

ARCH 2431. Building Technology III

Building Information Modeling with Revit

Steel Connections *#2 Column Base Plates*



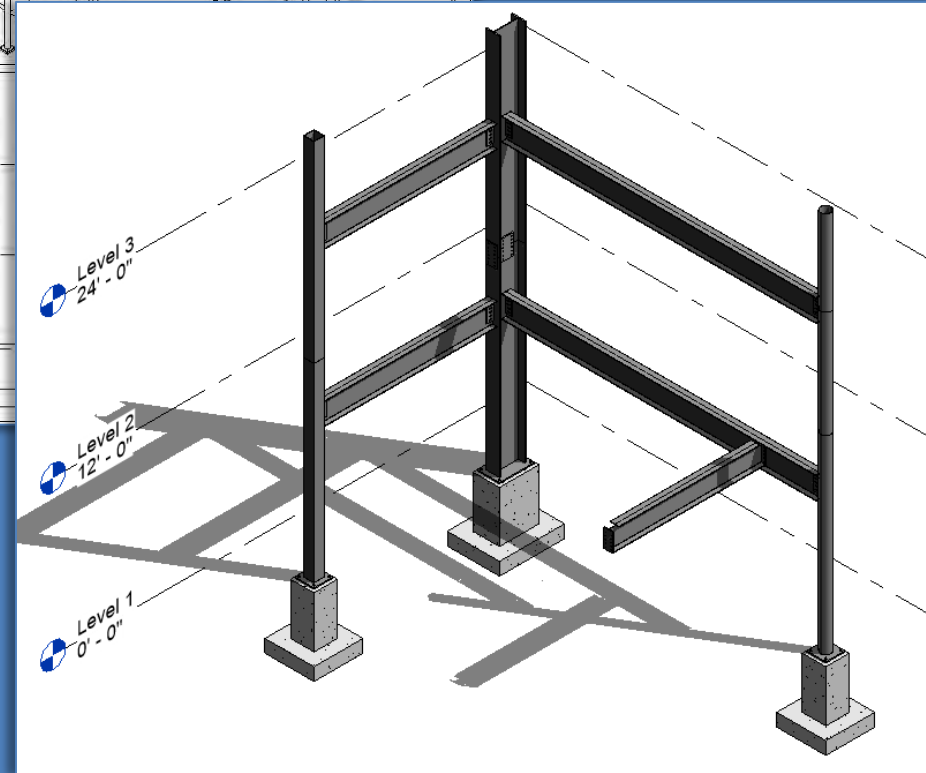
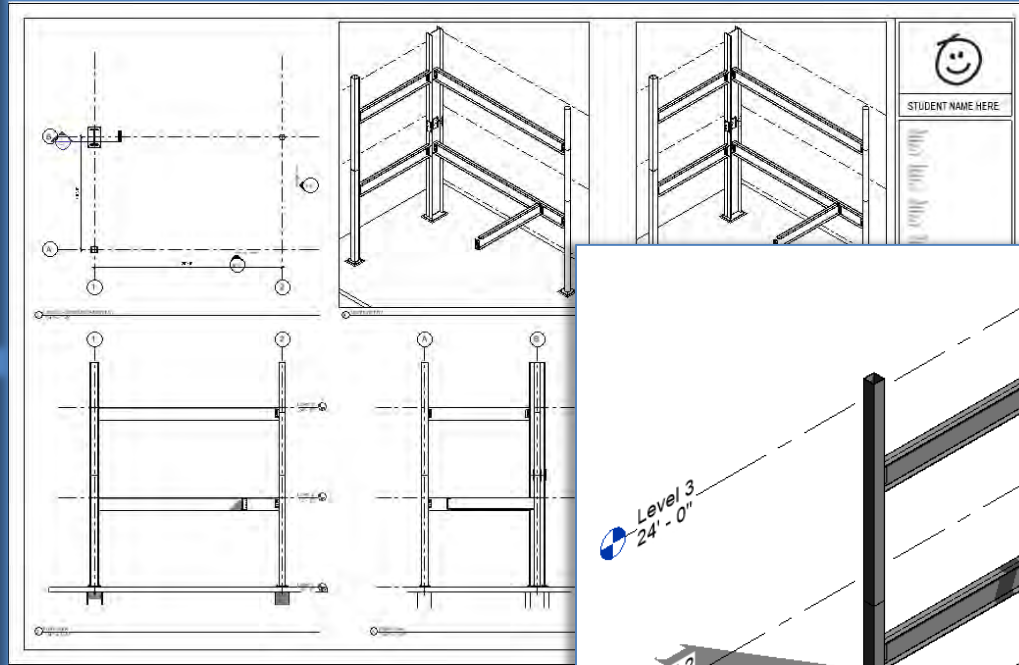
Professor Paul C. King, RA, AIA, ARA

