

Tips and Tricks for Effective Rebar Detailing in Revit

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About the speaker

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- Senior Product Owner at Autodesk working on expanding the rebar modeling and detailing capabilities of Revit
- Structural Engineer
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Class Summary

In this class, you will learn how to get the most out of the reinforcement modeling and detailing tools available in Revit software. You will learn tips and tricks for configuring your rebar project and working with rebar shapes and rebar constraints. You will learn techniques for presenting rebar in construction drawings and extracting fabrication data using schedules and tags. Finally, you will learn best practices for placement and adjustment of free-form and shape-driven rebar, area, and path reinforcement.

Key Learning Objectives

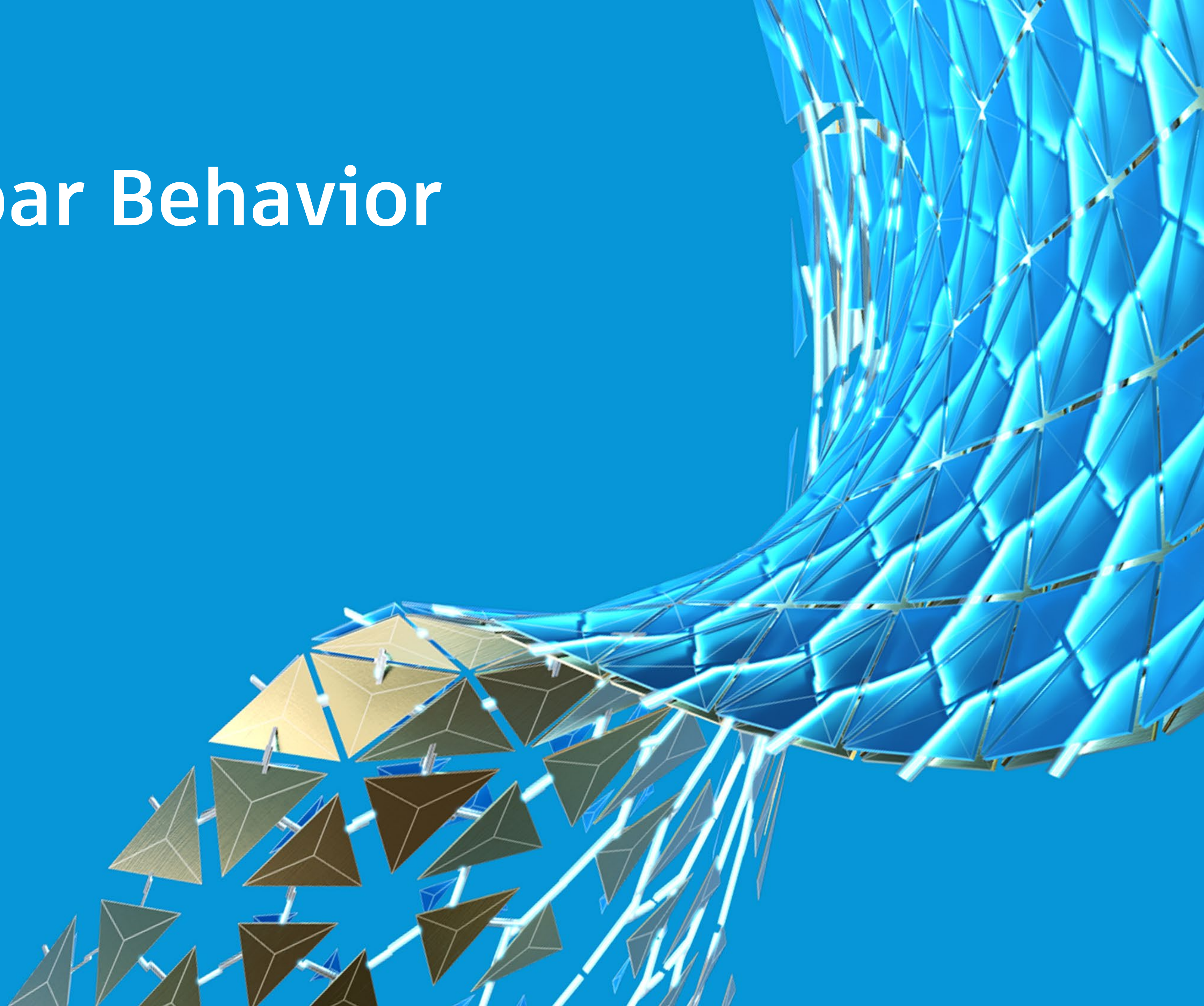
DISCOVER TIPS, TRICKS, AND BEST PRACTICES FOR THE REBAR MODELING AND DETAILING TOOLS IN REVIT

