AUTODESK UNIVERSITY 2014

# AB5745 - When is a Door Not a Door?

Bill Glennie – Autodesk, Inc.

**AB5745** This classic children's riddle holds the key to using any program for detailed building design, including AutoCAD Architecture software. No software provides every tool that is needed to model a building completely, so it is necessary to discover creative uses for the tools that are provided. This session will present several ways in which AutoCAD Architecture software customers are adapting standard objects to non-standard purposes. For example, a door is not a door, at least not one that you want to include in a door schedule, when it is part of a cabinet created as a door and window assembly. We can use the railing object to create, modify, and schedule seating layouts. Railings can also create railroad tracks, telephone posts, and cables. Windows can be skylights or manhole covers. Structural members can form parking lines. The class will describe these adaptations and others, as well as the steps needed to employ them effectively.

## Learning Objectives

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

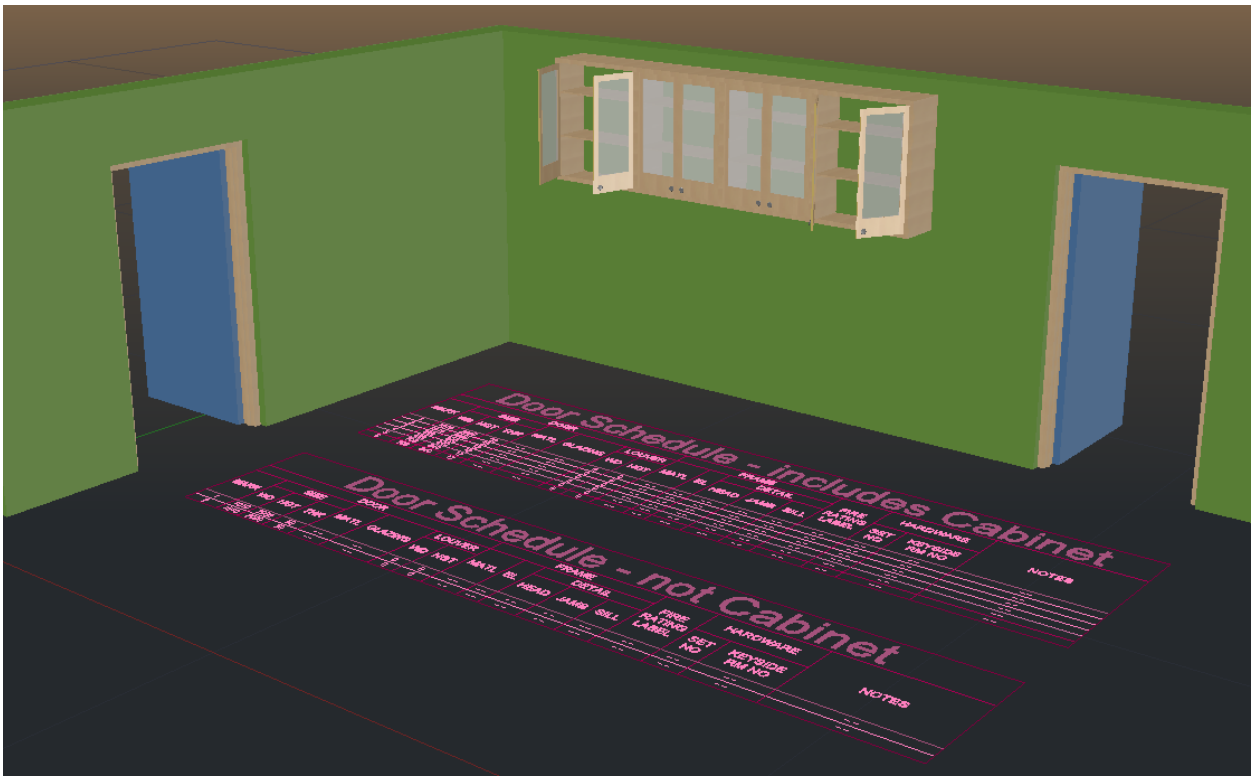
- Understand and use schedules, property set definitions, and classifications to get the desired results
- Learn how to apply custom blocks to structural members and railings, as well as other objects
- Explore advanced use of the display system: representations, properties, sets, and overrides
- Learn the answer to the riddle

## About the Speaker

*Bill Glennie is passionate about AutoCAD Architecture software. He joined Autodesk, Inc., as a quality assurance analyst in 1997, a year before the release of Version 1. For several years Bill led the design of the stair and railing features. For 3 years he also managed the AutoCAD Architecture Quality Assurance Team. He participated in the design of structural member enhancements in the 2006 release. He is now product owner, a central role in the Agile development process, for both AutoCAD Architecture software and AutoCAD MEP software. Prior to joining Autodesk, Bill taught CAD courses for 14 years at the University of Pennsylvania and Rensselaer Polytechnic Institute. He also worked for a small architecture and solar consulting firm as a programmer and design analyst after receiving a Bachelor of Arts degree in Architecture and a Master of Science Degree in Engineering (Civil-Structures) from Princeton University.*

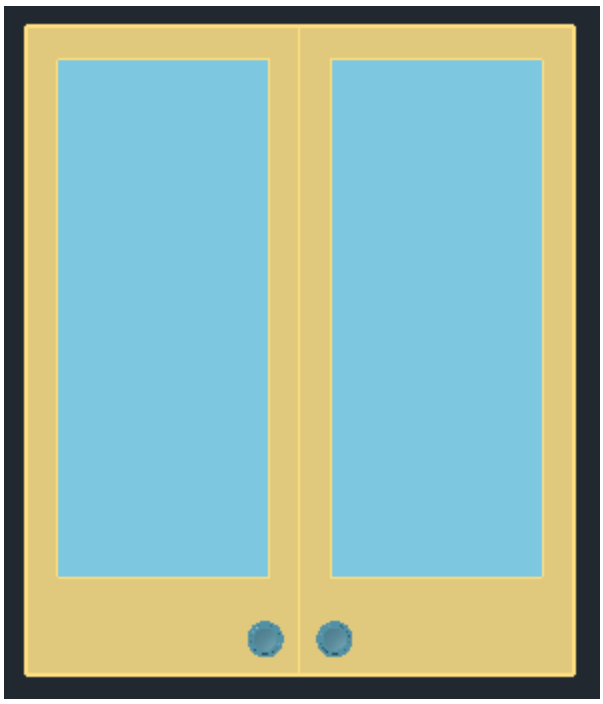
bill.glennie@autodesk.com

## 1. Creating a Cabinet with Doors that do not Appear in a Schedule




### a. Prepare the Cabinet Doors as a Door & Window Assembly

- Specify a Style for Infill, rather than a panel
- Use the double full-lite door style as a starting point
- I added a custom block for a door pull, which requires experimentation to get the location and orientation correct.