Prof.Paul.King@Gmail.com

Pking@CityTech.Cuny.Edu

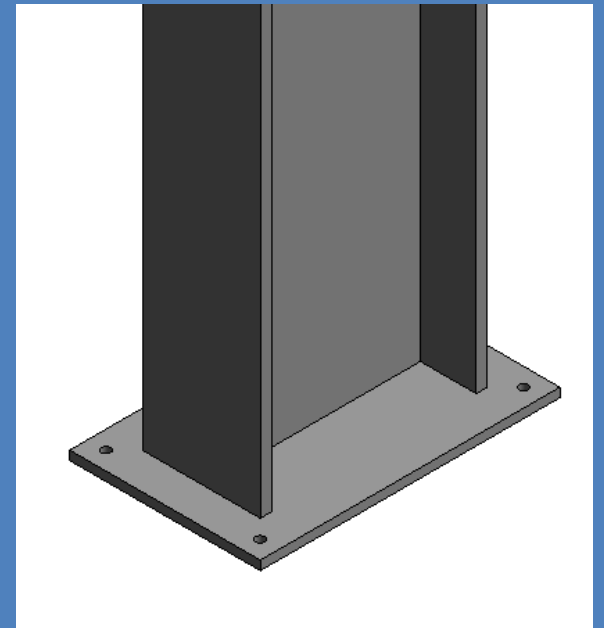
Steel Connection Detail Development

- 22 X 34 Sheet
- Coordinated Views & Isometrics



- *Base Plate & Footing*
- *Fin Plate Connection*
- *Splice Plate Connection*
- *Notched Beam with Bolting Plate*

Steel Column Baseplate

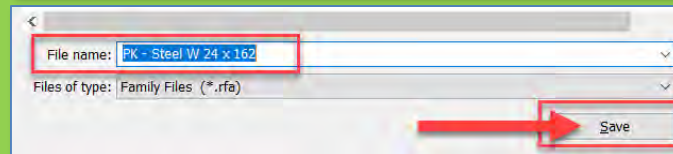
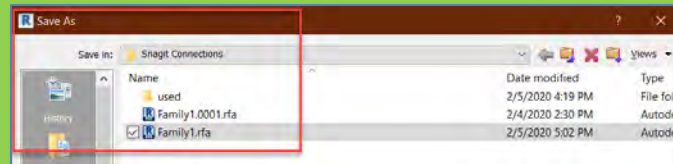
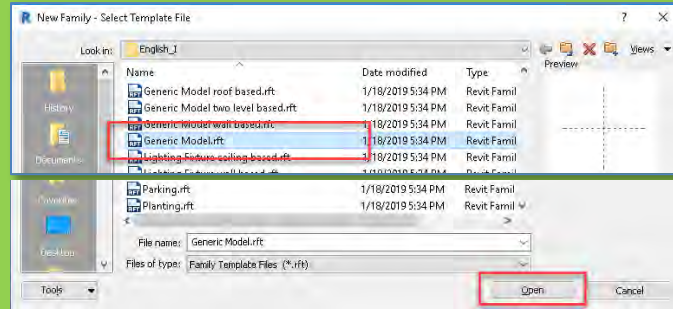
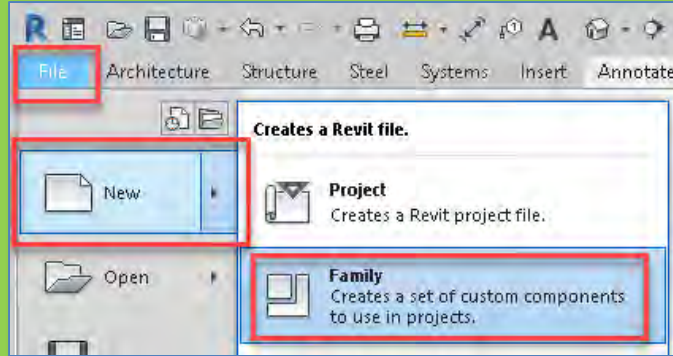


Connection Details

- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate

- Connections
- Video

Creating a new 3D Family File



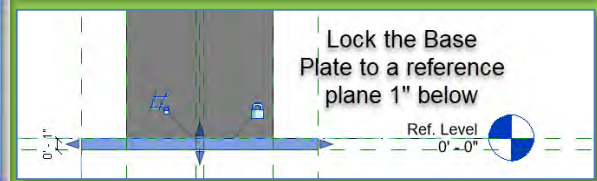
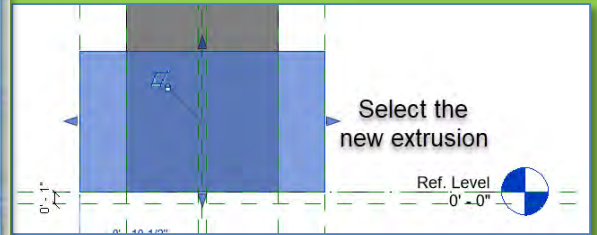
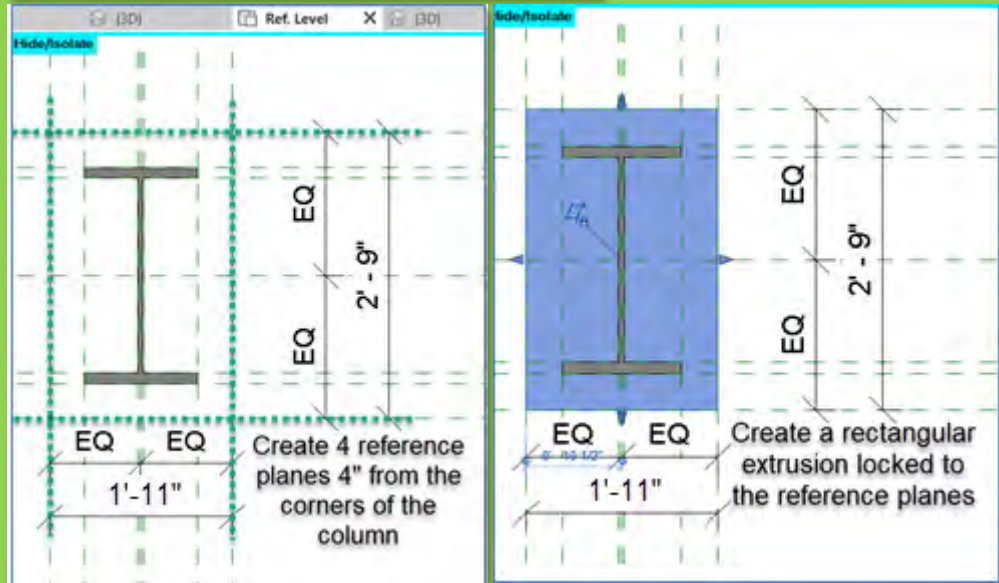
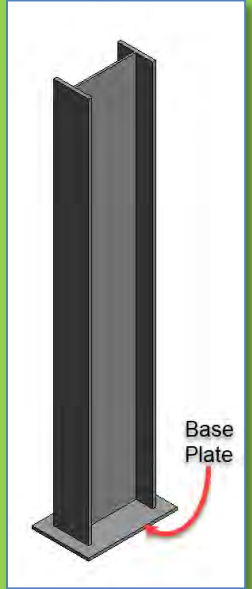
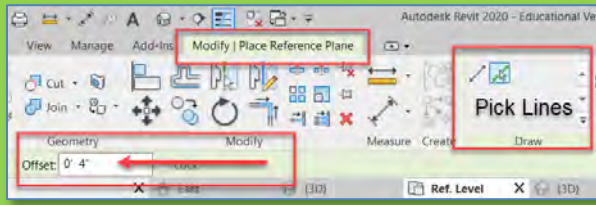
- We will repeat this for each component of the Steel Connection Assembly
- Create a new Family
 - File > New > Family
 - Generic Model Template
- Save and Name the File
- Select an appropriate directory
- Name the files as follows:
 - *Initials- Description*
 - *PK – Steel W 24 x 162 baseplate*
 - *PK – Steel baseplate*
 - *PK – Steel Fin*
 - *PK – Steel splice double*
 - *PK – Steel Notched Beam*