DISCOVER A VARIETY OF PRESENTATION TECHNIQUES TO SHOW REBAR CLEARLY IN BOTH CONSTRUCTION DRAWINGS AND MODEL VIEWS

LEARN HOW REBAR SHAPES WORK AND HOW REBAR REACTS TO CHANGES OF THE HOST OR OTHER BARS

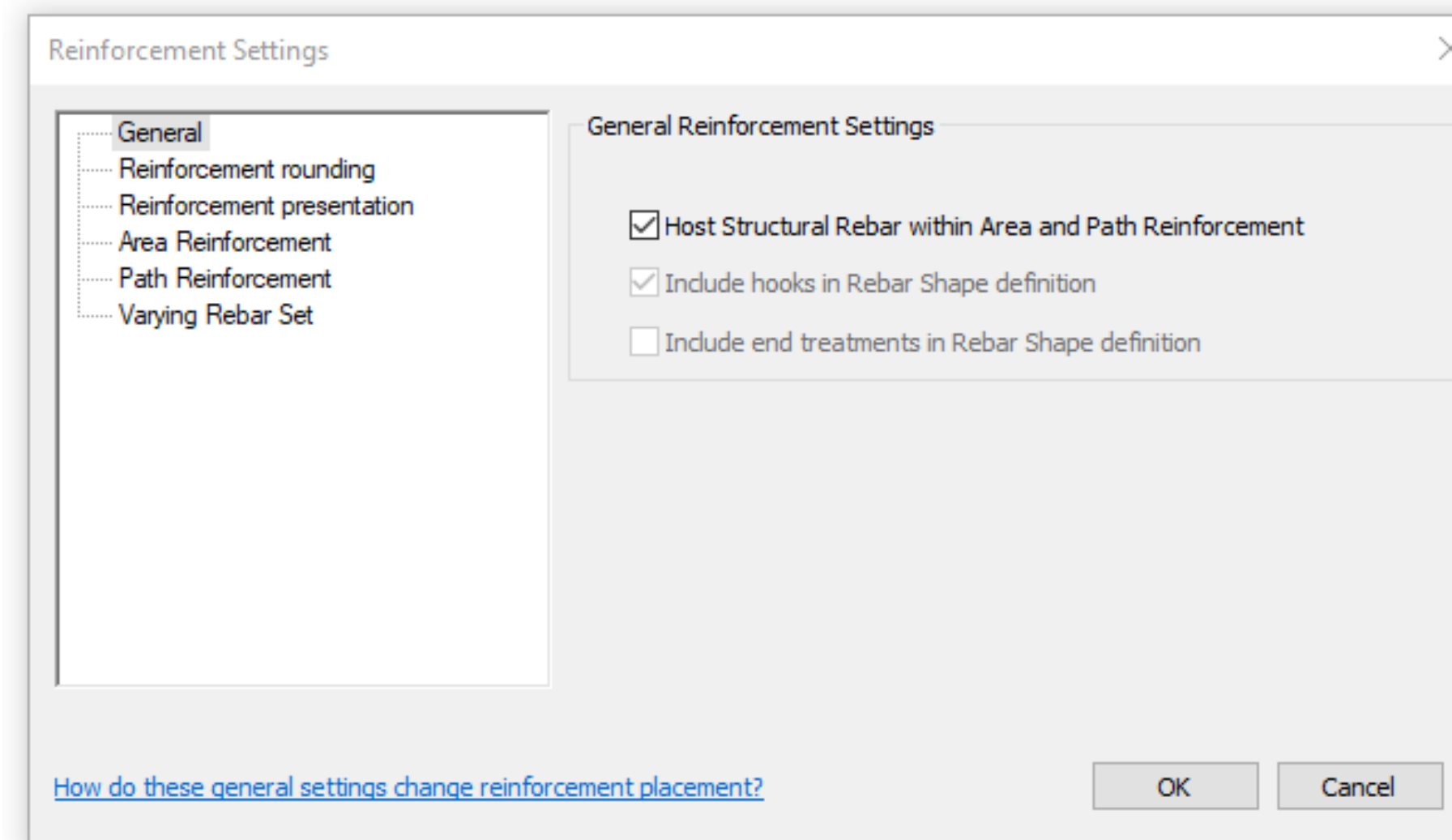
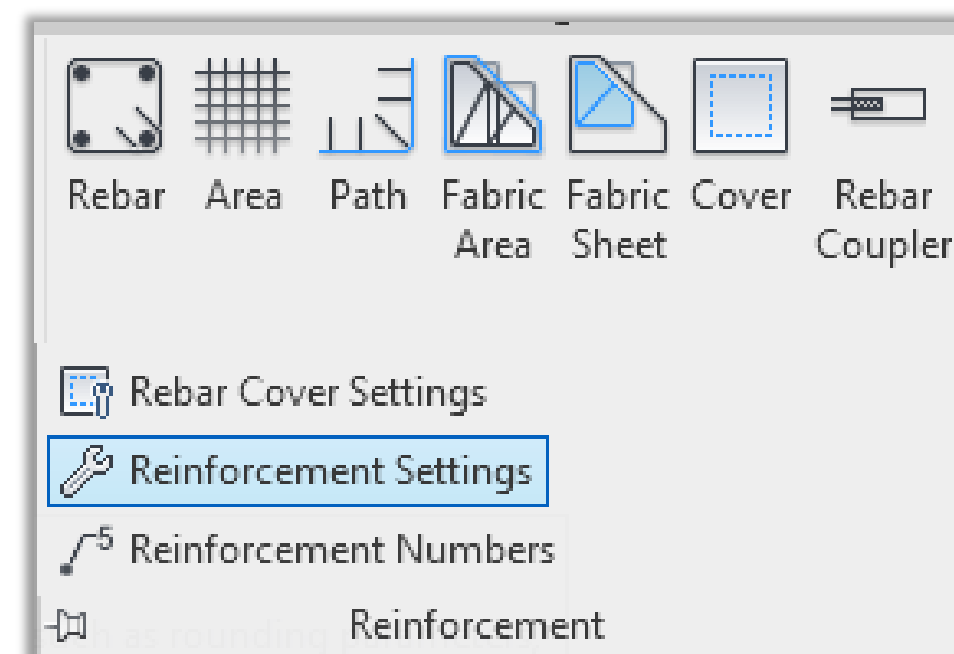
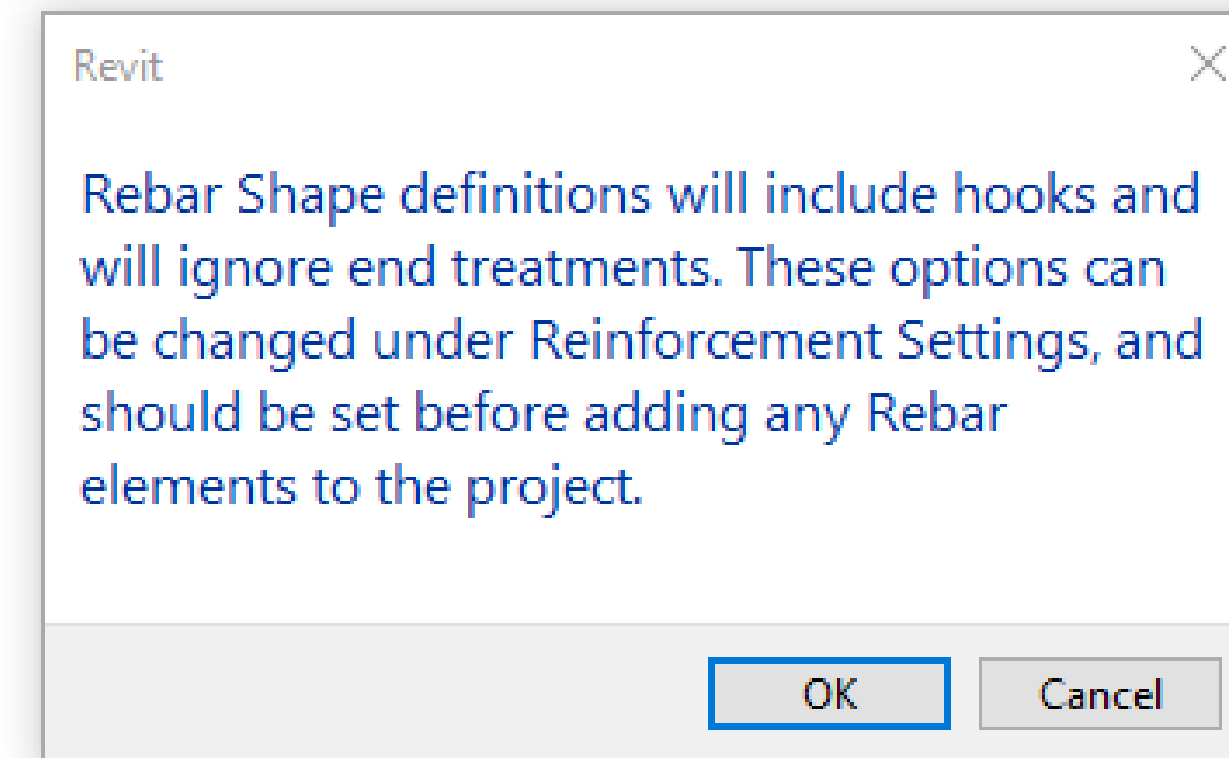
DISCOVER THE VARIOUS REBAR PROJECT SETTINGS AND SELECT THE BEST OPTION FOR THE TASK AT HAND

