

MP1272 – Pesky Electrical Settings that Drive You Crazy

Mike Massey

Sr. AEC Application Specialist

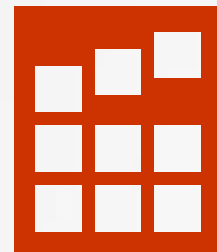
Twitter: @mgmassey01



Presenting Today.....



Mike Massey
Senior AEC Application Specialist



Applied
Software®

- 20+ Years of AEC Experience
- Repeat speaker at AU, RTC and AIA events
- A contributing author for Autodesk Official Training Courseware.
- Autodesk Revit Certified Professional
- Autodesk Revit Implementation Certified Expert
- Autodesk Consultative Methodology Certification
- Autodesk MEP Systems Engineering Specialization Certification
- Autodesk Fabrication Specialization Certification

About You

- Who is in the audience?
 - Electrical Engineers
 - Other MEP
 - Architects
 - Structural
 - BIM Managers
 - Other
- Why did you come to this class?

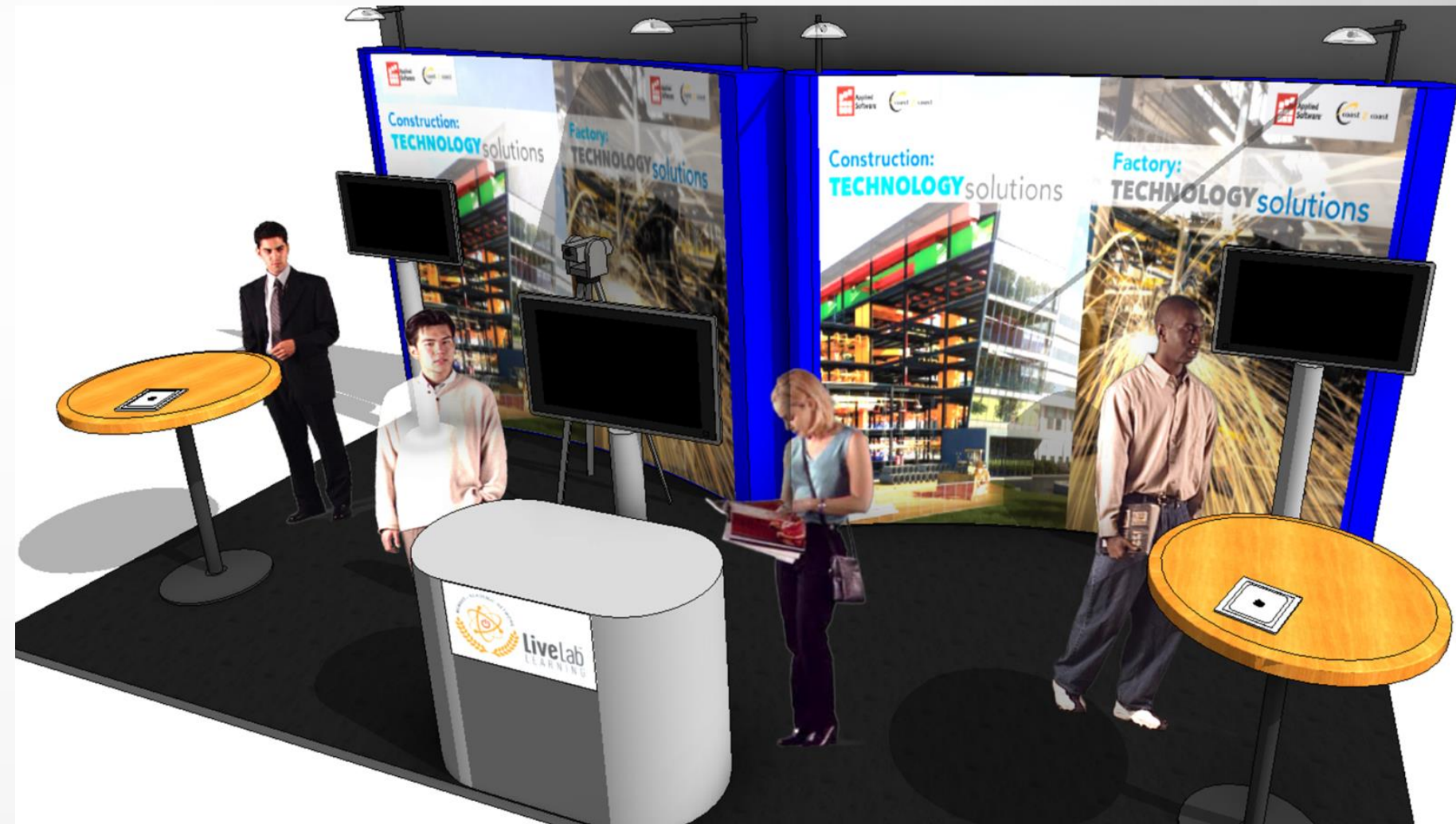


Thanks for spending your valuable time with me today!

Continue the Discussion at our Booth

- Booth 2422
- First 3 to mention that you attended my class will receive a prize

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Class summary



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!

Key learning objectives

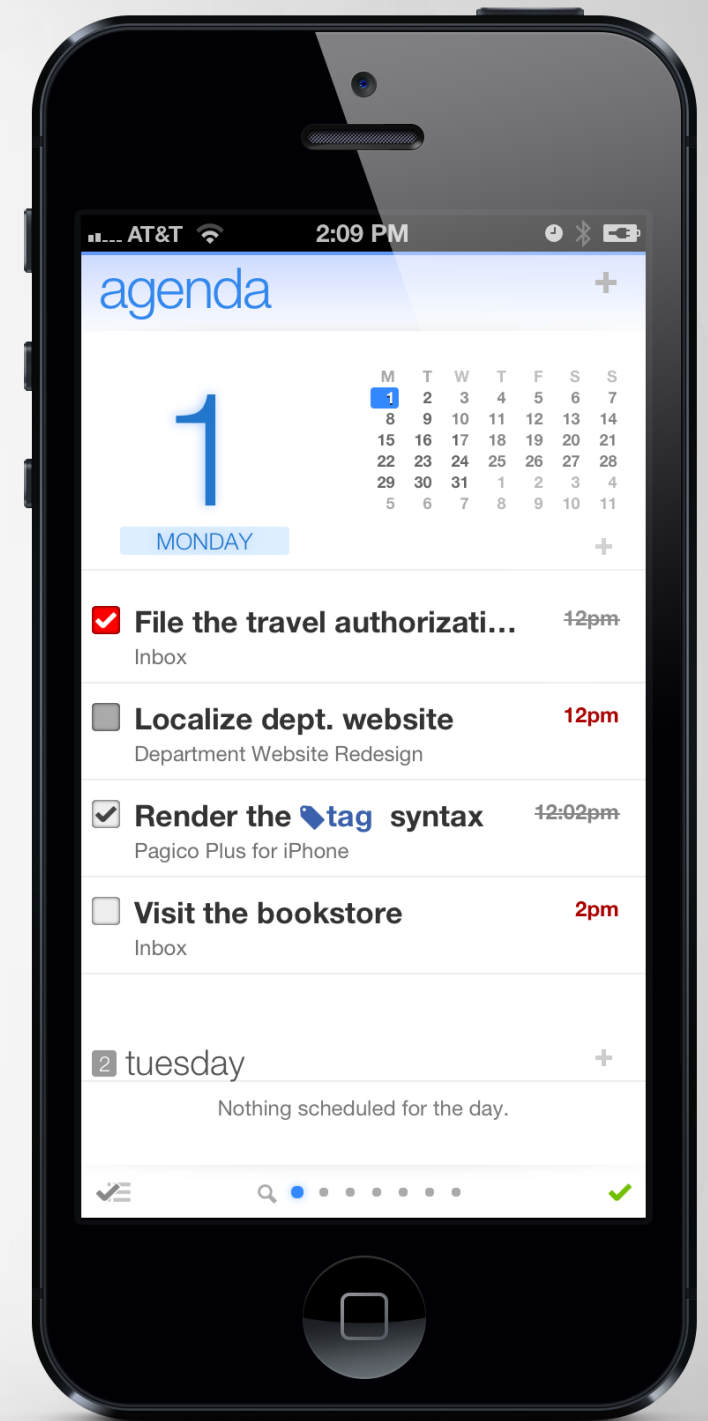
At the end of this class, you will be able to:

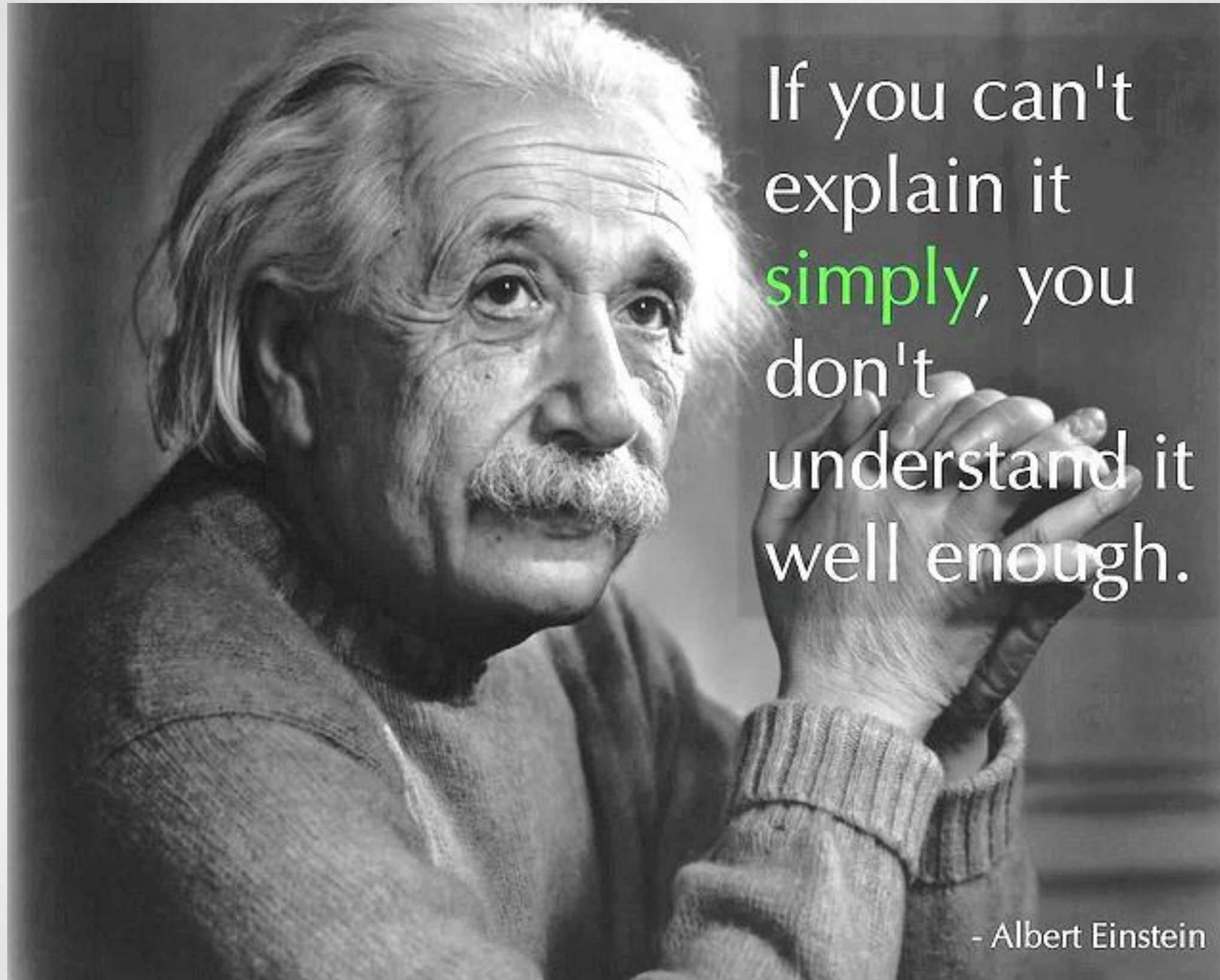
- Control the graphics of nested symbol families
- Apply tips and tricks when creating electrical circuits
- Work with and configure electrical panel schedules
- Explain how Load Classifications and Demand Factors are applied



Agenda

- Introductions
- Customizing Nested Families
- Working with Lights
- Creating Electrical Circuits
- Working with Panel Schedules
- Using Load Classifications and Demand Factors
- Wrap Up

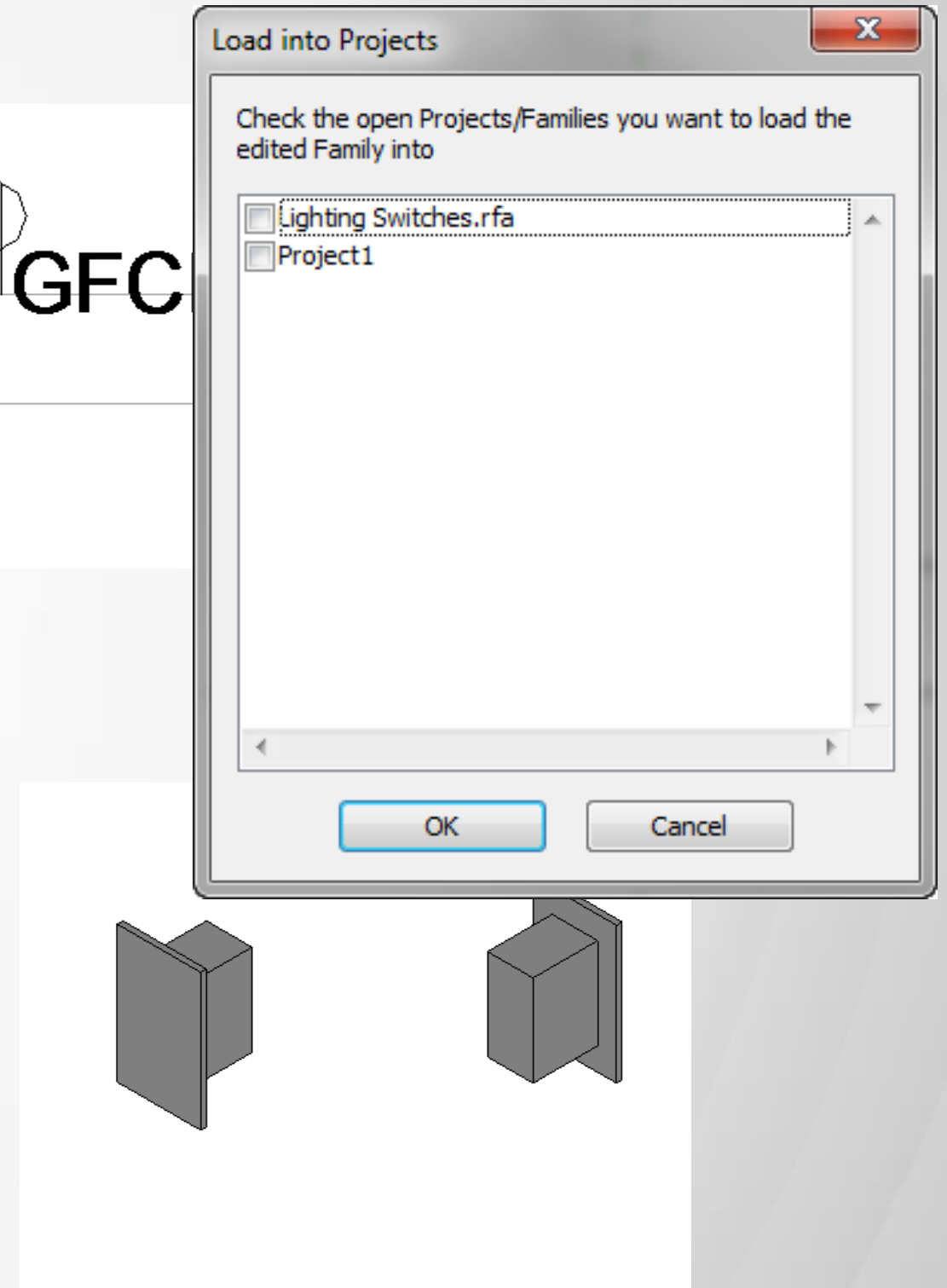
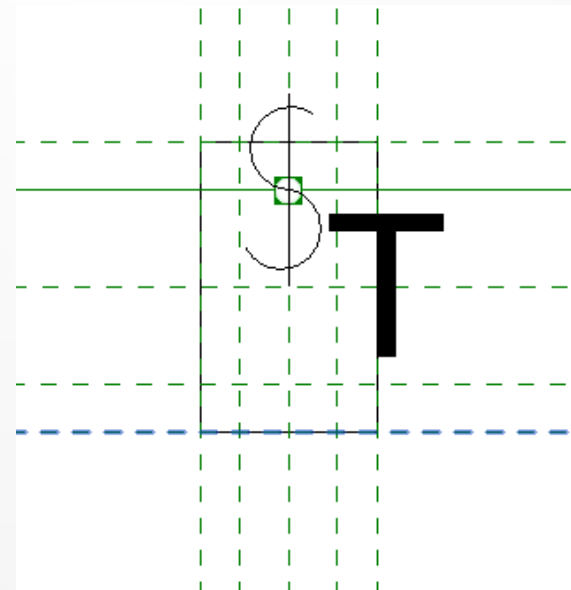
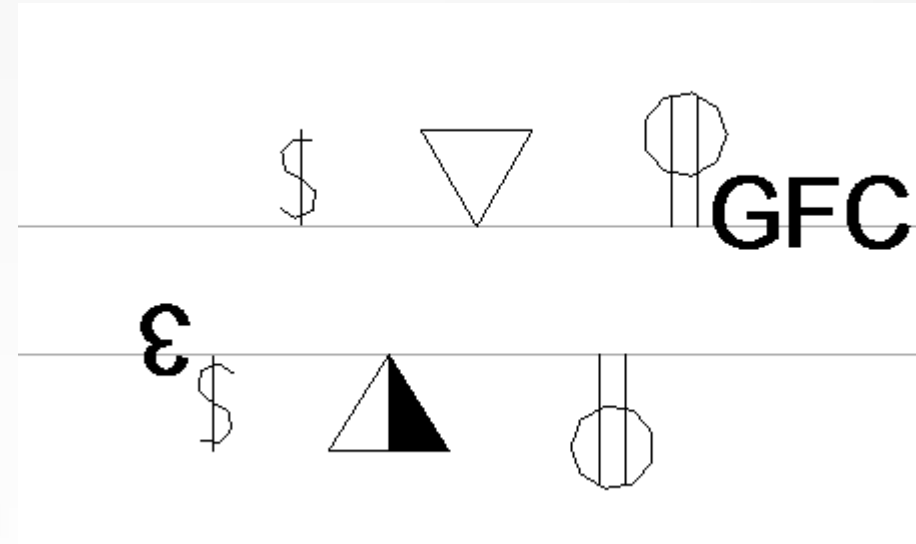