Add Base Plate to Wide Flange W 24 x 162

- Connection Details
- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate
- Connections
- Video

- Open family
PK – Steel W 24 x 162
- Save-as
PK – Steel W 24 x 162 baseplate

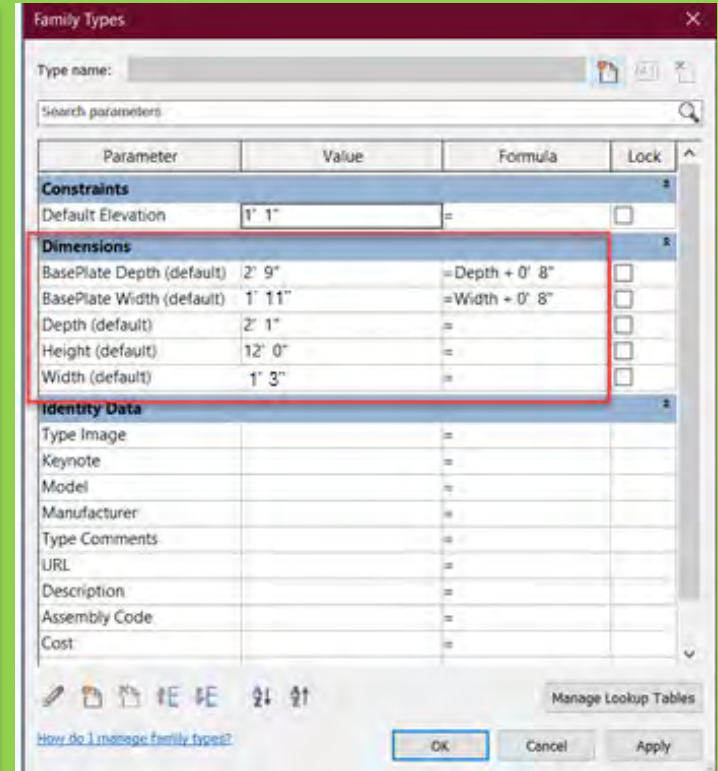
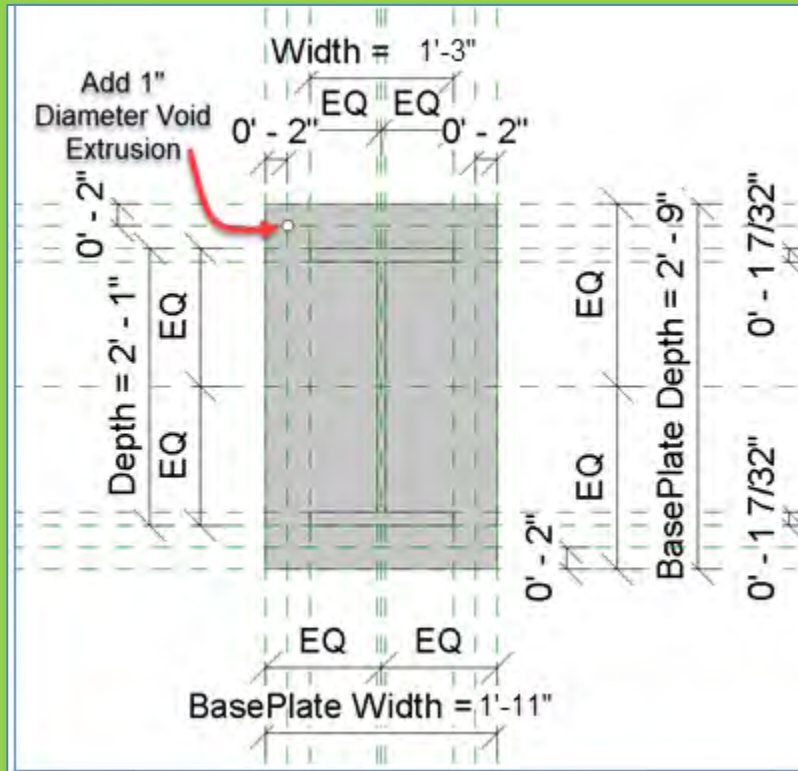
- Create 4 reference planes –
 - 4" from the corners of the column for the baseplate
- Create > Extrusion > Rectangle & lock to the reference planes
- Front View > Reference Plane @ 1"
- Edit Extrusion to snap to Ref. Level and Reference Plane for 1" Thickness