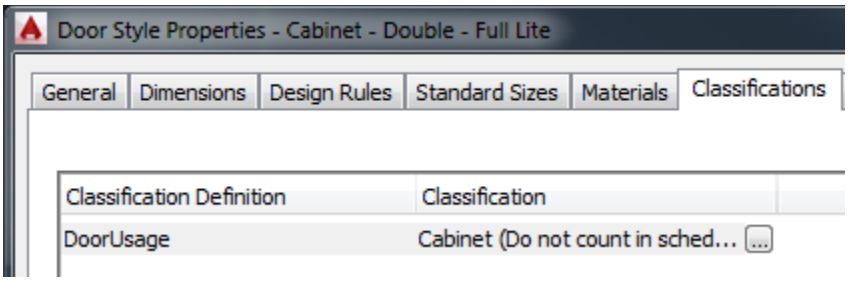


### b. Create a Classification Definition for Door Usage

- Style Manager > Multi-Purpose Objects
- New > Rename (e.g. “Door Usage”)
- Applies to Door
- Two Classifications
    - Cabinet (Do not count in schedules)
    - Normal (Count in schedules)

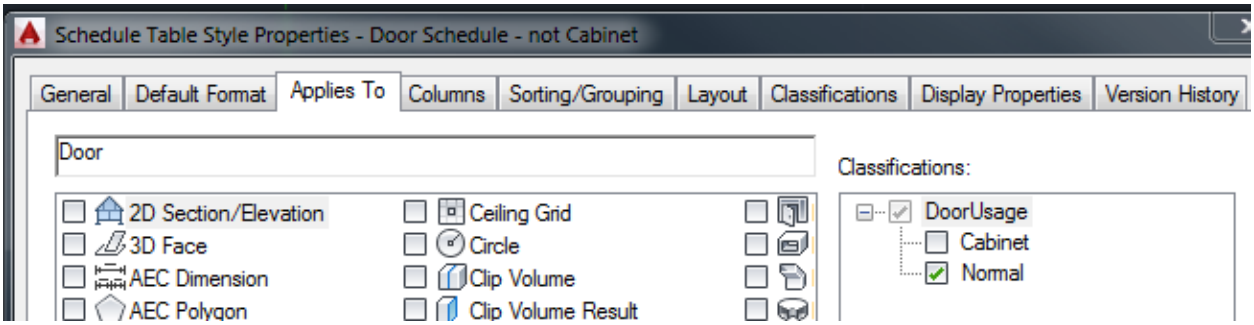
### c. Add the Classification to the Cabinet Door Style

- On the Classifications tab, pick […] to set




### d. Modify the default Door Schedule Table Style

- Applies To tab > Check only “Normal” under Classifications




### e. Resulting Door Schedule does not include the four cabinet doors.

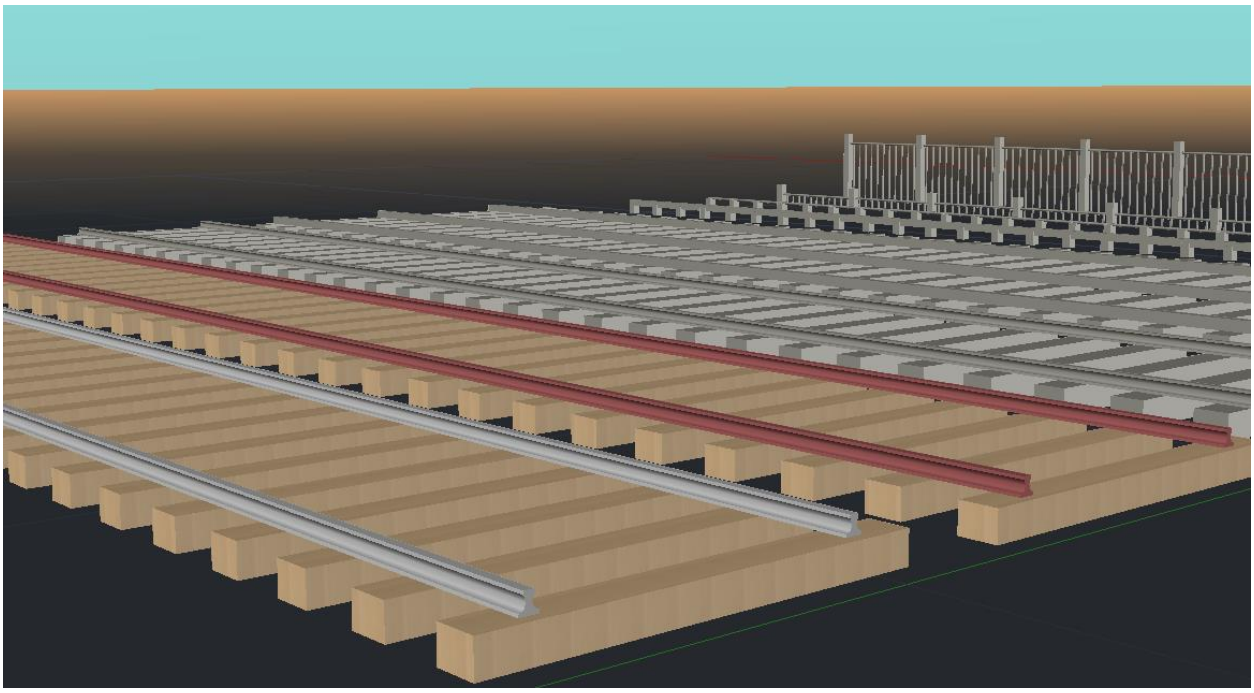
**Door Schedule - includes Cabinet**

| DOOR | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| MARK | SIZE | | | MATL | GLAZING | LOUVER | | MATL | E |
| | WD | HGT | THK | | | WD | HGT | | |
| 1 | 1010 | 2000 | 50 | -- | -- | 0 | 0 | -- | |
| 2 | 1010 | 2000 | 50 | -- | -- | 0 | 0 | -- | |
| 3 | 699 | 840 | 12 | -- | -- | 0 | 0 | -- | |
| 4 | 699 | 840 | 12 | -- | -- | 0 | 0 | - | |
| 5 | 708 | 840 | 12 | -- | -- | 0 | 0 | | |
| 6 | 708 | 840 | 12 | -- | -- | 0 | 0 | | |

**Door Schedule - not Cabinet**

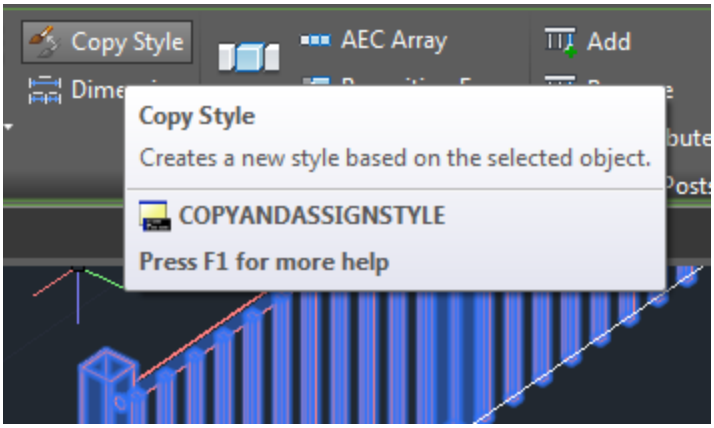
| DOOR | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MARK | SIZE | | | MATL | GLAZING | LOUVER | | MATL |
| | WD | HGT | THK | | | WD | HGT | |
| 1 | 1010 | 2000 | 50 | -- | -- | 0 | 0 | - |
| 2 | 1010 | 2000 | 50 | -- | -- | 0 | 0 | |