Customizing Nested Families

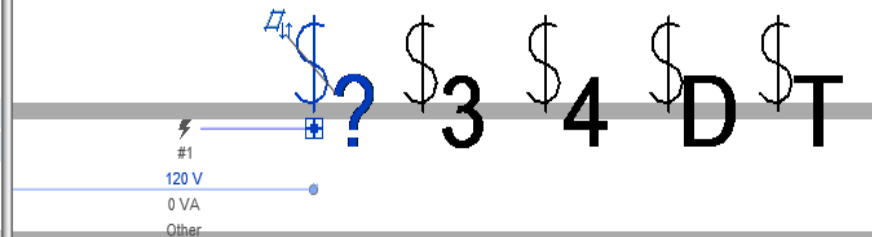
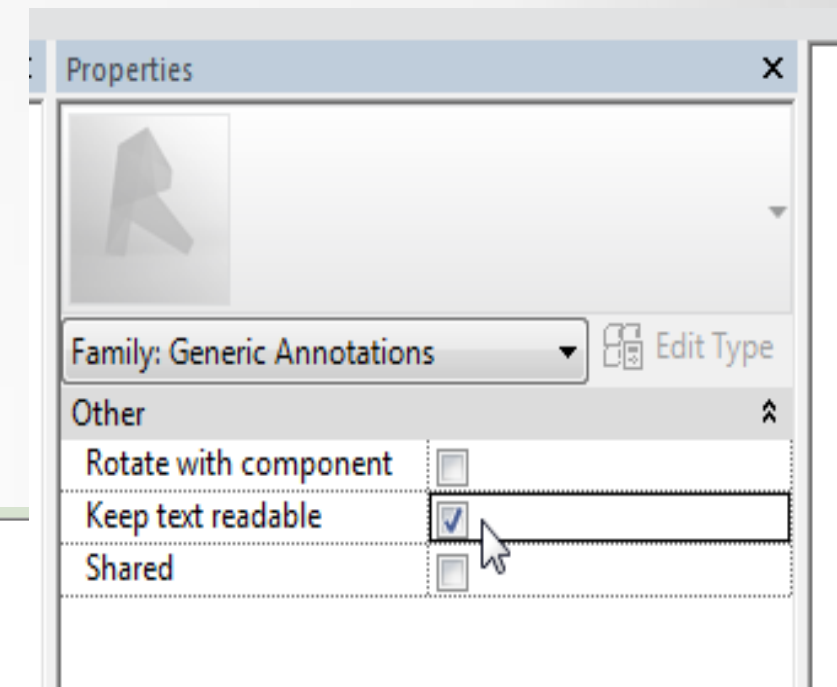
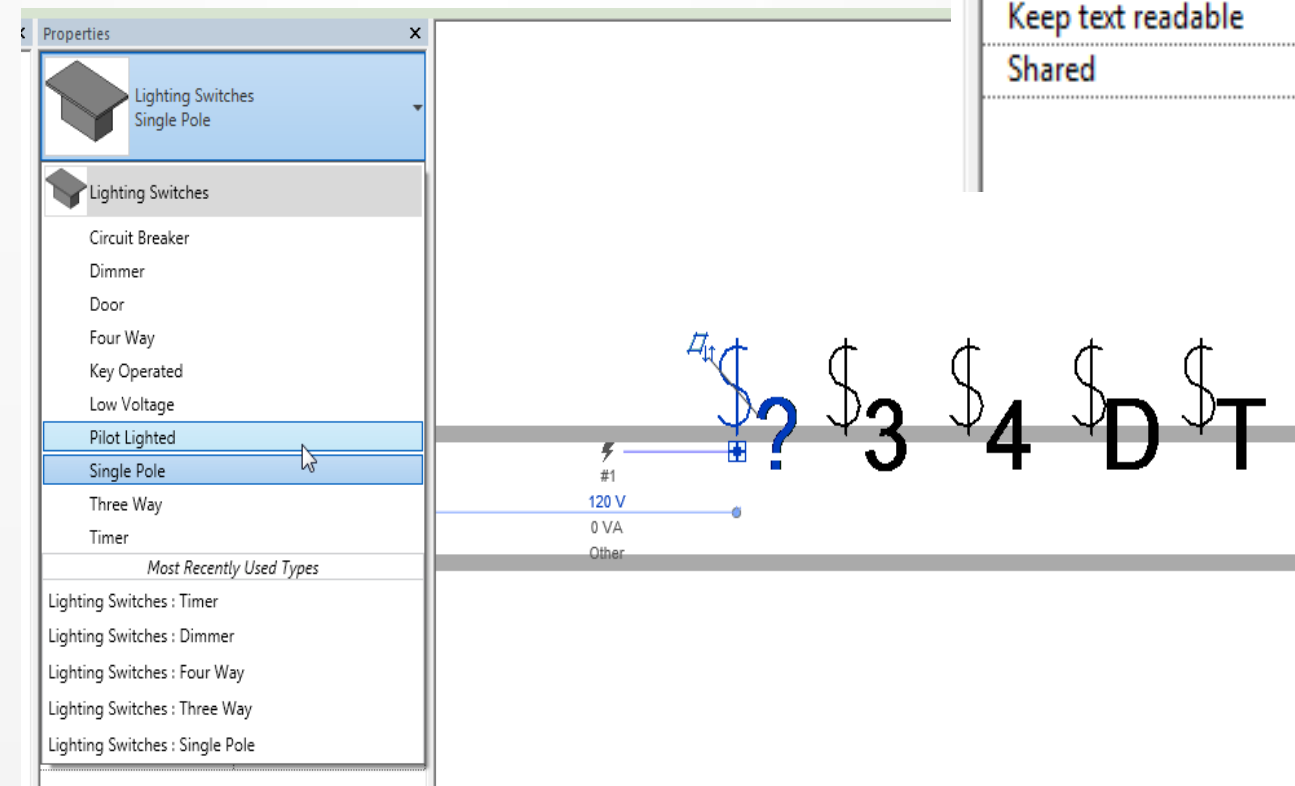
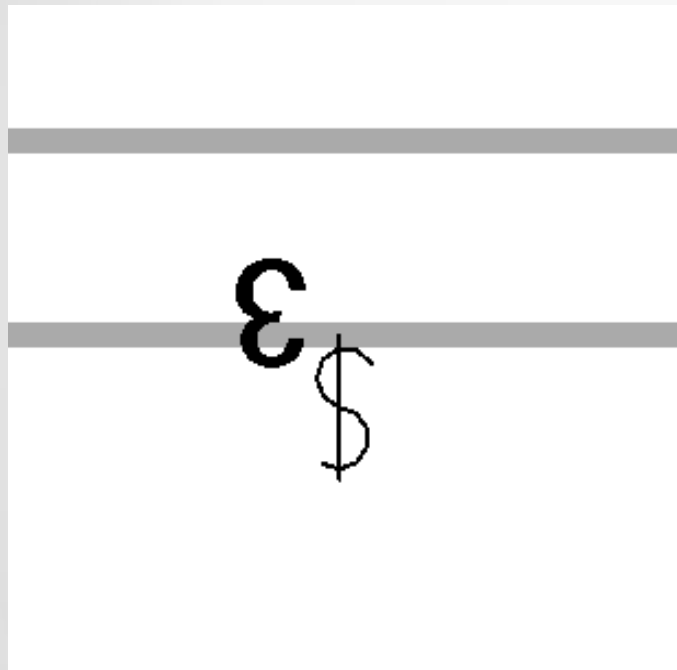
Control the Graphics of Nested Symbol Families

- 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



Control the Graphics of Nested Symbol Families

- Correcting Upside Down Switch Labels

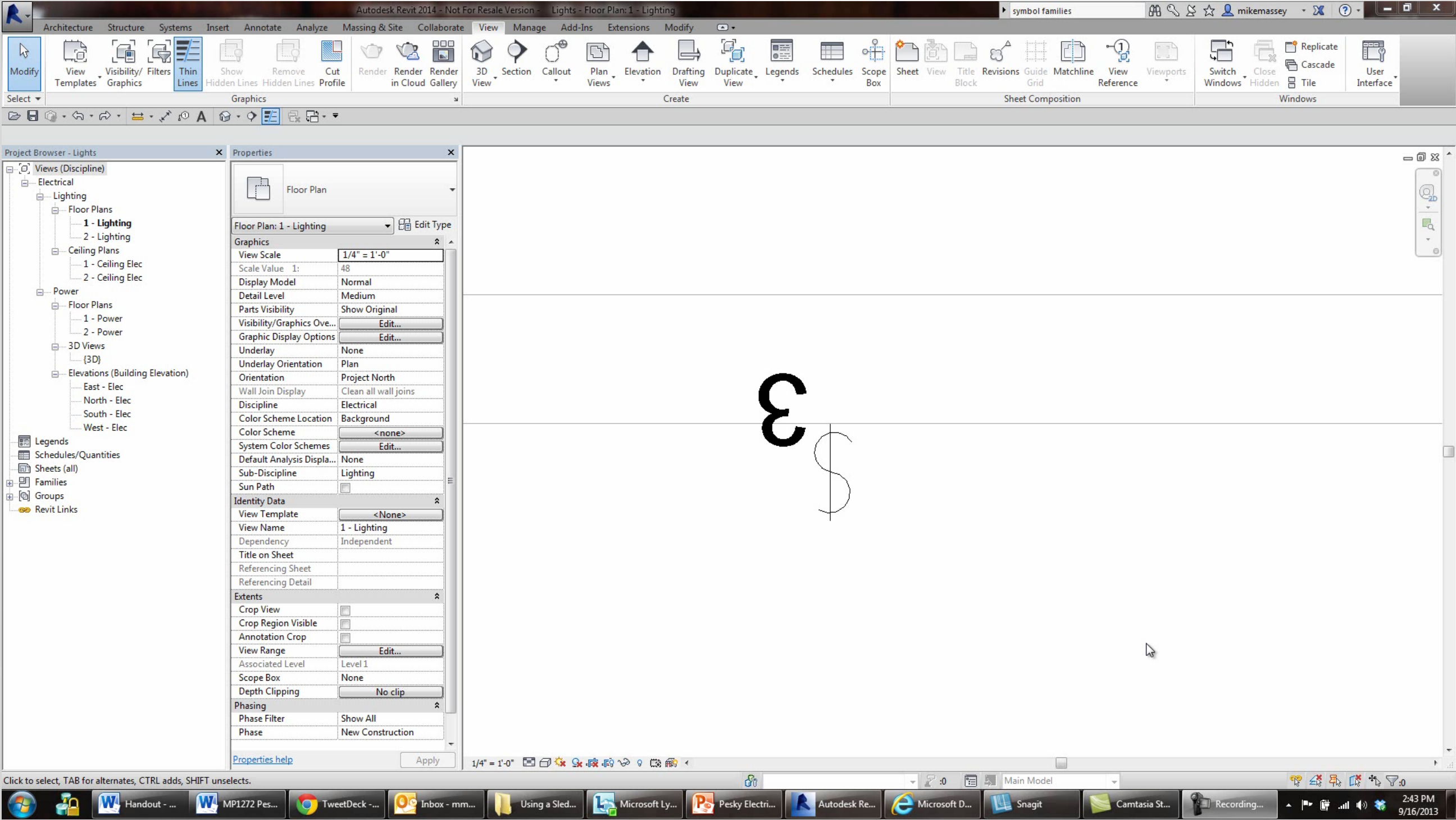




Correcting Upside Down Switch Labels

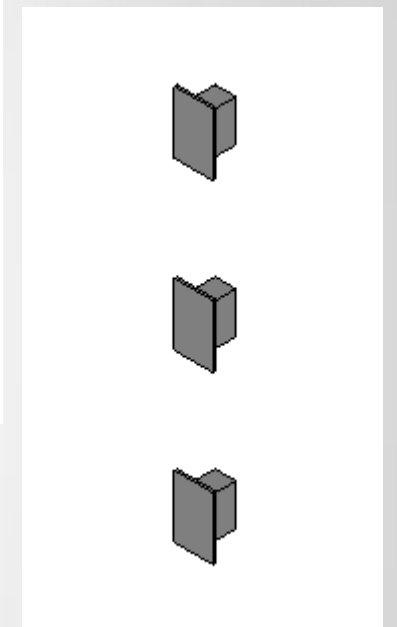
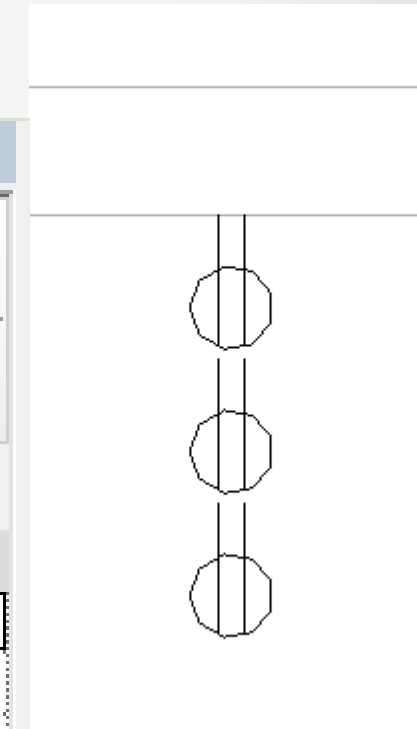
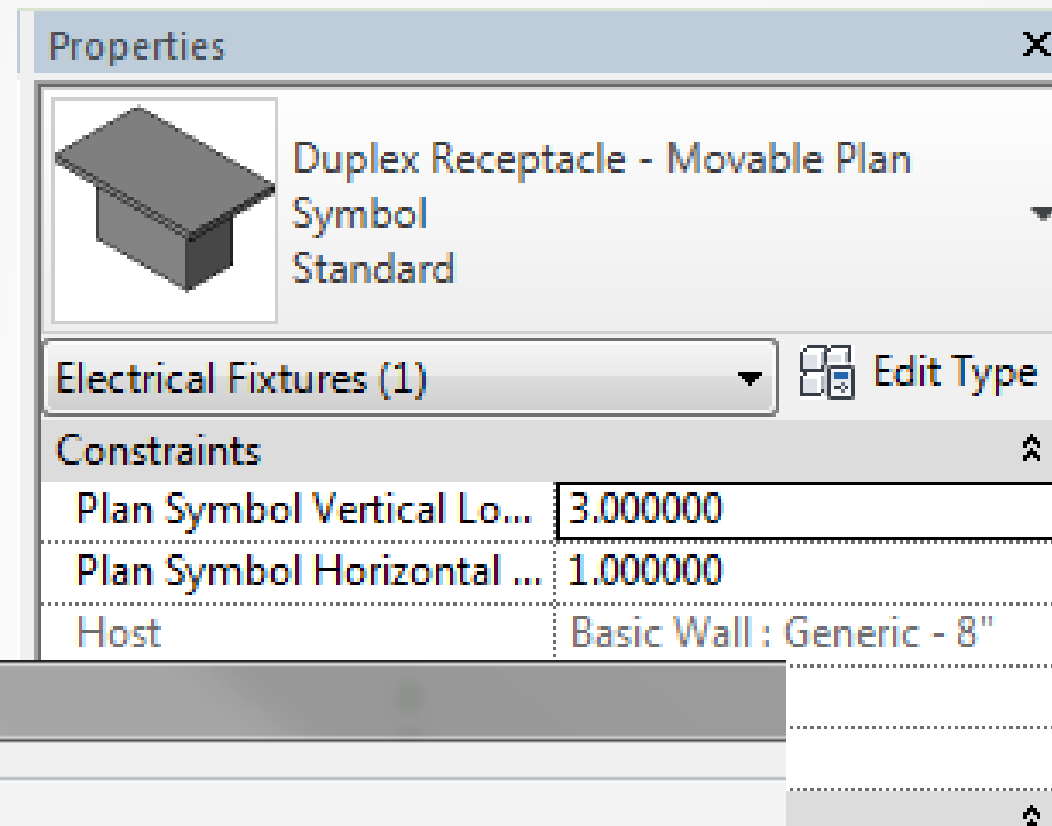
Let's see how this works...

