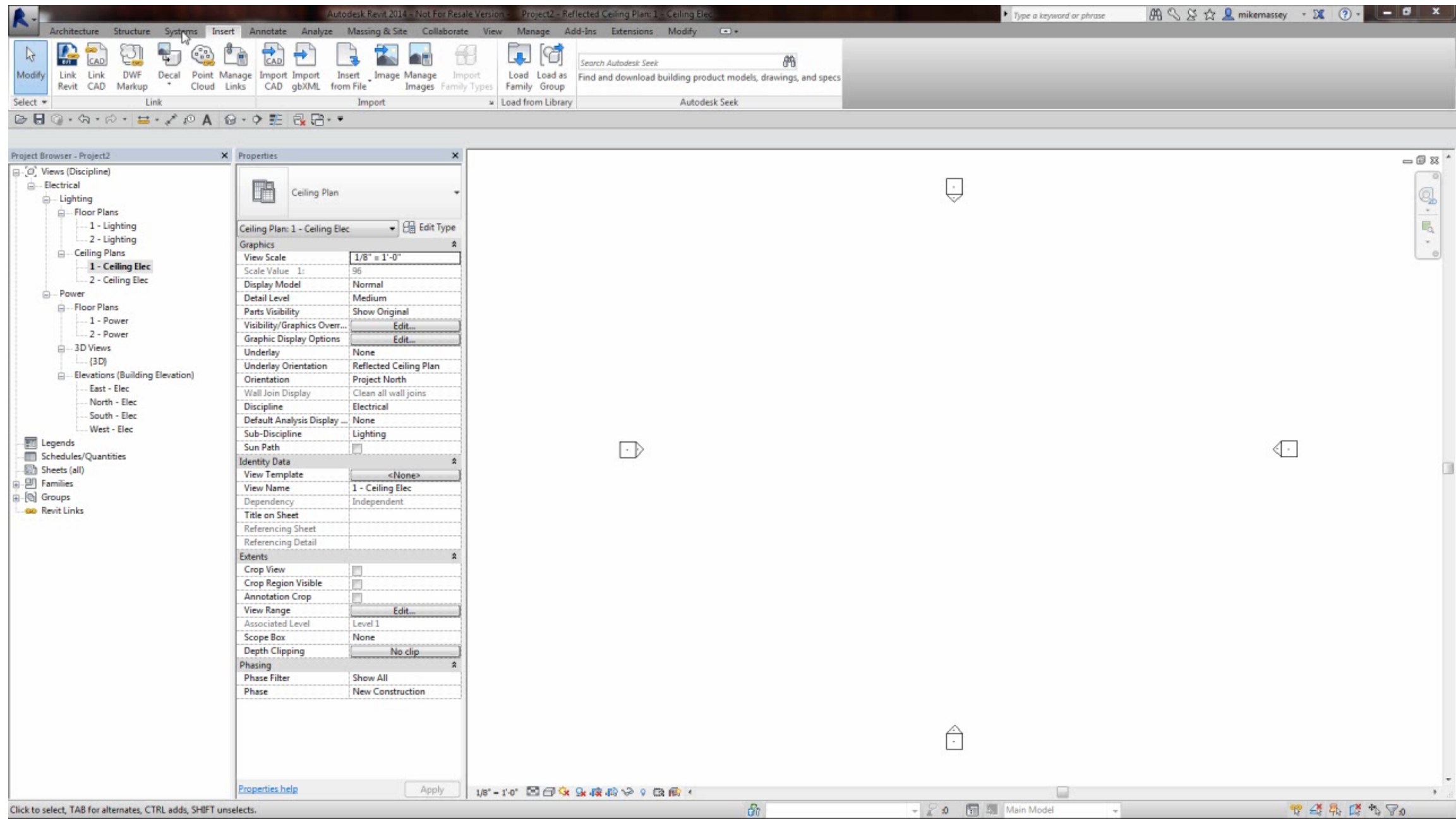




# Converting a Ceiling Hosted Family to a Non-hosted Family

Let's see how this works...

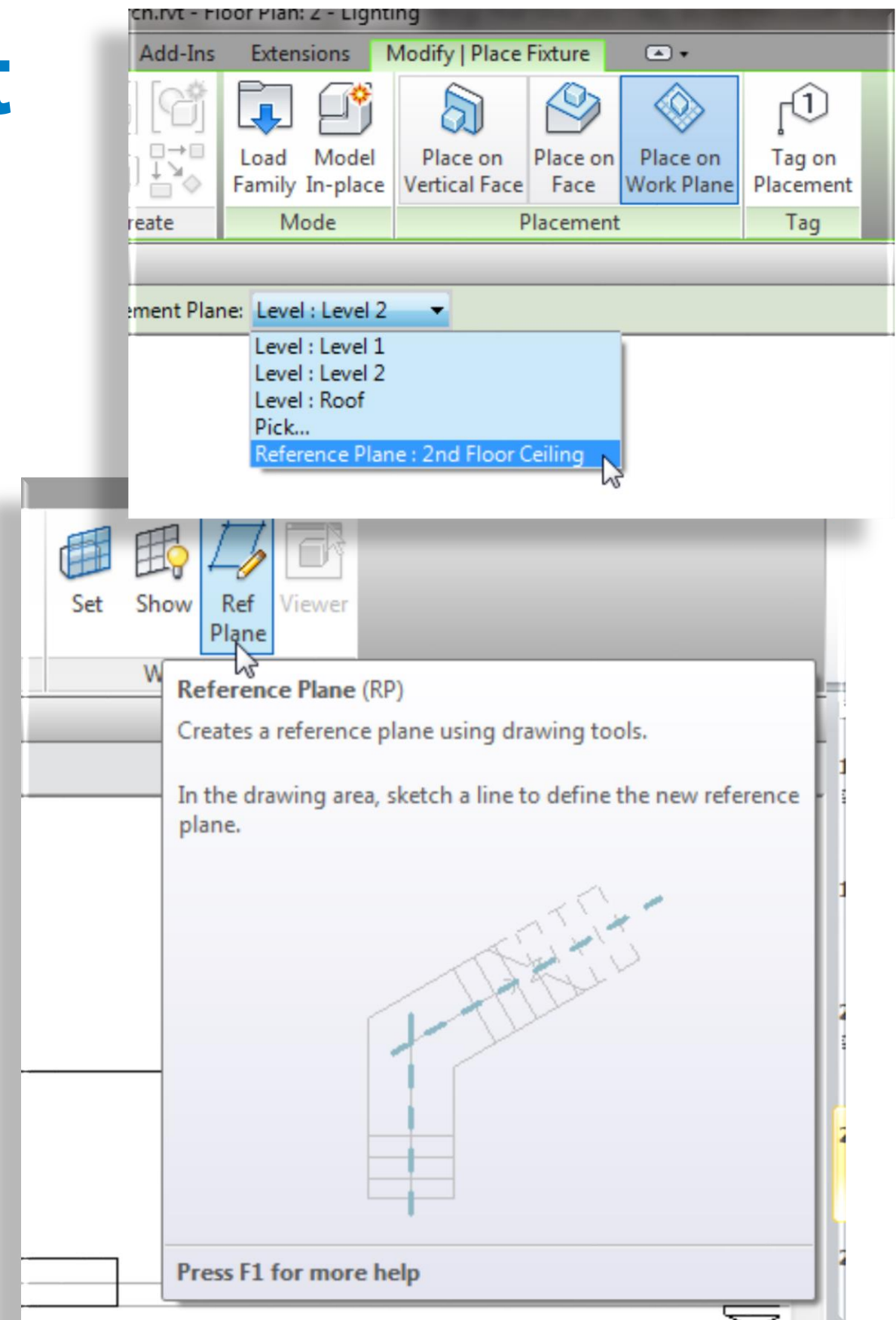
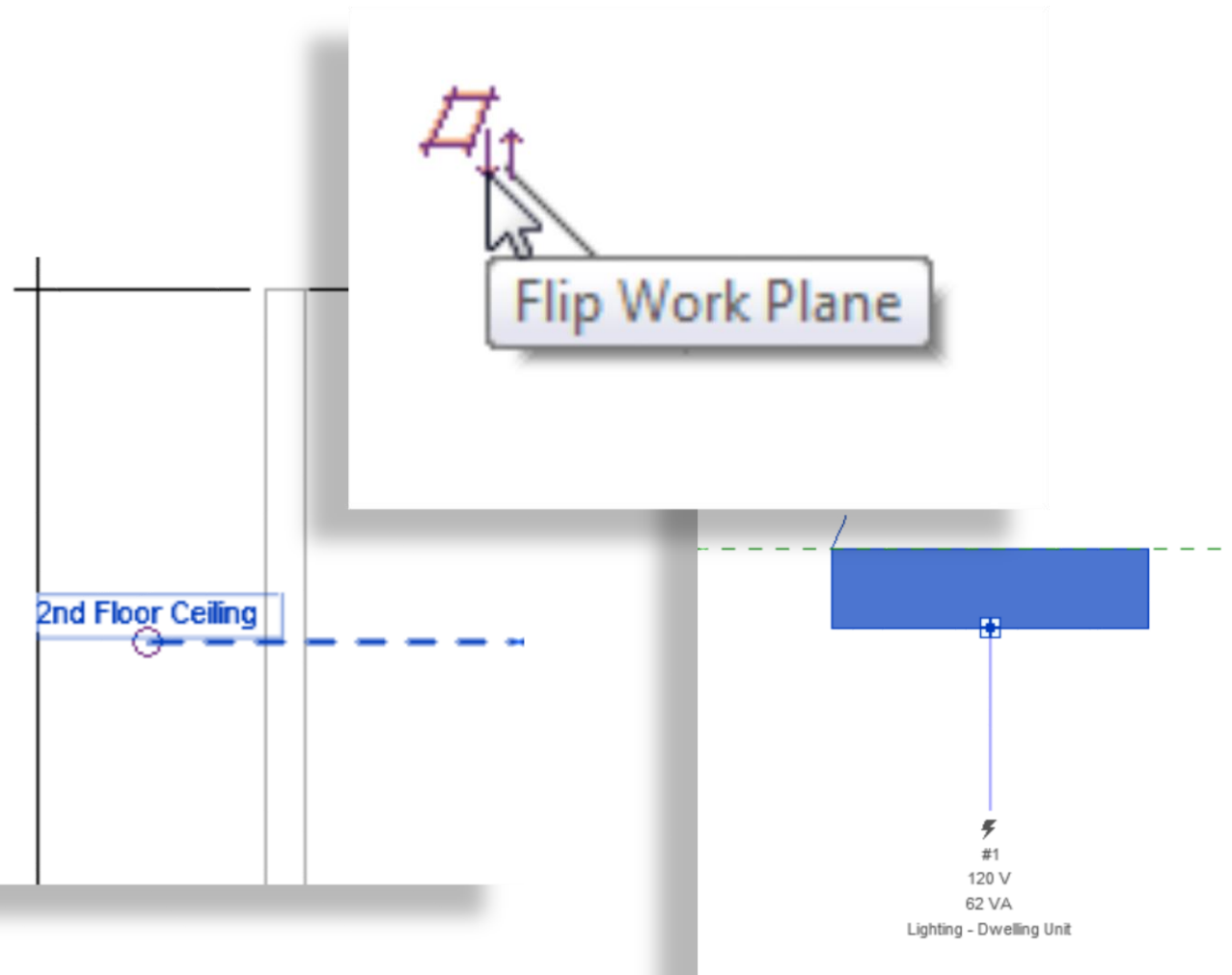
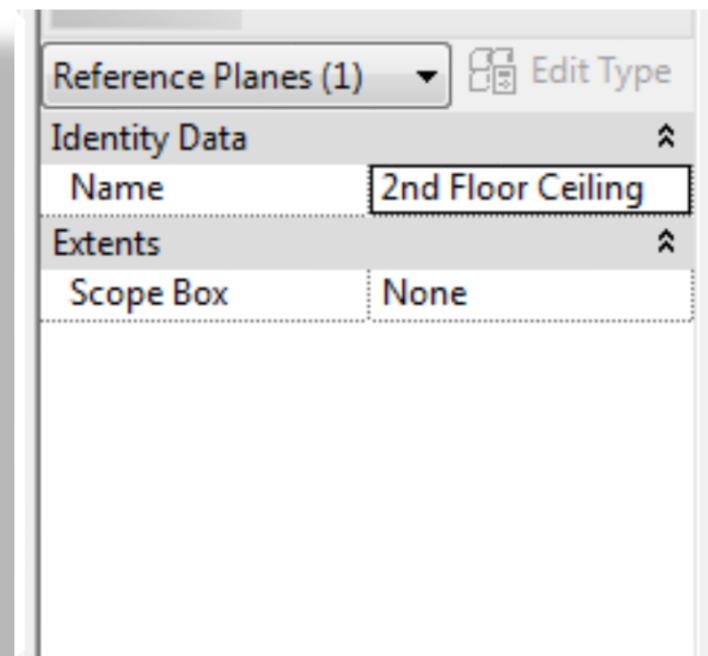
# Converting a Ceiling Hosted Family to a Non-hosted Family





# Placing Hosted Lights Without a Face (Ceiling)

- Lights are upside down?
- Draw Reference Plane Right to Left

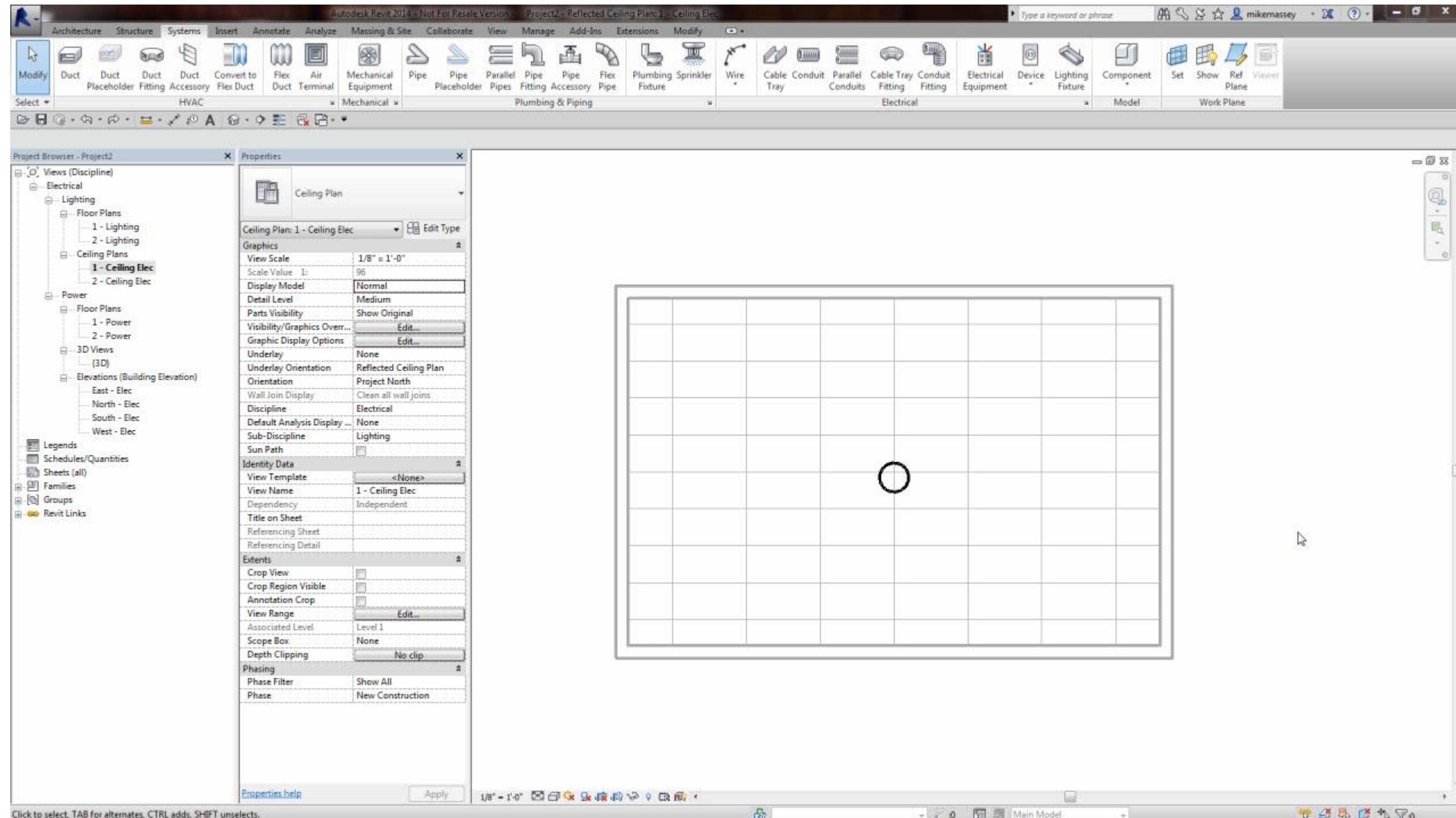




# Placing Hosted Lights without a Face (Ceiling)

## Let's see how this works...

# Placing Hosted Lights without a Face (Ceiling)




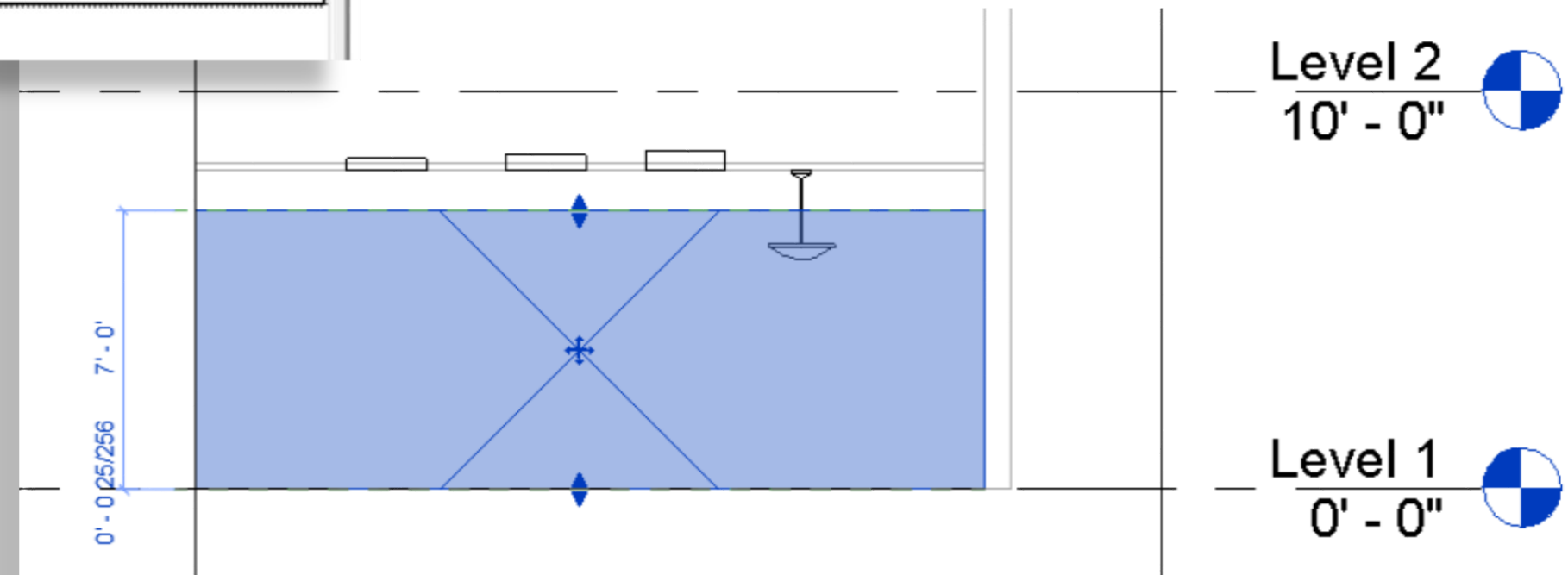
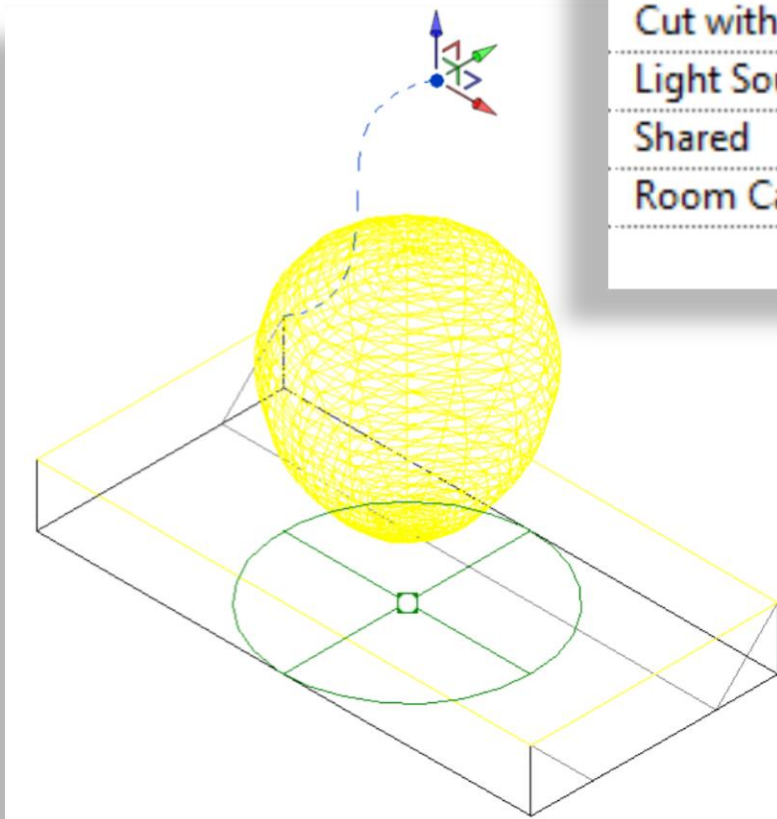


# Space Not Calculating Foot Candles

- Light is outside of Space
- Use Room Calculation Point

OmniClass Title	Direct/Indirect
Other	
Cut with Voids When Loaded	<input type="checkbox"/>
Light Source	<input checked="" type="checkbox"/>
Shared	<input type="checkbox"/>
Room Calculation Point	<input checked="" type="checkbox"/>