## 2. Using a Railing to Create Railroad Tracks



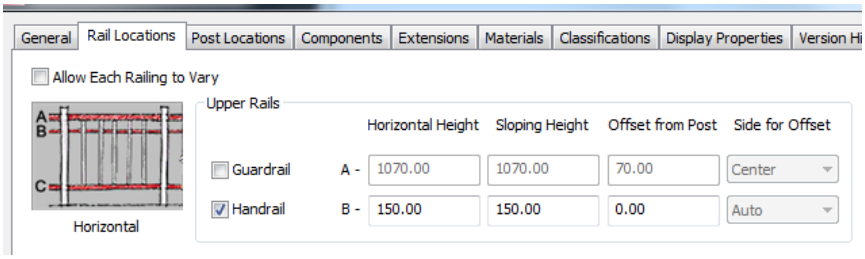
**a. Create a style. This can be done starting with the Standard style.**

- Add Railing
- Select and use Copy Style
- Rename




**b. Set the Handrail height to the top of what will be the sleepers (also called ties).**

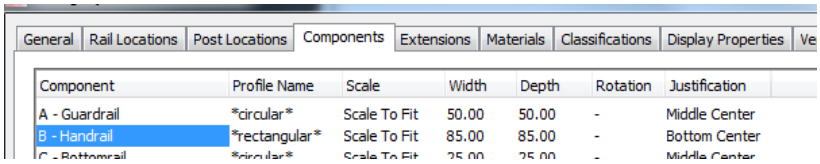
- Rail Locations
- Set both Horizontal and Sloping Height



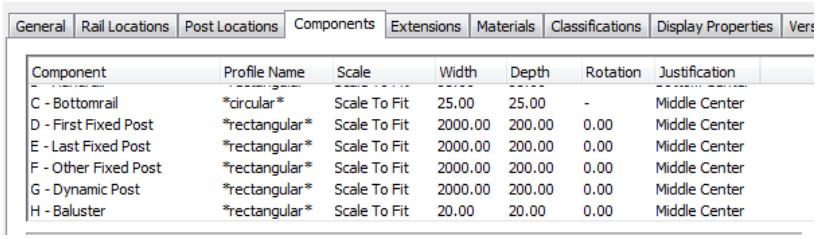
**c. Turn off the Balusters and set the Post spacing for the sleepers, and the top extension to zero.**

- Post Locations
- Dynamic Post Spacing
- Uncheck Balusters


**d. Set the height and width of the handrail approximately for a single rail.**

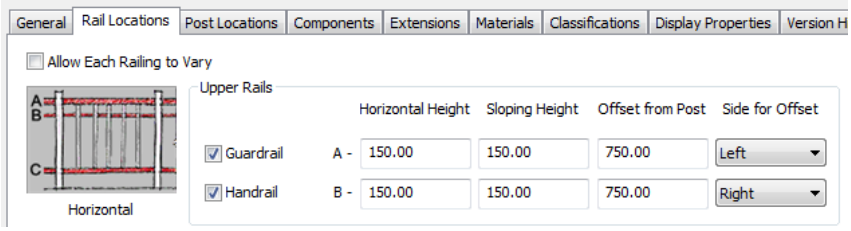



**e. Set the width and depth of all post components appropriately for the sleeper.**



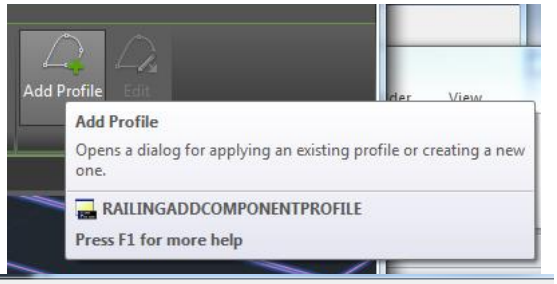

**f. Add the Guardrail to form the second rail**

- Match the settings for the Handrail
- Set offset to ½ the desired track spacing
- One right, one left

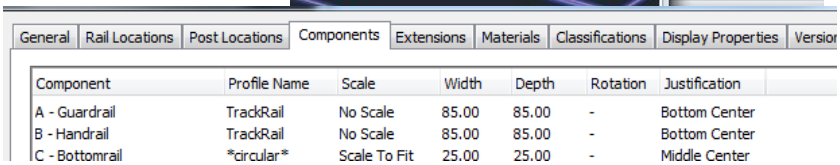


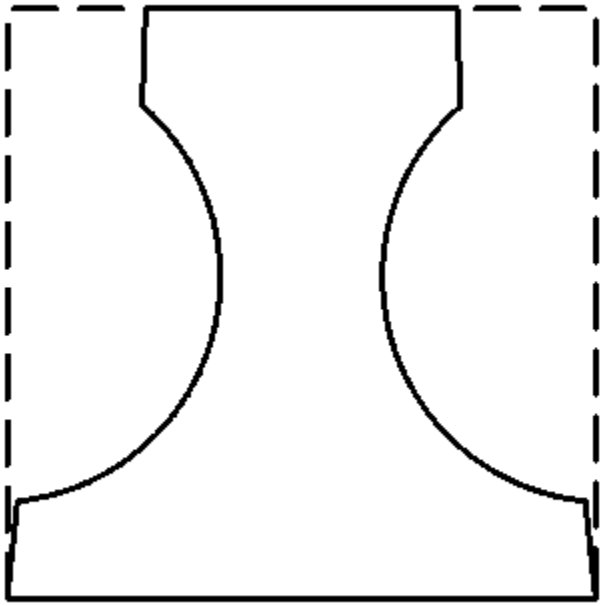
**g. Create the profile for a single rail and copy to the second rail**

- With the railing selected, pick “Add Profile” from the contextual tab
- Provide a name for the new profile
- Use the profile extended grip commands to add vertices and curve some edges




- Finish the profile definition
- Set the other rail in the style to use the new profile definition