Correcting Upside Down Switch Labels



Control the Graphics of Nested Symbol Families

- Creating Stacked Devices



Family Types

Name:

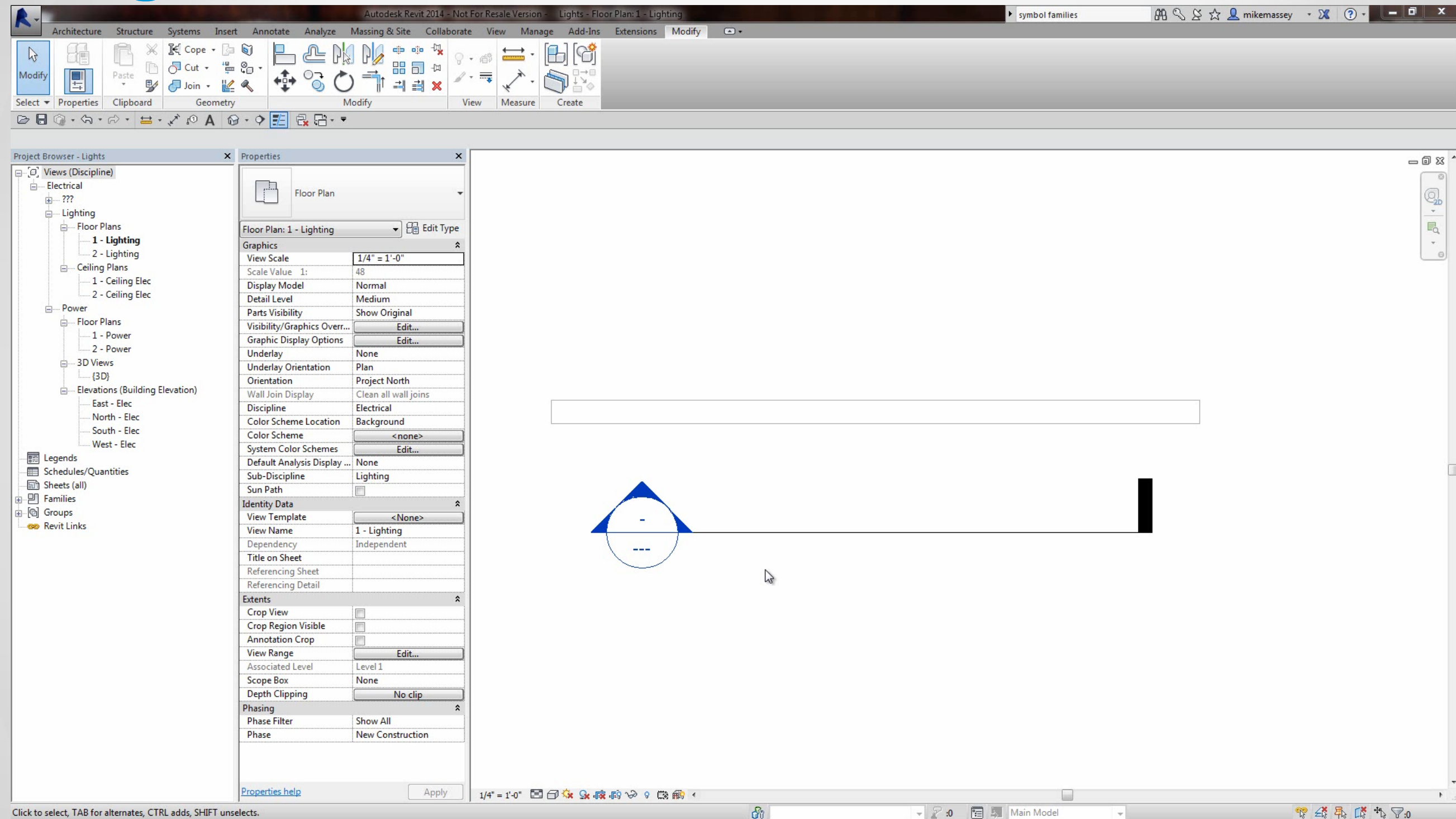
Parameter	Value	Formula
Constraints		
Plan Symbol Vertical Location (default)	1.000000	=
Plan Symbol Horizontal Location (default)	1.000000	=
Other		
Vertical Offset (default)	0' 0"	= (Plan Symbol Vertical Location - 1) * 0' 0 3/16"
Horizontal Offset (default)	0' 5"	= 0' 5" + (Plan Symbol Horizontal Location - 1) * 0' 0 3/16"
Identity Data		



Creating Stacked Devices

Let's see how this works...

Creating Stacked Devices

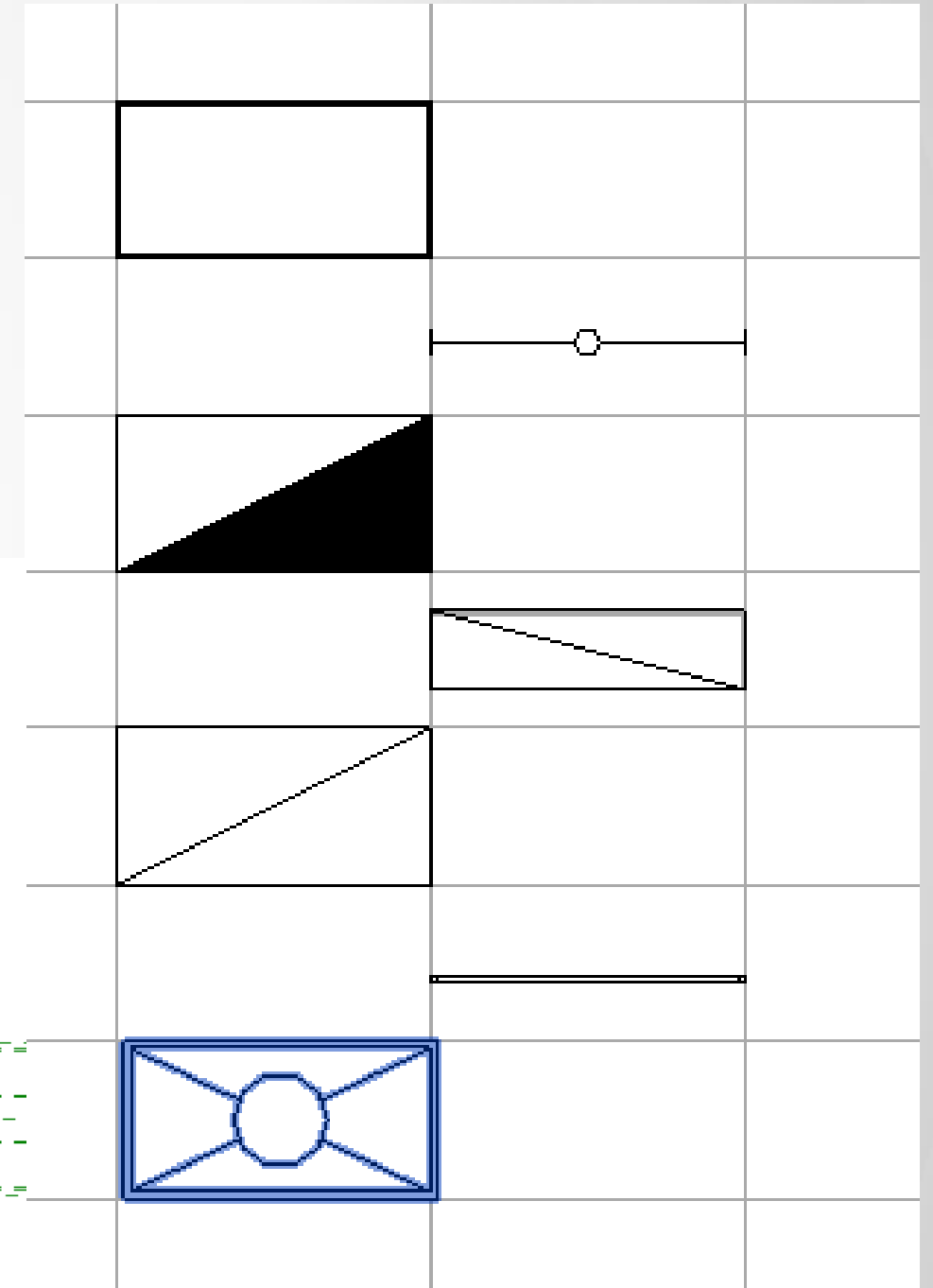
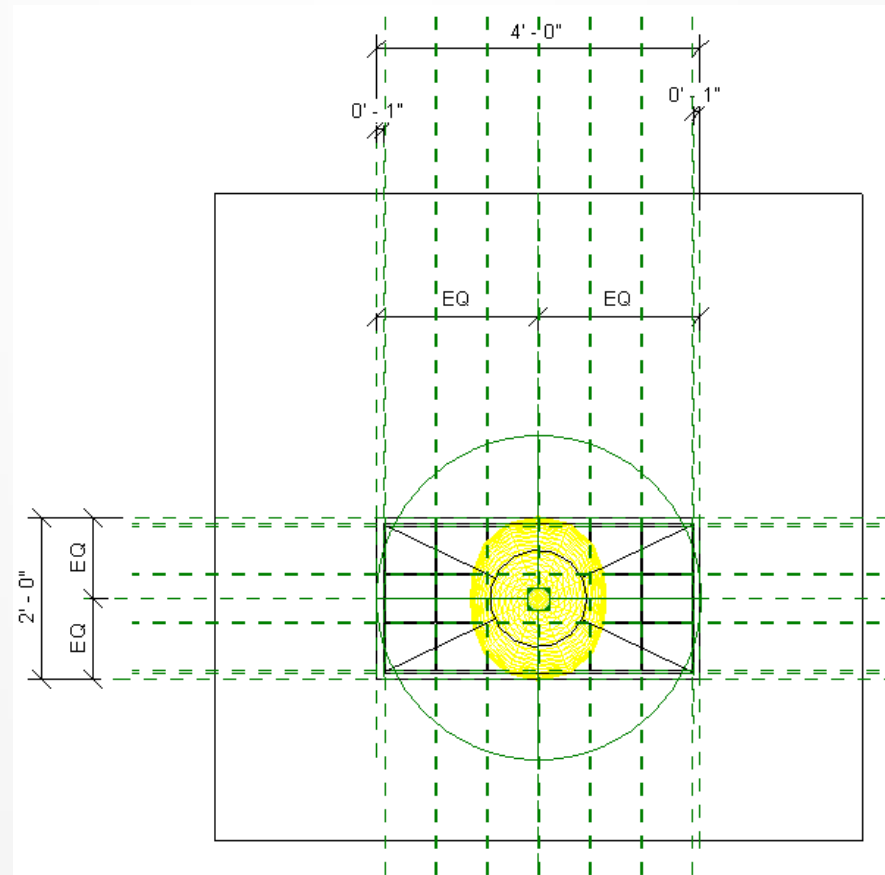


* Family is in Class Files

Working with Lights

Working with Light Fixtures

- Changing the Graphics of a Light Fixture
 - Model Lines Vs. Symbolic Lines

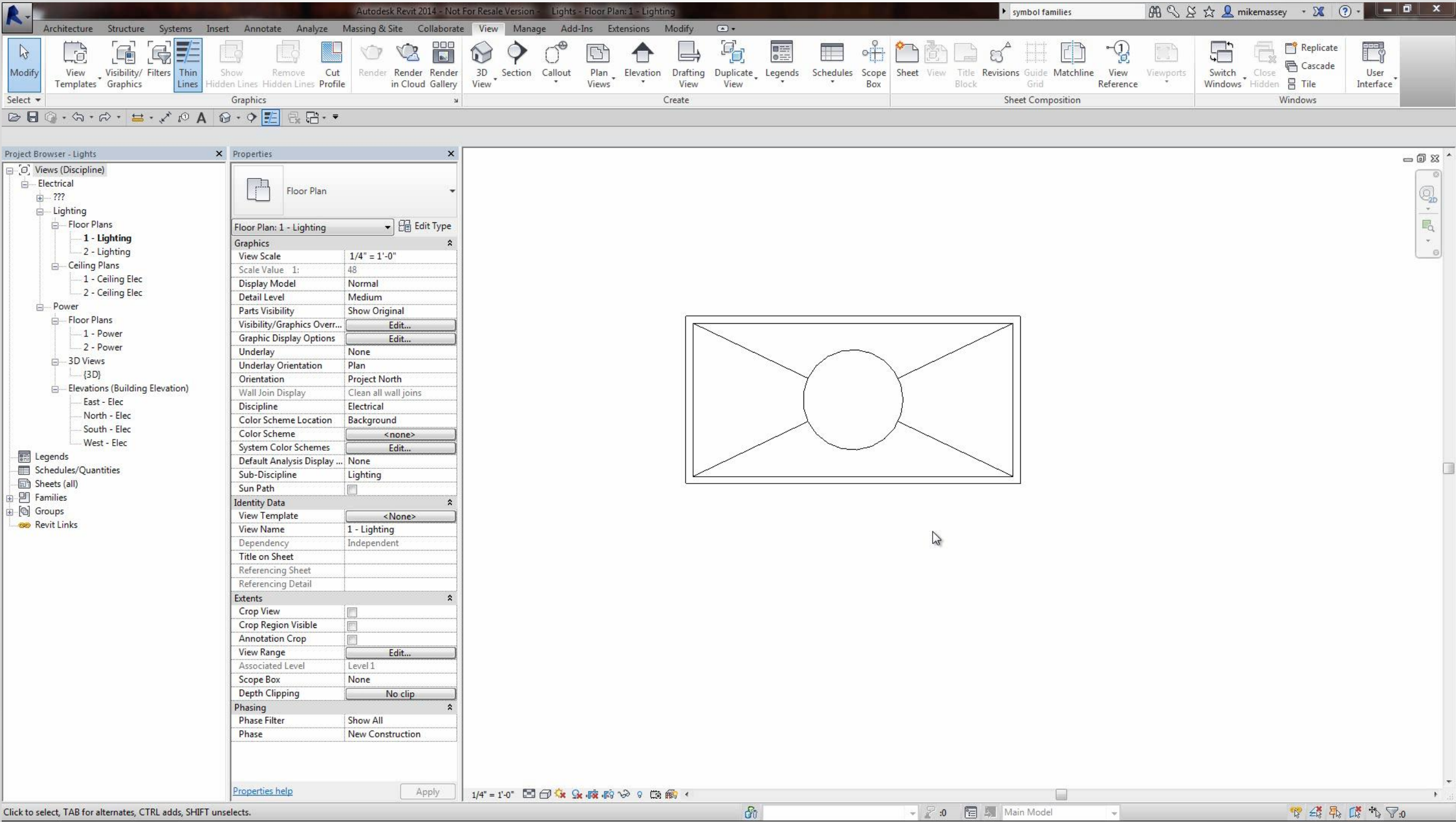




Changing the Graphics of a Light Fixture

Let's see how this works...