Baseplate uses parameter formulas

Connection Details

- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate
- Connections
- Video

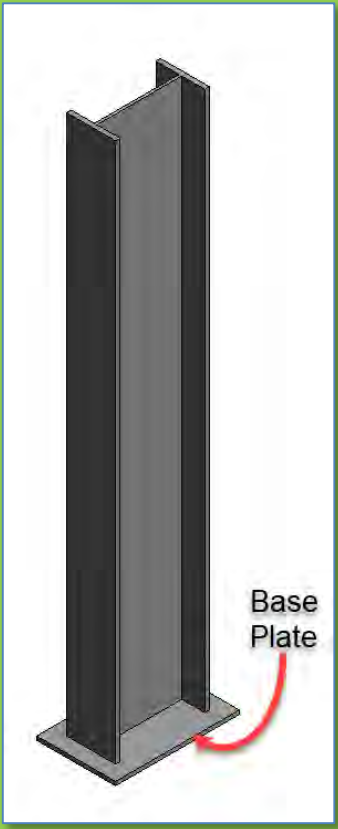
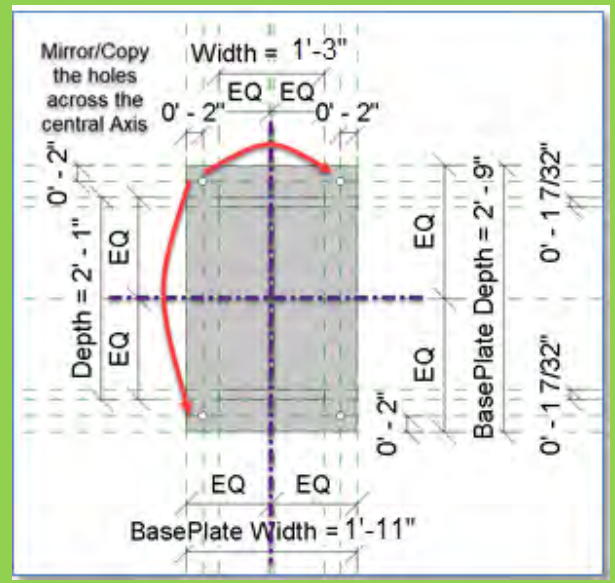
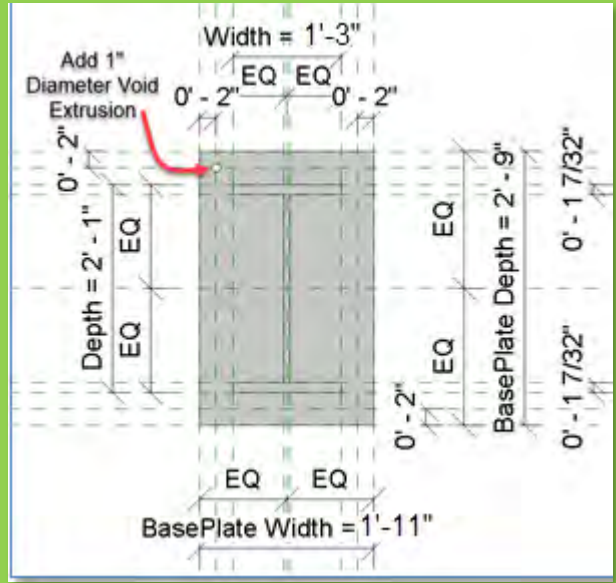


- The base plate is 4" beyond the corners of the column and uses parameter formulas
 - $BasePlate\ Depth = Depth + 0' 8" \quad 2' 1" + 8" = 2' 9"$
 - $BasePlate\ Width = Width + 0' 8" \quad 1' 3" + 8" = 2' 11"$

Add holes for anchor bolt to footing connection

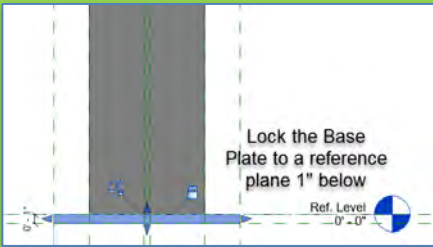
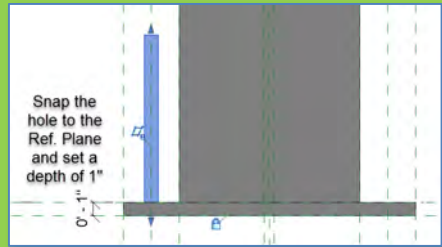
Connection Details

- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate
- Connections
- Video



- *Create > Void Forms > 1" Diameter holes*
- *Snap to Reference Planes 2" from edge of base plate*

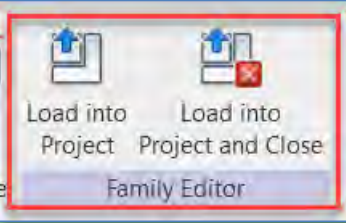
- *Mirror/Copy the holes across the center axis*



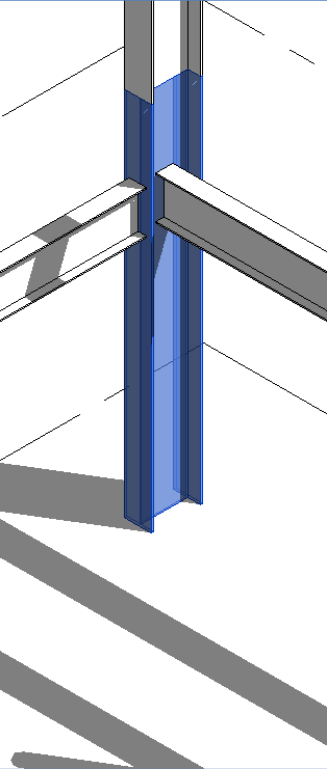
- *Snap the hole height to match the top and bottom of the baseplate*

Load new column with baseplate into project

- Connection Details
- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate
- Connections
- Video



- Load into Project
- Select the lower W 24 x 162 on Level 1
- Replace W 24x162 with the new family W 24x162 baseplate
- The height will revert to 12'-0". Change it back to 15'-0"
- Be certain your 3d View is not cropped and baseplate is visible!



Properties

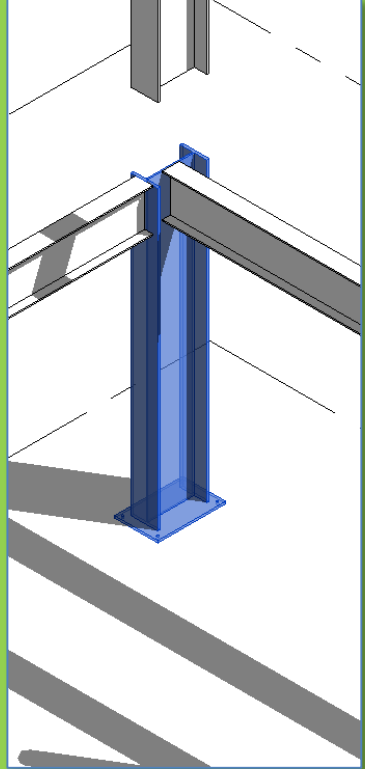
PK - Steel W 24 x 162

Search

- PK - HSS Round 10 x .5
- PK - HSS Round 10 x .5
- PK - HSS Square 10 x 10 x .5
- PK - HSS Square 10 x 10 x .5
- PK - Steel W 21 x 62 Beam
- PK - Steel W 21 x 62 Beam
- PK - Steel W 24 x 162
- PK - Steel W 24 x 162**
- PK - Steel W 24 x 162 Baseplate**
- PK - Steel W 24 x 162 Baseplate**
- PK - Steel W 24 x 162 Baseplate

Replace W 24 x 162 with the new family with the baseplate

right view



Properties

PK - Steel W 24 x 162 Baseplate

Structural Connections (1) Edit Type

Constraints

Level	Level 1
Host	Level : Level 1
Offset from Host	0' 0"
Moves With Nearby E...	<input type="checkbox"/>

Structural

Rebar Cover	Rebar Cover 1 <0' - 1">
-------------	-------------------------

Dimensions

BasePlate Depth	2' 9"
BasePlate Width	1' 9"
Depth	2' 1"
Height	15' 0"
Width	1' 1"
Volume	5.35 CF

Identity Data

Image	
Comments	
Mark	

Phasing

Phase Created	New Construction
Phase Demolished	None

Change Height back to 15'-0"