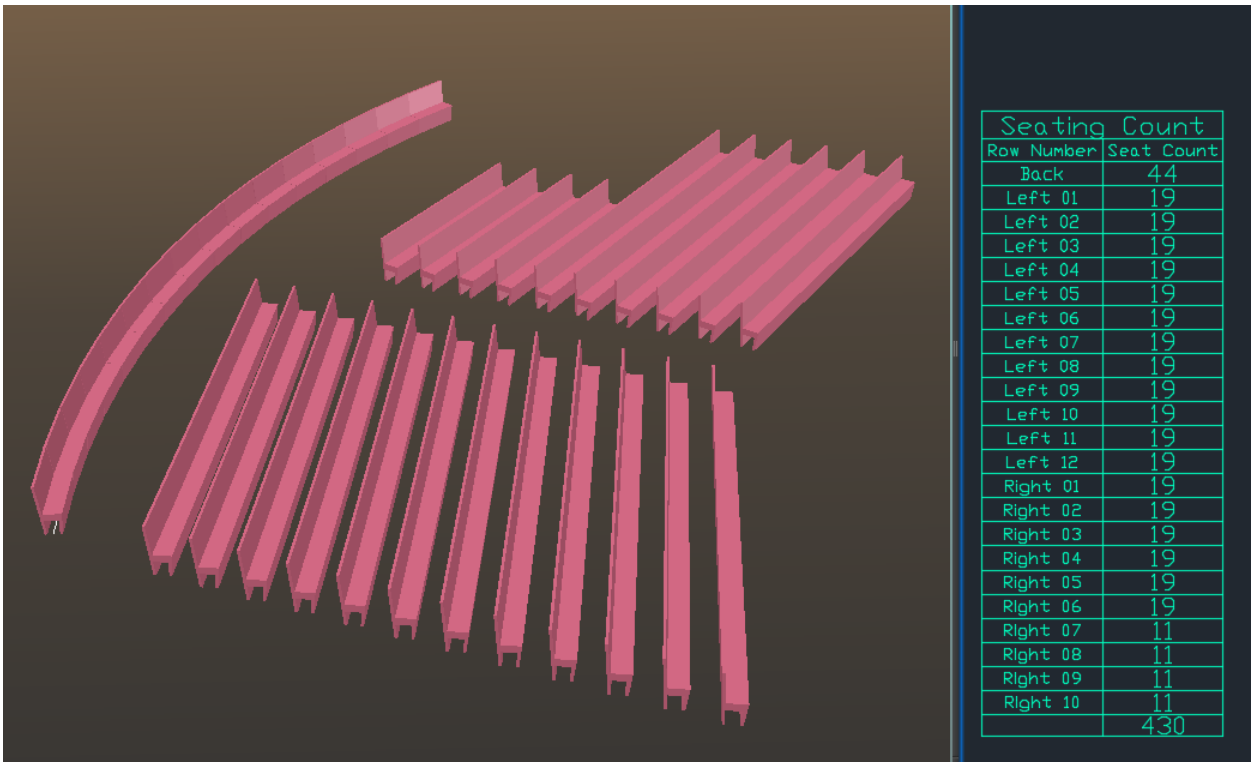


**h. Optional extra – add materials to the components of the railing**

- Use steel for the Rails
- Use wood for the Posts
- Change steel material

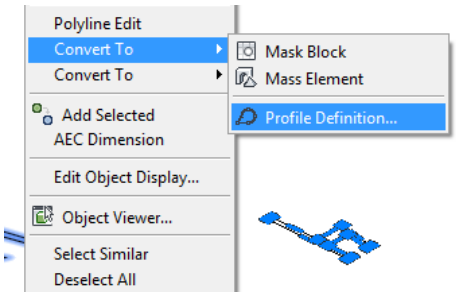
## 3. Using a Railing to Create and Modify Seating Layouts



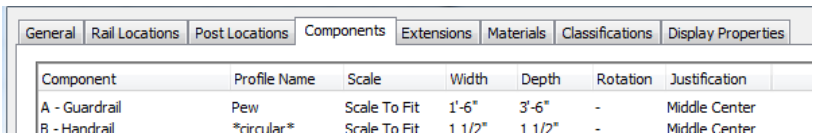
| Seating Count | |
|---|---|
| Row Number | Seat Count |
| Back | 44 |
| Left 01 | 19 |
| Left 02 | 19 |
| Left 03 | 19 |
| Left 04 | 19 |
| Left 05 | 19 |
| Left 06 | 19 |
| Left 07 | 19 |
| Left 08 | 19 |
| Left 09 | 19 |
| Left 10 | 19 |
| Left 11 | 19 |
| Left 12 | 19 |
| Right 01 | 19 |
| Right 02 | 19 |
| Right 03 | 19 |
| Right 04 | 19 |
| Right 05 | 19 |
| Right 06 | 19 |
| Right 07 | 11 |
| Right 08 | 11 |
| Right 09 | 11 |
| Right 10 | 11 |
| | 430 |

### a. Create a profile at full scale to represent the seating

- Draw a closed polyline
- Convert to profile
  - Set insertion point
  - New definition
  - Specify name