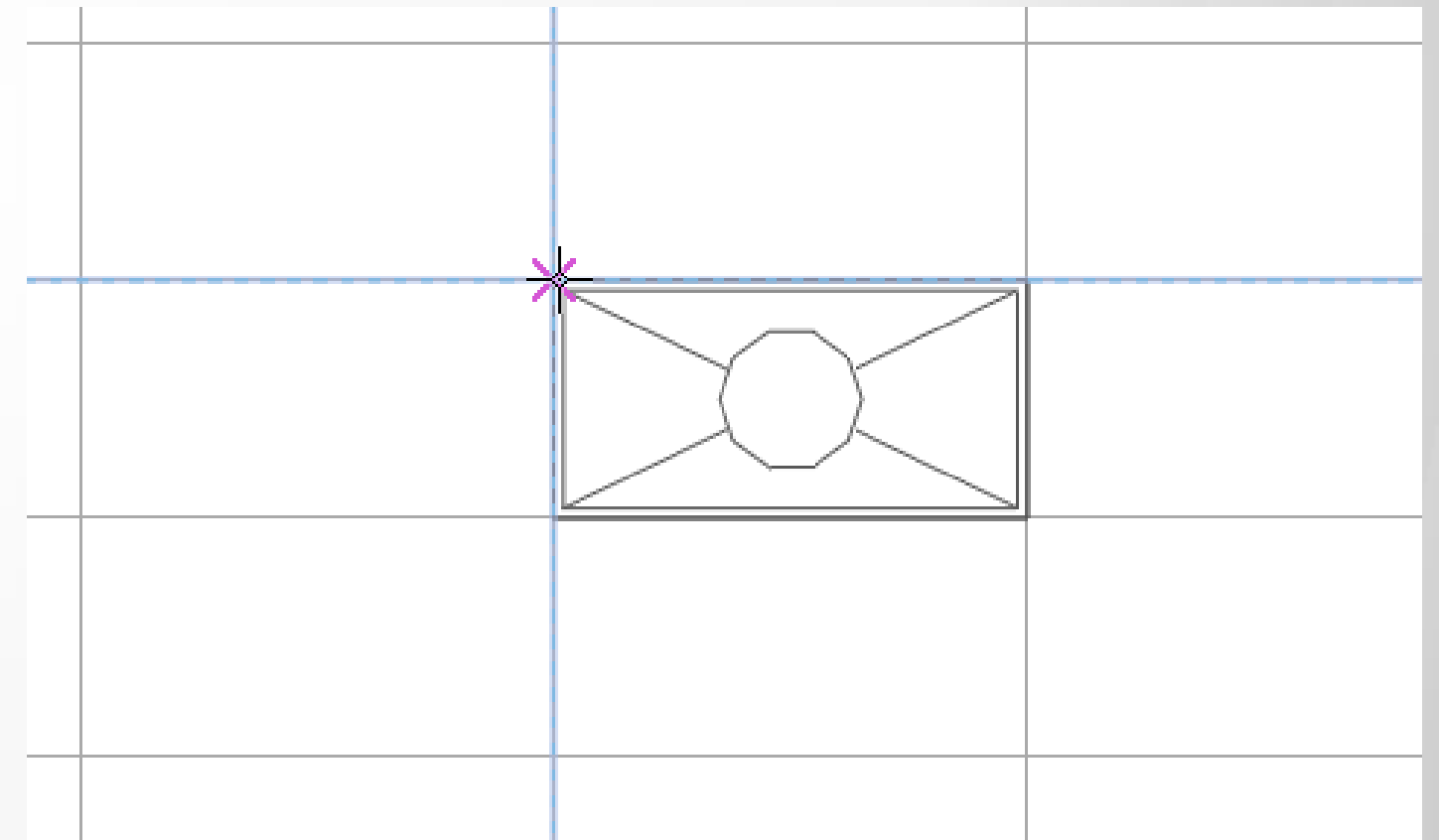
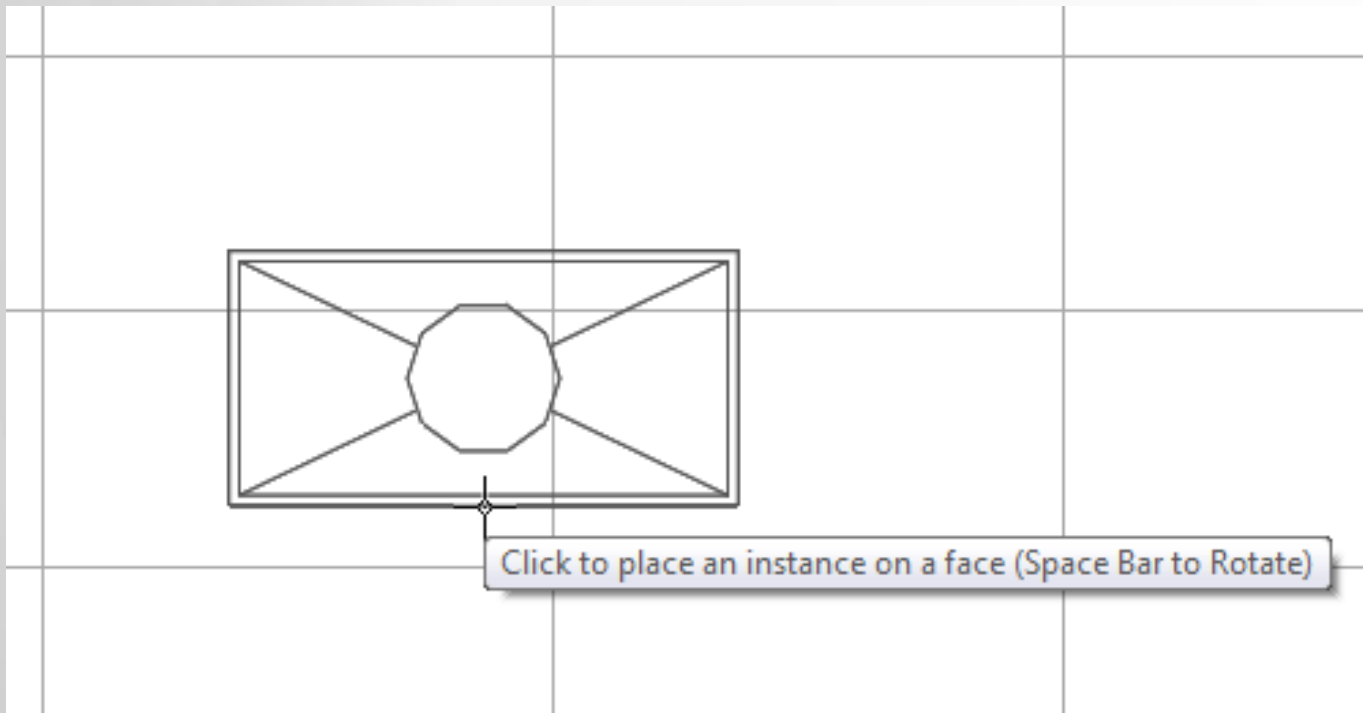
Changing the Graphics of a Light Fixture



Working with Light Fixtures

- Changing the Origin of a Light Fixture

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

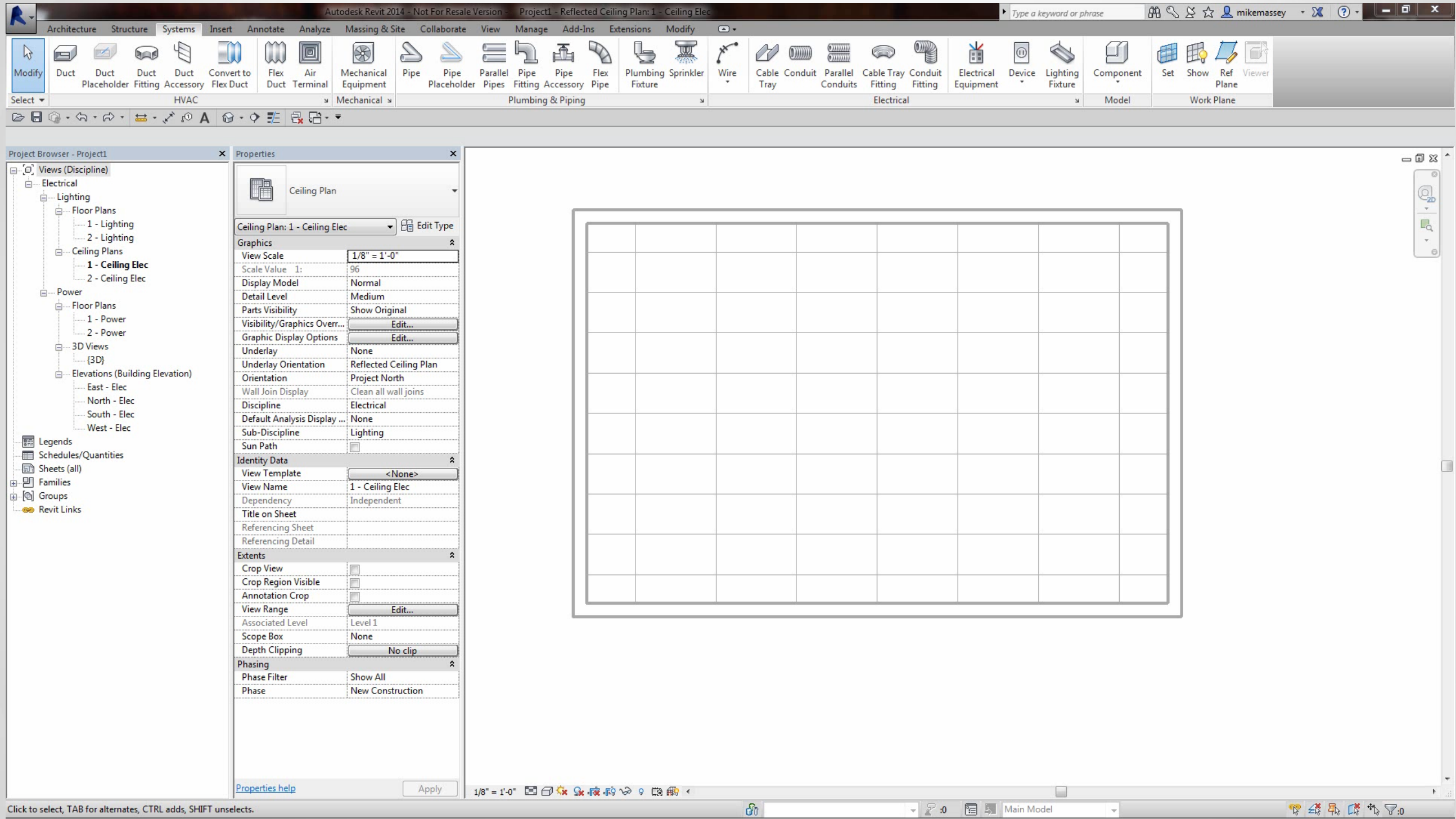




Changing the Origin of a Light Fixture

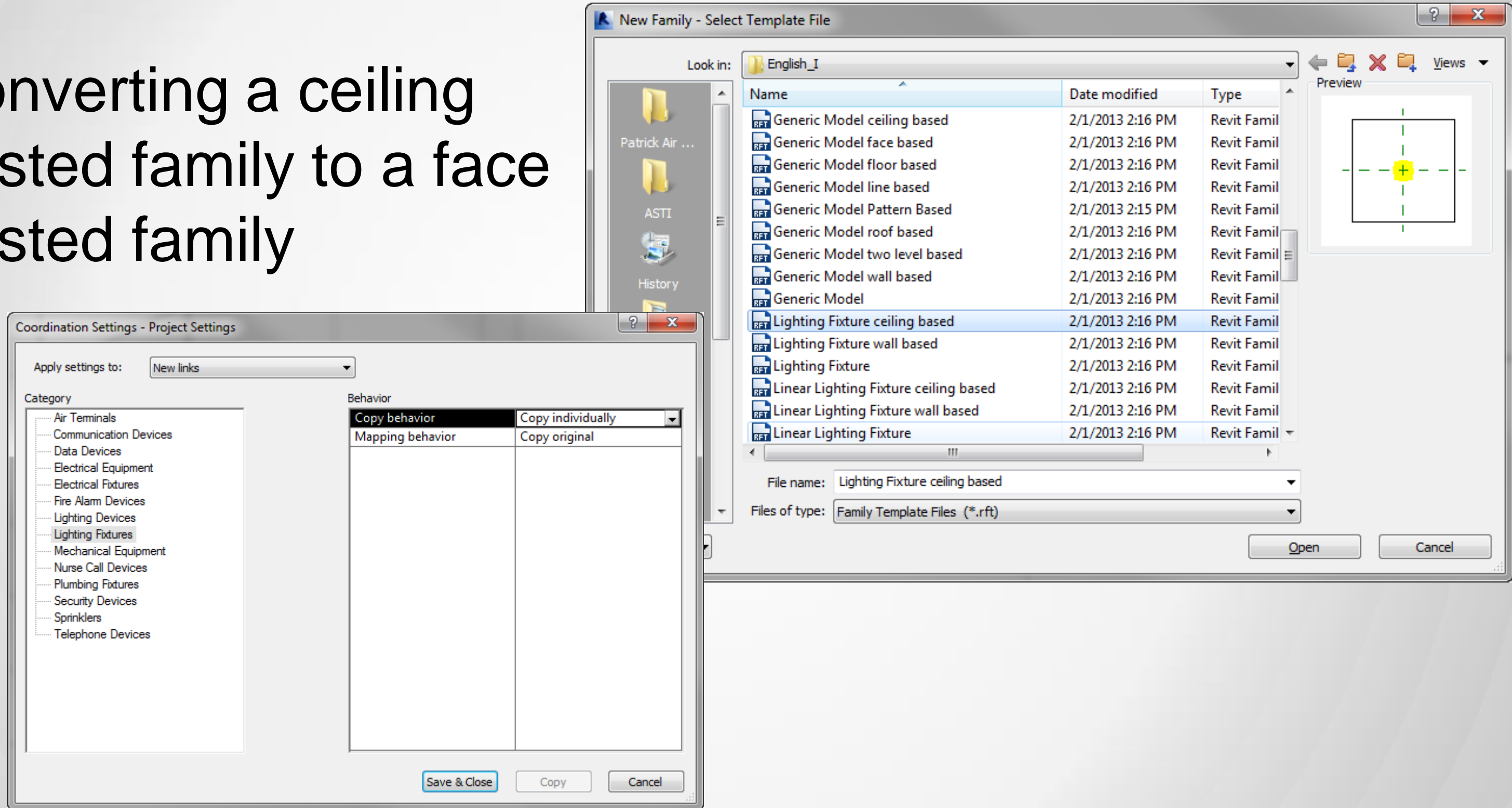
Let's see how this works...