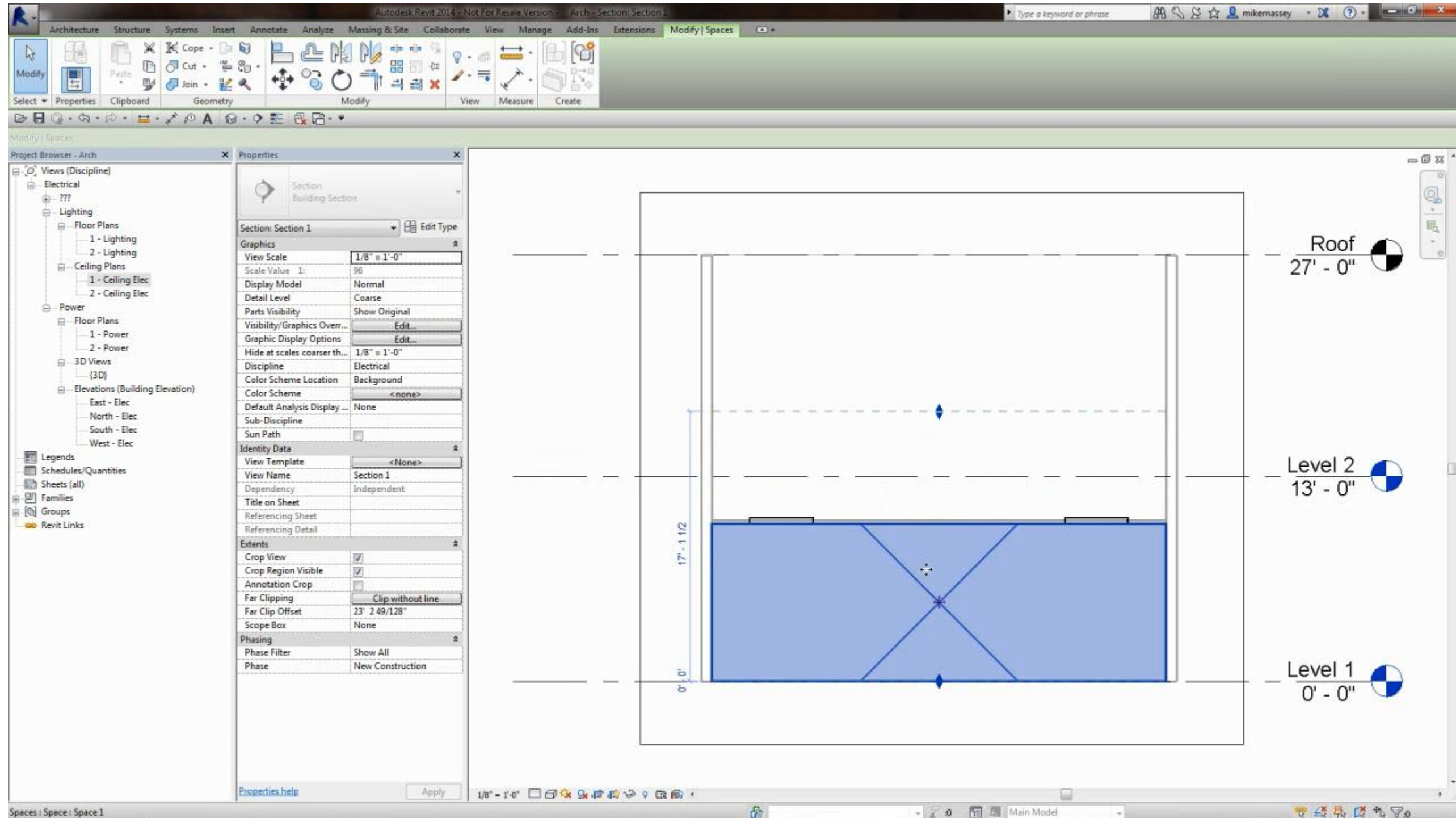
Properties	
	
Spaces (1)	Edit Type
Constraints	
Level	Level 2
Upper Limit	Level 2
Limit Offset	8' 0"
Base Offset	0' 0"
Electrical - Lighting	
Average Estimated Illumination	0.00 fc
Room Cavity Ratio	0.000000
Lighting Calculation Workplane	2' 6"
Lighting Calculation Luminaire Plane	Not Computed
Ceiling Reflectance	75.0000%
Wall Reflectance	50.0000%





**Space not Calculating Foot  
Candles  
Let's see how this works...**

# Space not Calculating Foot Candles





# Creating Schedule Keys for Lighting Loads

- Keys for main Space Types
- Create a Calculated Value Parameter
- Use Conditional Formatting

D	E	F	G	H
Space Style	Area	Average Estimated	Desired FC	Delta FC
Public	153 SF	65 fc	60 fc	5 fc
Public	642 SF	53 fc	60 fc	-7 fc
Public	59 SF	0 fc	60 fc	-60 fc
Public	483 SF	75 fc	60 fc	15 fc
Toilet	59 SF	44 fc	60 fc	-16 fc
Toilet	32 SF	62 fc	60 fc	2 fc
Toilet	59 SF	44 fc	60 fc	-16 fc
Public	135 SF	68 fc	60 fc	8 fc
Clinical	37 SF	55 fc	100 fc	-45 fc
	20 SF	0 fc	60 fc	-60 fc
	981 SF	72 fc	60 fc	12 fc
	55 SF	48 fc	60 fc	12 fc

Conditional Formatting

Condition

Field: Delta FC Test: Not Between Value: -50 fc and 50 fc

Conditions to Use: -50 fc > Delta FC or Delta FC > 50 fc

Background Color:

Clear All

OK Cancel

<Space Style Schedule>

A	B
Key Name	Desired FC
Clinical	100 fc
Exam	75 fc
Public	60 fc
Storage	50 fc
Toilet	60 fc

New Schedule

Filter list: <show all>

Category: RVT Links, Security Devices, Site, Spaces, Specialty Equipment, Sprinklers, Stairs, Structural Area Reinforcem..., Structural Beam Systems, Structural Columns, Structural Connections, Structural Fabric Areas

Name: Space Style Schedule 2

☐ Schedule building components

☒ Schedule keys

Key name: Space Style 2

Phase:

OK Cancel Help

Calculated Value

Name: Delta FC

☒ Formula ☐ Percentage

Discipline: Electrical

Type: Illuminance

Formula: Estimated Illumination - Desired FC

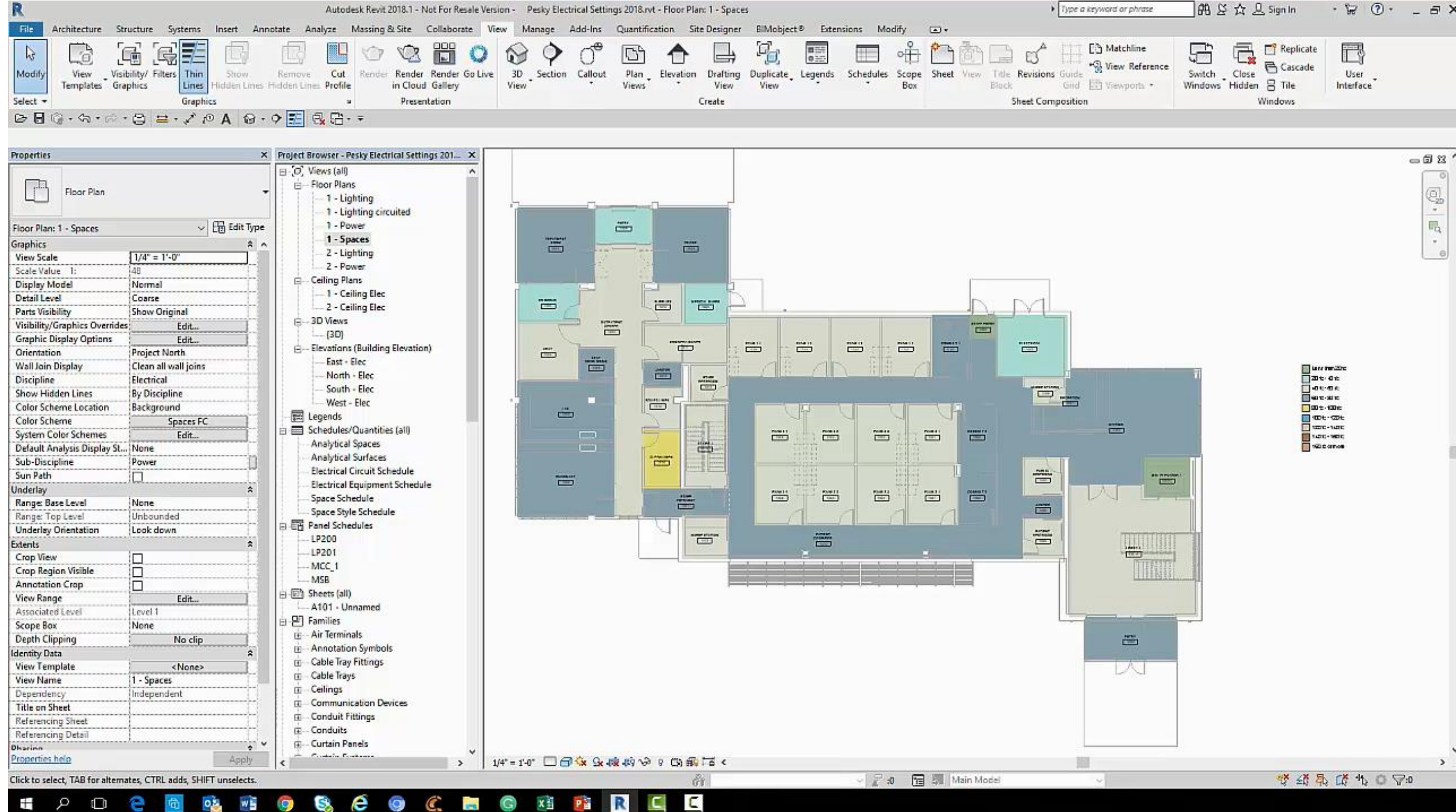
OK Cancel Help




# Creating Schedule Keys for Lighting Loads

Let's see how this works...

# Creating Schedule Keys for Lighting Loads





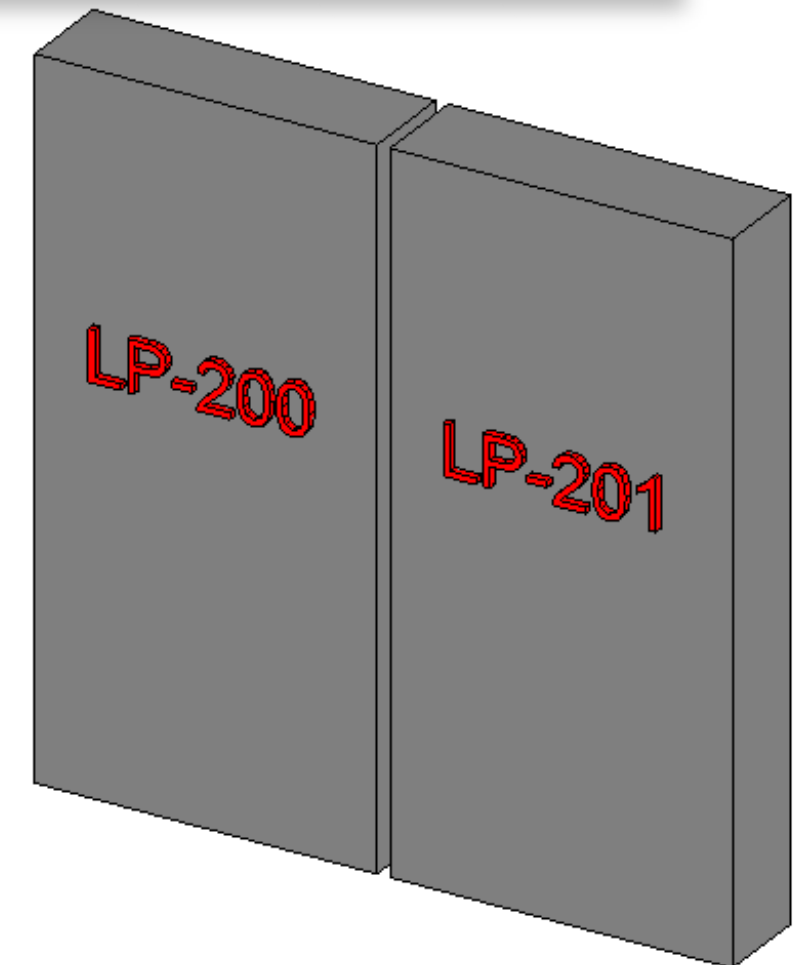
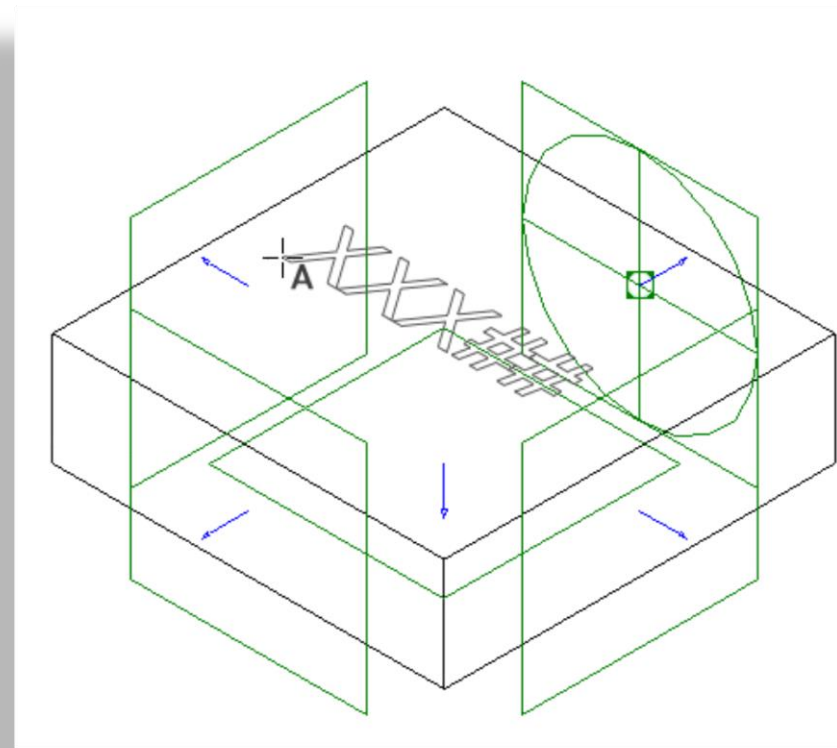
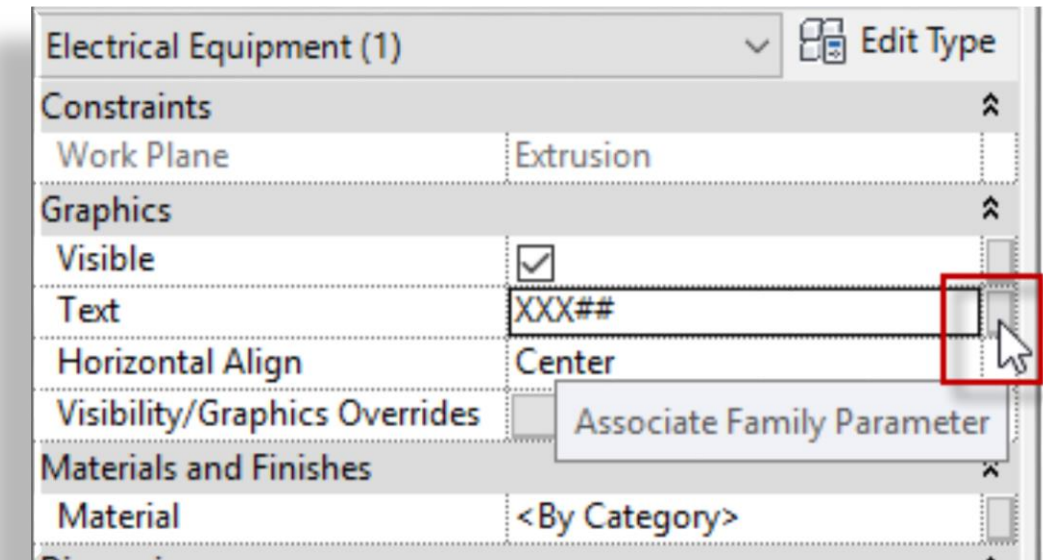


# Working with Equipment Families



# Adding Panel Names to 3D Views

- Great for visualization
- Needed for Navisworks
- Automatically Populates the Panel Name
- Visibility by Sub-Category

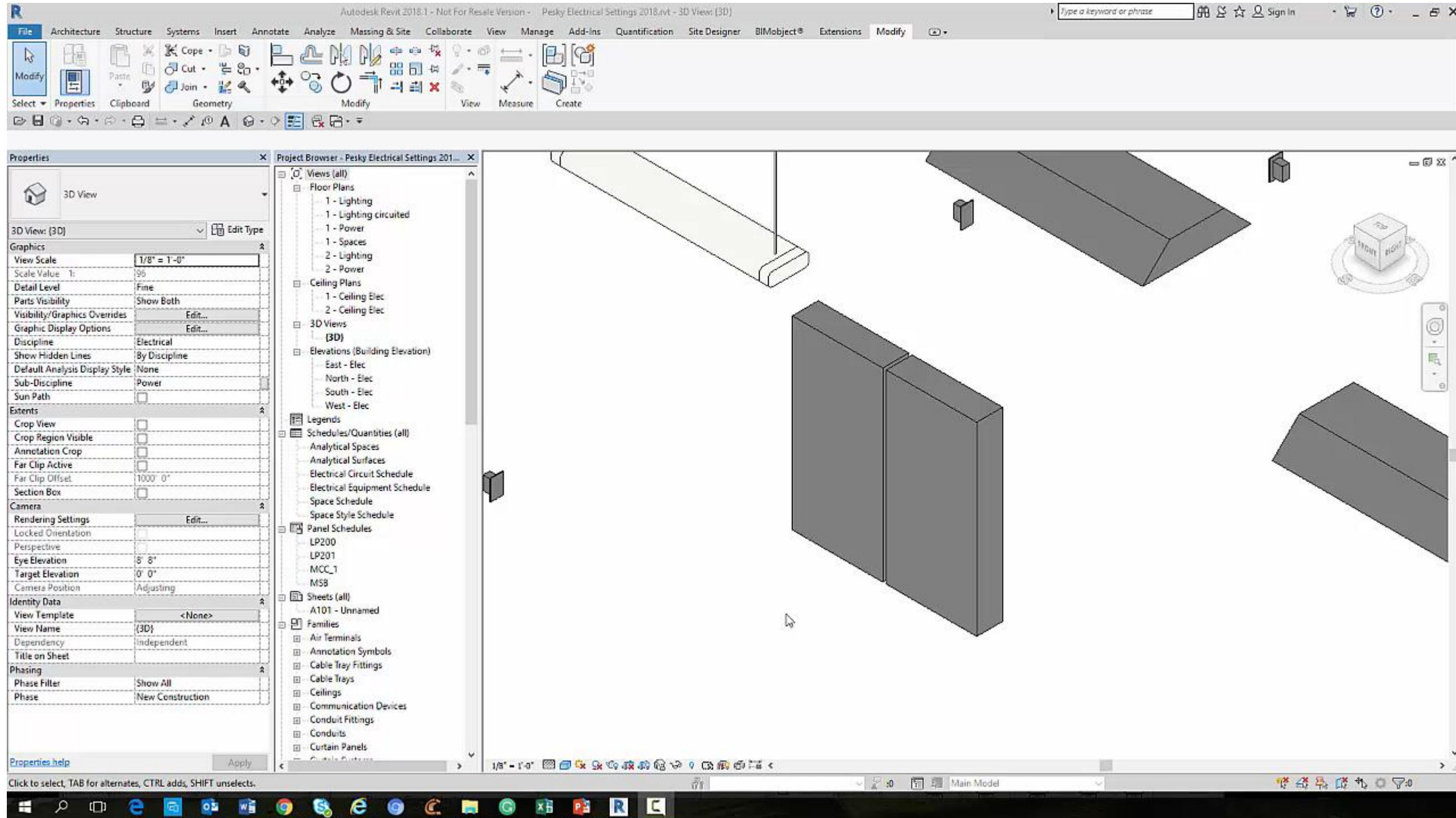




# Adding Panel Names to 3D Views

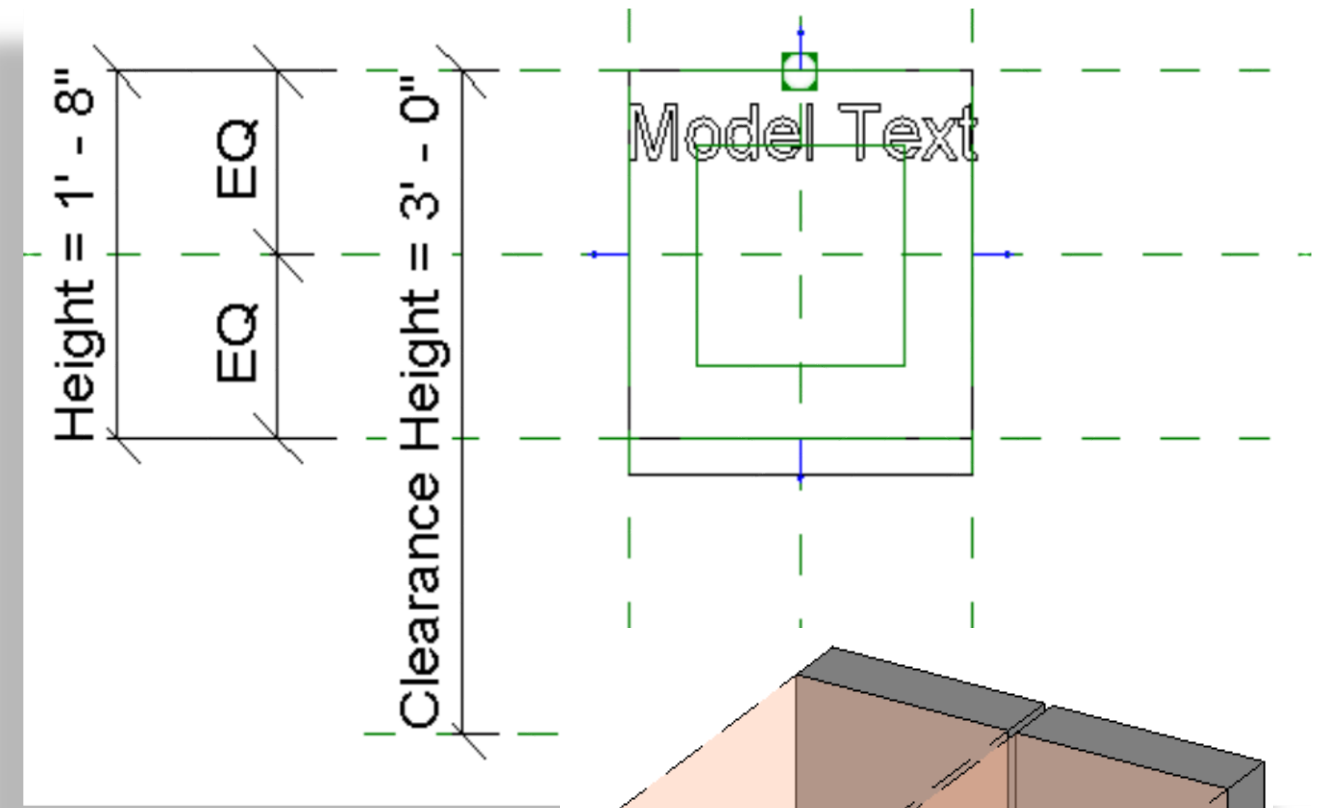
## Let's see how this works...