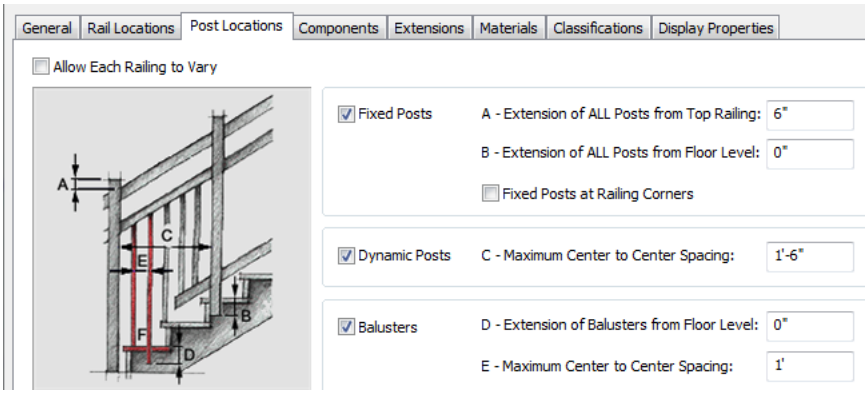



### b. Create a railing style that uses the profile for the Guardrail

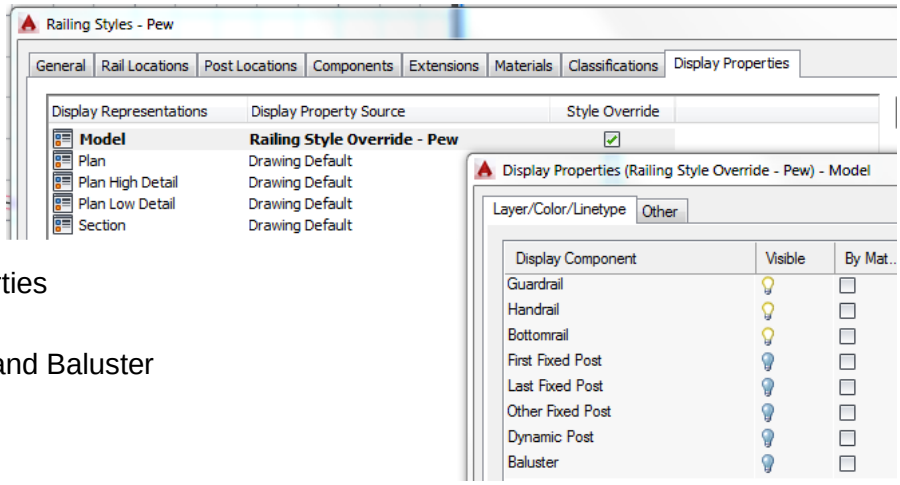



### c. Set the Dynamic Post spacing for one seat

**d. Set the Baluster spacing to more than ½ of that distance**

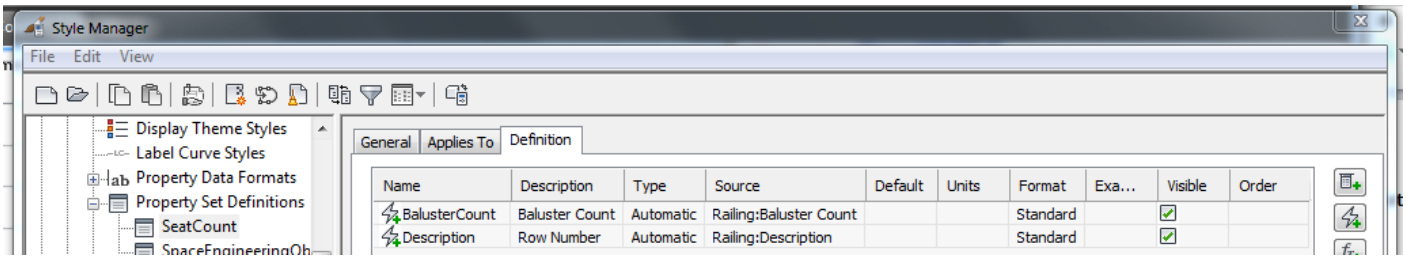



**e. Override the display of Posts and Baluster in the Model Representation**

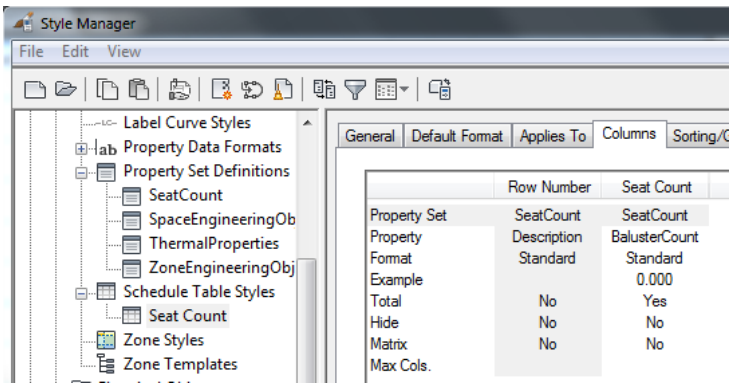



- Edit Style > Display Properties
- Check “Style Override”
- Turn off Visibility of Posts and Baluster

**f. Use the Baluster Count automatic property to count seats**

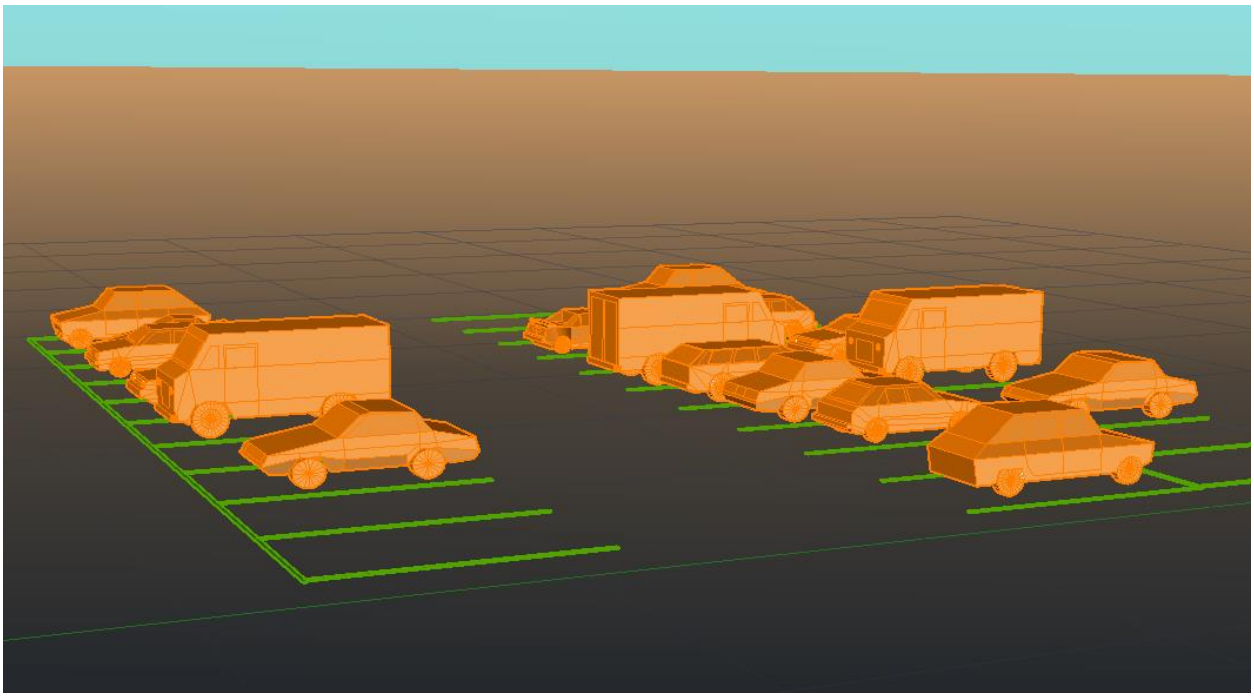



**g. Use this property in a Schedule Table Style**




| Seating Count | |
|---|---|
| Row Number | Seat Count |
| Back | 44 |
| Left 01 | 19 |
| Left 02 | 19 |
| Left 03 | 19 |
| Left 04 | 19 |
| Left 05 | 19 |
| Right 10 | 11 |
| | 430 |