Changing the Origin of a Light Fixture



Working with Light Fixtures

- Converting a ceiling hosted family to a face hosted family

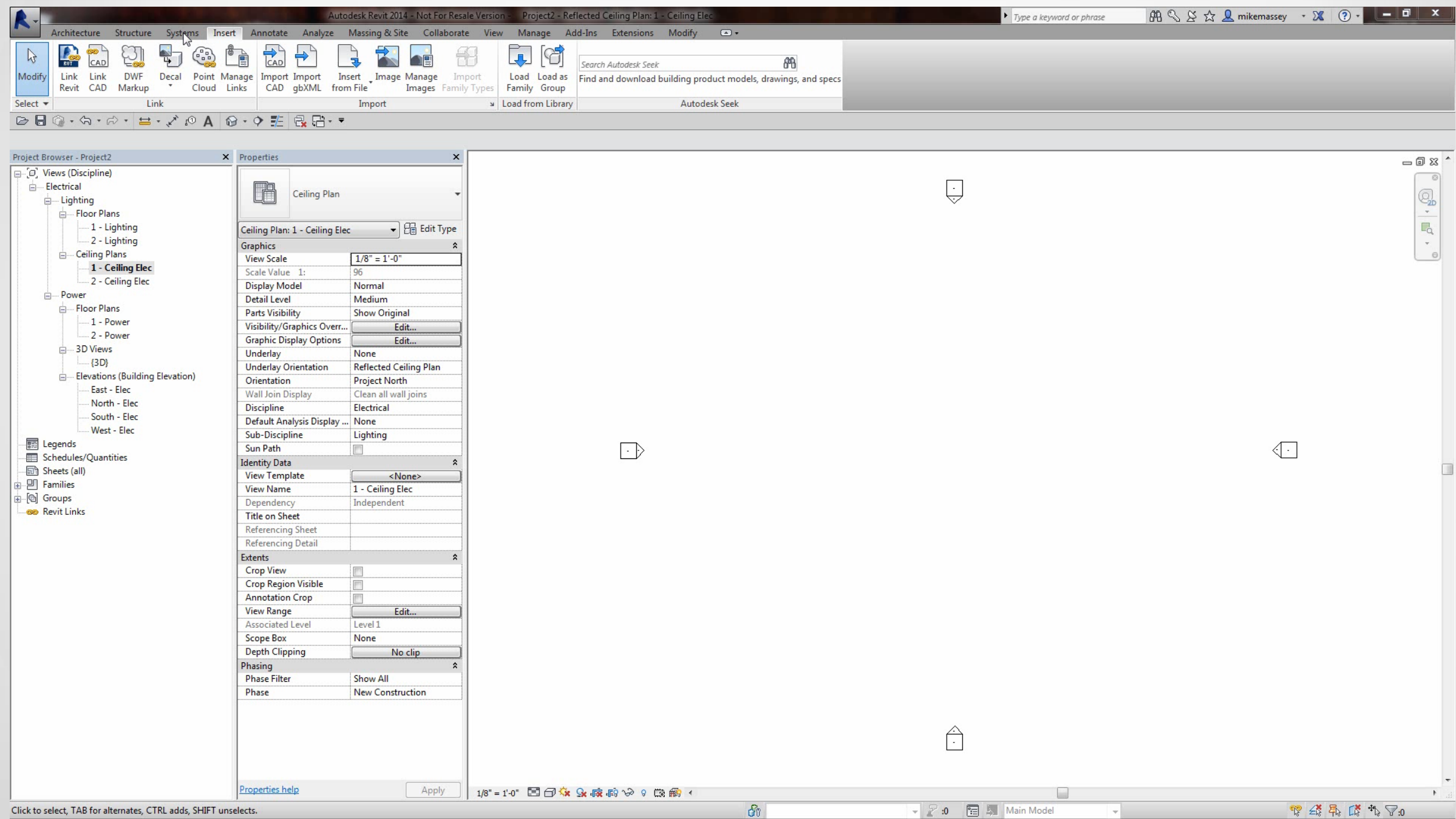




**Converting a ceiling hosted
family to a surface hosted
family**

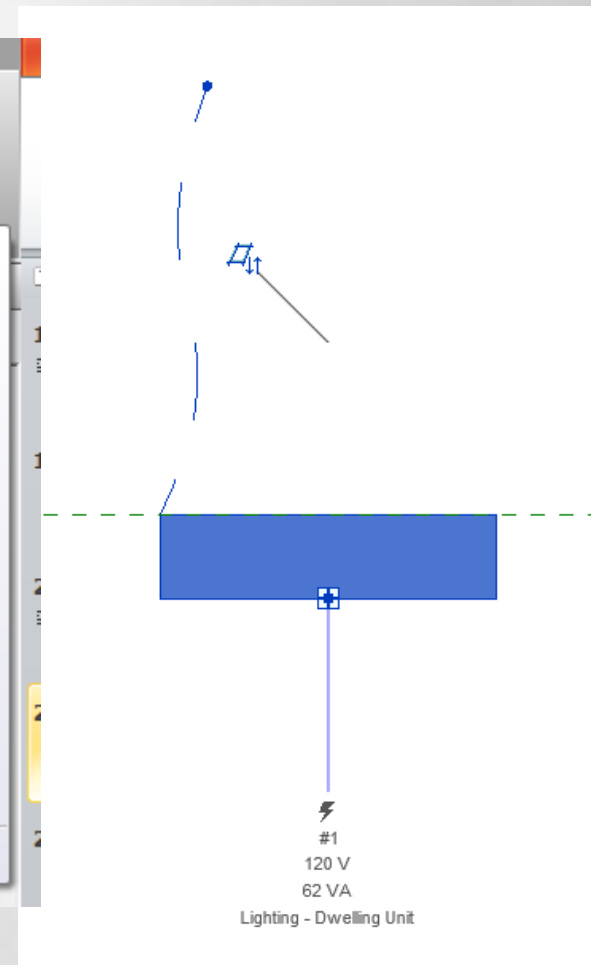
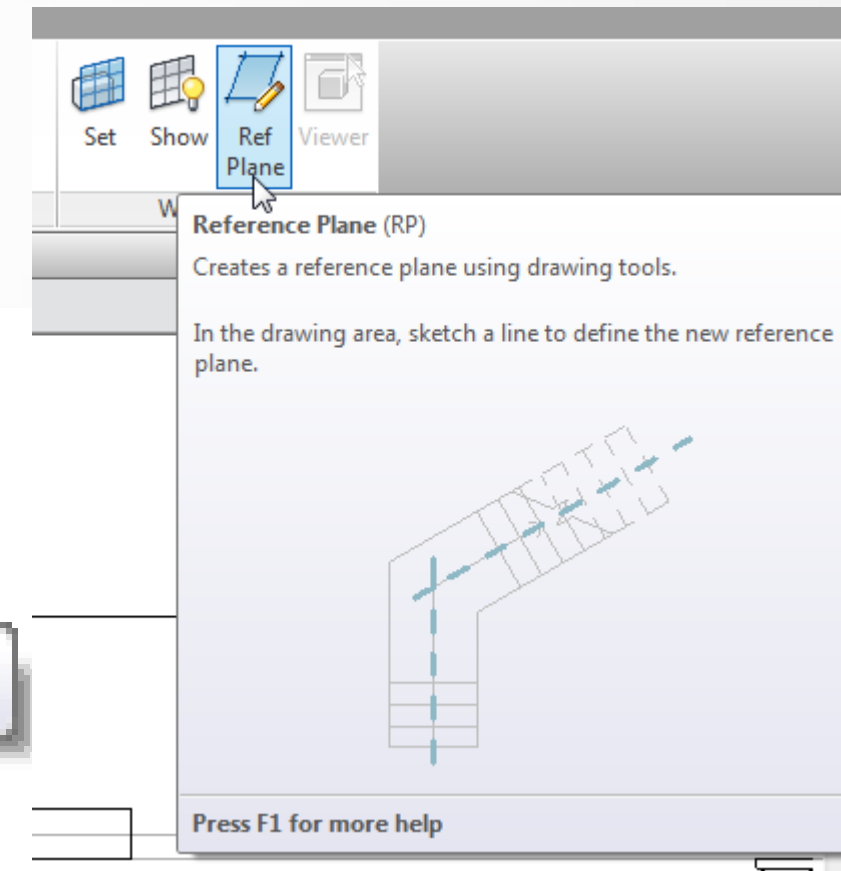
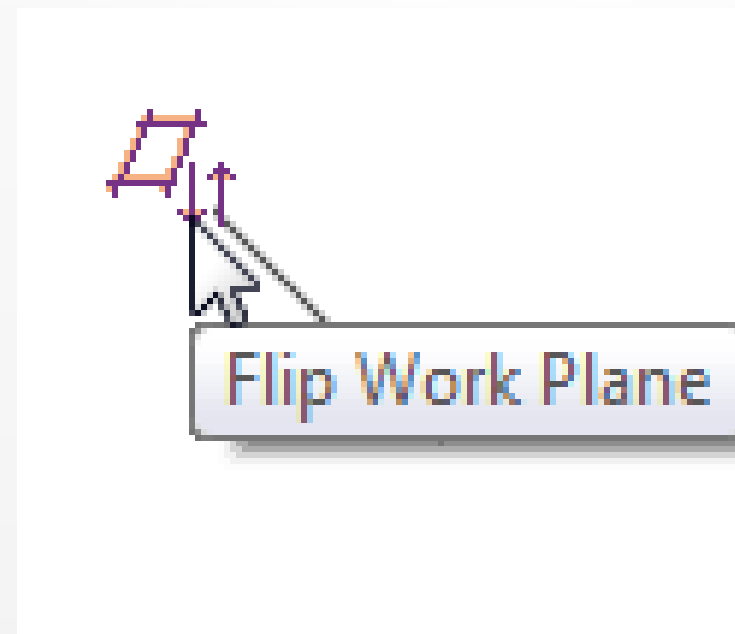
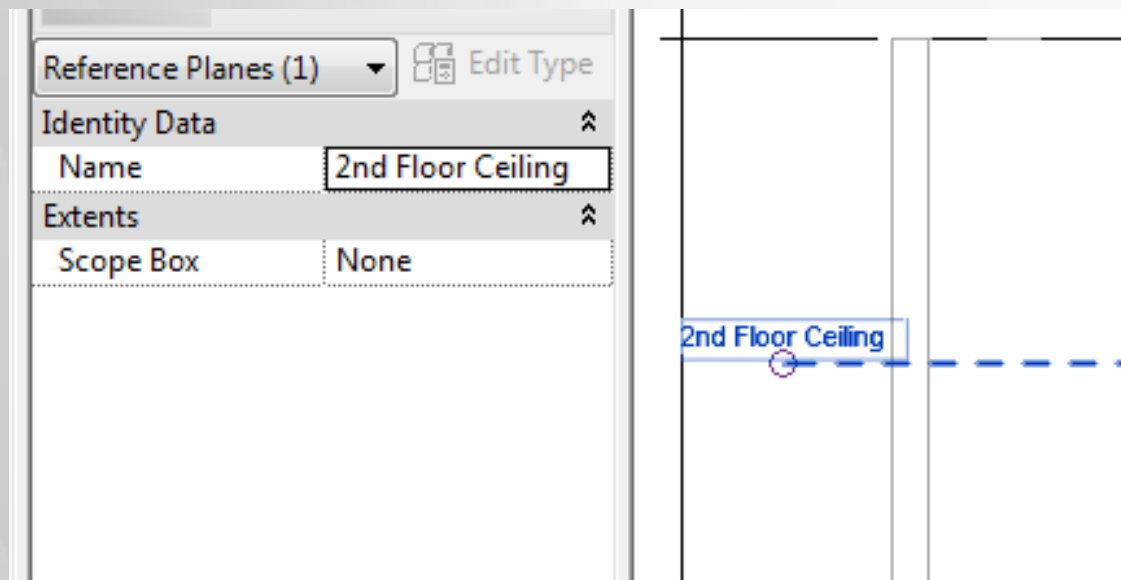
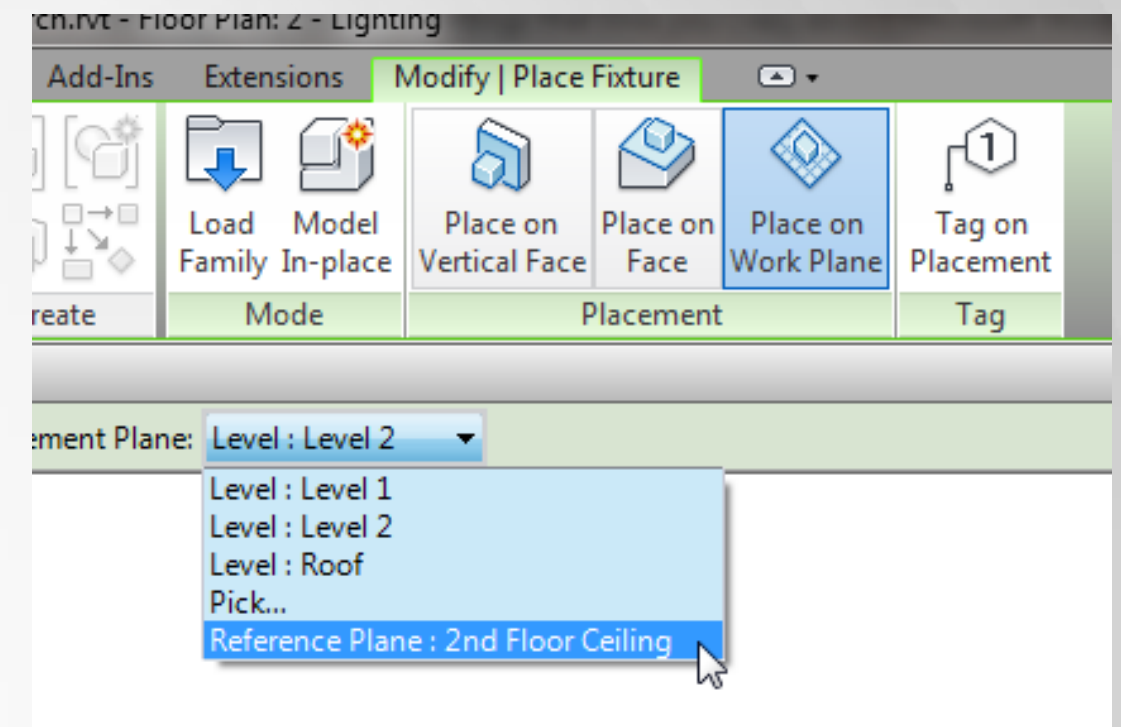
Let's see how this works...

Converting a ceiling hosted family to a surface hosted family



Working with Light Fixtures

- Placing Hosted Lights without a Face (Ceiling)
 - Lights are upside down?
 - Draw Reference Plane Right to Left

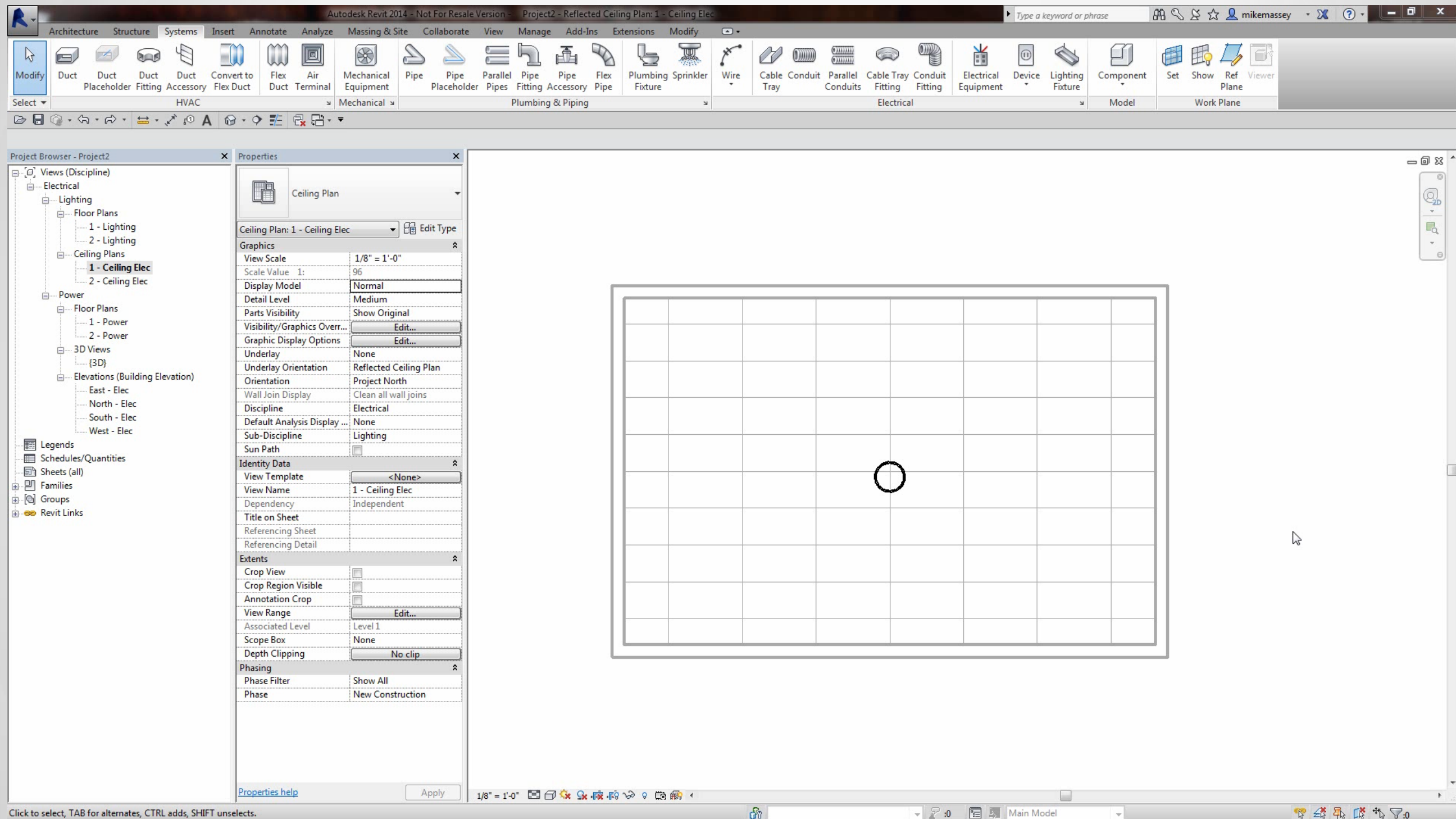




**Placing Hosted Lights without
a Face (Ceiling)**

Let's see how this works...