# Adding Panel Names to 3D Views

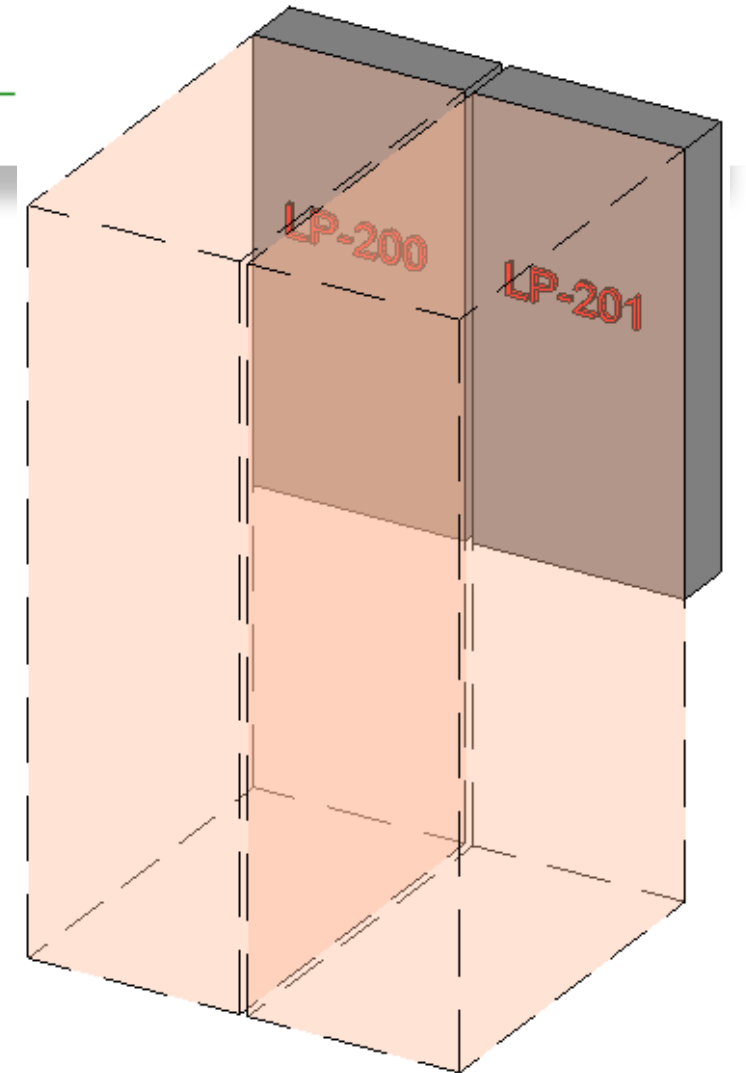


# Creating Clearance Zones

- Required for Clash Detection
- Geometry Built in Family
- Make Transparent
- Build with Parametrics
- Visibility by Sub-Category



Dimensions			
Clearance Depth (default)	3' 0"	=	<input type="checkbox"/>
Clearance Height (default)	4' 10"	= Default Elevation + (Height / 2)	<input checked="" type="checkbox"/>
Width	1' 8"	=	<input checked="" type="checkbox"/>
Height (default)	1' 8"	= if(Max #1 Pole Breakers > 12, if(	<input checked="" type="checkbox"/>
Depth	0' 5 3/4"		<input type="checkbox"/>



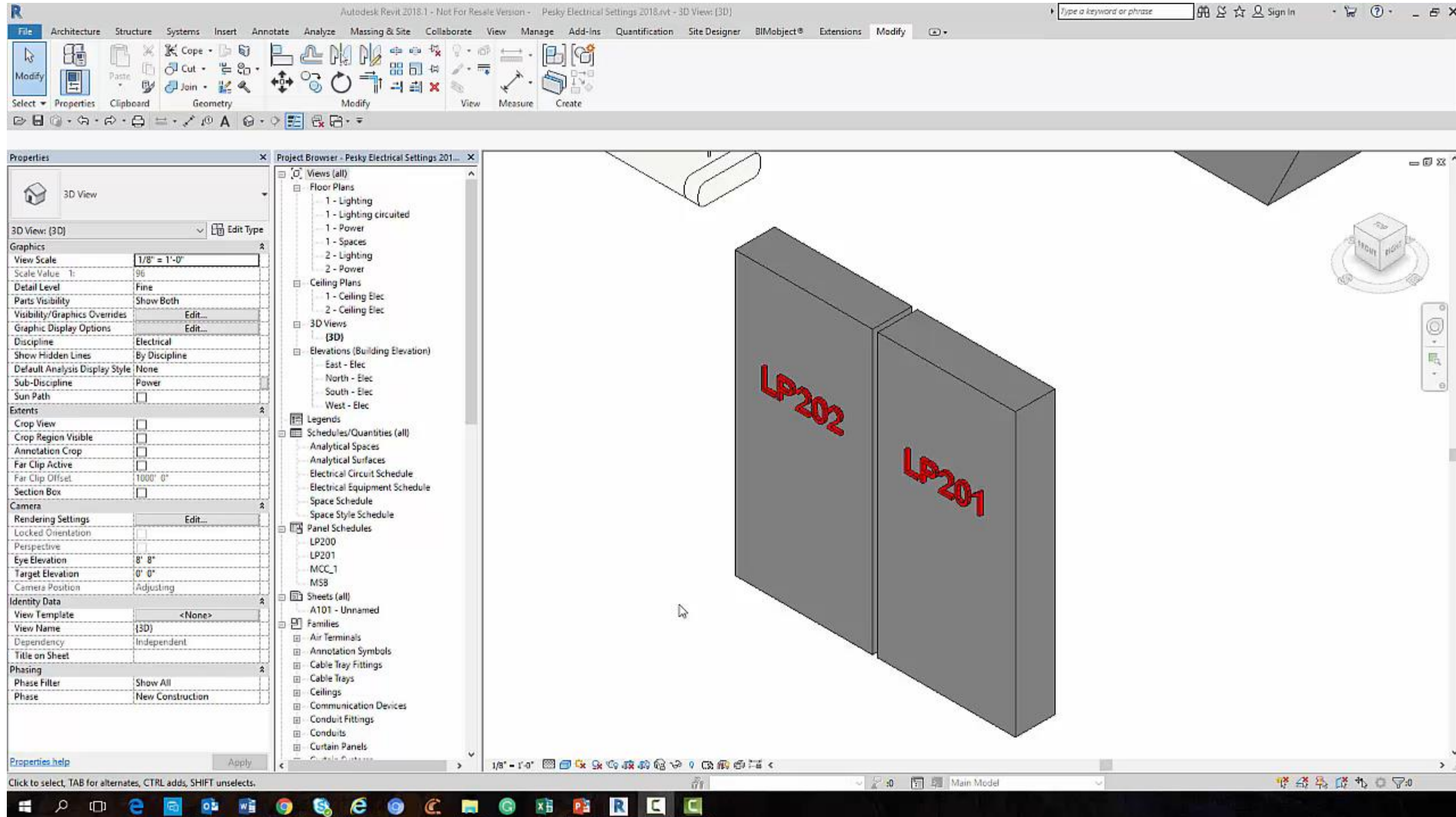




# Creating Clearance Zones

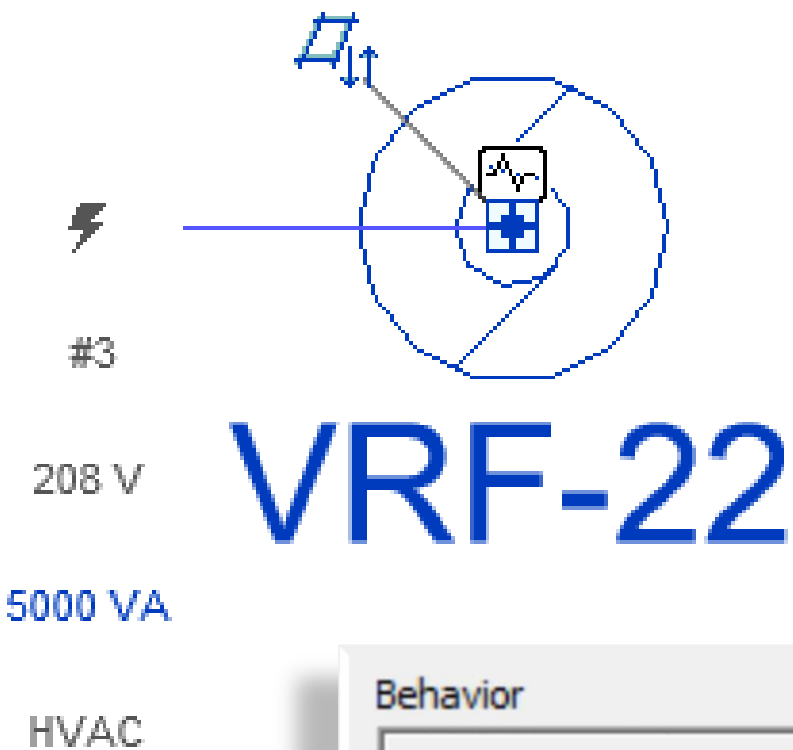
## Let's see how this works...

# Creating Clearance Zones



# Using Copy/Monitor for Mechanical Equipment

- Copy/Monitor from Mechanical Model
- Create a Connector Family
- Nest an Annotation Symbol
- Change to Mechanical Equipment Category
- Batch Copy with Type Mapping



Behavior	
Copy behavior	Allow batch copy
Mapping behavior	Specify type mapping

Behavior	
In the Linked Model	In the Host Model
PEFY-P-NMAU-E_Mediu	
PEFY-P18NMAU-E	Motor Connector : 208 V
PEFY-P30NMAU-E	Motor Connector
PEFY-P36NMAU-E	Motor Connector : 120 V
PEFY-P48NMAU-E	Motor Connector : 208 V
PEFY-P54NMAU-E	Motor Connector : 240 V
PEFY-P-NMSU-E_Low_Pr	Motor Connector : 277 V
PEFY-P12NMSU-E	Motor Connector : 480 V
PEFY-P15NMSU-E	Motor Connector : 208 V
PEFY-P24NMSU-E	Motor Connector : 208 V

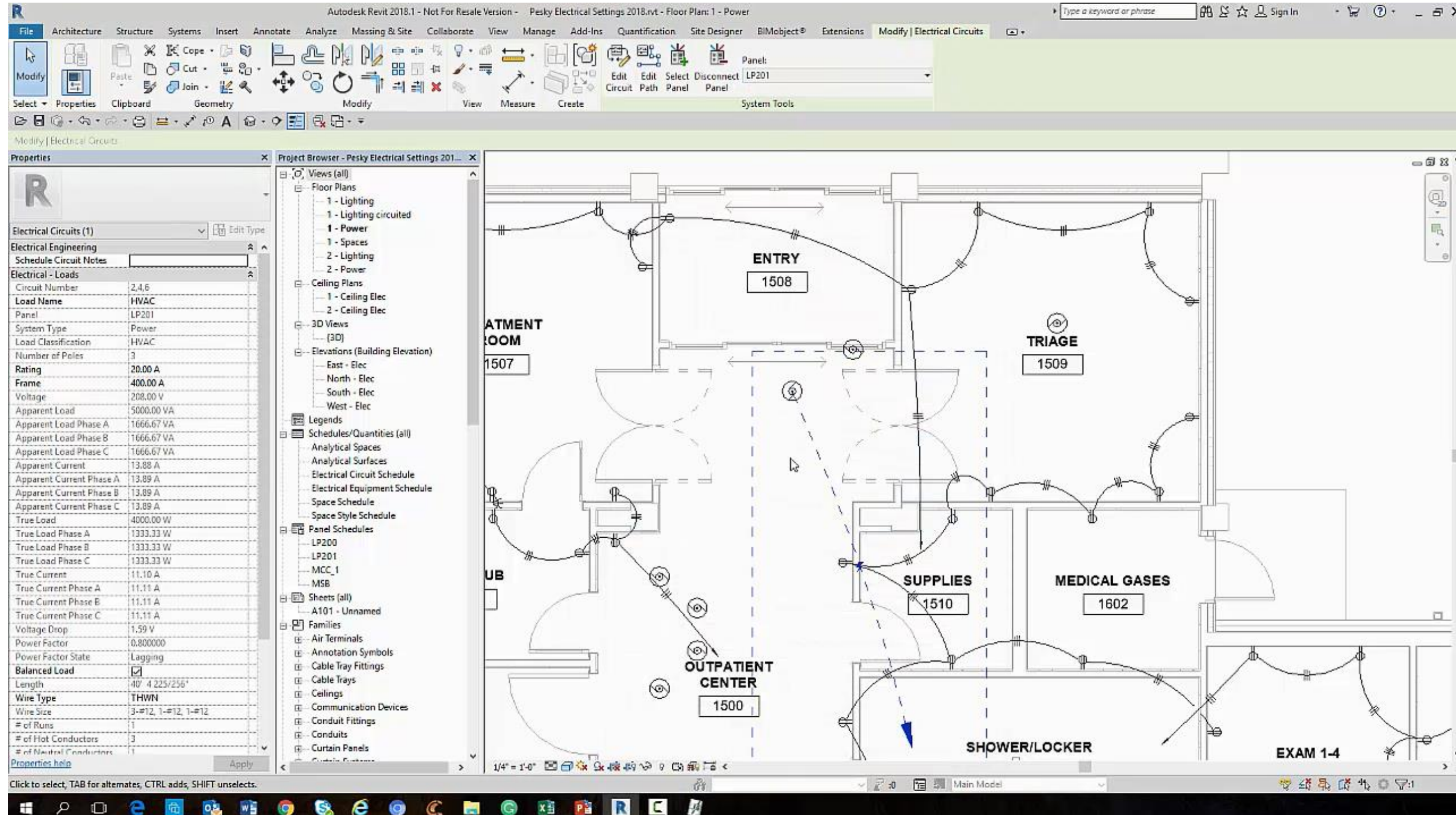
Technique by Amber Young – Affiliated Engineers, Inc.





# Using Copy/Monitor for Mechanical Equipment Let's see how this works...

# Using Copy/Monitor for Mechanical Equipment





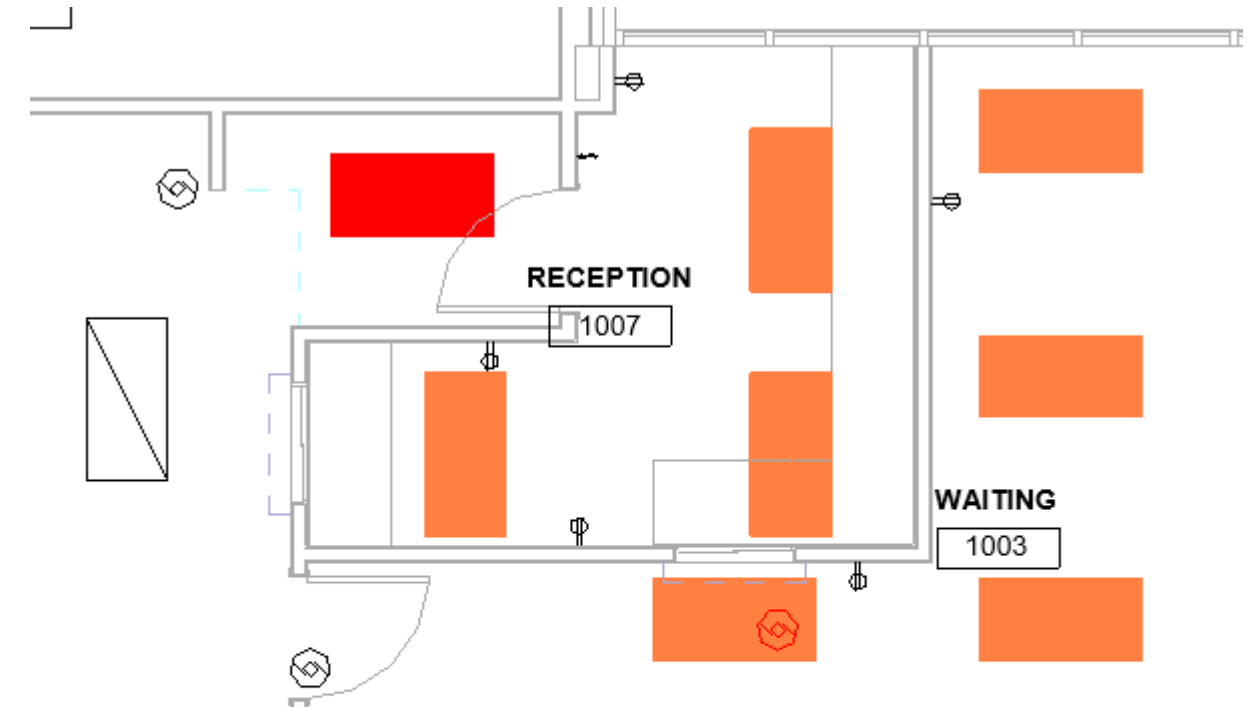


# Creating Electrical Circuits



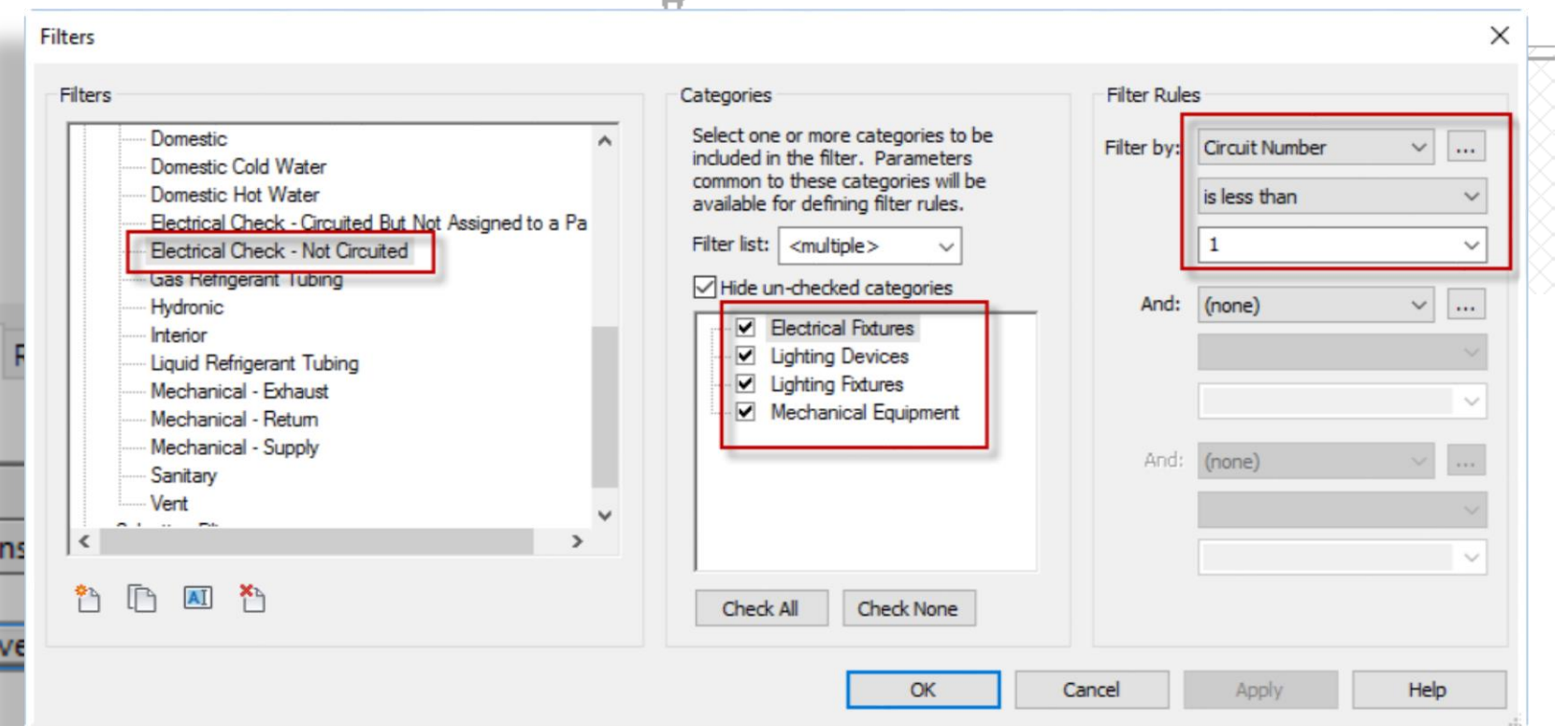
# Using Filters to show Un-Circuited Devices

- Create Filter for Items not Circuited
- Create Filter for Items Circuited but not Assigned to a Panel
- Assign Solid Color Patterns in Views



Visibility/Graphic Overrides for Floor Plan: 1 - Power

Name	Visibility	Projection/Surface		
		Lines	Patterns	Trans
Electrical Check - Not Circuited	<input checked="" type="checkbox"/>			
Electrical Check - Circuited But ...	<input checked="" type="checkbox"/>			Ove

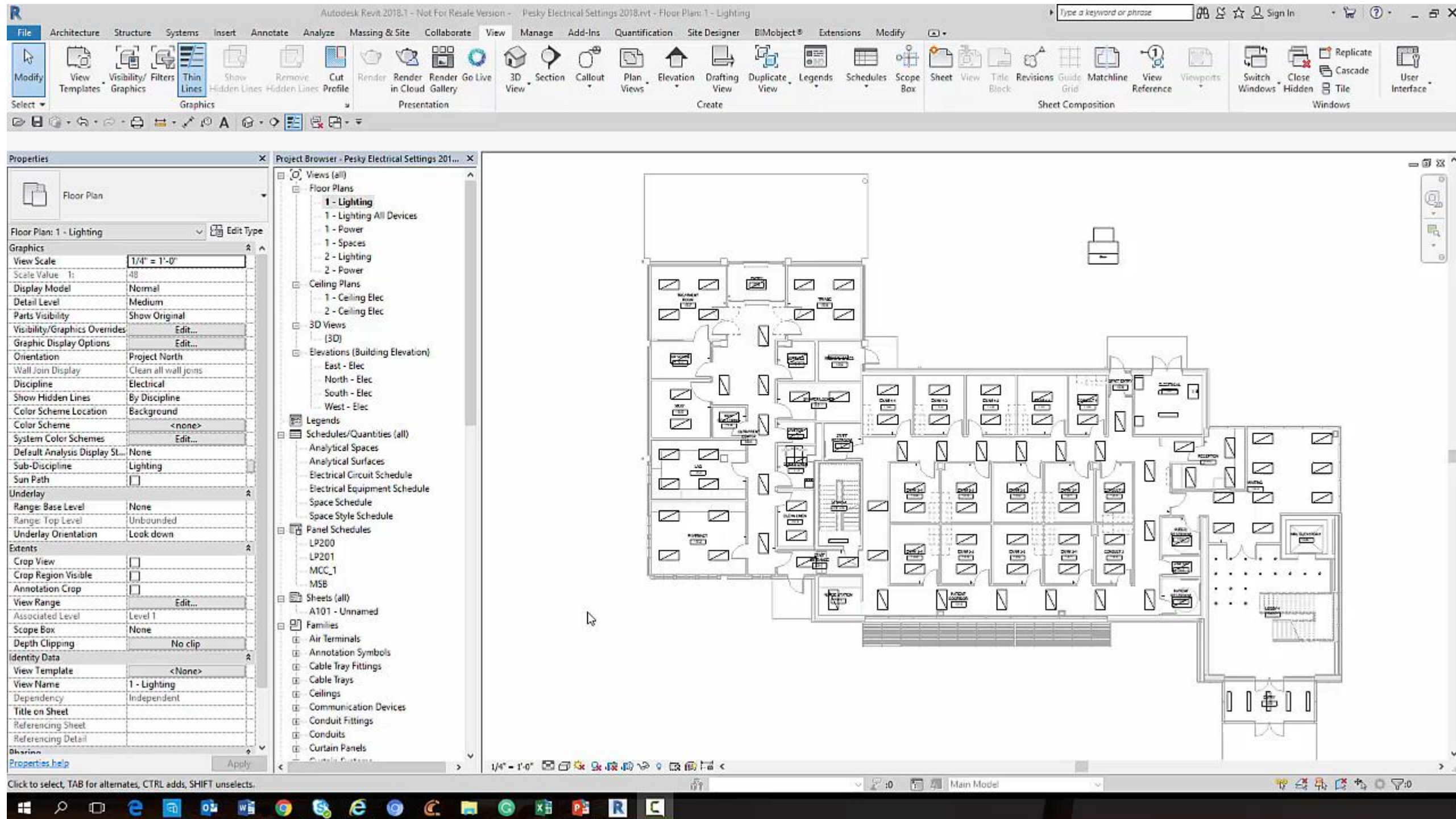




# Using Filters to show Un-Circuited Devices

## Let's see how this works...

# Using Filters to show Un-Circuited Devices

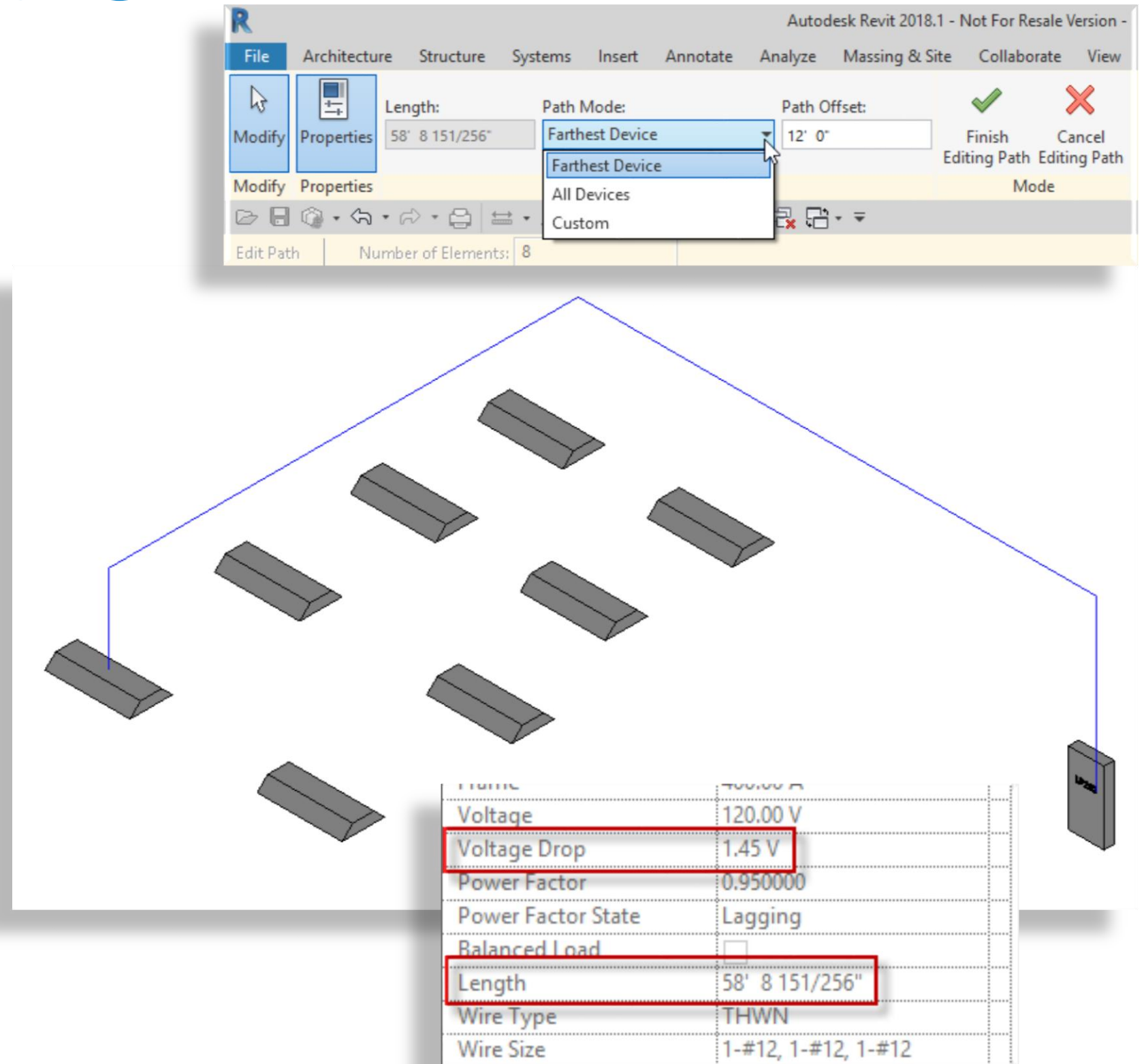




# View/Modify Circuit Paths

*New in Revit 2018!*

- Allows you to see the path that is used to determine the circuit length
- Modifiable
- All Devices or Farthest Device
- Updates Circuit Length and Voltage Drop