## 4. Using a Structural Member to do Parking Lot Layout

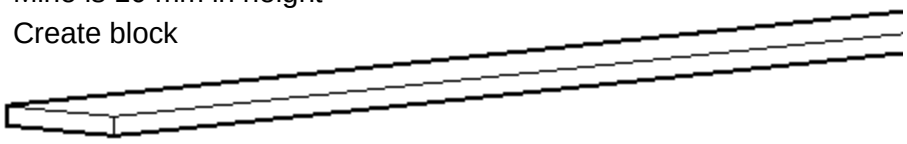


**a. Draw a rectangle for one parking lot line in plan**

- Mine is 6 meters by 8 cm
- Convert to a region
- Create block

**b. Draw a thin 3D solid for one parking lot line in model representation**

- Mine is 10 mm in height
- Create block

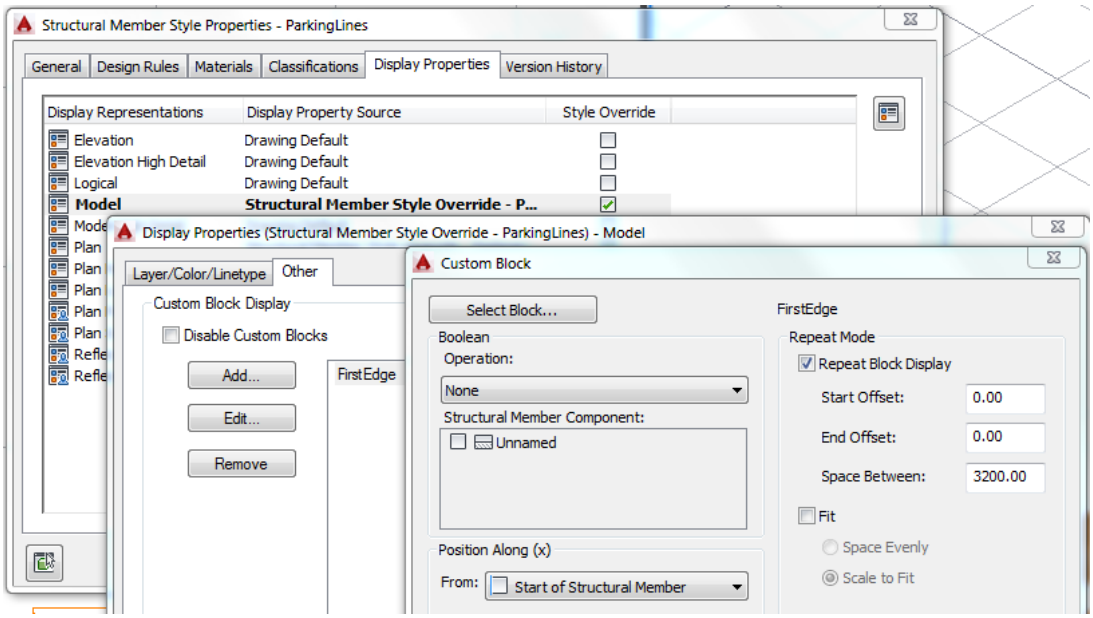


**c. Draw a rectangle that is the cross-section of the box**

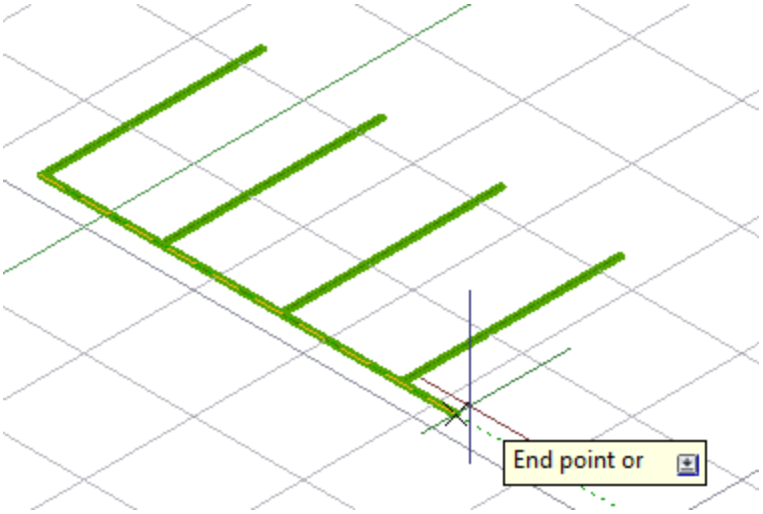
- Create a Custom Column using that polyline
- This creates the Structural Member Shape and Style