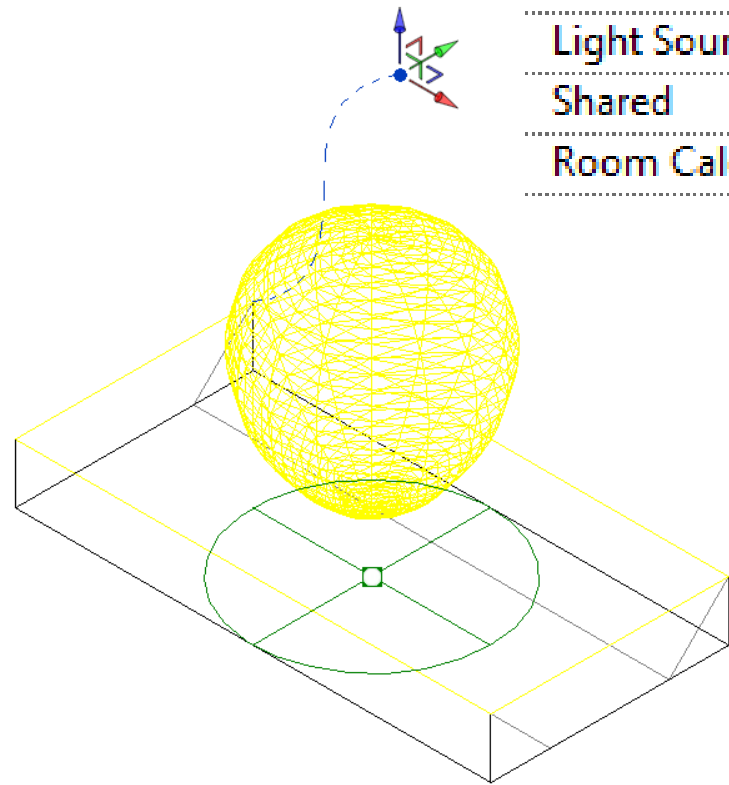
Placing Hosted Lights without a Face (Ceiling)

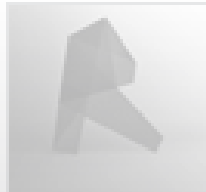


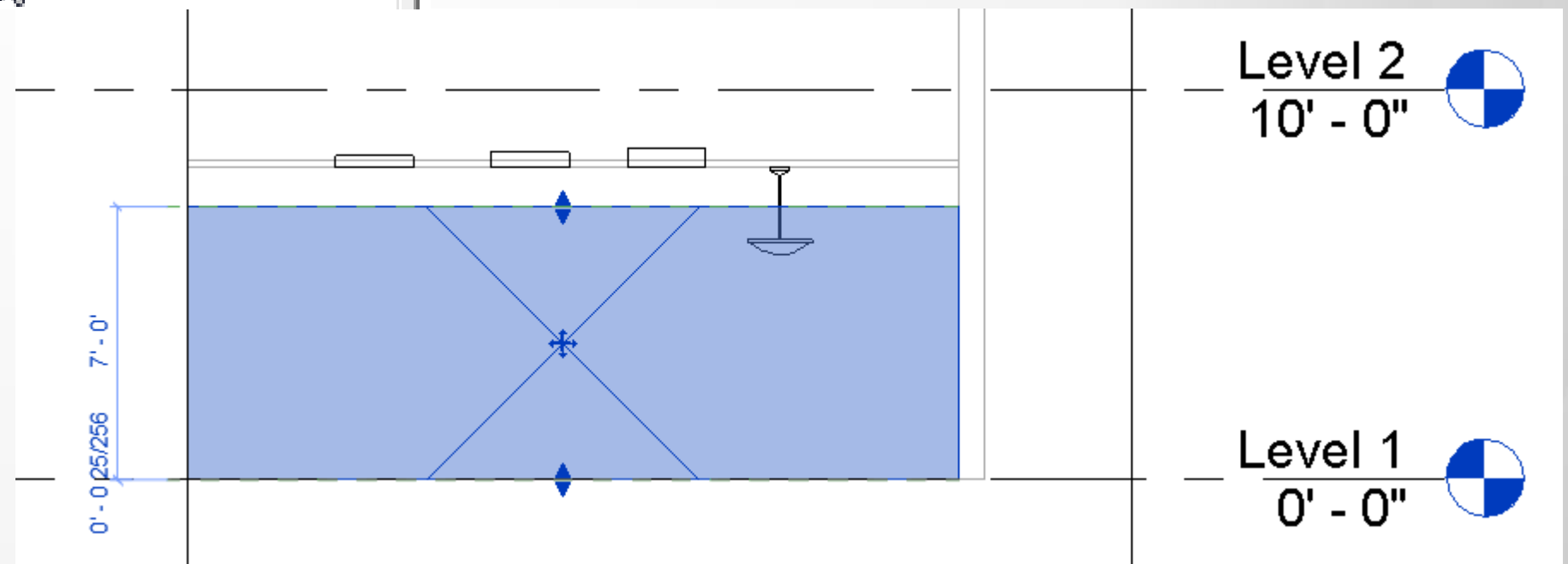
Working with Light Fixtures

- Space not Calculating Foot Candles

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%

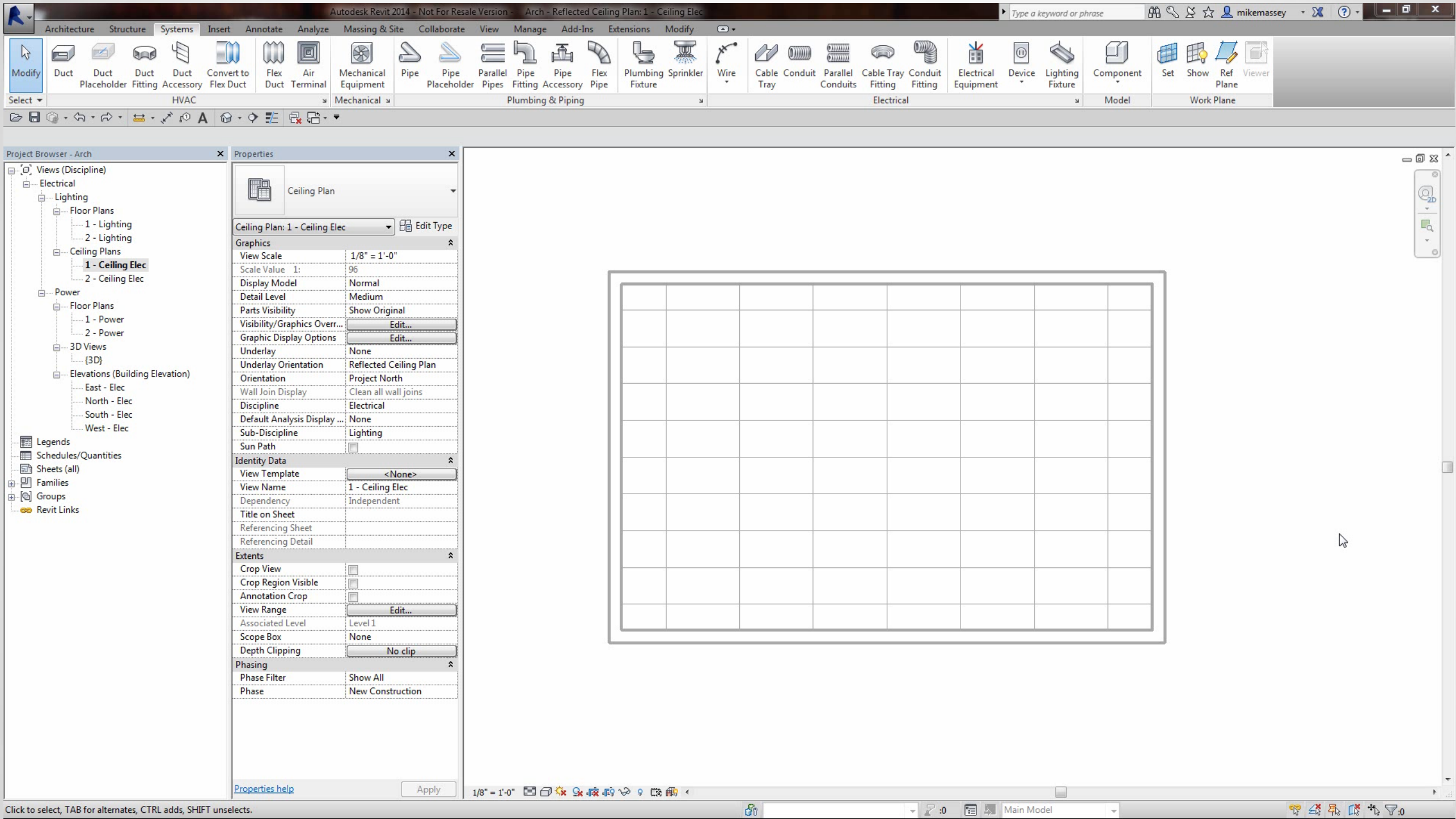




**Space not Calculating Foot
Candles**

Let's see how this works...

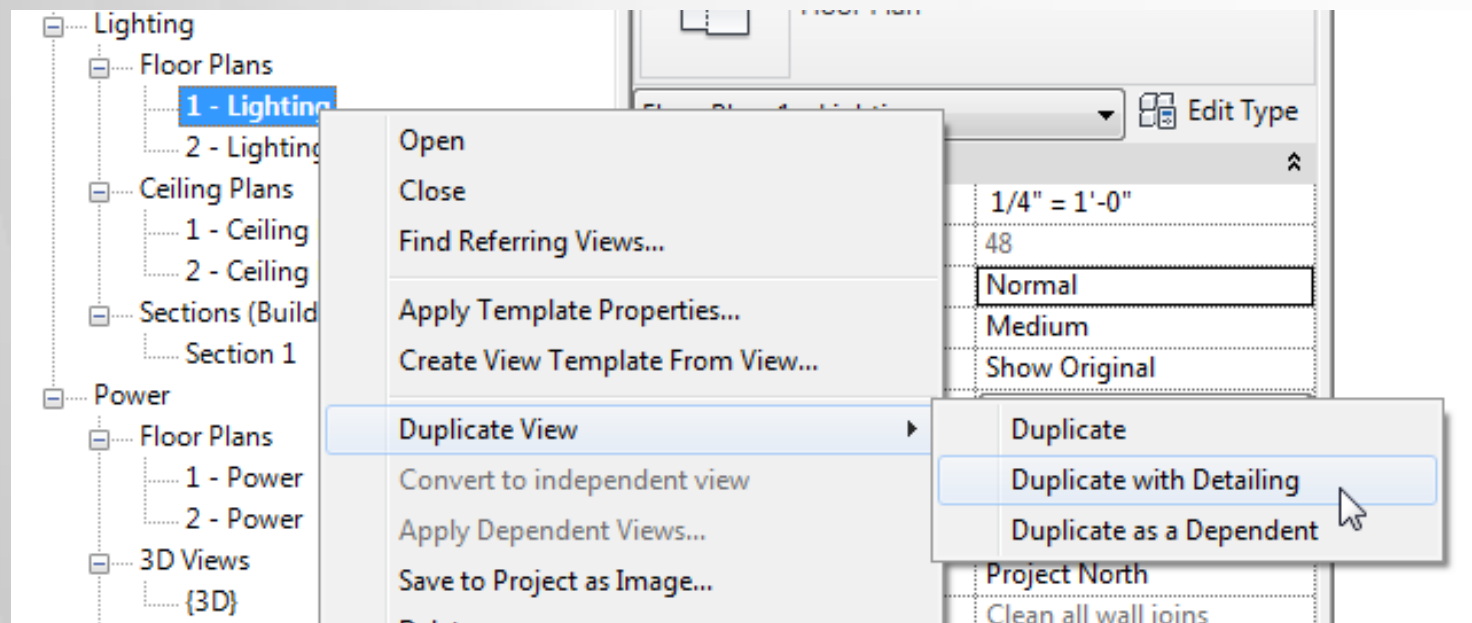
Space not Calculating Foot Candles



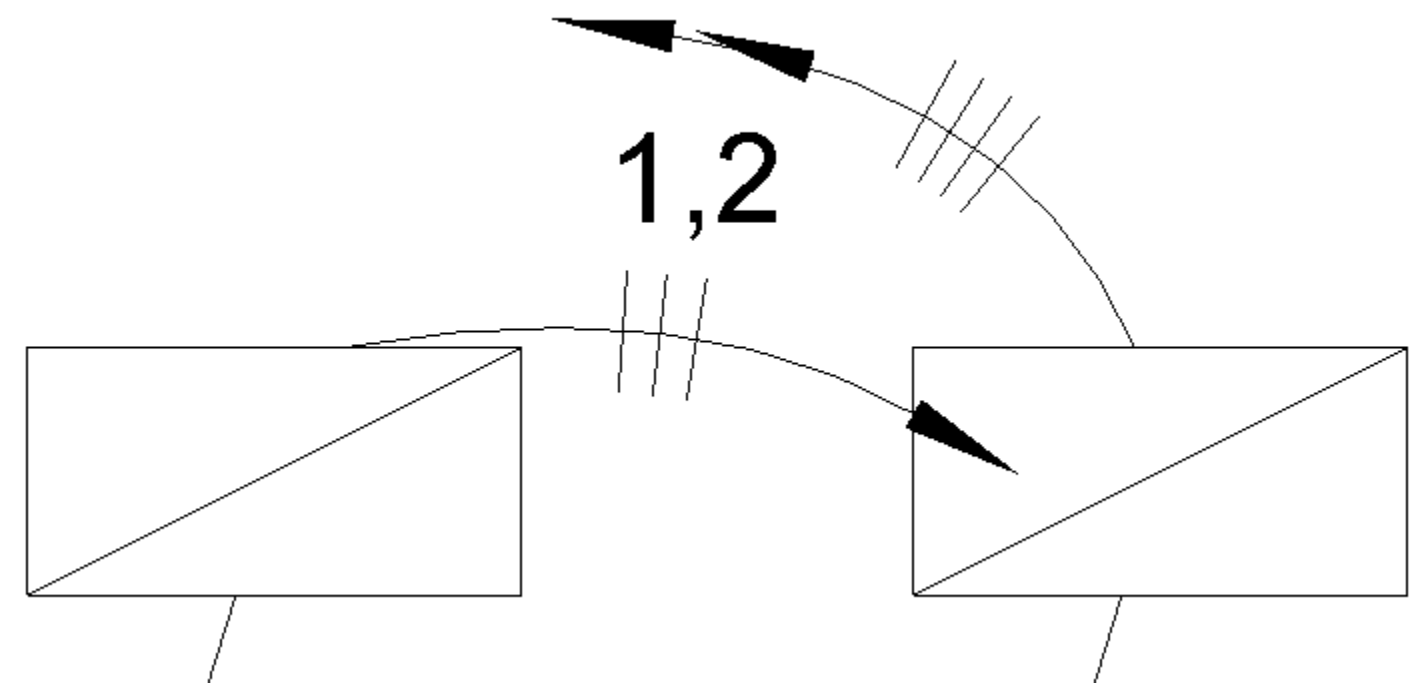
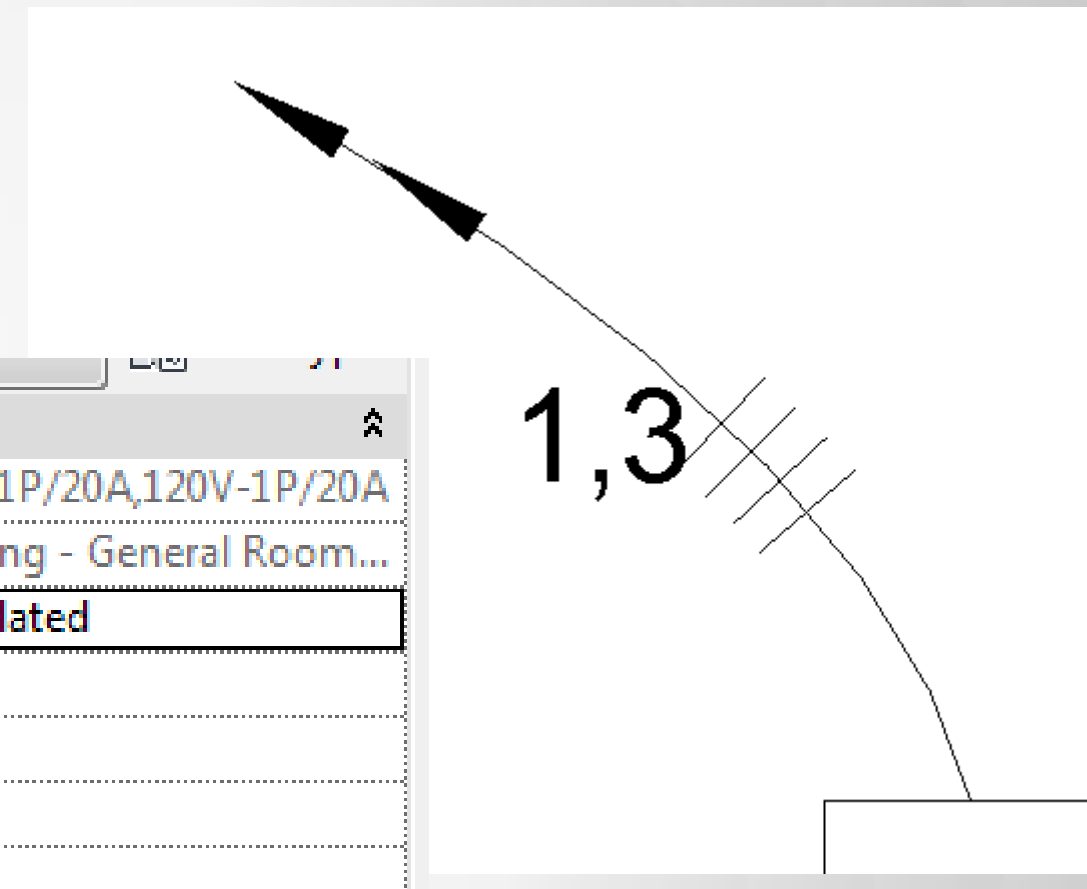
Creating Electrical Circuits