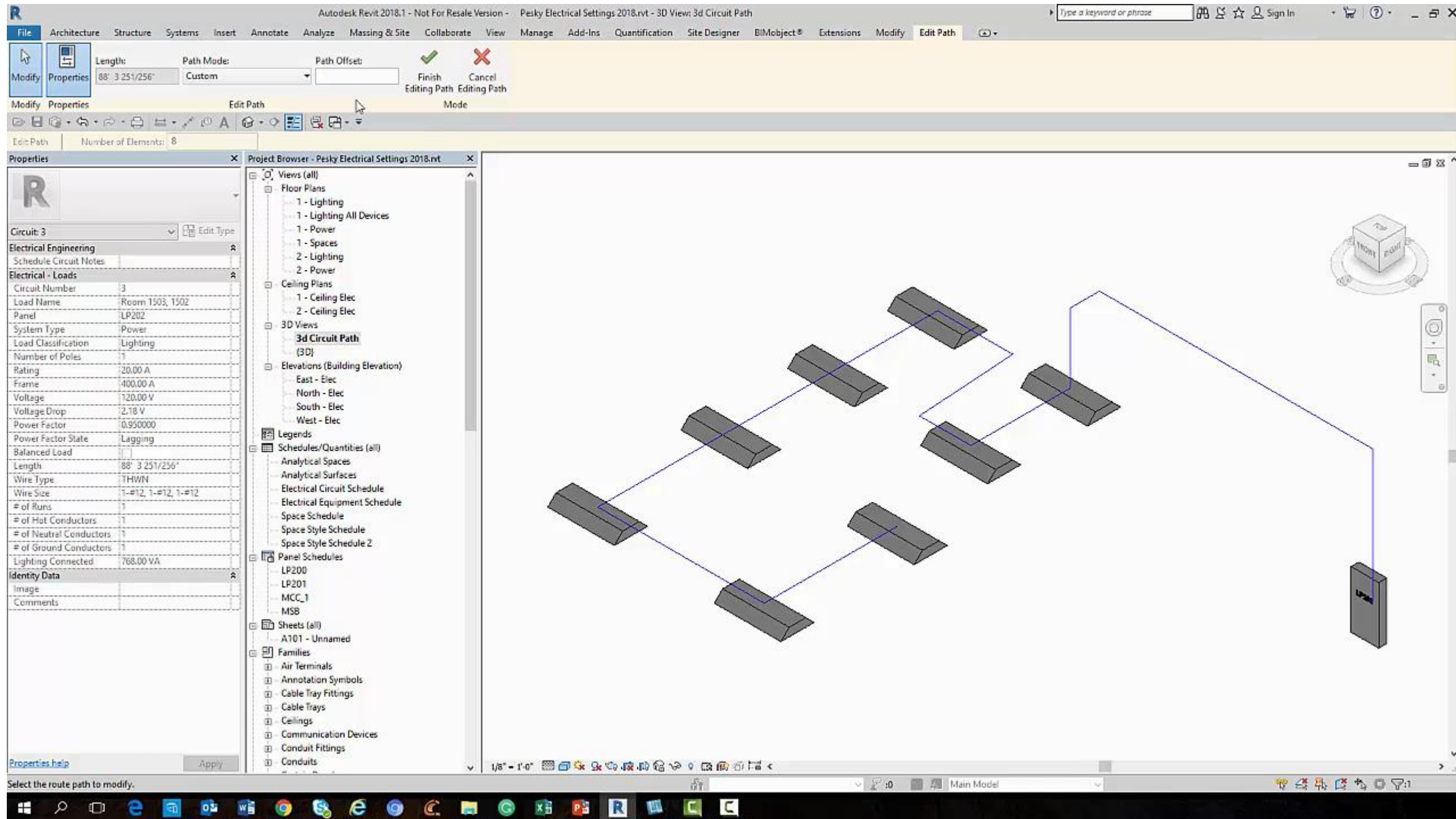






**View/Modify Circuit Paths**  
**Let's see how this works...**

# View/Modify Circuit Paths







# Working with Panel Schedules

# Load Classifications and Demand Factors

- Demand Factors
- Load Classifications

Demand factor types

Appliance - Dwelling Unit  
Cooling  
Default  
Demand Factor  
Electric Clothes Dryer  
Electric Range - 3.5 kW to  
Electric Range - Less than  
Elevator  
Equipment  
Existing Load  
Existing Load - 30 Day Met  
Existing Load - Lighting  
Farm Load  
Heating  
HVAC  
Kitchen Equipment - Non-D  
Lighting - Dwelling Unit  
Lighting - Exterior  
Lighting - General  
Lighting - Hospital

Name:

Lighting - Dwelling Unit

Calculation method:

By load

Calculation options

Total at one percentage

☒ Incrementally for each range

Example: First 100 kVA at 100%, plus the next 50 kVA at 50%.

Load		Demand Factor
Greater Than	Less Than or Equal To	
0 VA	3000 VA	100.00%
3000 VA	120000 VA	35.00%

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

Load Classification

Appliance - Dwelling Unit  
Cooling  
Default  
Electric Clothes Dryer  
Electric Range - 3.5 kW to 8.75 k  
Electric Range - Less than 3.5 kV  
Elevator  
Equipment  
Existing Load  
Existing Load - 30 Day Metered  
Existing Load - Lighting  
Farm Load  
Heating

Appliance - Dwelling Unit

Demand factor:

Appliance - Dwelling Unit

Select the load class for use with spaces:

Power

OK

Cancel

Light Box Material	< By Category >
Grid Material	< By Category >
Diffuser Material	< By Category >
Electrical	
Load Classification	Lighting - Dwelling Unit
Lamp	T5
Ballast Voltage	120.00 V
Ballast Number of Poles	1
Wattage Comments	
Electrical - Loads	
Apparent Load	80.00 VA





# Load Classifications and Demand Factors

## Let's see how this works...

# Load Classifications and Demand Factors

Autodesk Revit 2014 - Not For Resale Version - Load Names - Panel Schedule: LP1

Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins Extensions Modify Modify Panel Schedule

Change Template Rebalance Loads Move Up Move Down Move Across Assign Spare Assign Space Remove Spare/Space Lock/Unlock Group/Ungroup Update Names Edit Font Horizontally Align Vertically Align

Template Loads Circuits Text

Project Browser - Load Names Properties

Views (Discipline) Electrical Lighting Floor Plans 1 - Lighting 2 - Lighting Ceiling Plans 1 - Ceiling Elec 2 - Ceiling Elec Sections (Building Section) Section 1 Power Floor Plans 1 - Power 2 - Power 3D Views (3D) Elevations (Building Elevation) East - Elec North - Elec South - Elec West - Elec Legends Schedules/Quantities Panel Schedules LP1 Sheets (all) A101 - Unnamed Families Groups Revit Links

Panel Schedule Panel Schedule: LP1 Edit Type Identity Data Panel Schedule Name LP1 Other Template Branch Panel

Branch Panel: LP1 Location: Space 1 Supply From: Mounting: Recessed Enclosure: Type 1

Volts: 120/208 Wye 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 6000 ...			3	20 A	Power Space 1	2
3	Lighting - Dwelling Unit Space 1	20 A	1		480 VA 6000 ...					4
5	Receptacle Space 1	20 A	1			1440 ... 6000 ...				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
Total Load:				6480 VA	6480 VA	7440 VA				
Total Amps:				54 A	54 A	62 A				

Legend:

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

Notes:

Ready

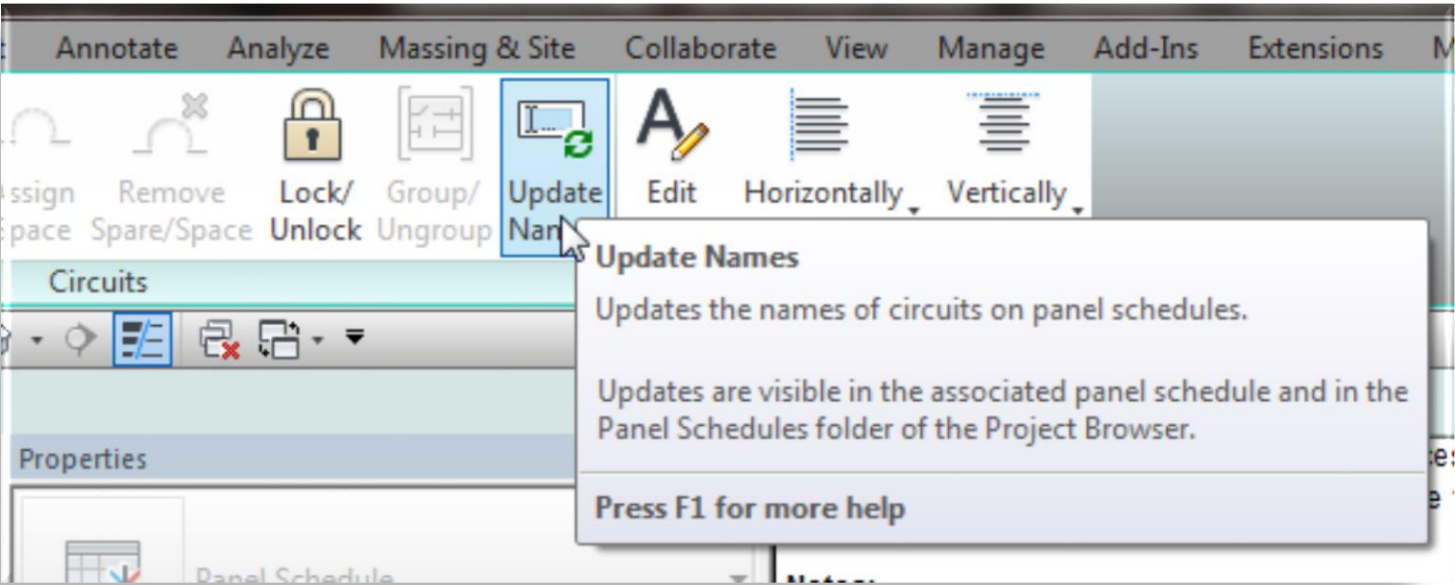
# Load Names in Panel Schedules

- (Load Classification) (Space Name) (Space Number)
- Or (Load Classification) Room (Space Numbers)

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

Space

1



Light Box Material	<By Category>
Grid Material	<By Category>
Diffuser Material	<By Category>
<b>Electrical</b>	
Load Classification	Lighting - Dwelling Unit
Lamp	T5
Ballast Voltage	120.00 V
Ballast Number of Poles	1
Wattage Comments	
<b>Electrical - Loads</b>	
Apparent Load	80.00 VA





# Load Names in Panel Schedule

Let's see how this works...

# Load Names in Panel Schedule

Autodesk Revit 2014 - Not For Resale Version - Load Names - Panel Schedule: LP1

Architecture Structure Systems Insert Annotate Analyze Massing & Site Collaborate View Manage Add-Ins Extensions Modify Modify Panel Schedule

Change Template

Rebalance Loads

Move Up

Move Down

Move Across

Assign Spare

Assign Space

Remove Spare/Space

Lock/Unlock

Group/Ungroup

Update Names

Edit Font

Horizontally Align

Vertically Align

Template Loads Circuits Text

File Edit View Window Help

Type a keyword or phrase mikemassey

Modify Panel Schedule

Project Browser - Load Names

Views (Discipline)

Electrical

Lighting

Floor Plans

1 - Lighting

2 - Lighting

Ceiling Plans

1 - Ceiling Elec

2 - Ceiling Elec

Sections (Building Section)

Section 1

Power

Floor Plans

1 - Power

2 - Power

3D Views

{3D}

Elevations (Building Elevation)

East - Elec

North - Elec

South - Elec

West - Elec

Legends

Schedules/Quantities

Panel Schedules

LP1

Sheets (all)

A101 - Unnamed

Families

Groups

Revit Links

Properties

Panel Schedule

Panel Schedule: LP1

Edit Type

Identity Data

Panel Schedule Name LP1

Other

Template Branch Panel

Mounting: Recessed

Enclosure: Type 1

Wires: 4

Mains Rating: 100 A

MCB Rating:

Notes:

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT
1	Lighting Space 1	20 A	1	480 VA	6000 ...		3	20 A	HVAC Space 1	2
3	Lighting Space 1	20 A	1		480 VA	6000 ...	--	--		4
5	Receptacle Space 1	20 A	1			1440 ...	6000 ...	--	--	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
Total Load:				6480 VA	6480 VA	7440 VA				
Total Amps:				54 A	54 A	62 A				

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	18000 VA	100.00%	18000 VA	Total Conn. Load:	20400 VA
Receptacle	1440 VA	100.00%	1440 VA	Total Est. Demand:	20640 VA
Lighting	960 VA	125.00%	1200 VA	Total Conn.:	57 A
				Total Est. Demand:	57 A

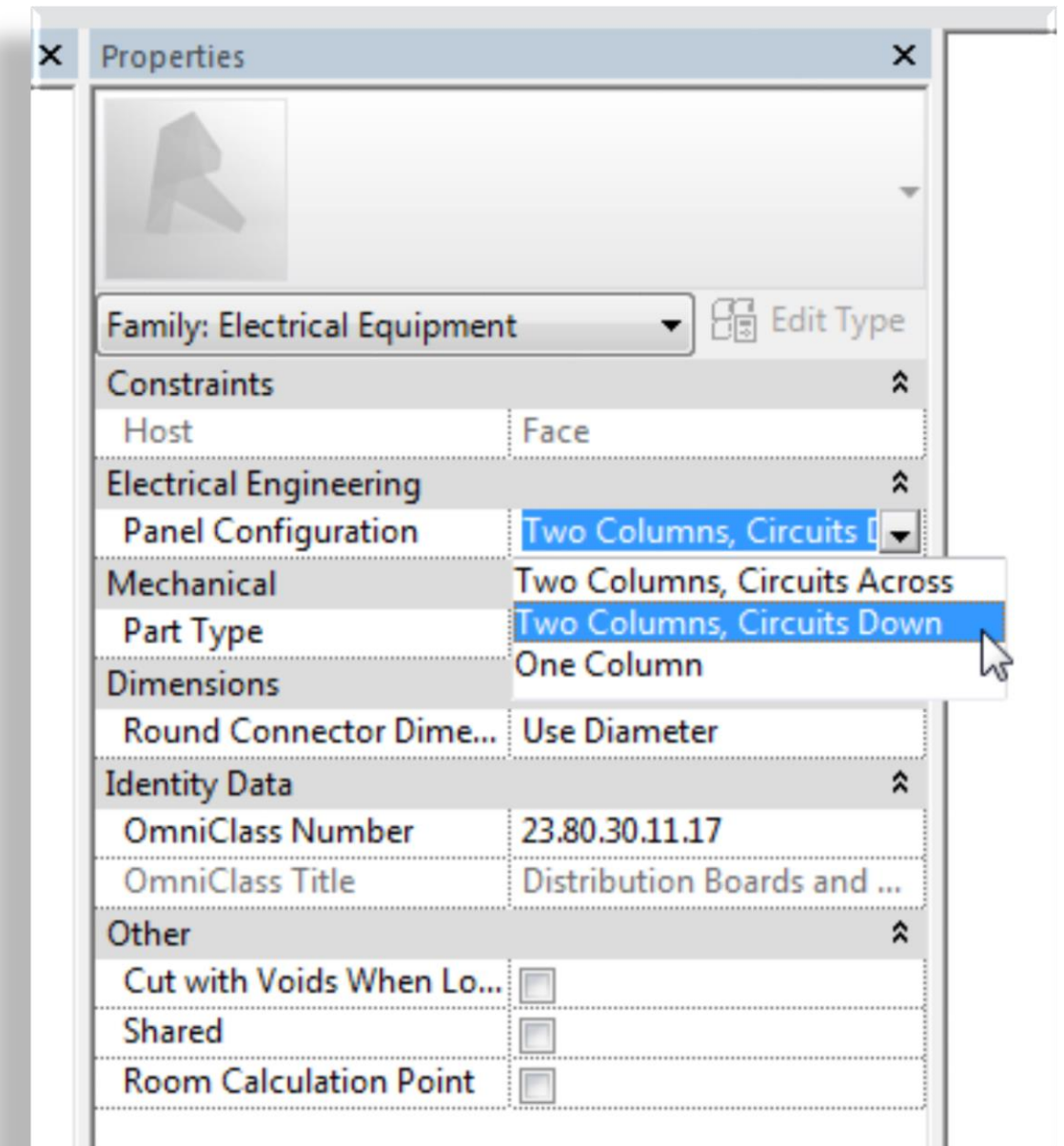
Notes:

Properties help Apply

# Getting Panels to Number Down Instead of Across

- Change Properties In Panel Schedule Family

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

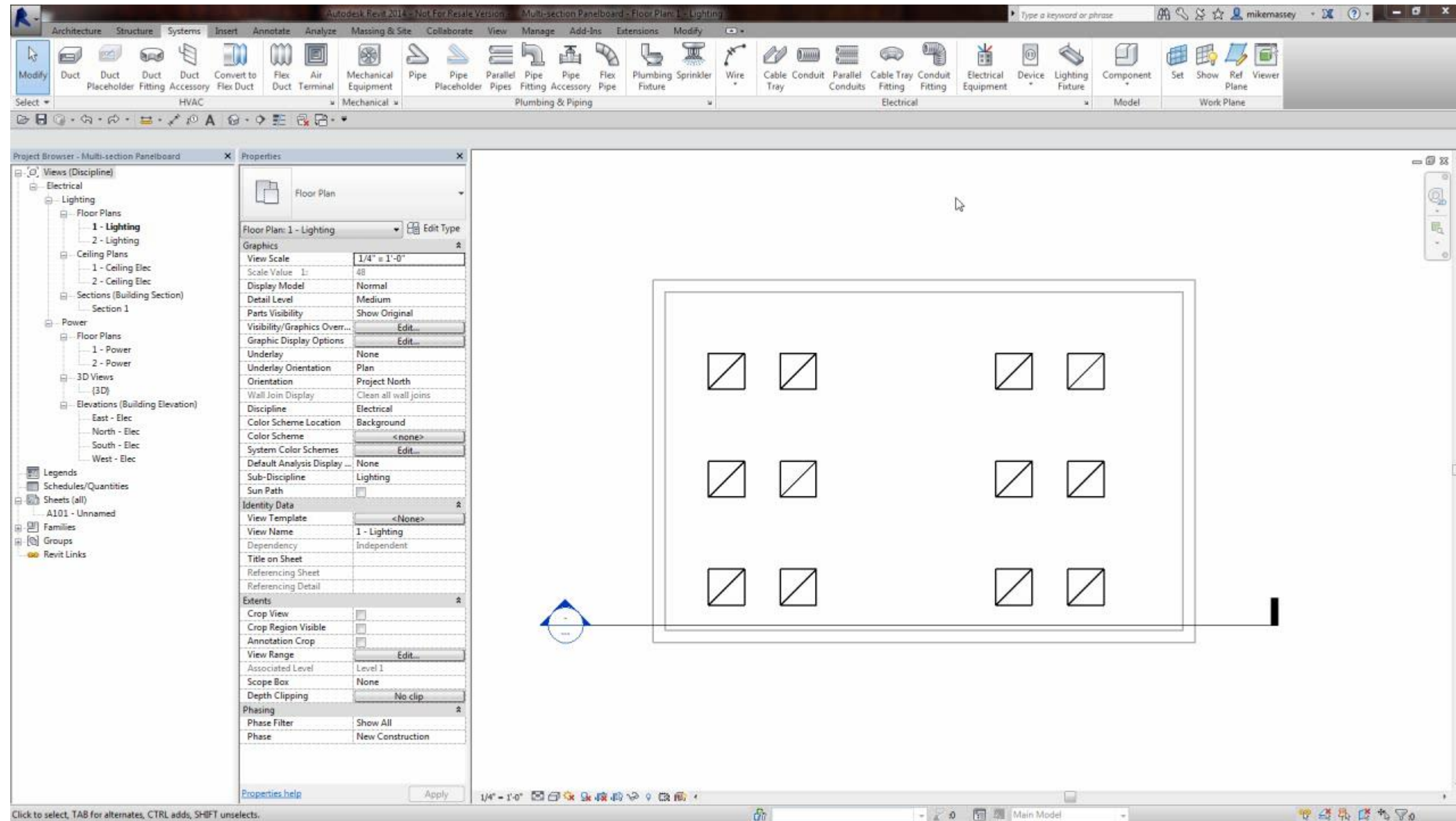






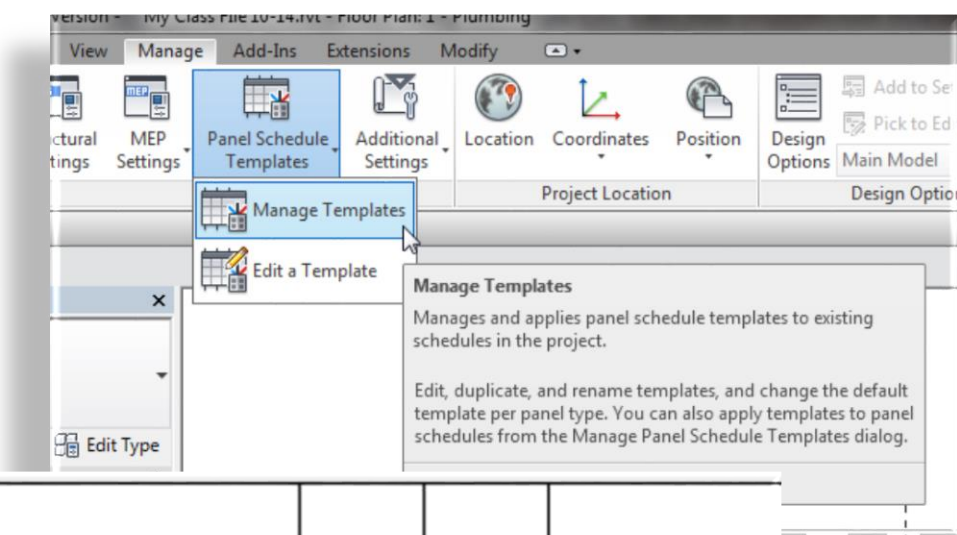
**Getting Panels to Number  
down instead of Across  
Let's see how this works...**

# Getting Panels to Number down instead of Across



# Panel Schedule Templates

- Multi-Section Panelboard



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		

Technique by Cory Dunn – Autodesk Discussion Groups

Branch Panel:

Location: Space 1

Supply From: Phase 1

Mounting: Rackmount

Enclosure: Type 1

Valid: 12/12/2014

Phases: 3

Wire G: 4

A.I.C Rating:

Main C Type:

Main C Rating: 100 A

M.C.B Rating:

Notes:

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT
1	Lighting - Dwelling Unit Space 1	20 A	1	400 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	400 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:	200 VA	0 VA	0 VA			
				Total Amps:	0 A	0 A	0 A			

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Lighting - Dwelling Unit	200 VA	100.00%	200 VA	Total Conn. Load:	200 VA
				Total Est. Demand:	200 VA
				Total Conn.:	0 A
				Total Est. Demand:	0 A

Notes:

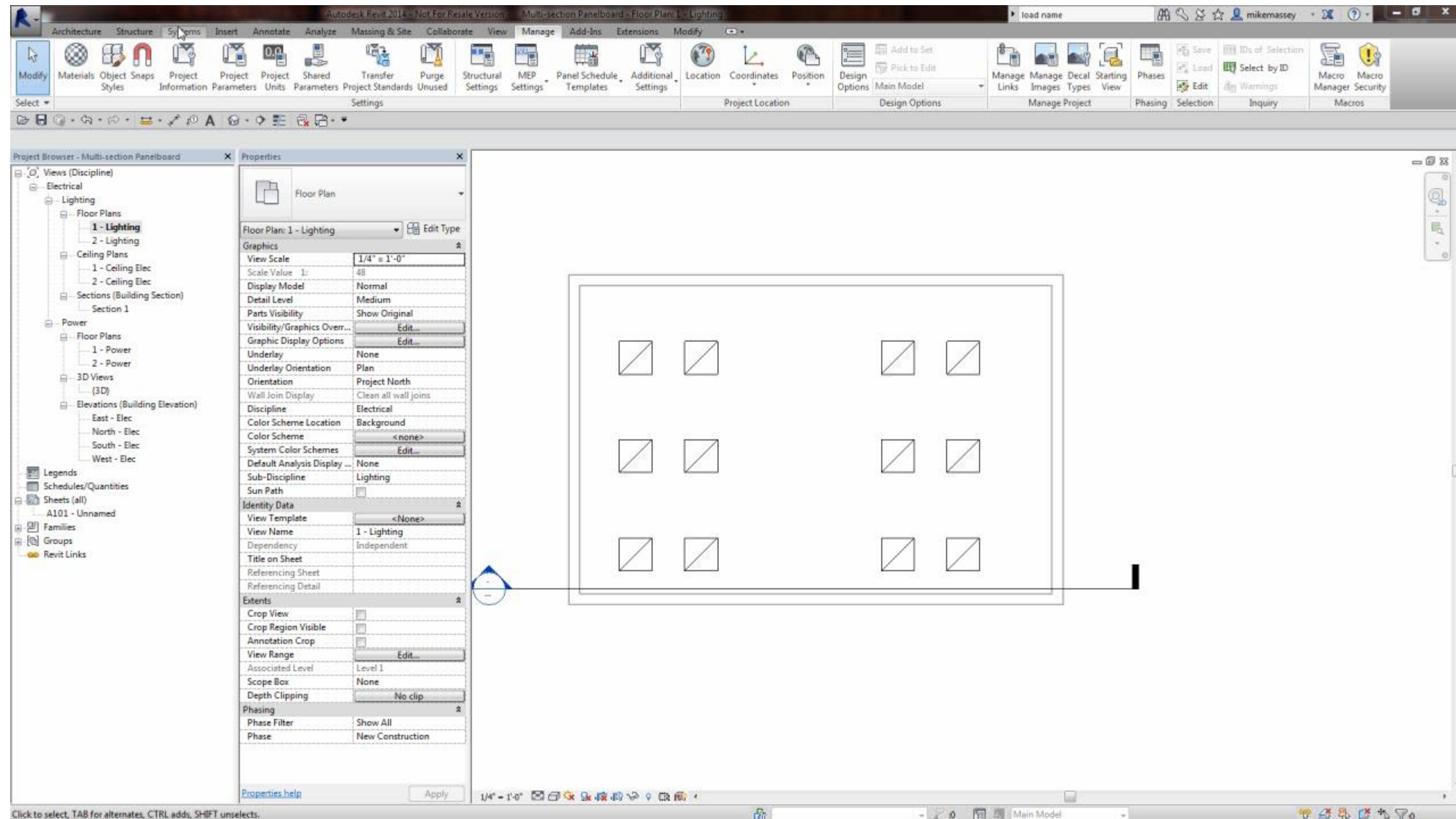




# Panel Schedule Templates

## Let's see how this works...

# Multi-Section Panel Board



\* Panel and Ghost Font are in Class Files

# Using Schedules to Check if Main is Sized Correctly

- Create Equipment Schedule
- Use Calculated Value
- Use Conditional Formatting

F	G	H
Mains	Total Connected C	Main Delta
100 A	280 A	-180 A
300 A	133 A	167 A
100 A	0 A	100 A


Conditional Formatting

Condition

Field: Main Delta Test: Not Between Value: 0 A and 100 A

Conditions to Use:

0 A > Main Delta or Main Delta > 100 A

Background Color: 

Clear All

OK Cancel

Calculated Value

Name: Main Delta

☒ Formula ☐ Percentage

Discipline: Electrical

Type: Current

Formula: Mains - Total Connected Current

OK Cancel Help





**Using Schedules to Check if  
Main is Sized Correctly  
Let's see how this works...**

# Using Schedules to Check if Main is Sized Correctly

<Electrical Equipment Schedule>							
A	B	C	D	E	F	G	H
Family	Panel Name	Supply From	Electrical Data	Total Connected	Total Connected C	Mains	Main Delta
Lighting and Applia	LP202	XFMR-200	208 V/3-0 VA	106020 VA	294 A	100.00 A	-194 A
Lighting and Applia	LP201	LP202	208 V/3-0 VA	57860 VA	161 A	300 A	139 A
Lighting and Applia	DP-100	MSB	480 V/3-0 VA	0 VA	0 A	100 A	100 A

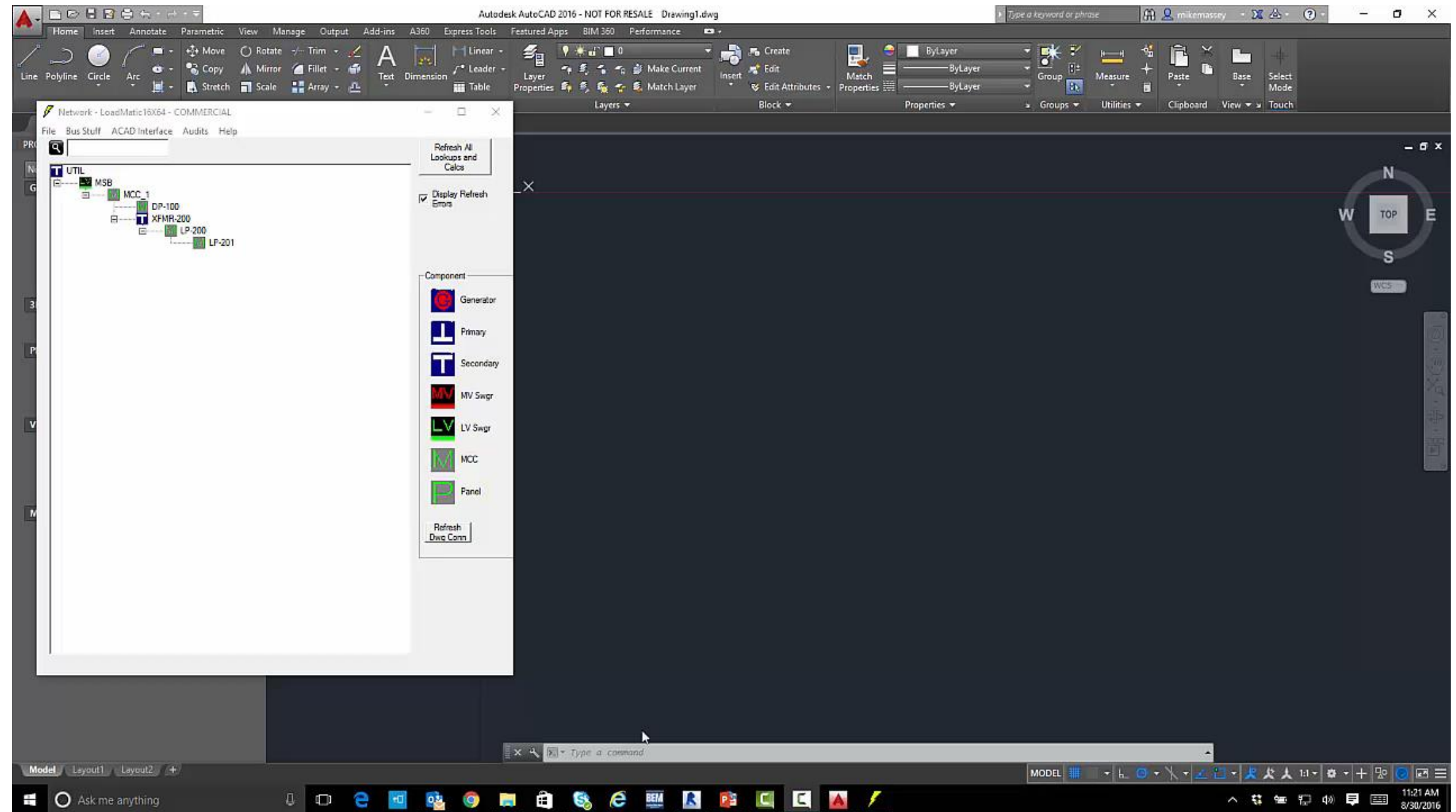


Questions From You!



# Questions From You

- One-Line Diagrams
  - Still no great solution 😞
  - Dynamo?
  - RushForth Tools?
  - Aeries?
  - Other?



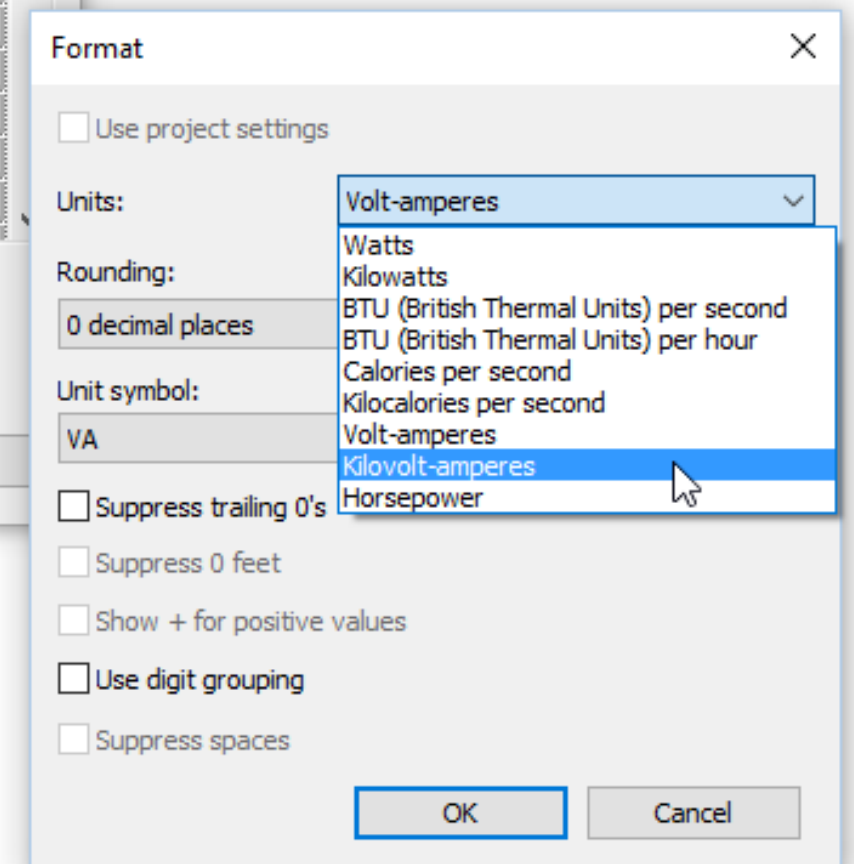
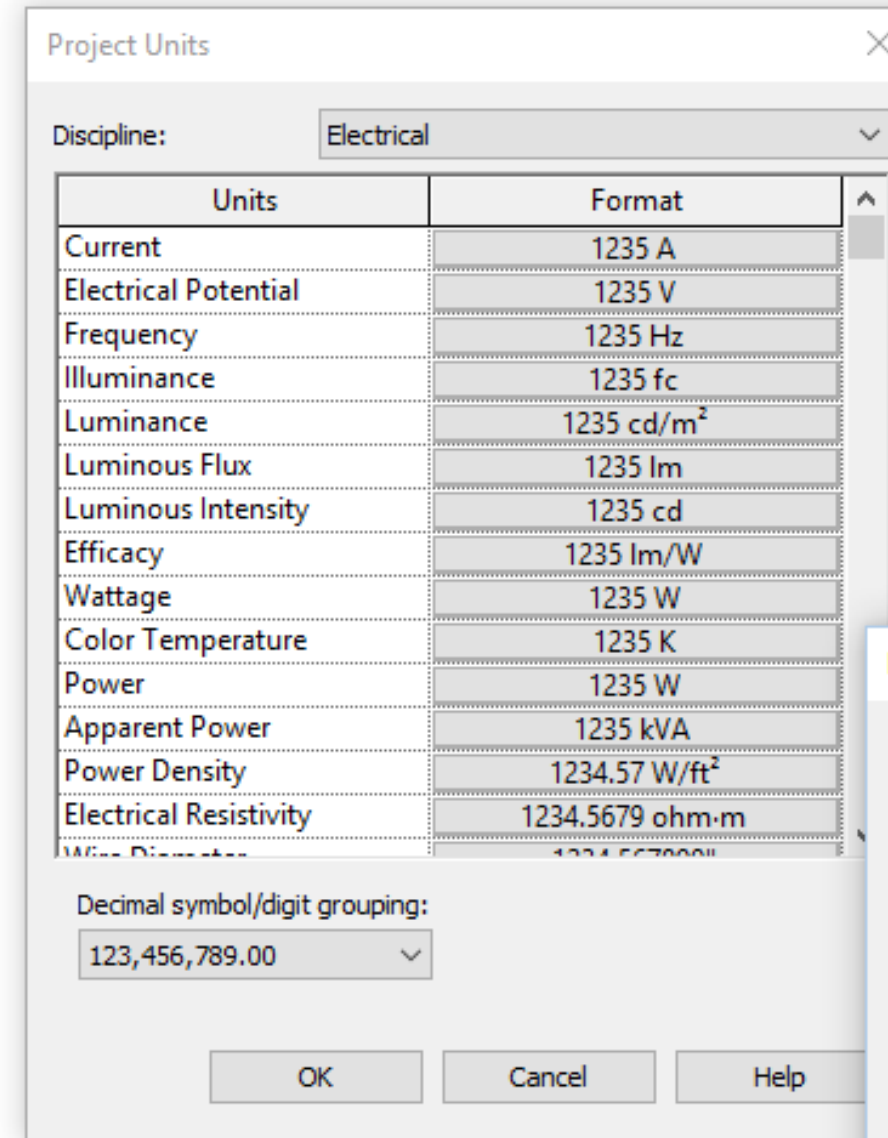
# Questions From You

- Creating a Family with Multiple connectors
  - Create multiple connector Parameters
    - Connector 1 Voltage
    - Connector 2 Voltage
    - Etc...

Electrical Engineering		⌵
Connector 1 Number of Poles	3	
Connector 1 Voltage	208.00 V	
Connector 2 Number of Poles	3	
Connector 2 Voltage	208.00 V	
Electrical - Loads		⌵
Connector 1 Apparent Load	500.00 VA	
Connector 1 Load Classification	HVAC	
Connector 2 Apparent Load	800.00 VA	
Connector 2 Load Classification	Heating	
Panel	PP1	
Circuit Number	1,3,5	
Mechanical		⌵

# Questions From You

- Load Summaries to display loads in KVA, not VA
- Change Project Units of Apparent Power to KVA
- Use Format Unit to override the circuit loads to be VA in the Panel Schedule Template
- Wishlist Item ☹️





# Questions From You

- Load Names Upper Case
  - Other, Motor, & Spare are hardcoded
- Unable to change to Upper Case
- Wishlist Item ☹️

Load Classifications

Load classification types

- Appliance - Dwelling Unit
- Cooling
- Default
- Electric Clothes Dryer
- Electric Range - 3.5 kW to 8.75 kW
- Electric Range - Less than 3.5 kW
- Elevator
- Equipment
- Existing Load
- Existing Load - 30 Day Metered
- Existing Load - Lighting
- Farm Load
- Heating
- HVAC
- Kitchen Equipment - Non-Dwelling Ur
- Lighting
- Lighting - Dwelling Unit
- Lighting - Exterior
- Lighting - General
- Lighting - Hospital
- Lighting - Hotel
- Lighting - Warehouse
- Motor
- Other**
- OTHER\_
- Power
- Power - General
- Receptacle
- Spare
- Transformer
- X-Ray

Name: Other

Demand factor: Other

Select the load class for use with spaces: None

OK Cancel

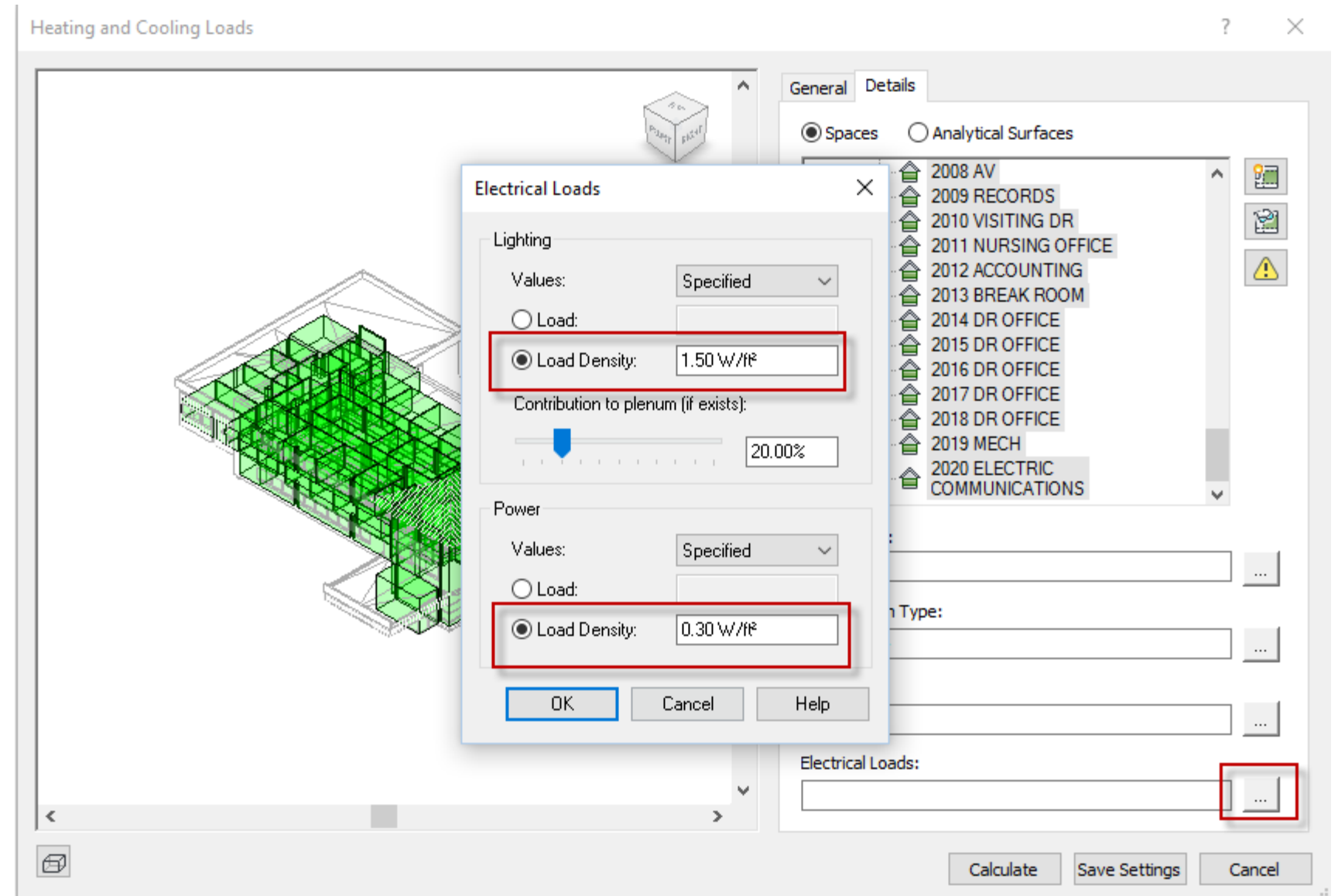
# Questions From You

- Simplified Wire Size Callout
  - Simply list #12 Instead of “1-#12, 1-#12, 1-#12”
- Wishlist Item ☹️

<Electrical Circuit Schedule>			
A	B	C	D
Panel	Circuit Number	Wire Type	Wire Size
LP1	3	THWN	1-#12, 1-#12, 1-#12
LP1	1	THWN	1-#12, 1-#12, 1-#12
LP1	5	THWN	1-#8, 1-#8, 1-#8
LP1	2,4,6	THWN	3-#12, 1-#12, 1-#12
PP1	1,3,5	THWN	3-#12, 1-#12, 1-#12
PP1	2,4,6	THWN	3-#12, 1-#12, 1-#12

# Questions From You

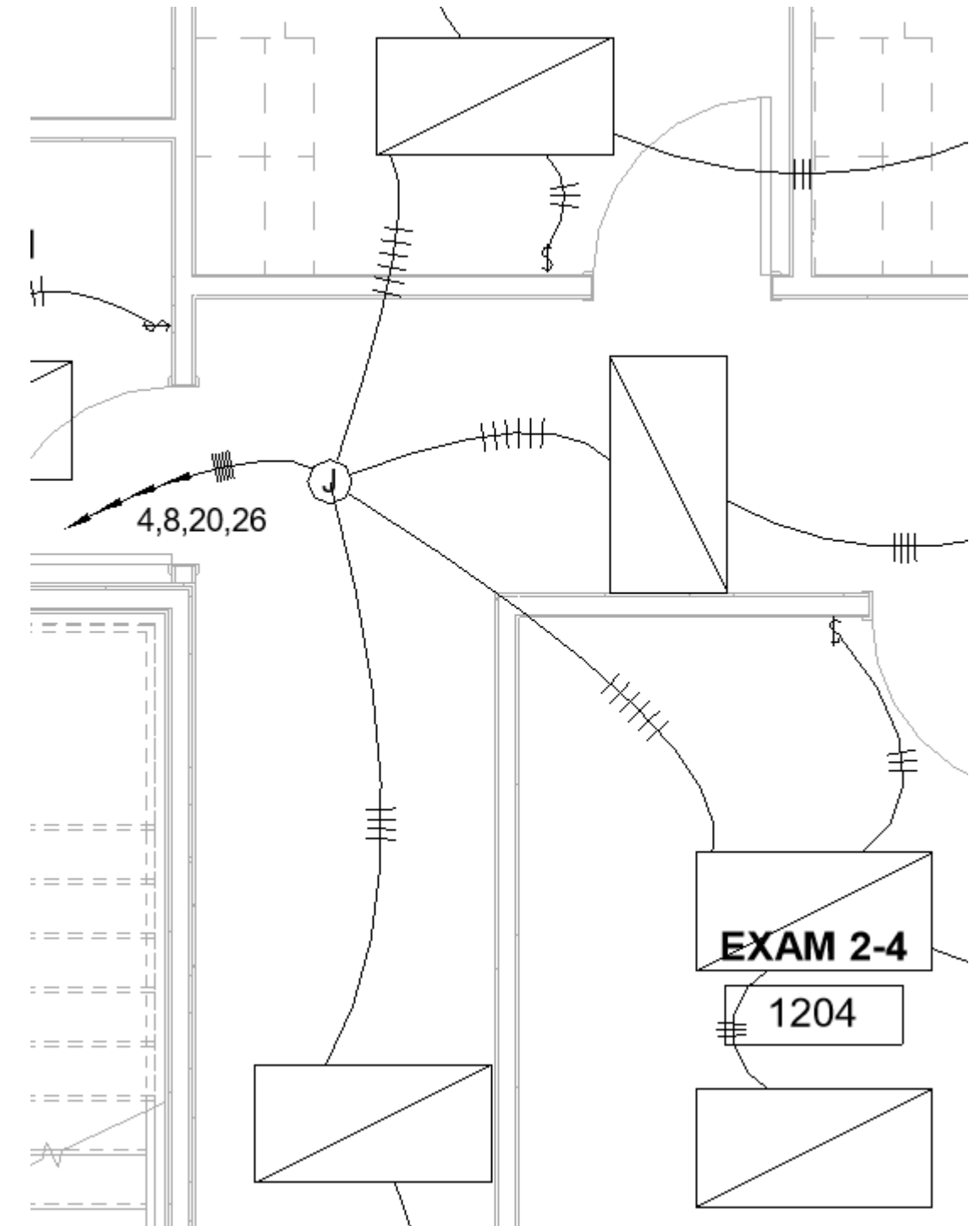
- Easy way of changing the building or space settings Watts/Square Feet from one Energy Code (say AHSRAE 90.1) to another Energy Code (say IECC or Title 24) values.