**d. Add the Plan and Model blocks to the respective Display Representations**

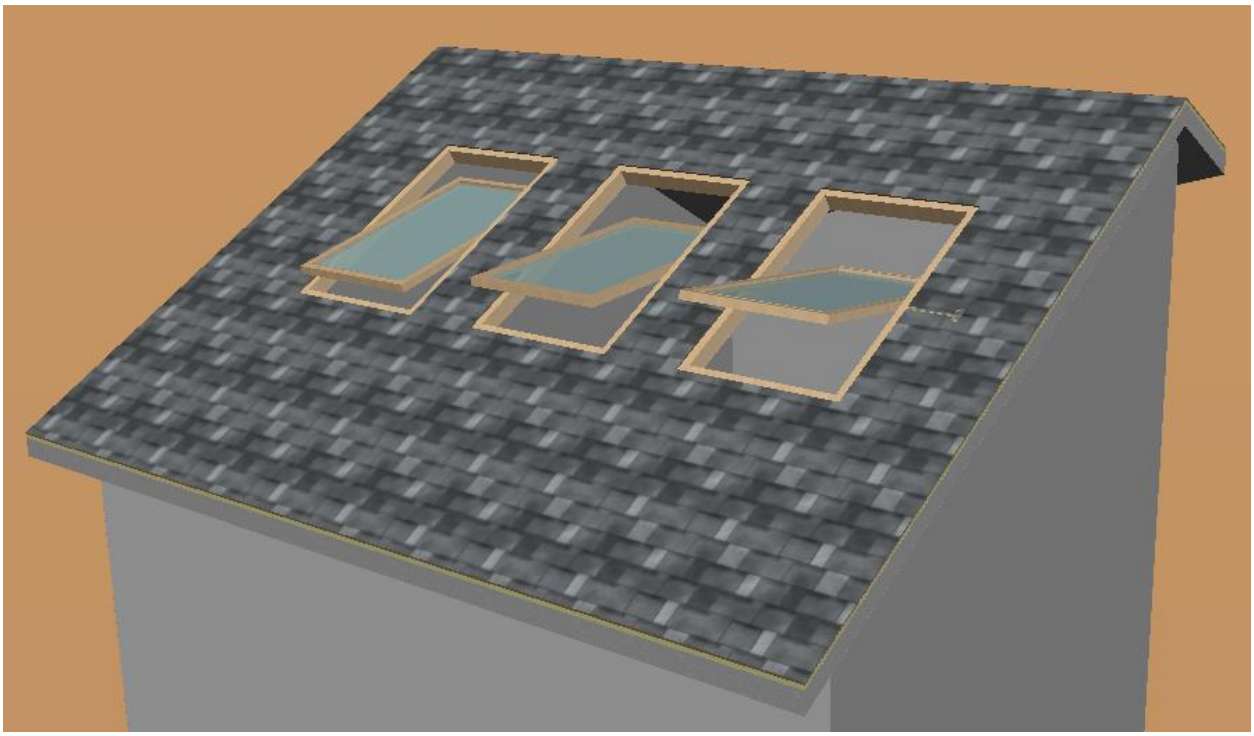
- As Style Override




**e. Add a beam of the ParkingLine style**



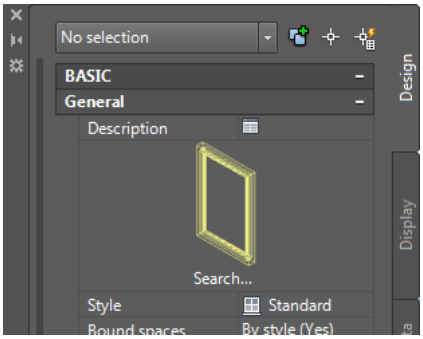
## 5. Using a Window for a Skylight

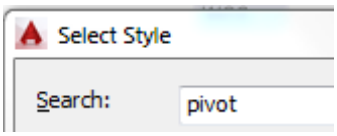


After drawing the Roof Slab that will contain the Skylight

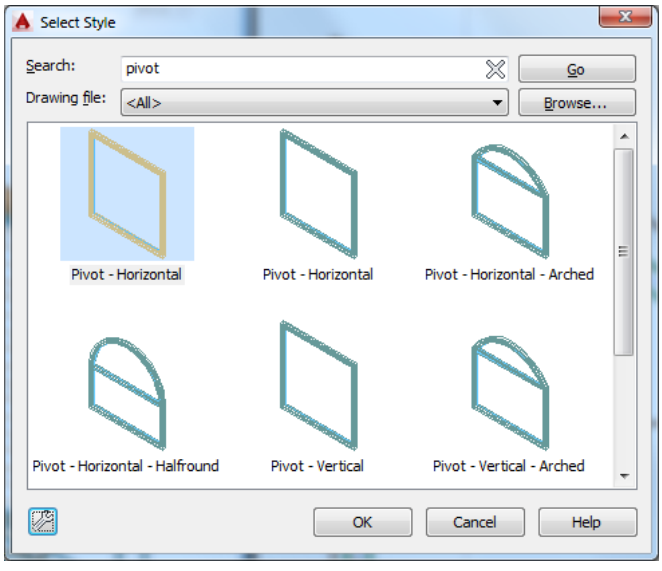
**a. Import the desired Window style – pivot or awning.**

- Select the new “Search…” button
- Search for “pivot” or “awning” in the “Select Style” dialog



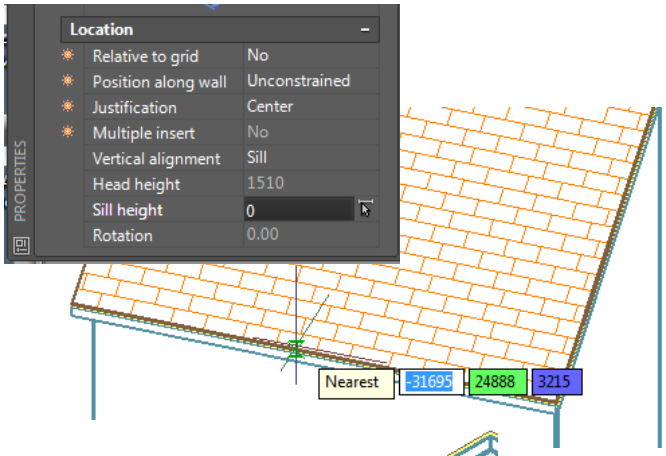




- Select the desired style and pick OK (or double- click)