Tips and tricks when creating electrical circuits

- Double Homeruns
 - Connecting them in order
 - Eliminating Extra Arrow
 - Duplicate with Detailing
 - FIXED in 2014!



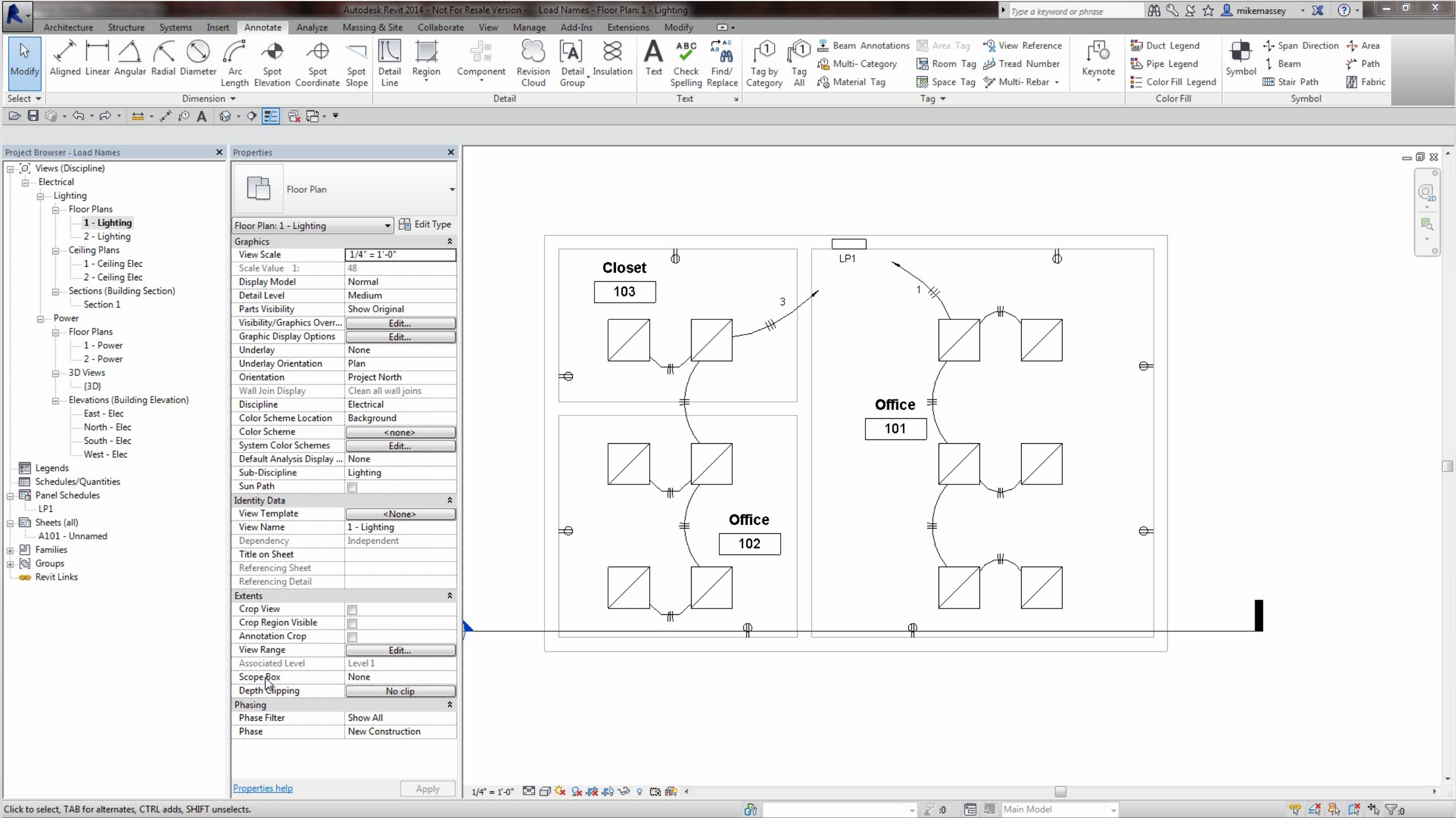
Electrical - Loads	
Circuit Description	120V-1P/20A,120V-1P/20A
Circuit Load Name	Lighting - General Room...
Tick Marks	Calculated
Panel	LP1
Circuits	1,3
Type	Arc
Hot Conductors	2
Neutral Con	
Ground Con	
Wire Size	





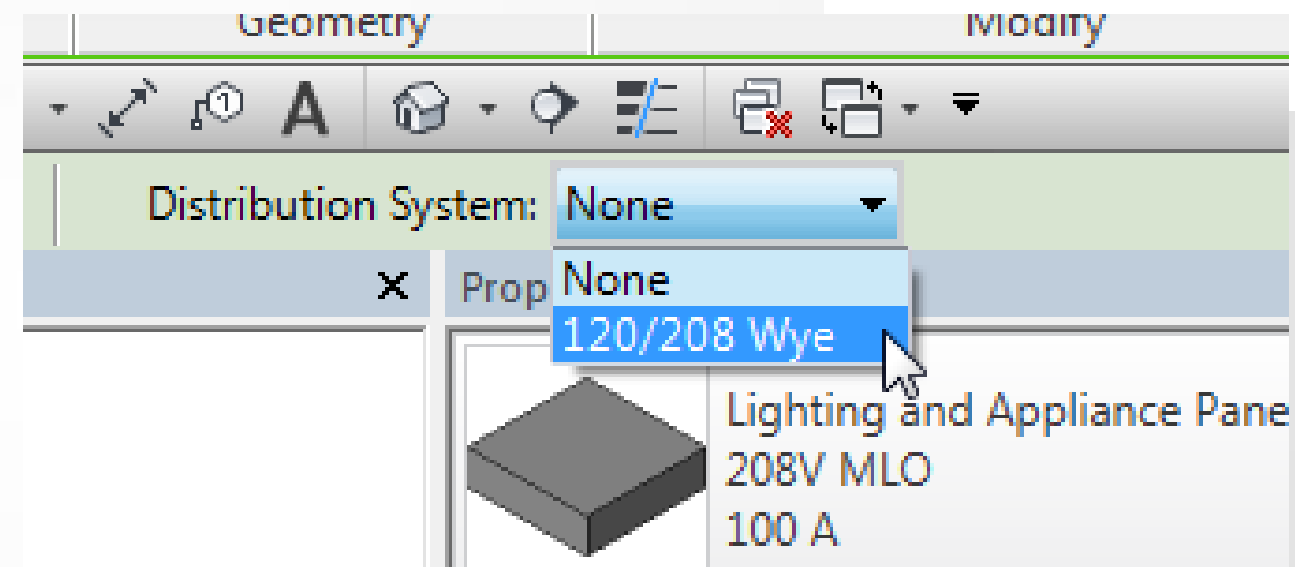
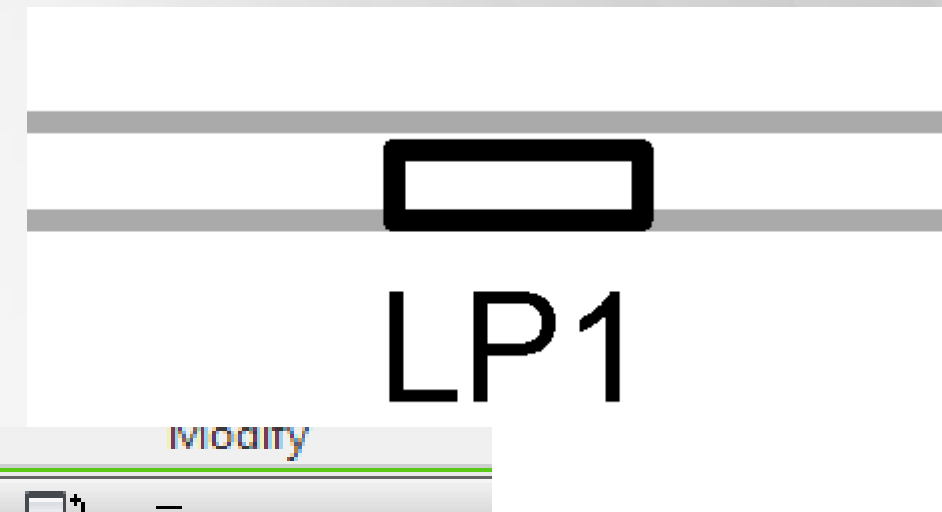
Double Homeruns
Let's see how this works...

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	

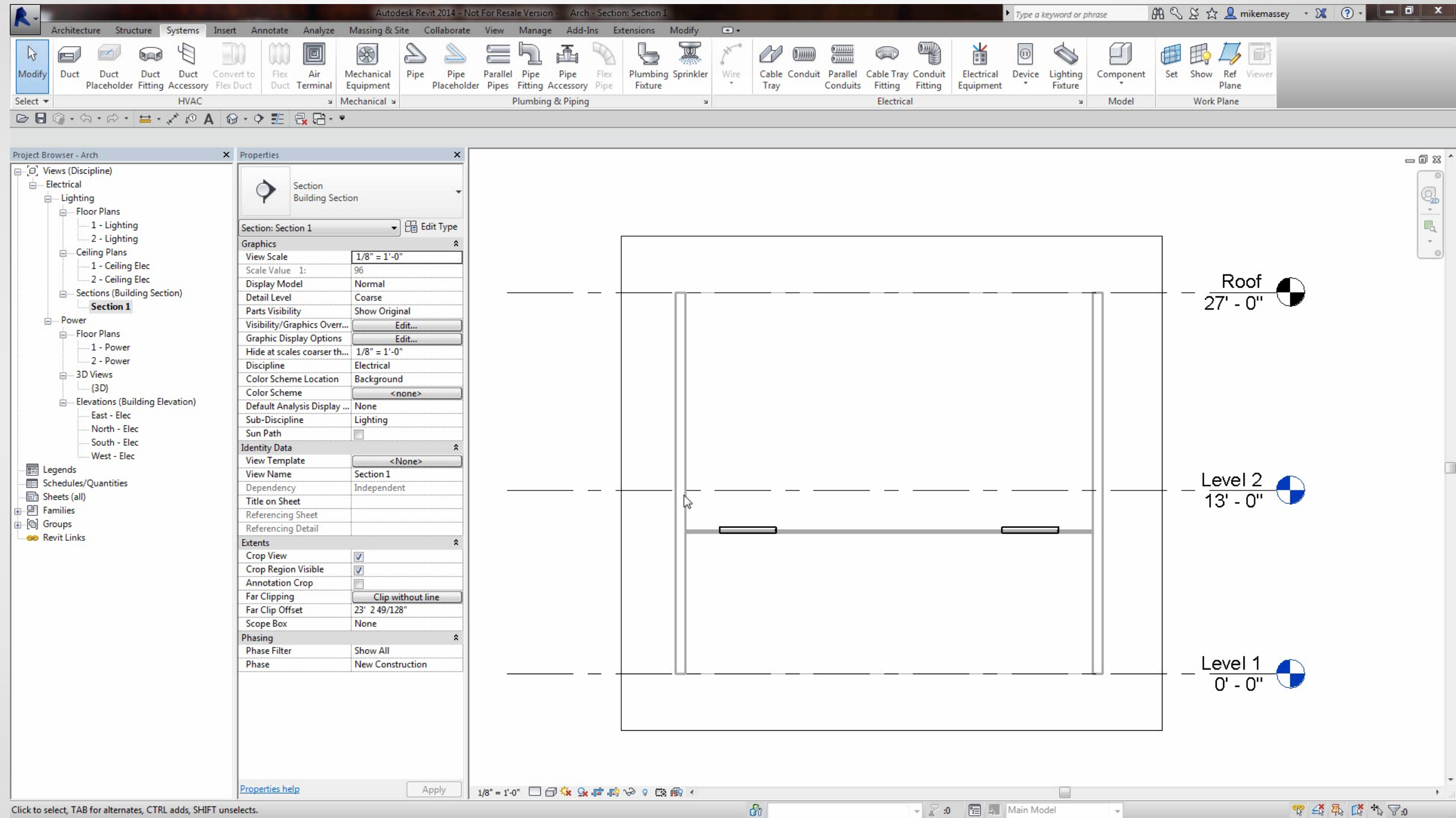
Dimensions	
Width	1' 8"
Depth	0' 5 3/4"
42 Circuit Height	3' 5"
30 Circuit Height	2' 2"
24 Circuit Height	1' 11"
12 Circuit Height	1' 8"
Identity Data	



3 Most Important Parameters when Inserting Panels

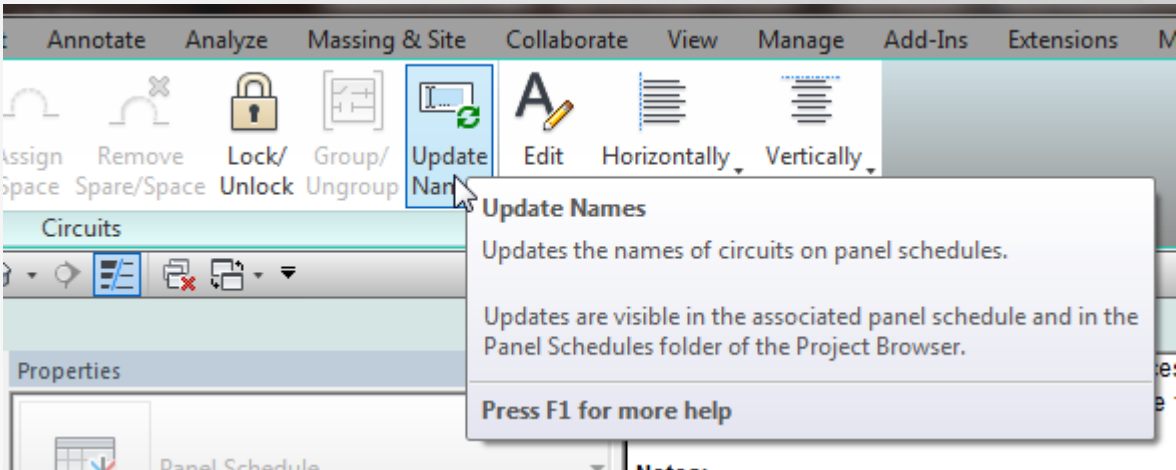
Let's see how this works...