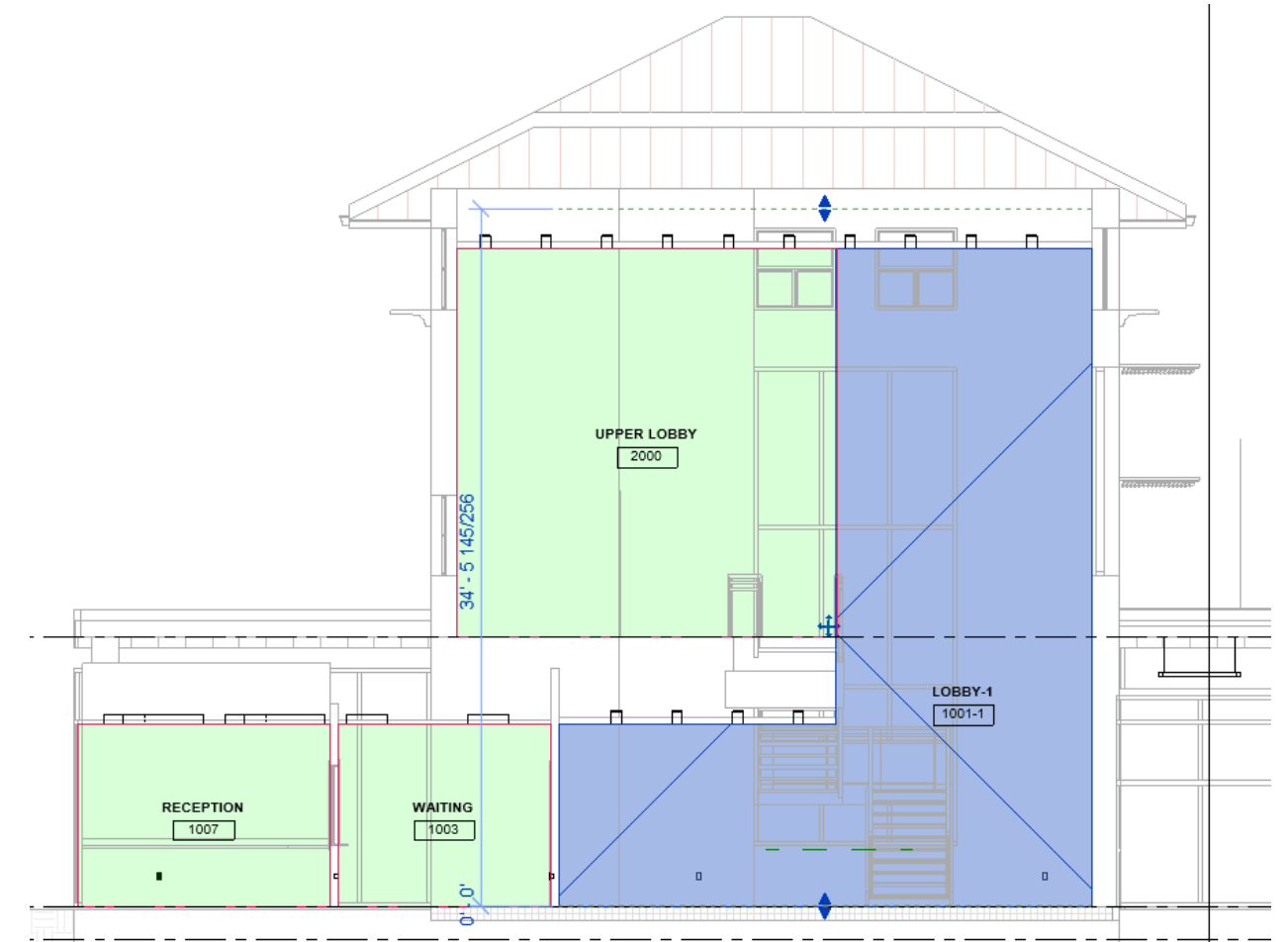
# Questions From You

- How to get multiple circuits to group into a common homerun junction box so that they all show up in a single tag when the wiring command can't seem to find the electrical connector in a family.
- Is there a way to have the wire command snap to that and not any other snap point (i.e. mid, end, quadrant).



# Questions From You

- How to create a space to handle an area open to multiple floors (i.e. Atriums) so that everything calculated within that space for purposes of lighting calculation software like ElumTools or determining the total W/SF within that lobby/atrium for both power and lighting loads.



Load Classifications... Demand Factors...

☒ Run calculations for loads in spaces  
Calculations of loads on spaces may slow system response. You can turn off active calculations to improve performance.

Apparent load calculation method

☐ Sum true load and reactive load

	Apparent Load(VA)	Power Factor	True Load(W)	Reactive Load(VAR)
Load 1	1000	0.8	800	600
Load 2	1000	1	1000	0
Total	1897.37	0.948683	1800	600

☒ Sum apparent load

	Apparent Load(VA)	Power Factor	True Load(W)
Load 1	1000	0.8	800
Load 2	1000	1	1000
Total	2000	0.9	1800

[Learn about load calculations](#)

Electrical - Loads

Design HVAC Load per area	0.00 W/ft <sup>2</sup>
Design Other Load per area	0.00 W/ft <sup>2</sup>
Actual HVAC Load	5000.00 VA
Actual Lighting - Dwelling Unit Load	3900.00 VA
Actual Receptacle Load	900.00 VA

Dimensions

Mechanical - Flow

Identity Data

Phasing

Energy Analysis

Zone	Default
Plenum	<input type="checkbox"/>
Occupiable	<input checked="" type="checkbox"/>
Condition Type	Heated and cooled
Space Type	Lobby
Construction Type	<Building>
People	Edit...
Electrical Loads	Edit...
Outdoor Air Information	From Zone

Electrical Loads

Lighting

Values: Actual

☐ Load: 3900.00 W

☐ Load Density: 6.08 W/ft<sup>2</sup>

Contribution to plenum (if exists):

20.00%

Power

Values: Actual

☐ Load: 900.00 W

☐ Load Density: 1.40 W/ft<sup>2</sup>

OK Cancel Help

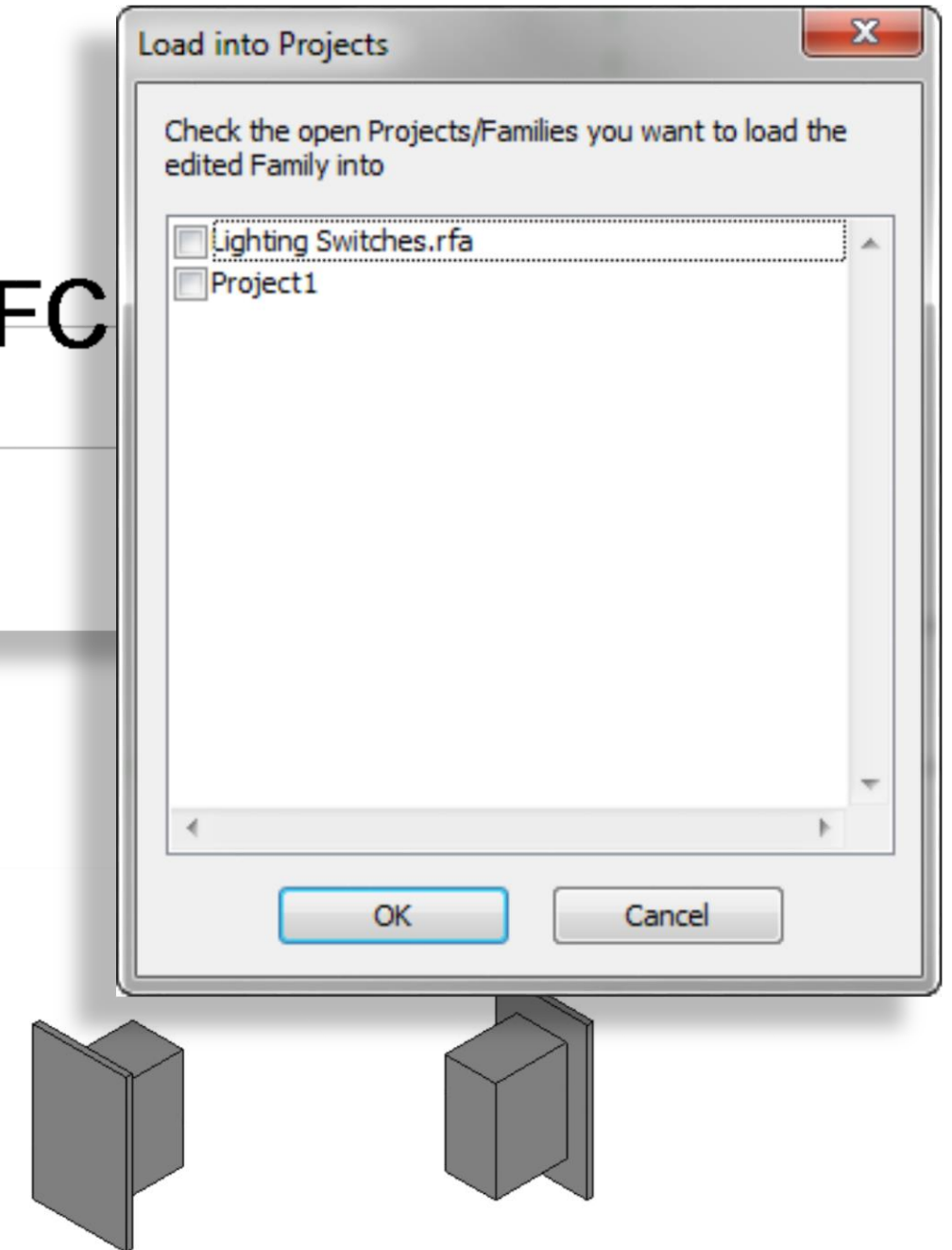
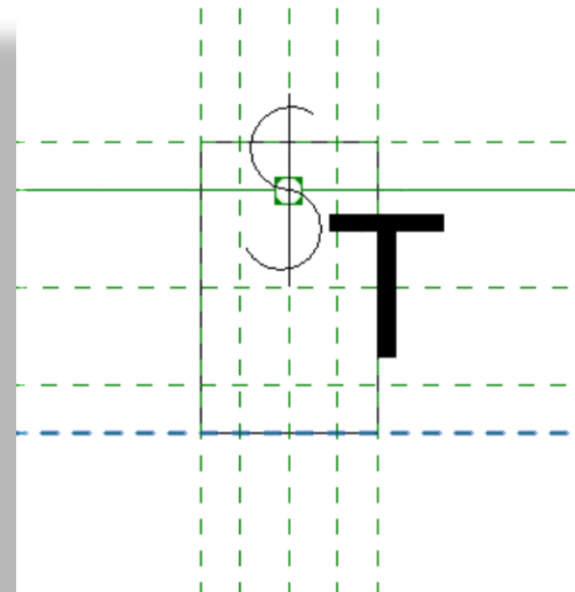
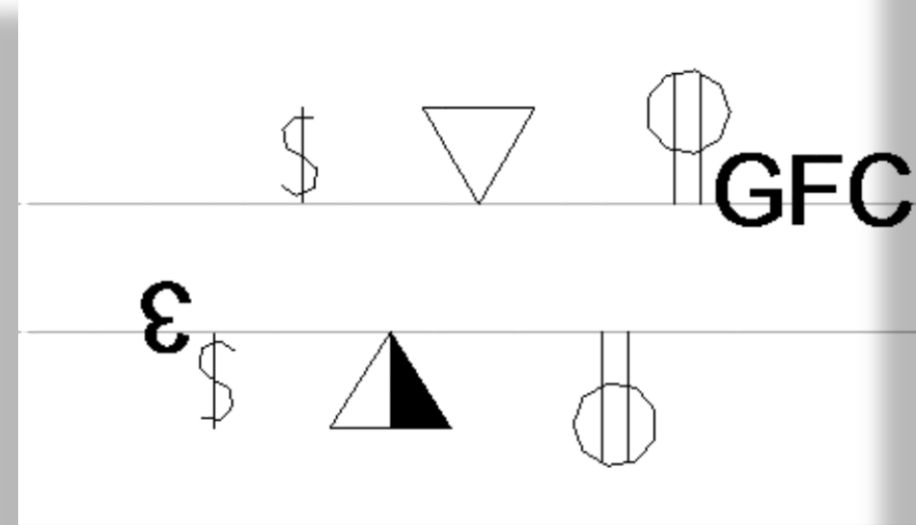
The background features a blue gradient bar at the bottom, transitioning from a darker blue on the left to a lighter blue on the right. Overlaid on this is a complex, light gray wireframe mesh pattern that forms a series of interconnected, flowing, and somewhat circular shapes, resembling a stylized, abstract representation of a network or a series of connected loops.

# Additional Topics



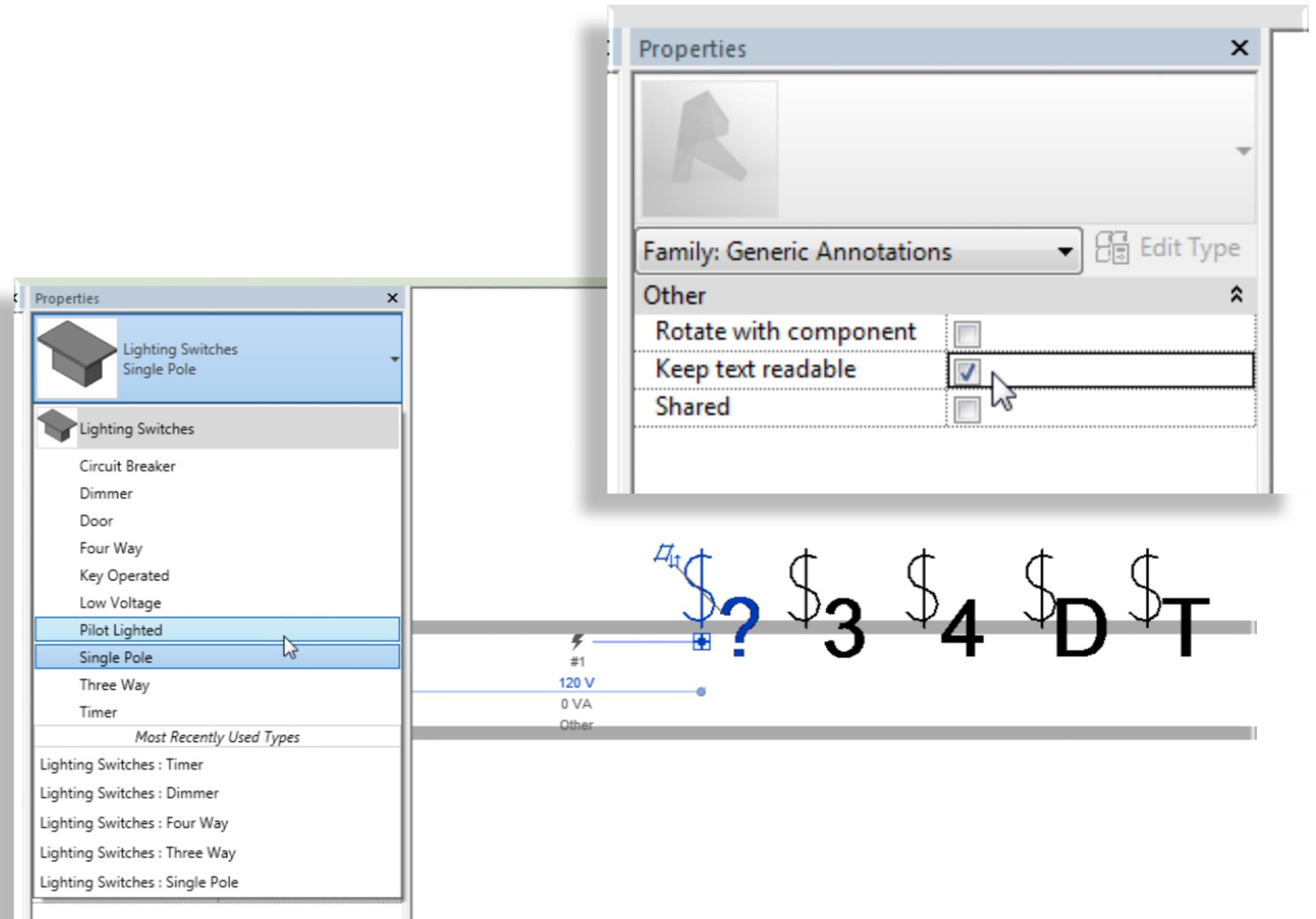
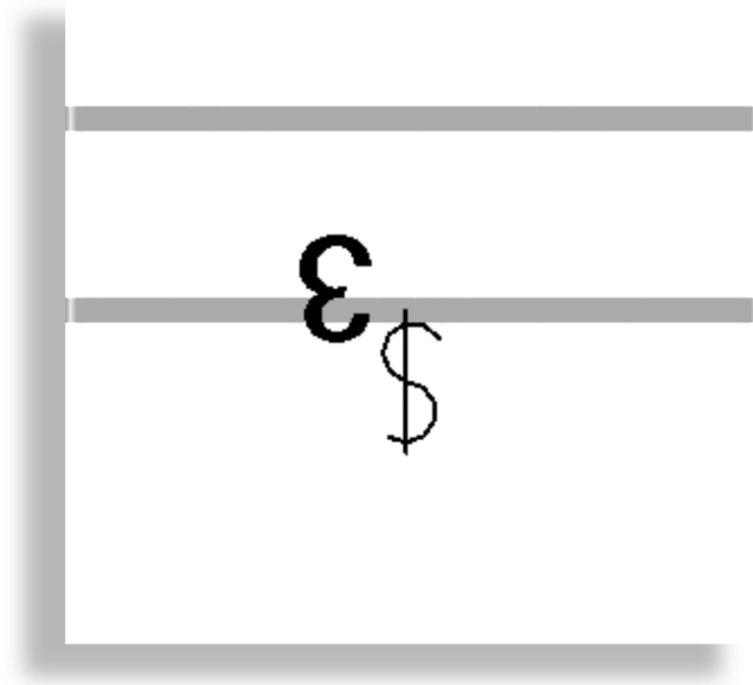
# Control the Graphics of Nested Symbol Families

- Family within a Family
- Symbol Families
  - Generic Annotation Families
  - Contain 2D lines and text and/or labels
  - Scale with View Scale
  - Only show up in Plan Views



# Correcting Upside Down Switch Labels

- Modify Nested Family
- Keep Text Readable

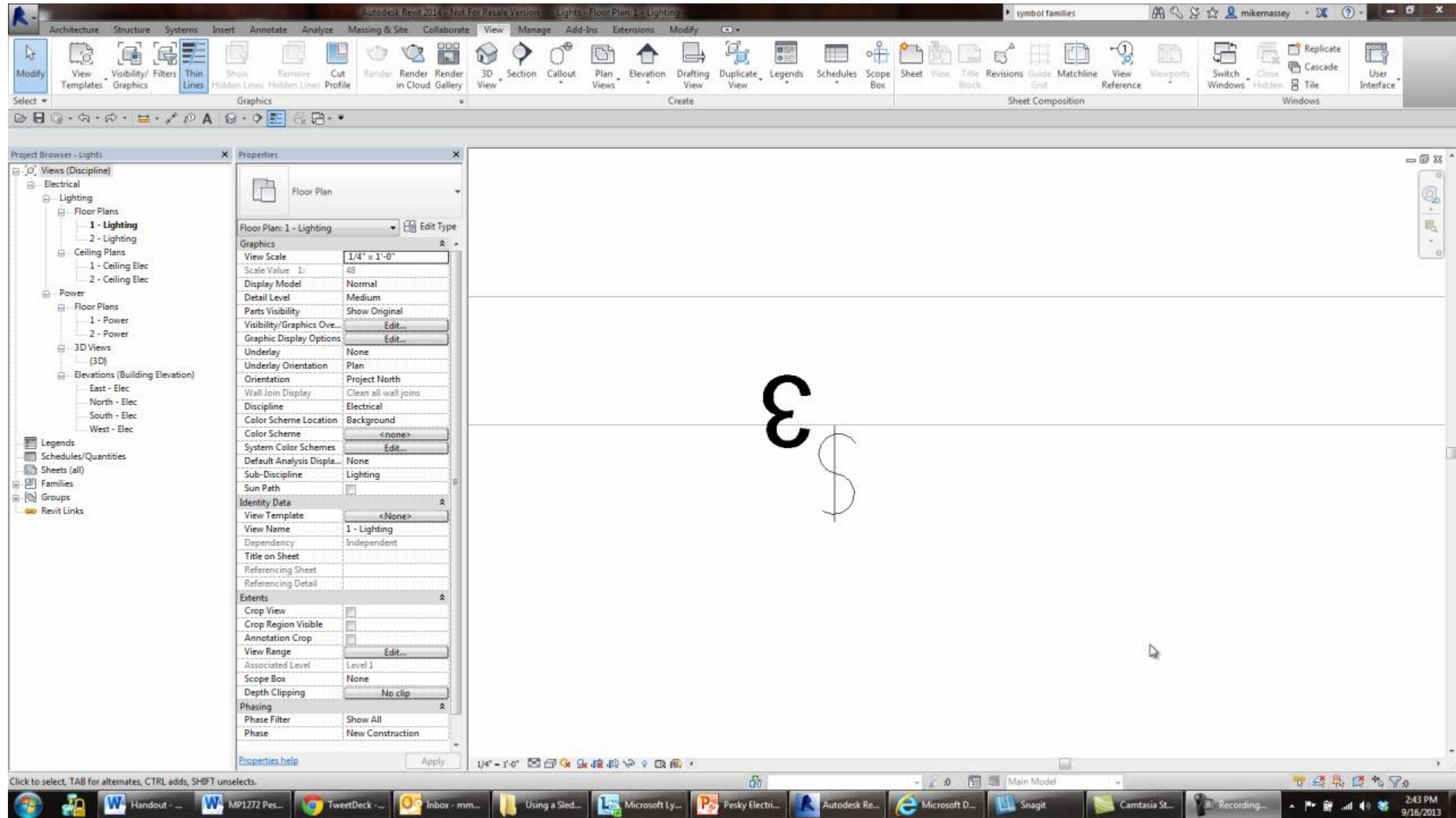




**Correcting Upside Down  
Switch Labels  
Let's see how this works...**



# Correcting Upside Down Switch Labels



# Creating Stacked Devices


- Adding Movable Parameters


Family Types

Name:

Parameter	Value	
<b>Constraints</b>		
Plan Symbol Vertical Location (default)	<input type="text" value="1.000000"/>	=
Plan Symbol Horizontal Location (default)	<input type="text" value="1.000000"/>	=
<b>Other</b>		
Vertical Offset (default)	<input type="text" value="0' 0"/>	= (Plan Symbol Vertical Location - 1) * 0' 0 3/16"
Horizontal Offset (default)	<input type="text" value="0' 5"/>	= 0' 5" + (Plan Symbol Horizontal Location - 1) * 0' 0 3/16"
<b>Identity Data</b>		