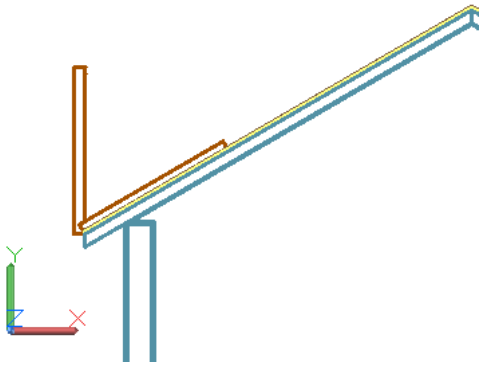


**b. Place it as a freestanding window, at the edge of the slab.**

- Set the Sill height to zero



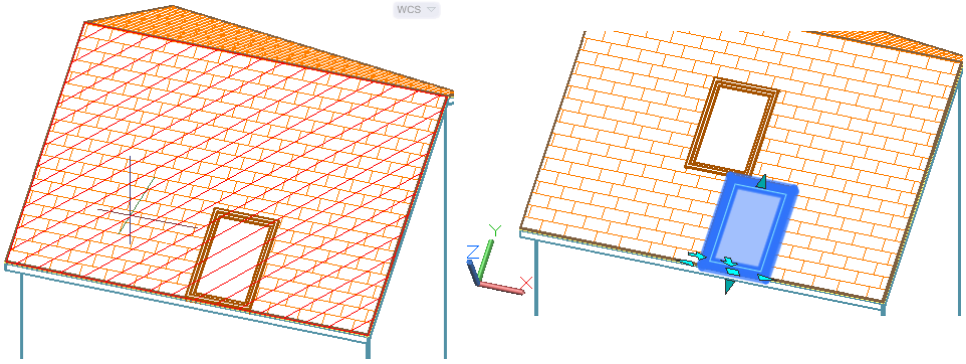

- Pick the edge of the Roof Slab



- Rotate the window to the plane of the Roof Slab

**c. Move into desired location.**

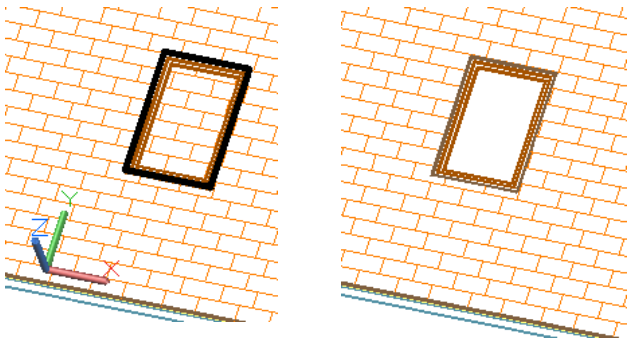
- AecAlignUcsToFace



- Move by displacement

**d. Create hole in roof.**

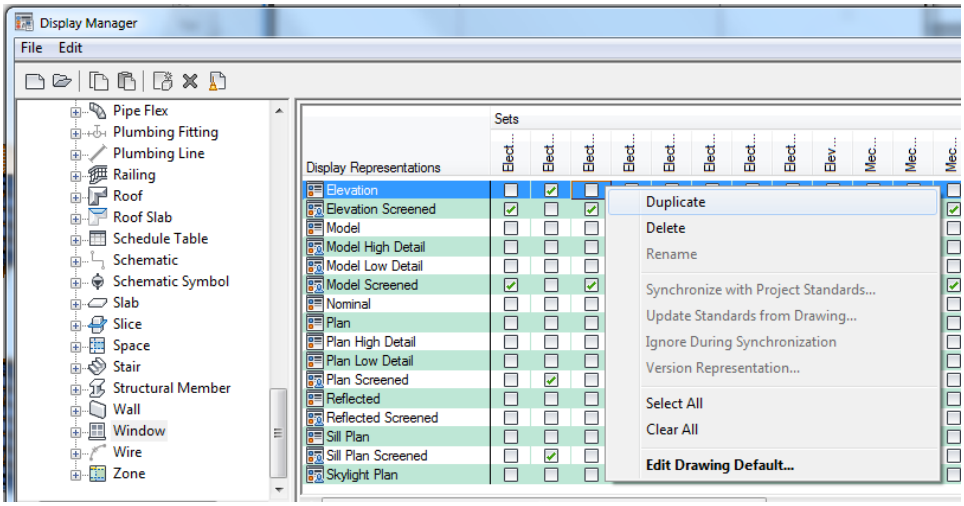
- Rectangle around Window



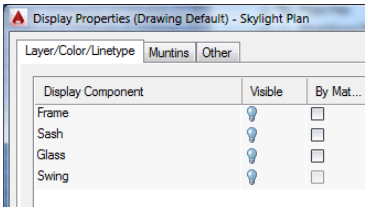
- Select Roof Slab > Hole > Add

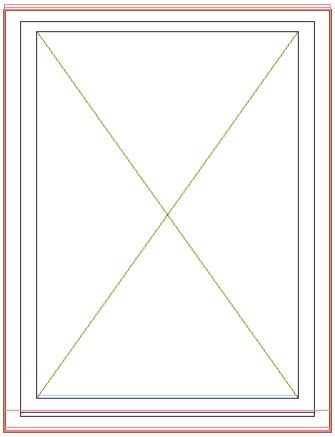
## e. Create skylight plan display representation

- Display Manager > Representations > Window
- Duplicate Elevation display representation
- Rename



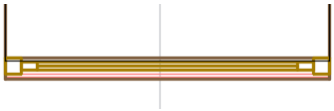

- Turn off all components (at the Drawing Default level)



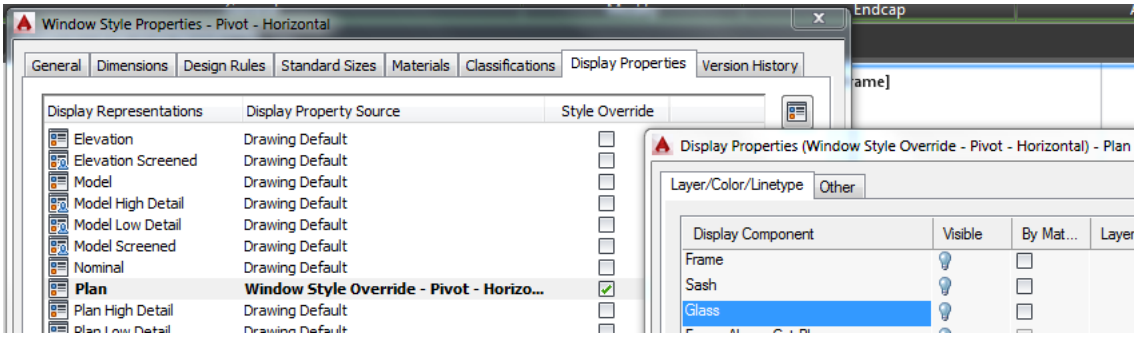



## f. Apply display overrides to Window Style

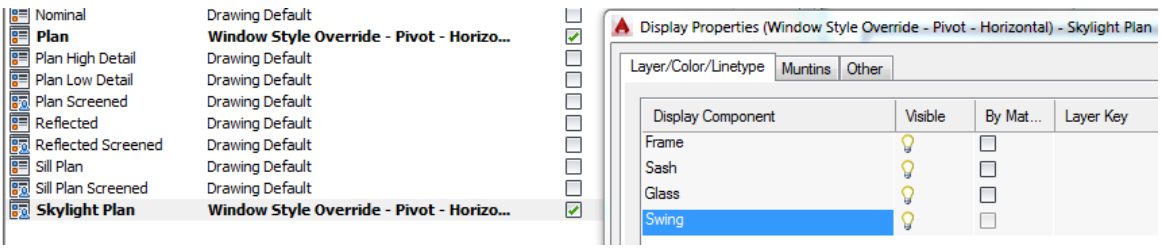
- Edit Style > Display Properties tab



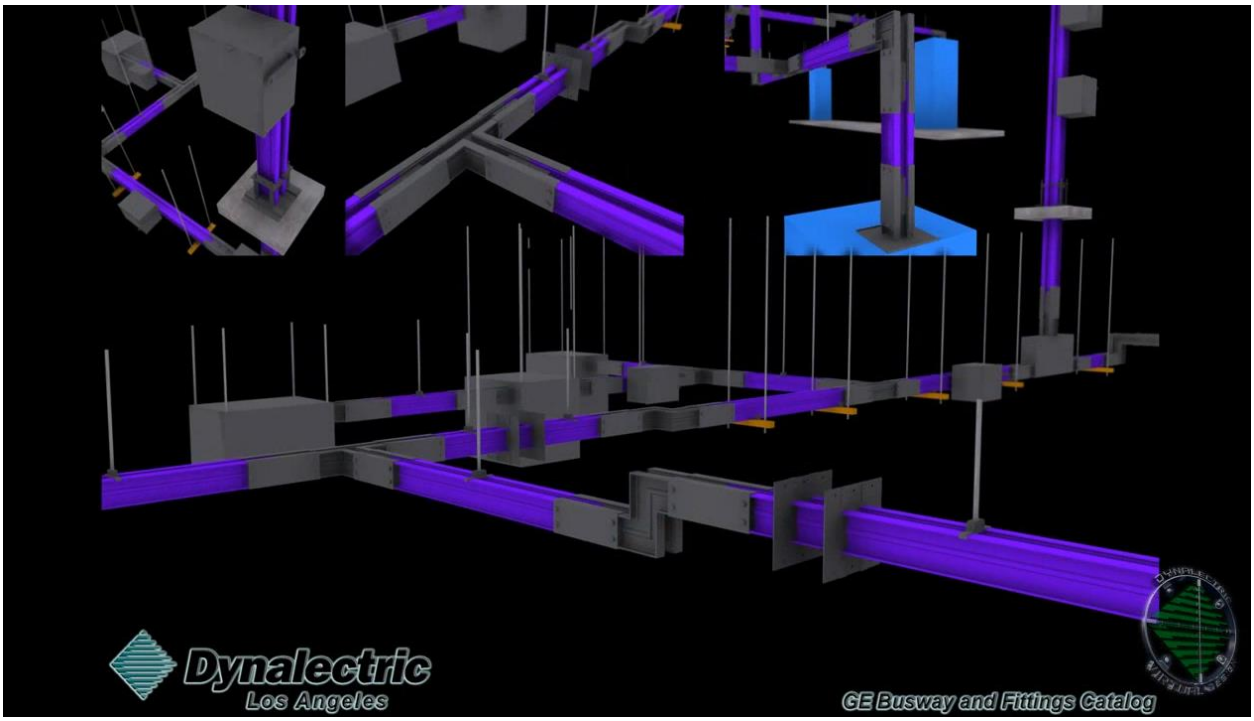
- Override Plan > turn off all components




- Override Skylight Plan > turn on all components



## 6. Using a Structural Member to Create an Electrical Bussway




**a. Draw the cross-section as a closed polyline**

**b. Use the Custom Column command to create the Member Shape**

**c. Create a Property Set definition that has the desired properties**