Properties help Apply

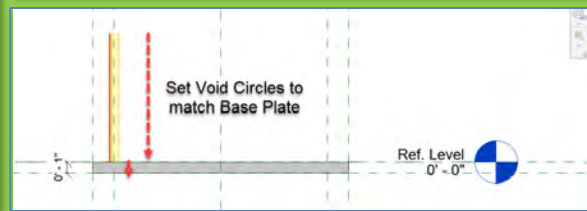
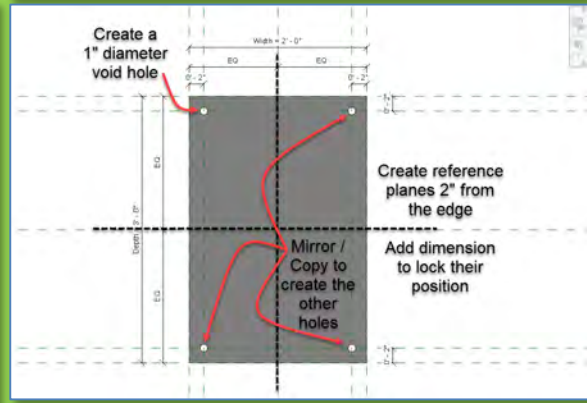
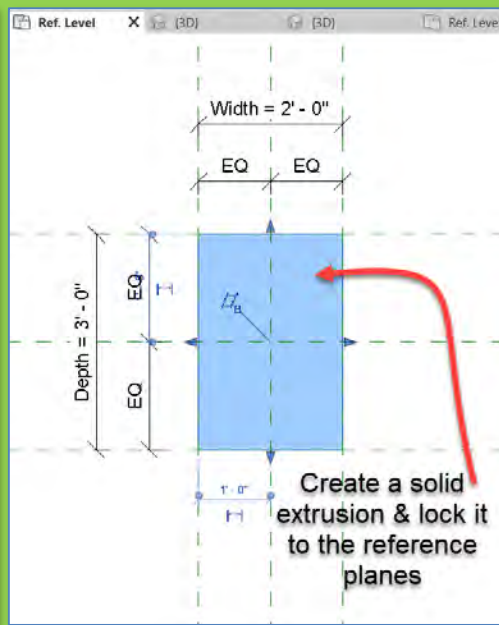
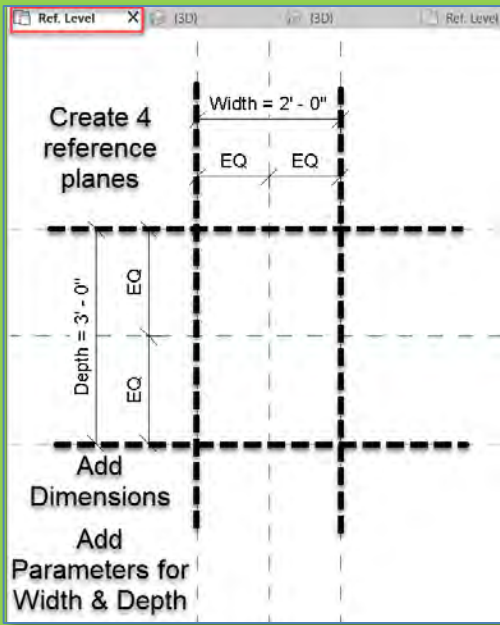
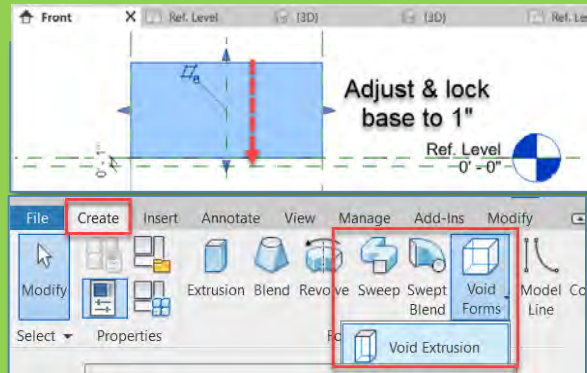
Creating an independent base plate with parameters

Connection Details

- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate

- Connections
- Video

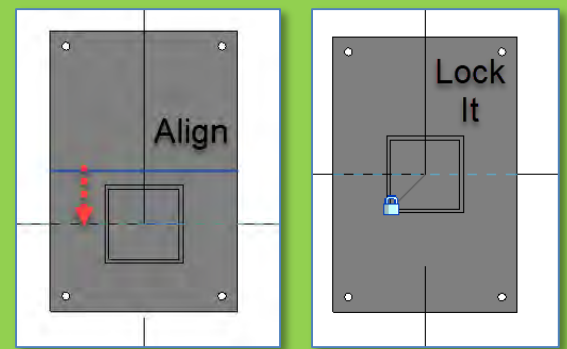
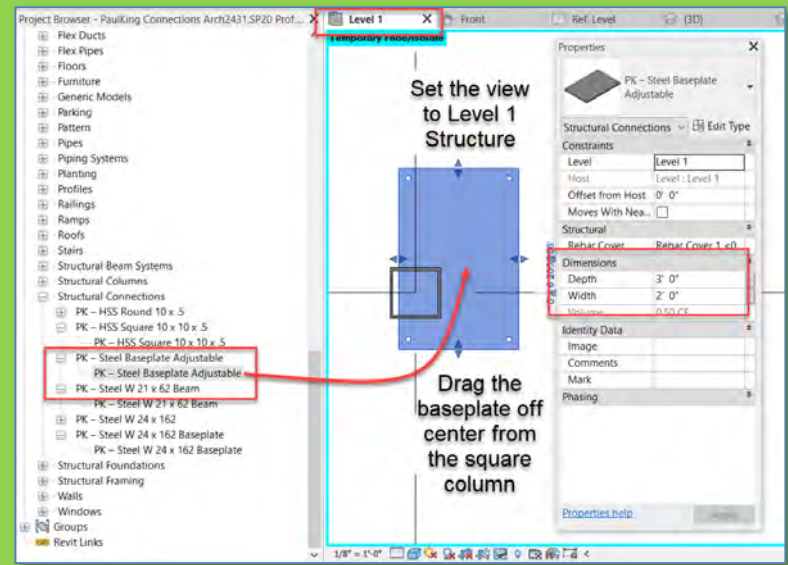
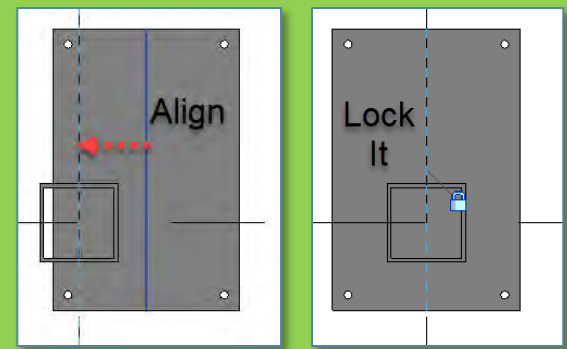
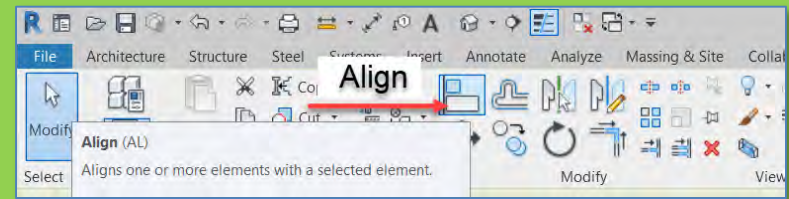
- *New Family > Generic Model*
- *Create > Reference Planes for edge of baseplate*
 - *Add Parameters for Width and Depth*
- *Create > Solid Extrusion > lock to Reference Planes*
- *Create > Reference Planes 2" in from edges*
- *Create > Void Forms > 1" Dia. Holes > lock to reference planes*
- *Mirror / Copy to create all 4 holes*