Properties

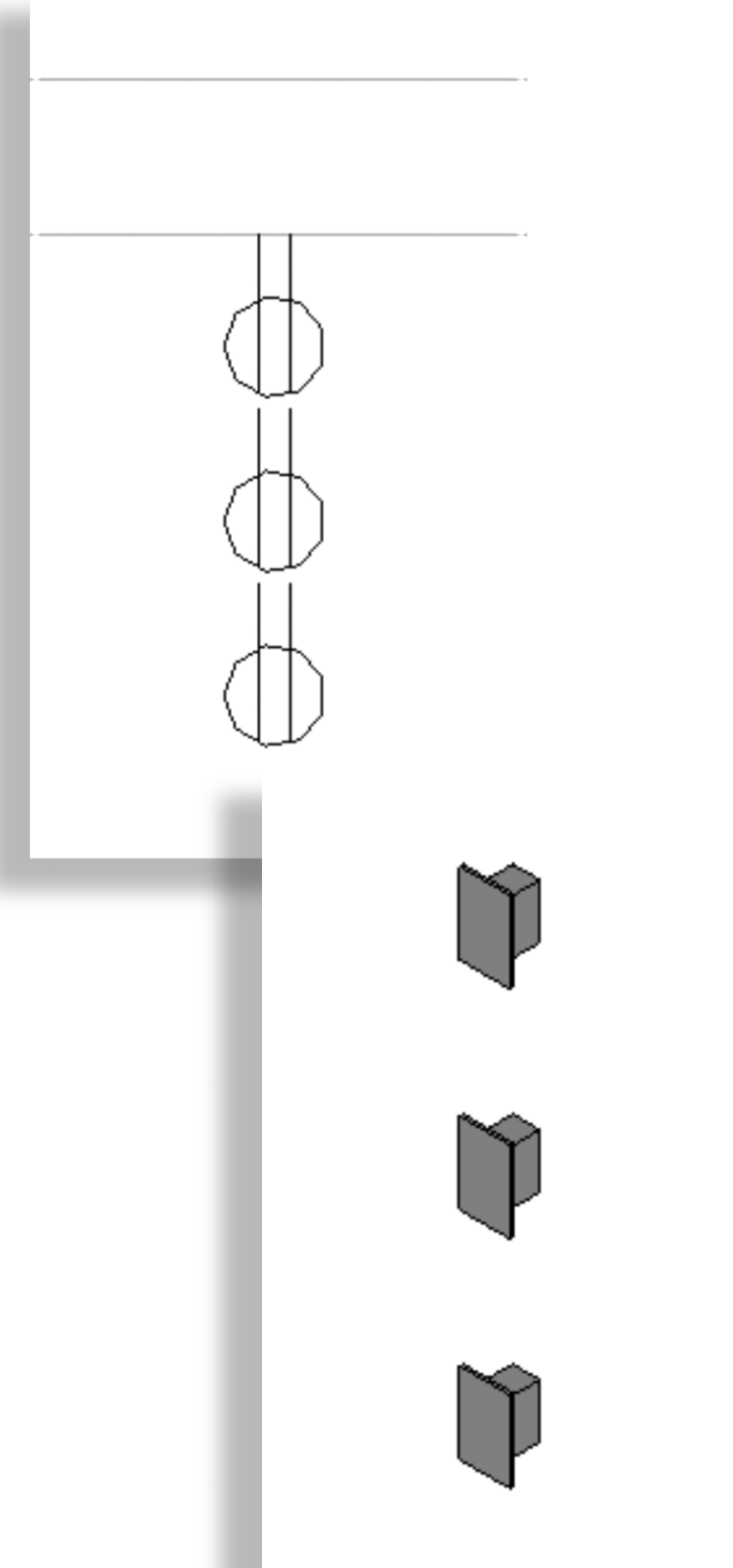
 Duplex Receptacle - Movable Plan  
Symbol Standard

Electrical Fixtures (1)  Edit Type

Constraints

Plan Symbol Vertical Location	<input type="text" value="3.000000"/>
Plan Symbol Horizontal Location	<input type="text" value="1.000000"/>
Host	Basic Wall : Generic - 8"
Elevation	2' 6"
Offset	0' 0"

Electrical - Loads



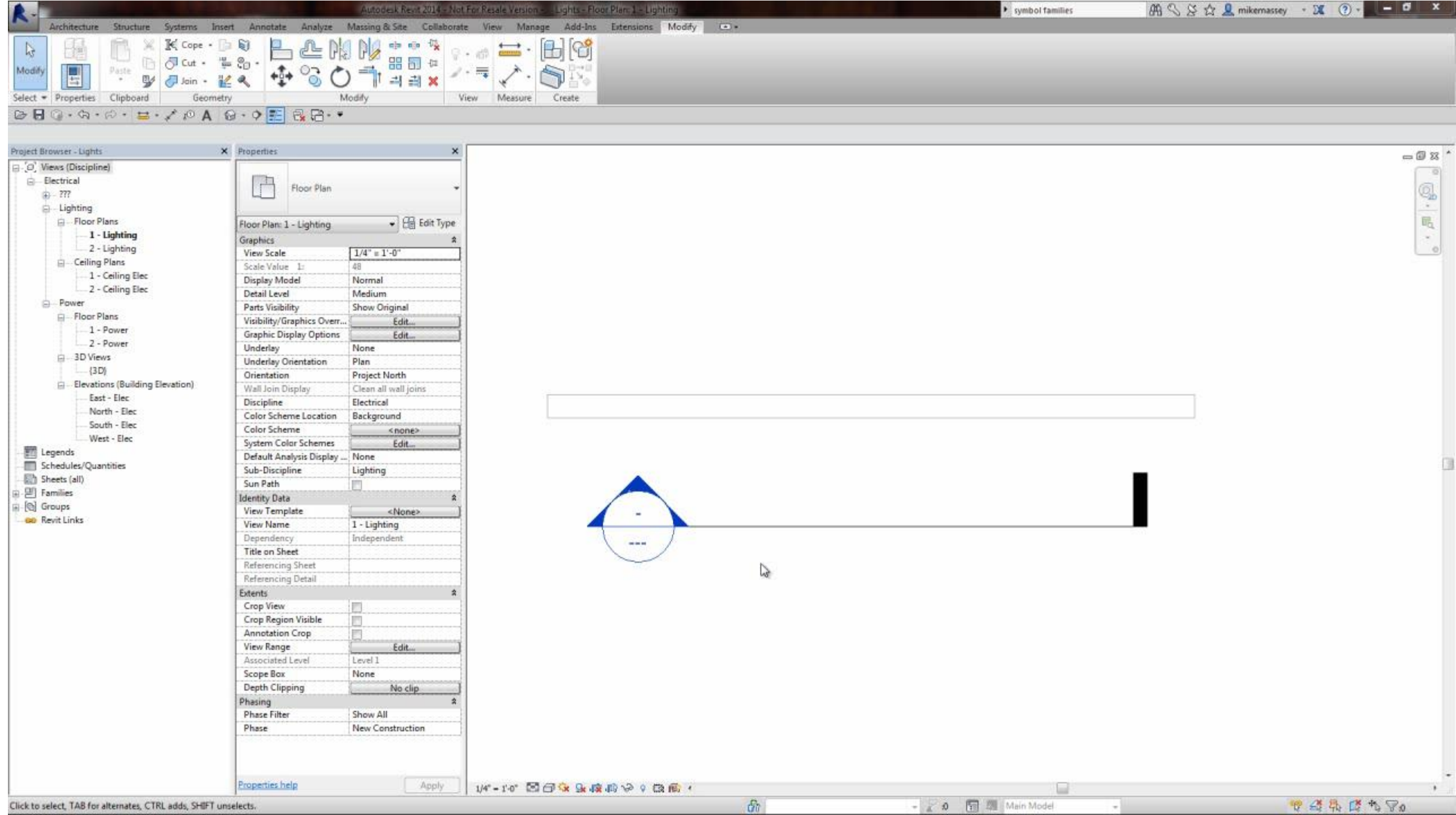


# Creating Stacked Devices

## Let's see how this works...



# Creating Stacked Devices

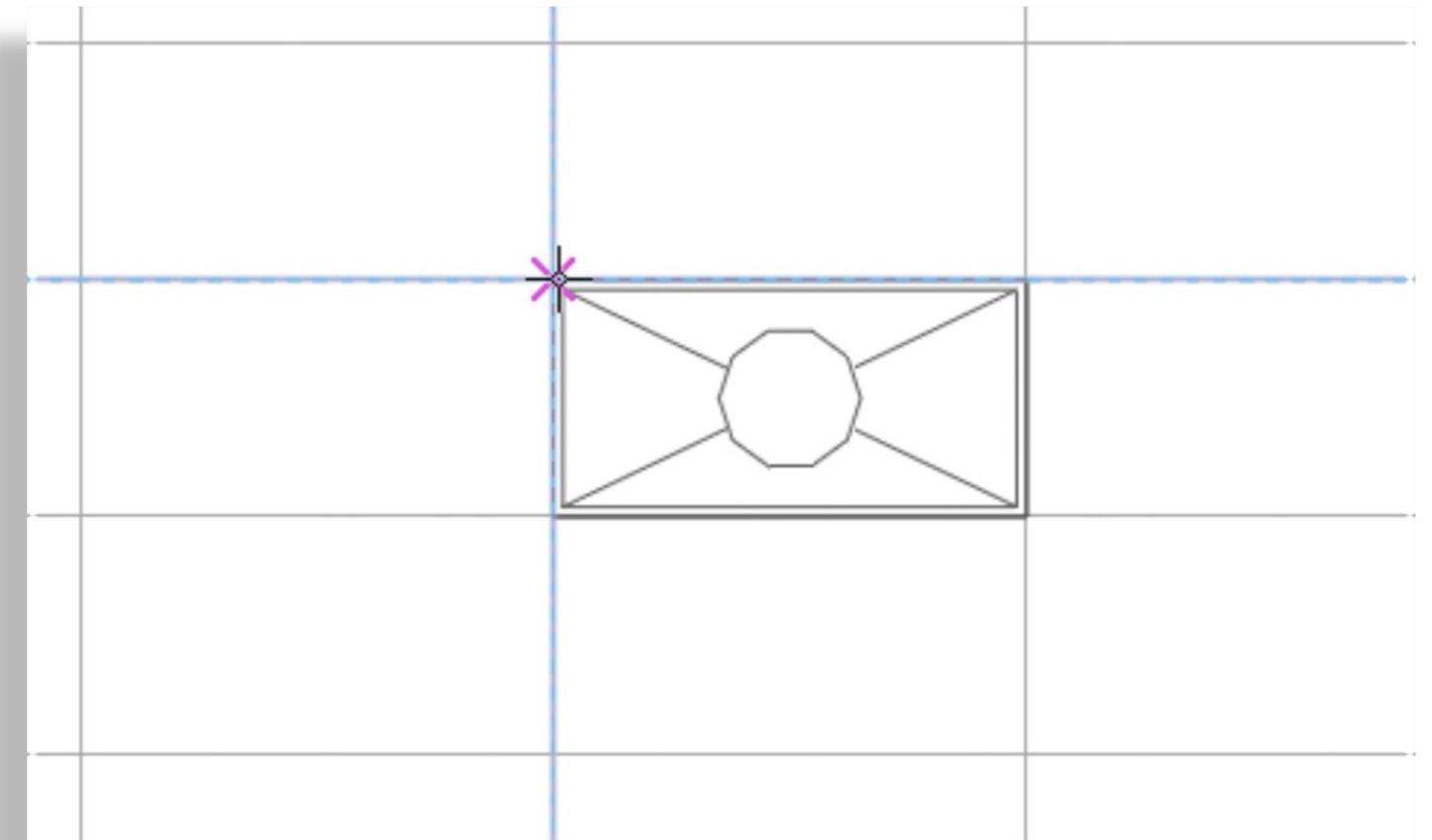
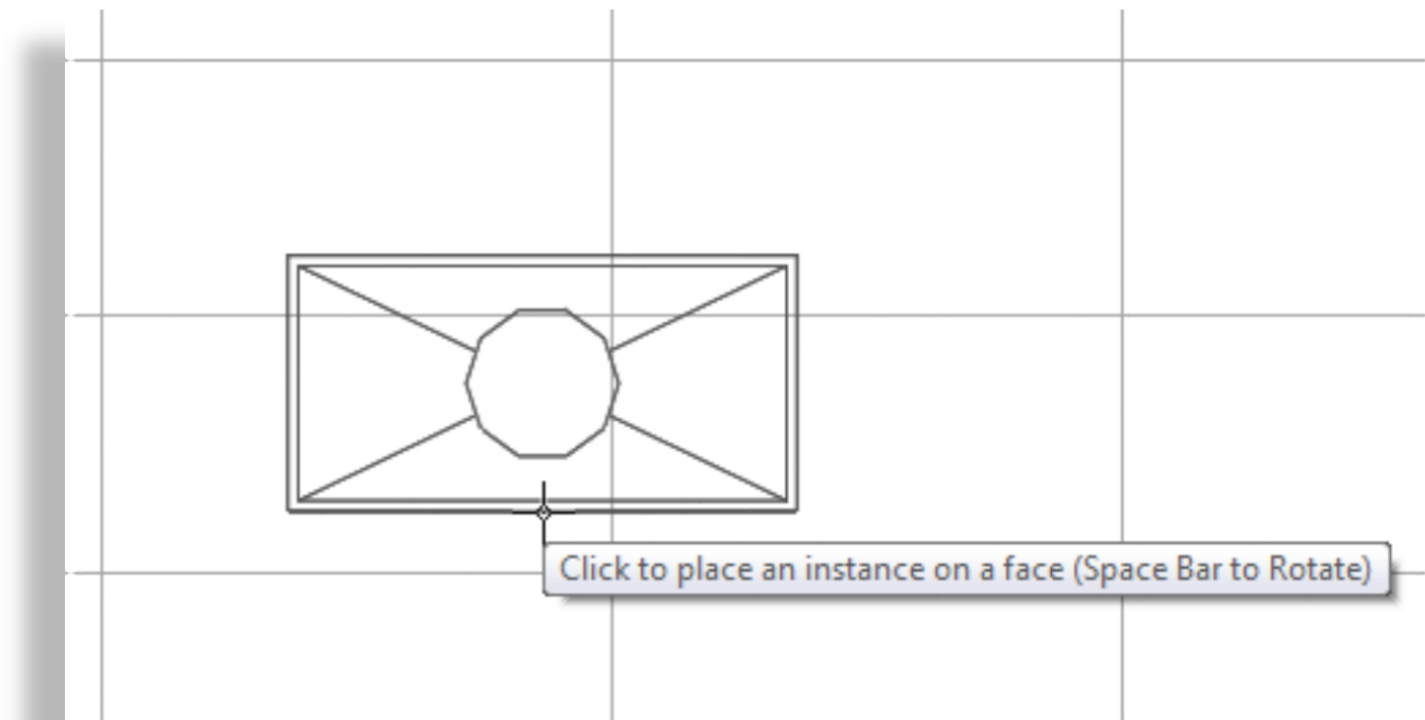


\* Family is in Class Files

# Changing the Origin of a Light Fixture

- Reference Plane
- Use Define Origin Parameter

Extents	
Scope Box	None
Other	
Is Reference	Not a Reference
Defines Origin	<input checked="" type="checkbox"/>

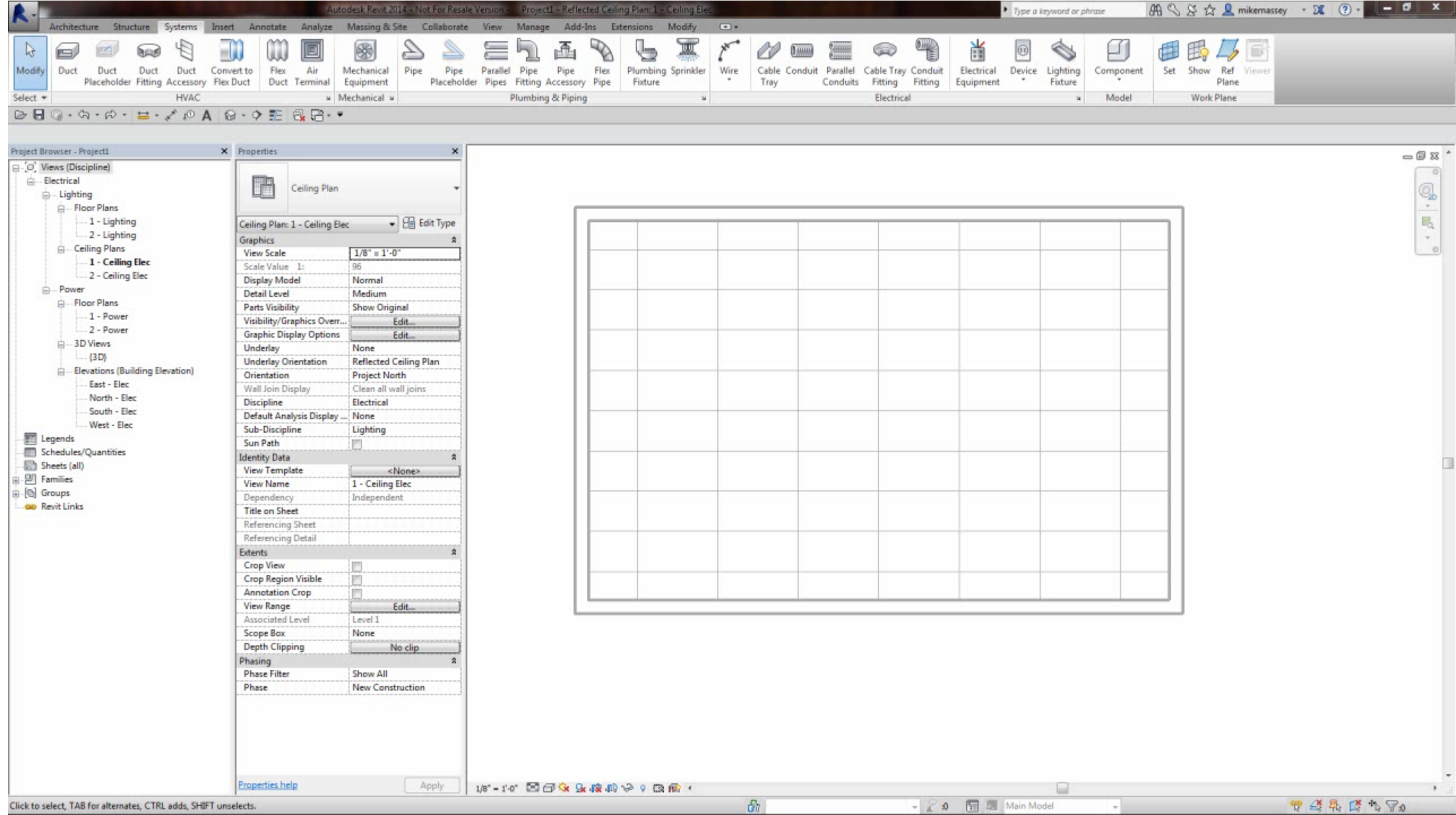




# Changing the Origin of a Light Fixture Let's see how this works...

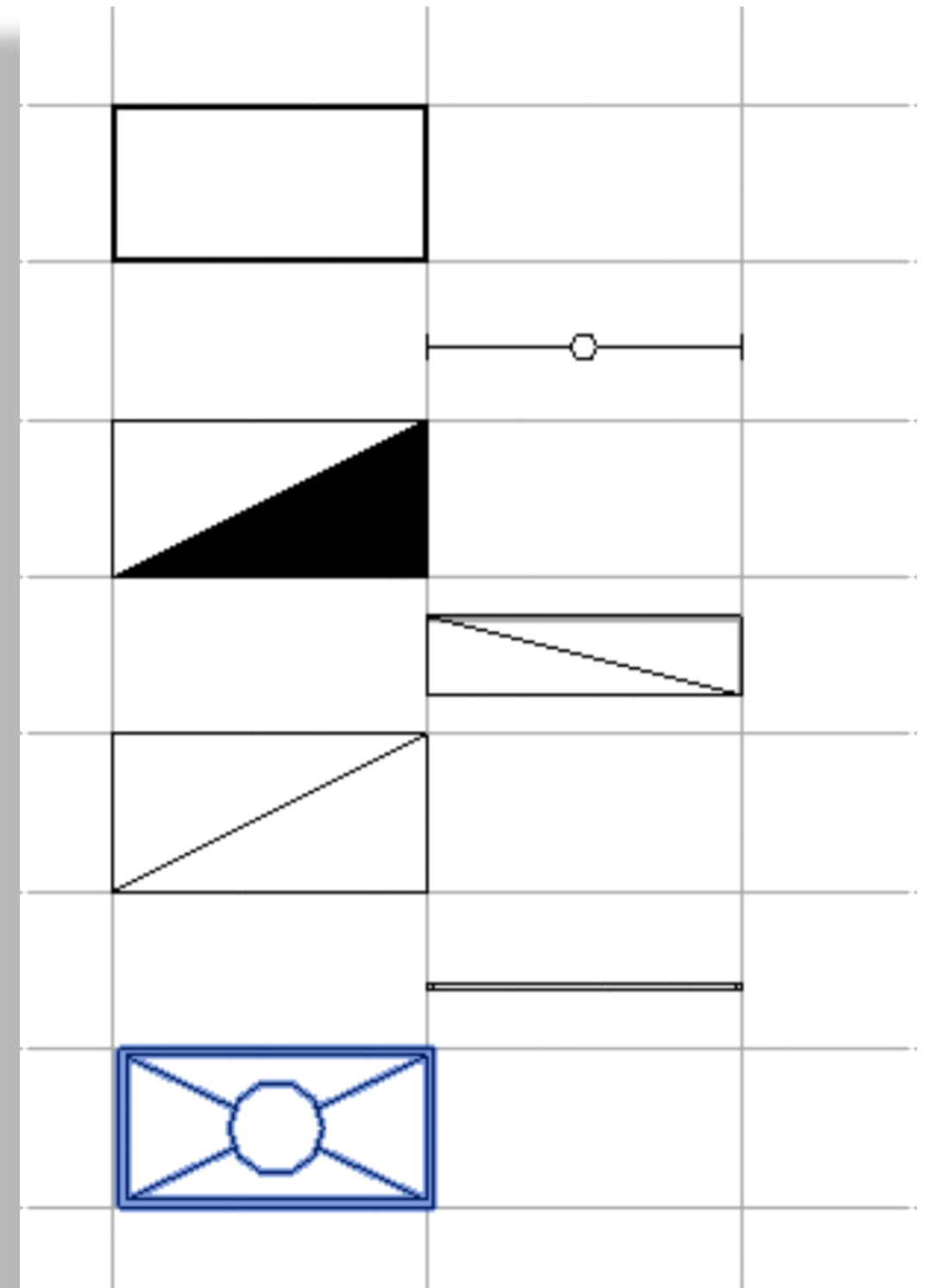
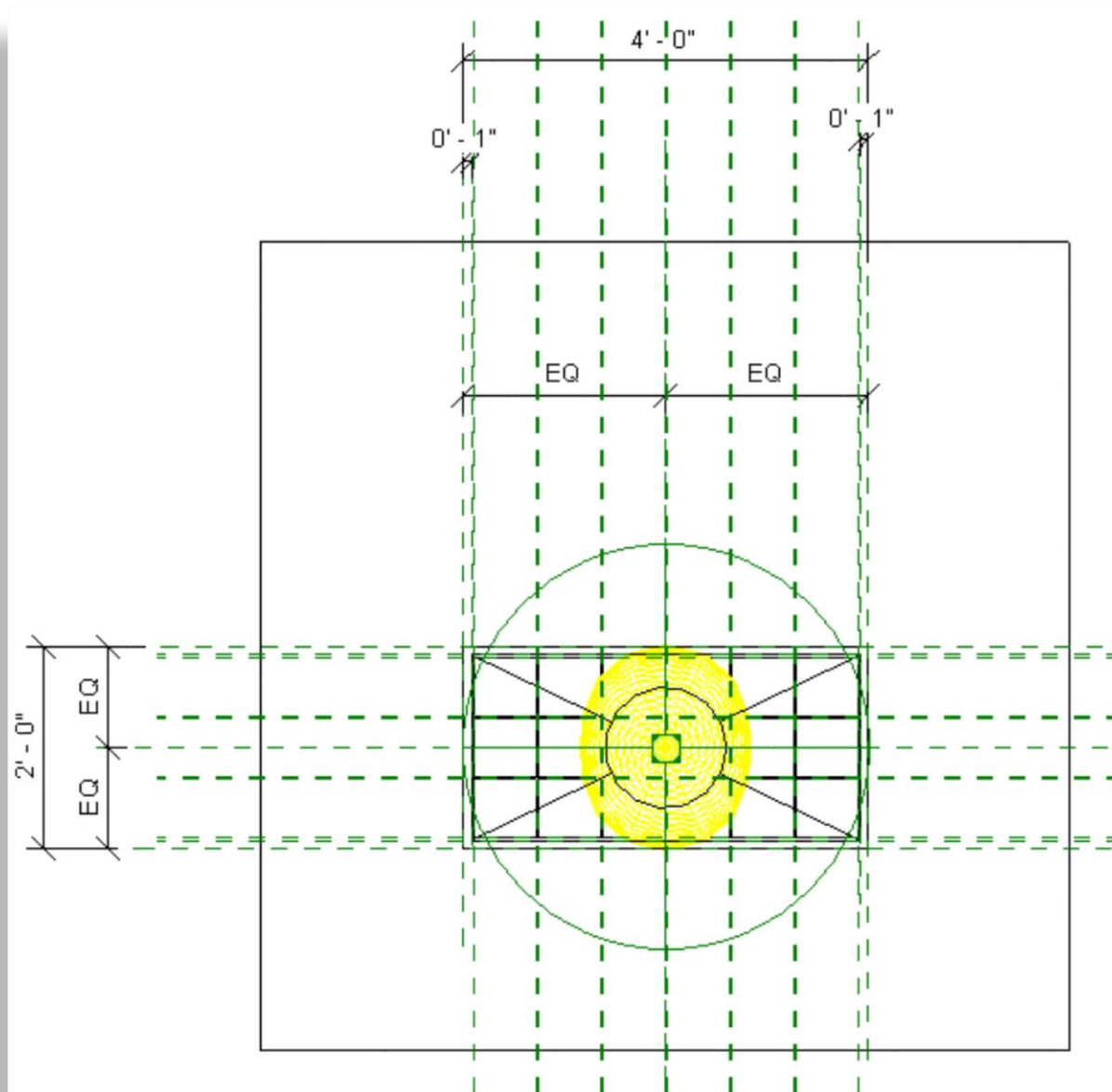