3 Most Important Parameters when Inserting Panels



Working with Panel Schedules

Working with Panel Schedules



- Load Names in Panel Schedule
 - (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	

Tri

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

Space

1



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

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

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	
Receptacle	1440 VA	100.00%	1440 VA	Total Conn. Load: 20400 VA
Lighting	960 VA	125.00%	1200 VA	Total Est. Demand: 20640 VA
				Total Conn.: 57 A
				Total Est. Demand: 57 A

Notes:

Ready

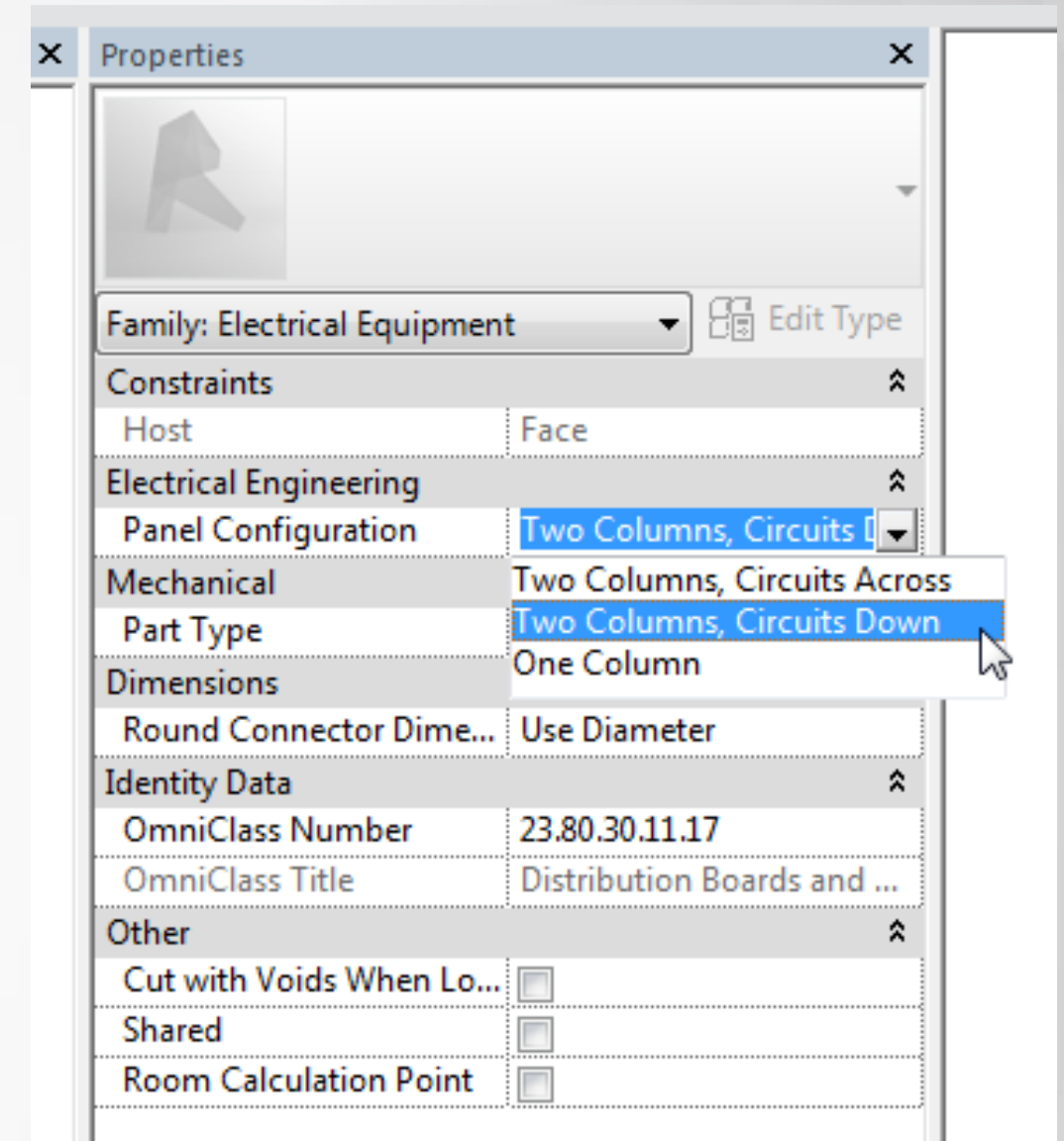
Main Model



Working with Panel Schedules

- Getting Panels to Number down instead of Across

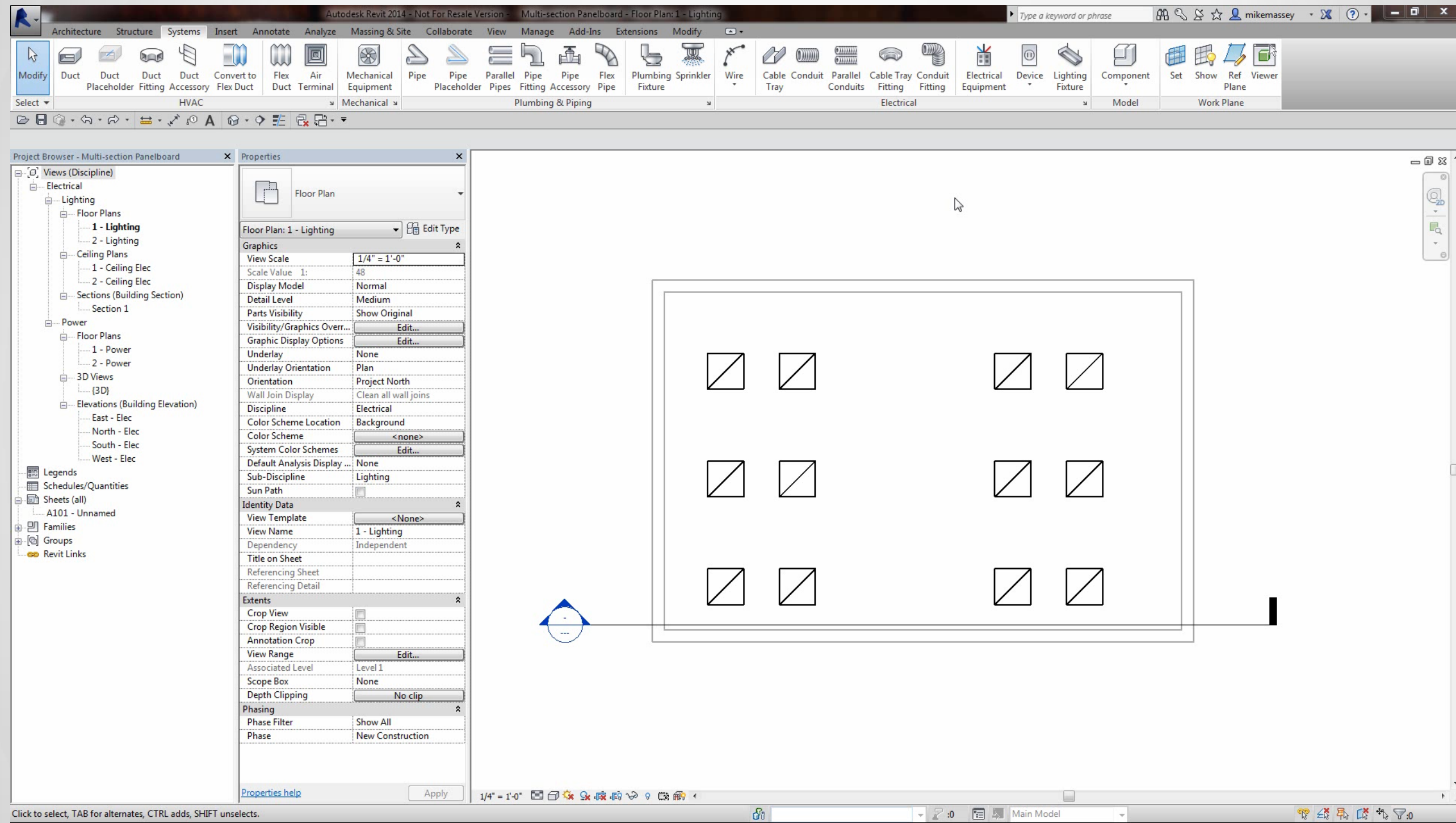
CKT	Circuit Description	Trip	Poles	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				





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

Getting Panels to Number down instead of Across



Working with Panel Schedules

- Panel Schedule Templates
 - Multi-Section Panelboard

My Class File 10-14.rvt - Floor Plan 1 - Plumbing

View

Manage

Add-Ins

Extensions

Modify

Panel Schedule Templates

Additional Settings

Location

Coordinates

Position

Design Options

Main Model

Panel Schedule Templates

Manage Templates

Edit a Template

Manage Templates

Manages and applies panel schedule templates to existing schedules in the project.

Edit, duplicate, and rename templates, and change the default template per panel type. You can also apply templates to panel schedules from the Manage Panel Schedule Templates dialog.

Press F1 for more help

1'-0"

CKT	Circuit Description	Trip	Pole
1	<Load Name>	<Rating>	<Number>
3	<Load Name>	<Rating>	<Number>
5	<Load Name>	<Rating>	<Number>
7	<Load Name>	<Rating>	<Number>
9	<Load Name>	<Rating>	<Number>
11	<Load Name>	<Rating>	<Number>
13	<Load Name>	<Rating>	<Number>
15	<Load Name>	<Rating>	<Number>
17	<Load Name>	<Rating>	<Number>

Manage Panel Schedule Templates

Manage Templates

Apply Templates

Template type:

Branch Panel

Panel configuration:

Two Columns, Circuits Across

Templates:

Branch Panel (Default)

Make Default

OK

Cancel

Branch Panel:

Location: Space 1

Supply From: Phase 2

Mounting: Rackmount

Enclosure: Type 1

Value: 120/208 V/1ph

Phase: 2

Wire G: 4

A.I.C Rating:

Main C Type:

Main C Rating: 100 A

MCB Rating:

Notes:

CKT	Circuit Description	Trip	Pole	A	B	C	Pole	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	Pole	A	B	C	Pole	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:				2 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.:	2 A
				Total Est. Demand:	2 A

Notes:

Technique by Cory Dunn – Autodesk Discussion Groups

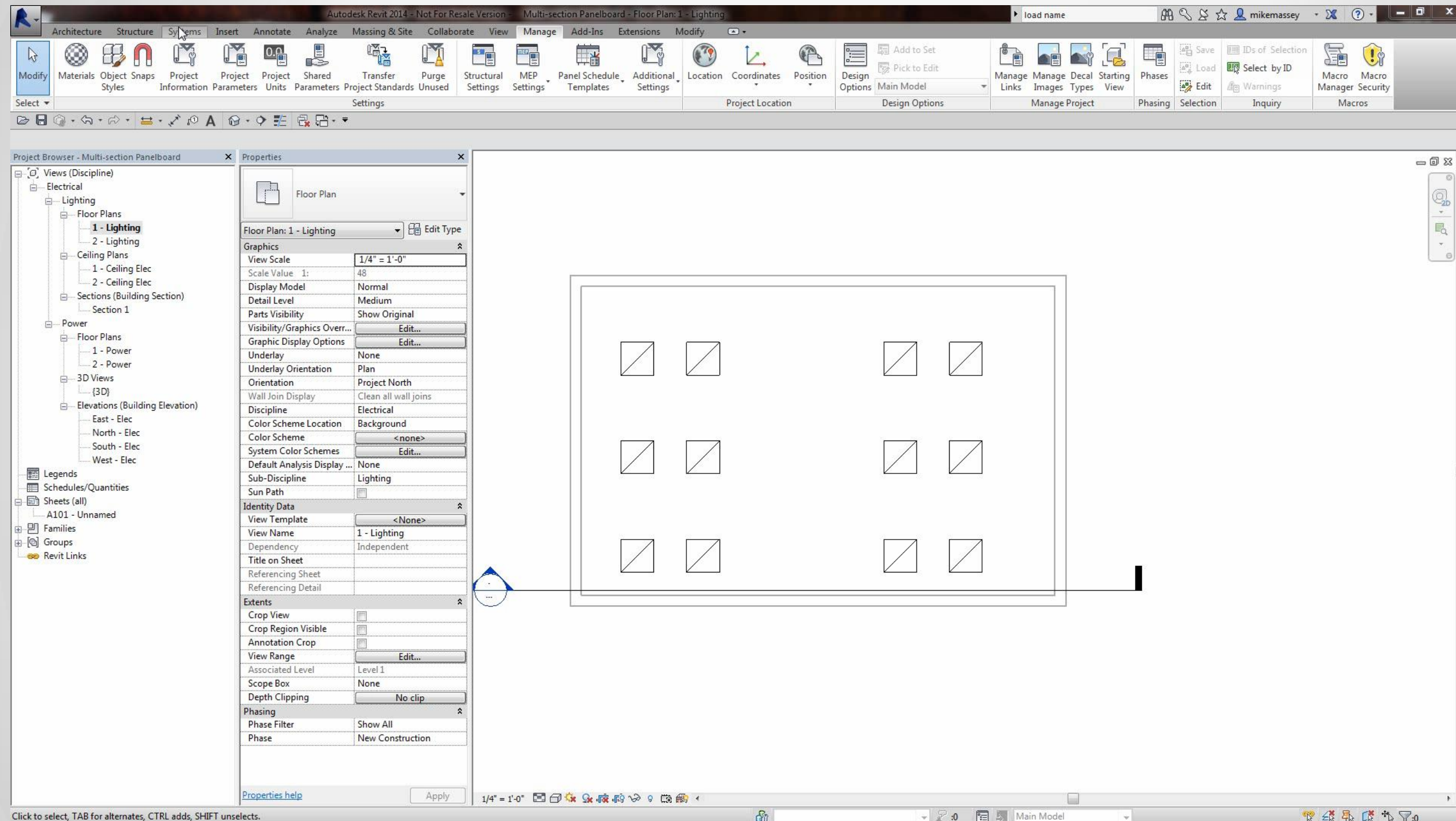




Panel Schedule Templates

Let's see how this works...

Multi-Section Panel Board



* Panel and Ghost Font are in Class Files

The background features a complex, abstract design with overlapping, curved, metallic-looking silver and bright green shapes that create a sense of depth and movement. A semi-transparent white horizontal band is centered across the image, serving as a backdrop for the title text.

Using Load Classifications and Demand Factors

Explain how Load Classifications and Demand Factors are applied

- 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-C
Lighting - Dwelling Unit
Lighting - Exterior
Lighting - General
Lighting - Hospital
Lighting - Hotel
Lighting - Warehouse
Motor

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%
120000 VA	unlimited	25.00%

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 types

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

Name:

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

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

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	Lighting - Dwelling Unit Space 1	20 A	1		480 VA 6000 ...					
5	Receptacle Space 1	20 A	1			1440 ... 6000 ...				
7										
9										
11										
13										
15										
17										
19										
21										
23										
25										
27										
29										
31										
33										
35										
37										
39										
41										
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:



Autodesk University Session Feedback

Your feedback is very important to Autodesk

- ✓ Attendees can complete session survey on their mobile device, PC or at a survey station
- ✓ Each completed session survey enters attendee in that day's drawing for a free AU 2014 pass
- ✓ You can help make AU 2014 better!



Session – MP1272 – Pesky Electrical Settings that drive you Crazy

10 is the correct answer!



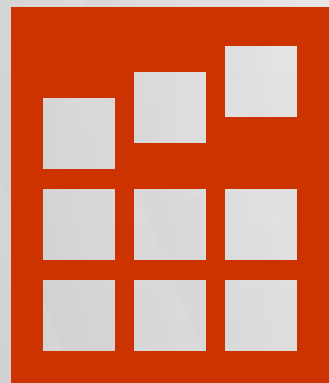
Wrap up

Thank you for attending!
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