Add independent base plate for Square Column

- Connection Details
- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate
- Connections
- Video

- Make Level 1 Structure the Current View
- Drag New Independent Baseplate close to the square column
- Locate it off-center to facilitate alignment
- Use Align to lock the baseplate to the center reference planes of the square column
- From side view align and lock to bottom of column



Use the parameters to modify the baseplate size

- Repeat the process and add a baseplate for the round column
- Align it with the center of the round column and lock it
- Resize the baseplate to be 4" larger on both sides ($10'' + 4'' + 4'' = 18'' [1'-6'']$)

Connection Details

- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate

- Connections
- Video

Temporary Hide/Isolate

Properties

PK - Steel Baseplate Adjustable

Structural Connections Edit Type

Constraints

Level	Level 1
Host	Level : Level 1
Offset from Host	0' 0"
Moves With Nea...	<input type="checkbox"/>

Structural

Rebar Cover	Rebar Cover 1 <0...
-------------	---------------------

Dimensions

Depth	3' 0"
Width	2' 0"
Volume	0.58 CF

Identity Data

Image

Comments

Mark

Phasing

Properties help Apply

Temporary Hide/Isolate

Properties

PK - Steel Baseplate Adjustable

Structural Connections Edit Type

Constraints

Level	Level 1
Host	Level : Level 1
Offset from Host	0' 0"
Moves With Nea...	<input type="checkbox"/>

Structural

Rebar Cover	Rebar Cover 1 <0...
-------------	---------------------

Dimensions

Depth	1' 6"
Width	1' 6"
Volume	0.18 CF

Identity Data

Image

Comments

Mark

Phasing

Properties help Apply

Set the dimensions to be 4" more than the 10"x10" column

Temporary Hide/Isolate

PK - Steel Baseplate Adjustable

Structural Connections Edit Type

Constraints

Level	Level 1
Host	Level : Level 1
Offset from Host	0' 0"
Moves With Nea...	<input type="checkbox"/>