# Changing the Origin of a Light Fixture



# Changing the Graphics of a Light Fixture

- Model Lines Vs. Symbolic Lines

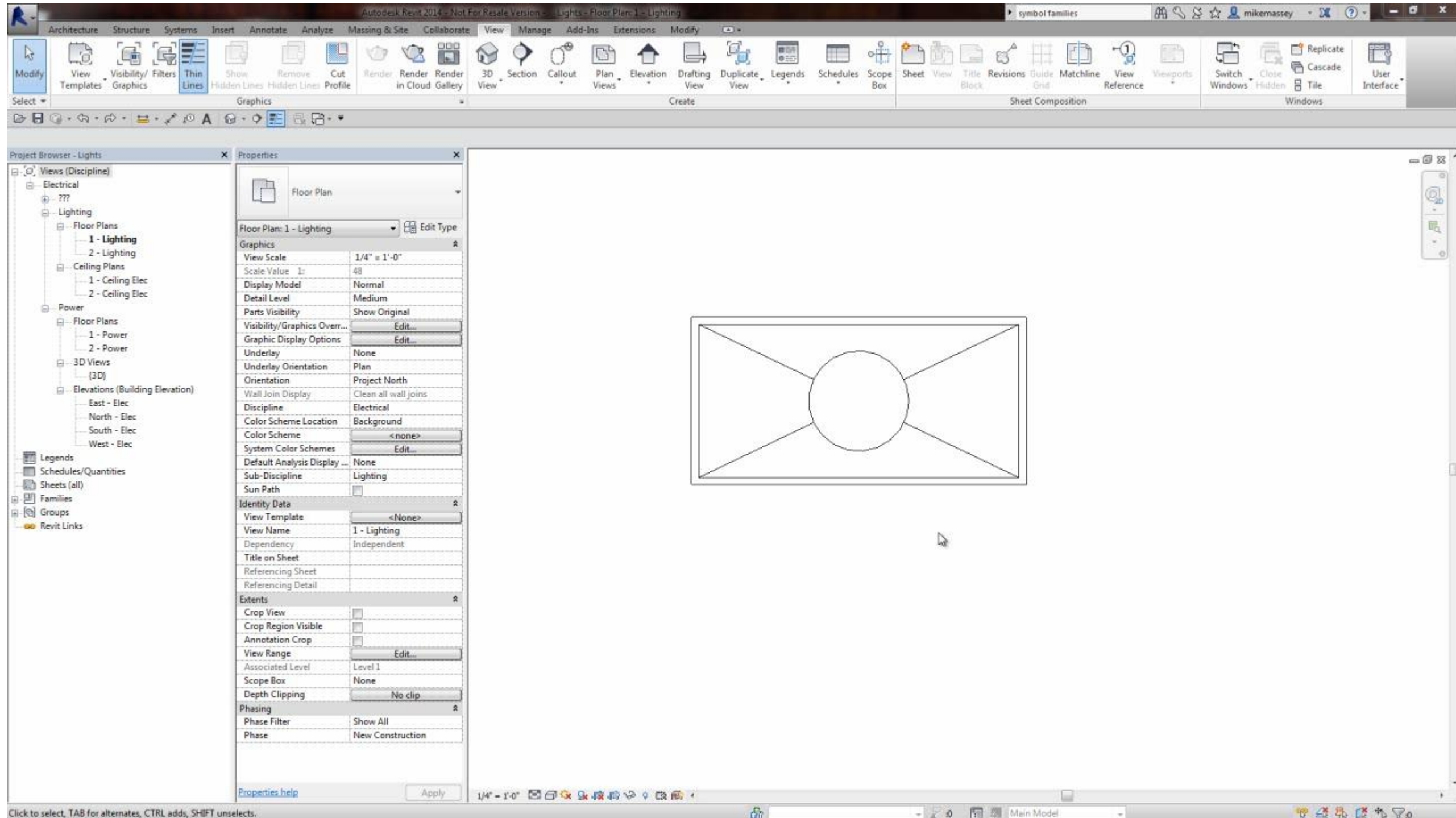




# Changing the Graphics of a Light Fixture

Let's see how this works...

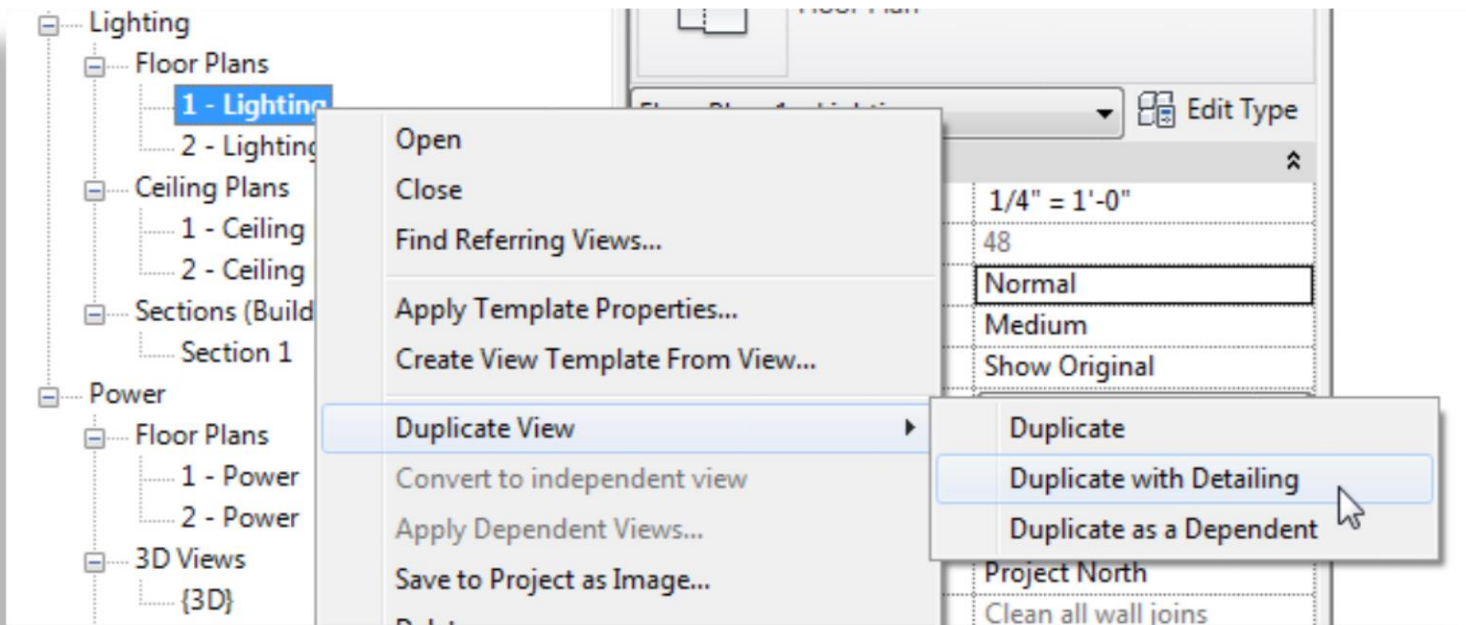
# Changing the Graphics of a Light Fixture



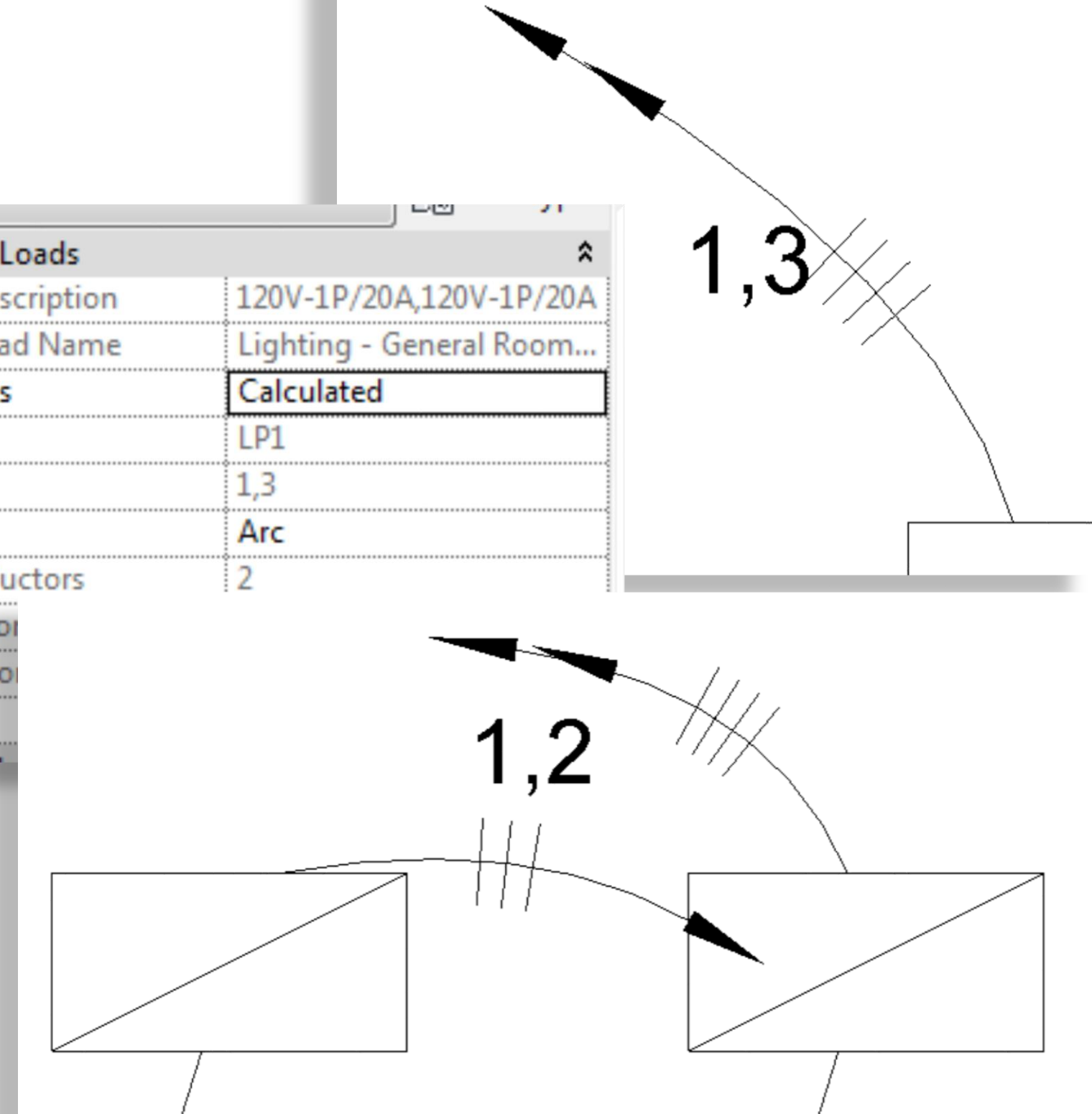


# Double Homeruns

- Connecting them in order
- Eliminating Extra Arrow
  - Duplicate with Detailing
  - FIXED in 2014??



Electrical - Loads	
Circuit Description	120V-1P/20A,120V-1P/20A
Circuit Load Name	Lighting - General Room...
Tick Marks	Calculated
Panel	LP1
Circuits	1,3
Type	Arc
Hot Conductors	2
Neutral Con	
Ground Con	
Wire Size	

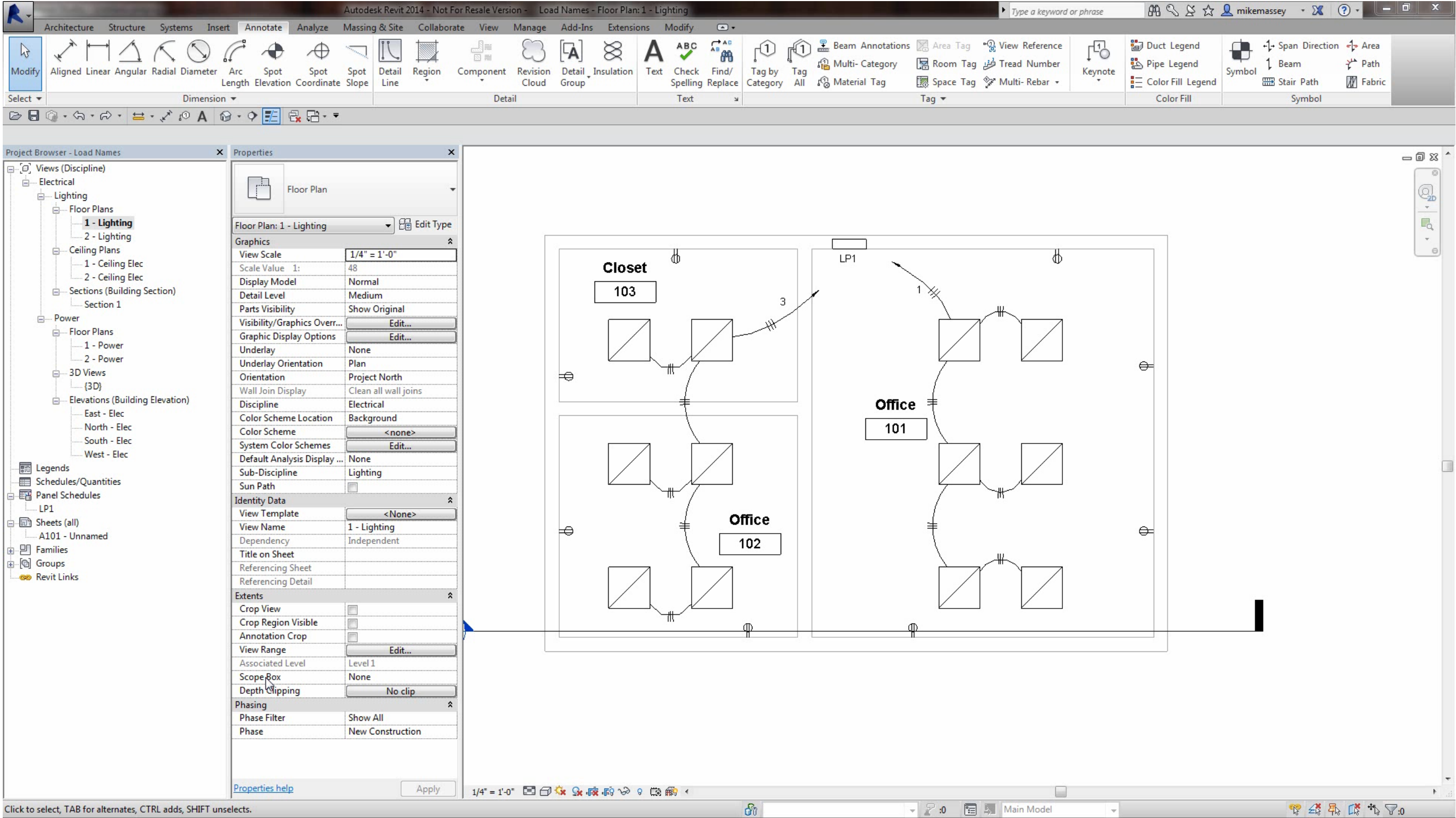




# Double Homeruns

## Let's see how this works...

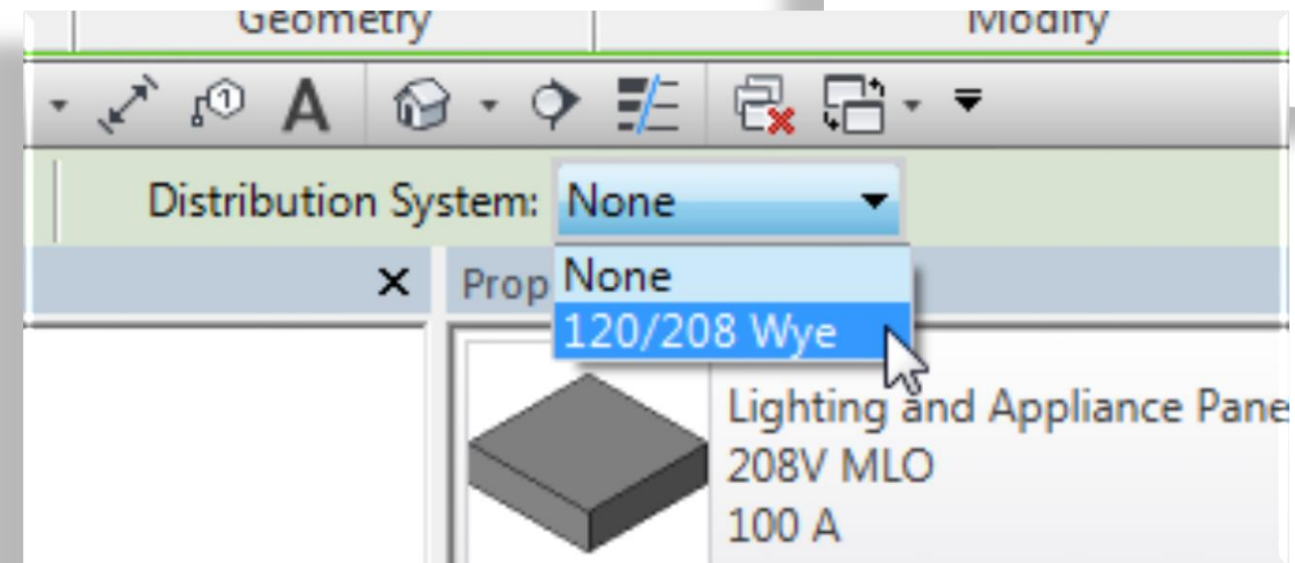
# Double Homeruns



# Tips and tricks when creating electrical circuits

- 3 Most Important Parameters when Inserting Panels
  - **Distribution System**
  - Panel Name
  - Max. #1 Pole Breakers

Electrical - Circuiting	
Max #1 Pole Breakers	12
Mains	100.00 A
Circuit Naming	
Circuit Prefix Separator	
Circuit Prefix	



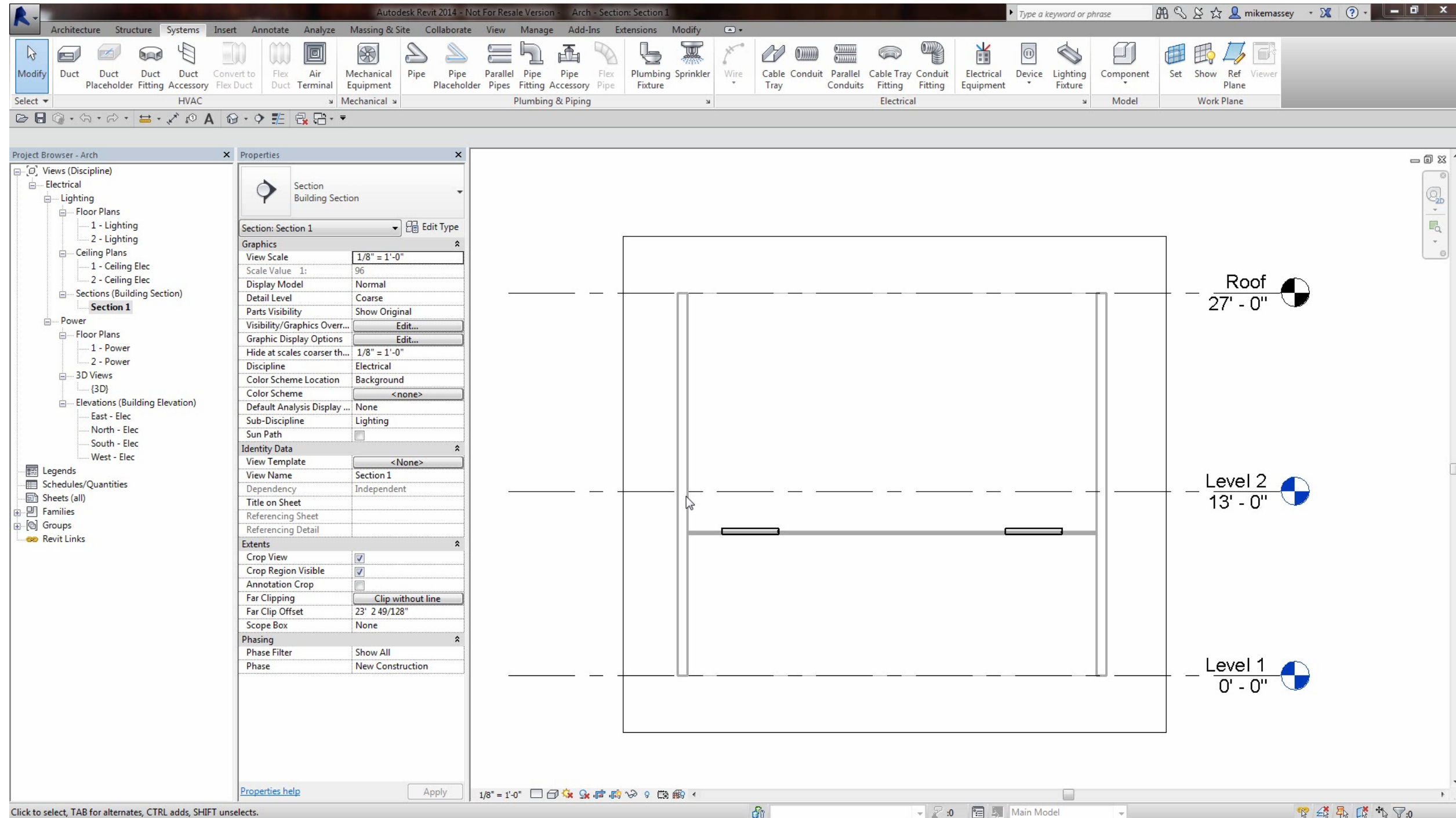
Dimensions	
Width	1' 8"
Depth	0' 5 3/4"
42 Circuit Height	3' 5"
30 Circuit Height	2' 2"
24 Circuit Height	1' 11"
12 Circuit Height	1' 8"





## **3 Most Important Parameters when Inserting Panels Let's see how this works...**

# 3 Most Important Parameters when Inserting Panels



# How did I do?

- Your class feedback is critical. Fill out a **class survey** now.
- Use the **AU mobile app** or fill out a class survey online.
- Give feedback after each session.
- AU speakers will get feedback in real-time.



# Thank you for attending

Mike Massey

Email - [mike.massey@asti.com](mailto:mike.massey@asti.com)



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