Structural

Rebar Cover	Rebar Cover 1 <0...
-------------	---------------------

Dimensions

Depth	1' 6"
Width	1' 6"
Volume	0.18 CF

Identity Data

Image

Comments

Mark

Phasing

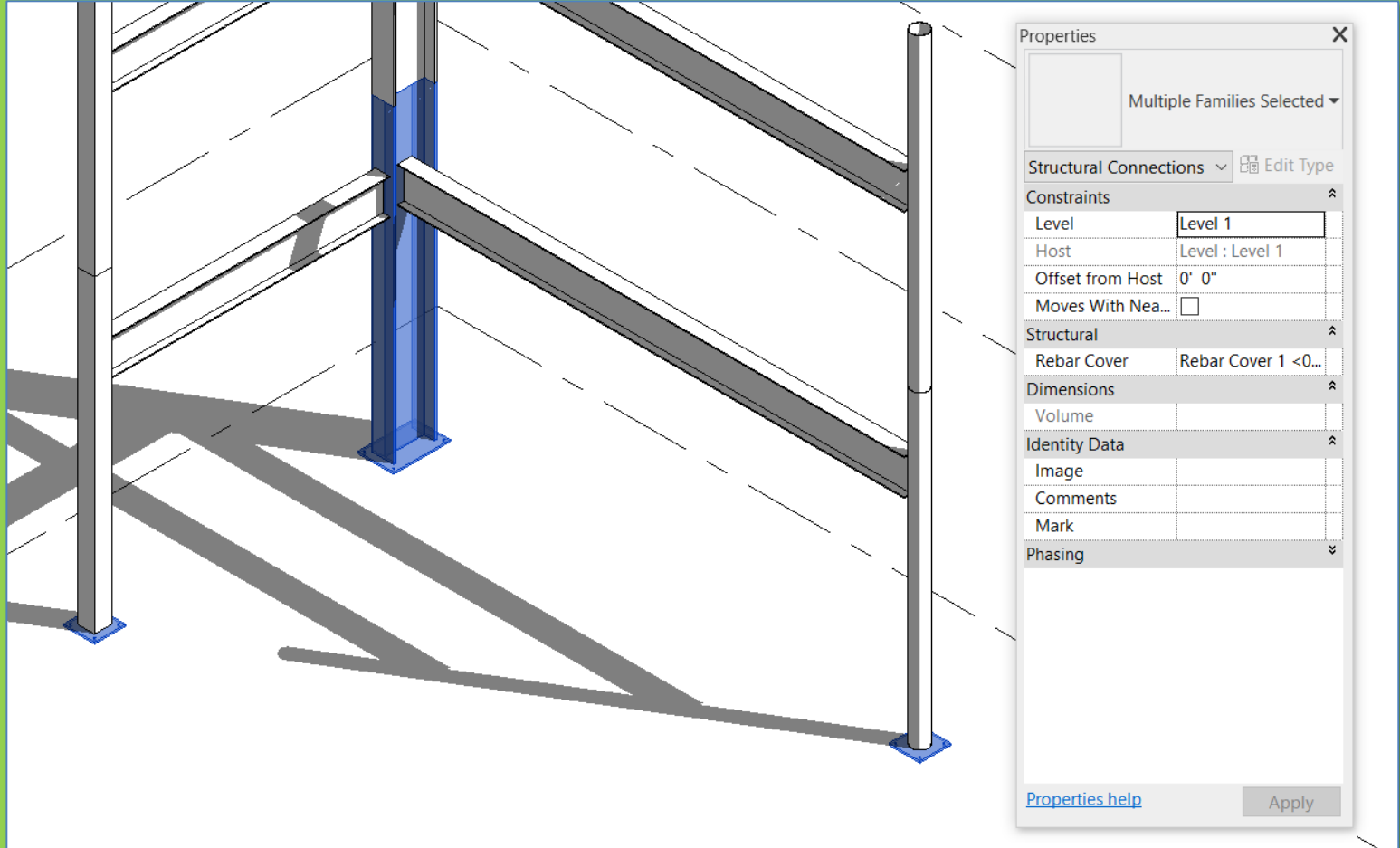
Properties help Apply

Columns with base plates

Be certain your 3d View is not cropped and baseplate is visible!

Connection Details

- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate
- Connections
- Video

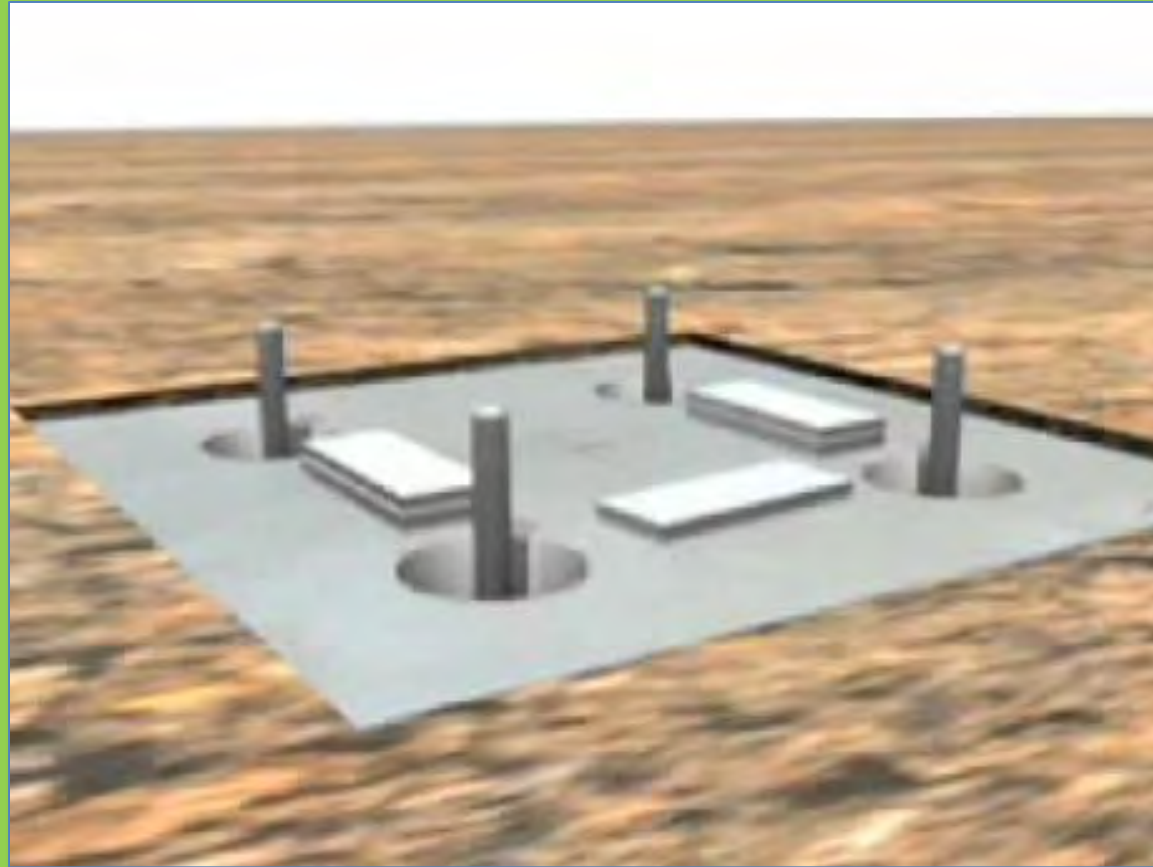


Connection
Details

- New 3D Families
- W24 x 162 with Baseplate
- Independent Baseplate
- Connections
- Video

Steel Column and Beam Connection Videos

Column Base Plate to Foundation



ARCH 2431. Building Technology III
Building Information Modeling with Revit

Steel Connections
#2 Column Base Plates



Professor Paul C. King, RA, AIA, ARA

Prof.Paul.King@Gmail.com

Pking@CityTech.Cuny.Edu