General Rebar Behavior



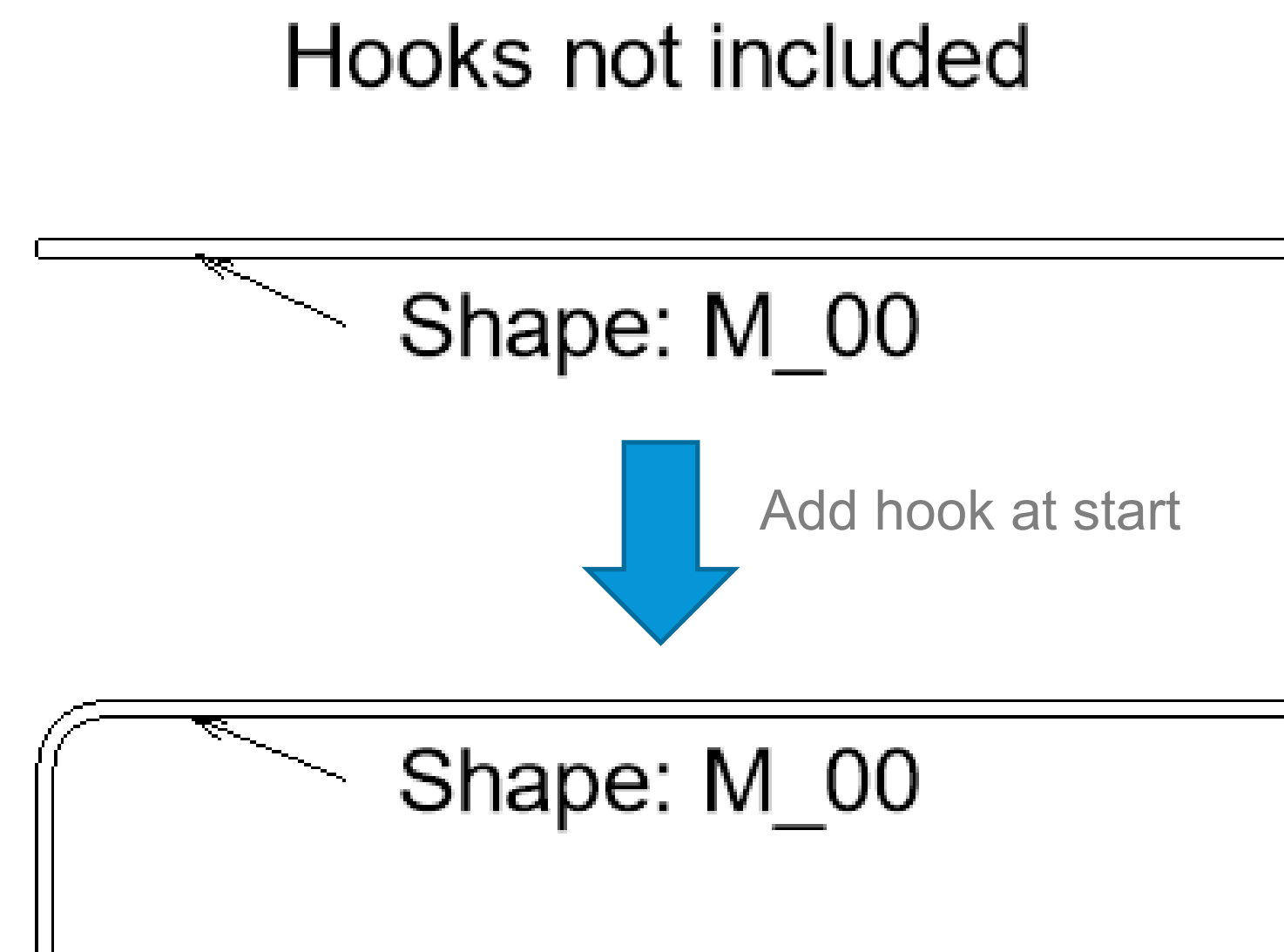
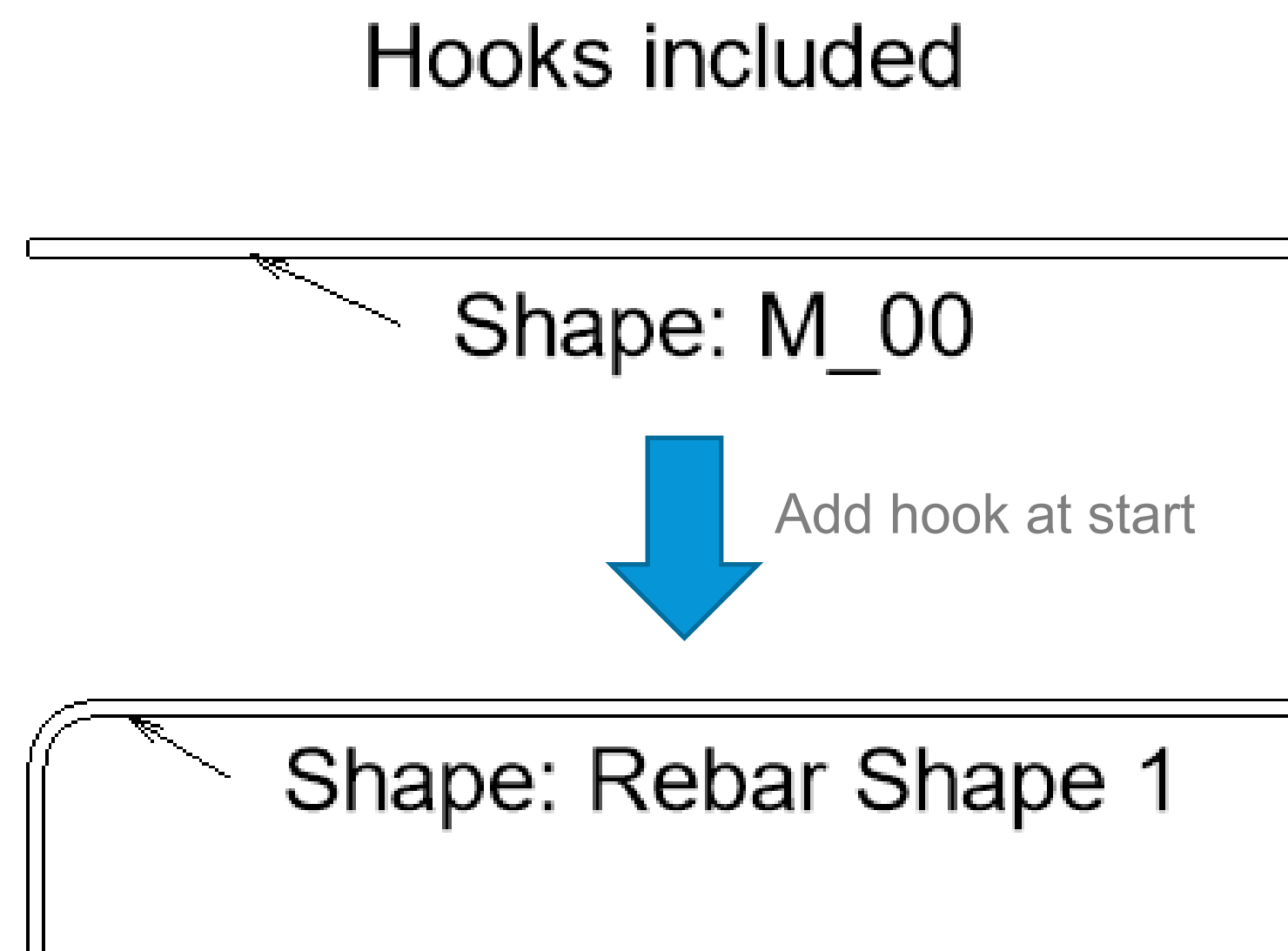
1. Include hooks or end treatments in the rebar shape definition

- Check the include hooks in the rebar shape definition option
 - Go to the Structure tab > Reinforcement > Reinforcement settings > General



1. Include hooks or end treatments in the rebar shape definition

- Add hook to a rebar
 - Hooks included > New shape is created (Rebar Shape 1)
 - Hooks not included > the shape matches to 01 or M_01



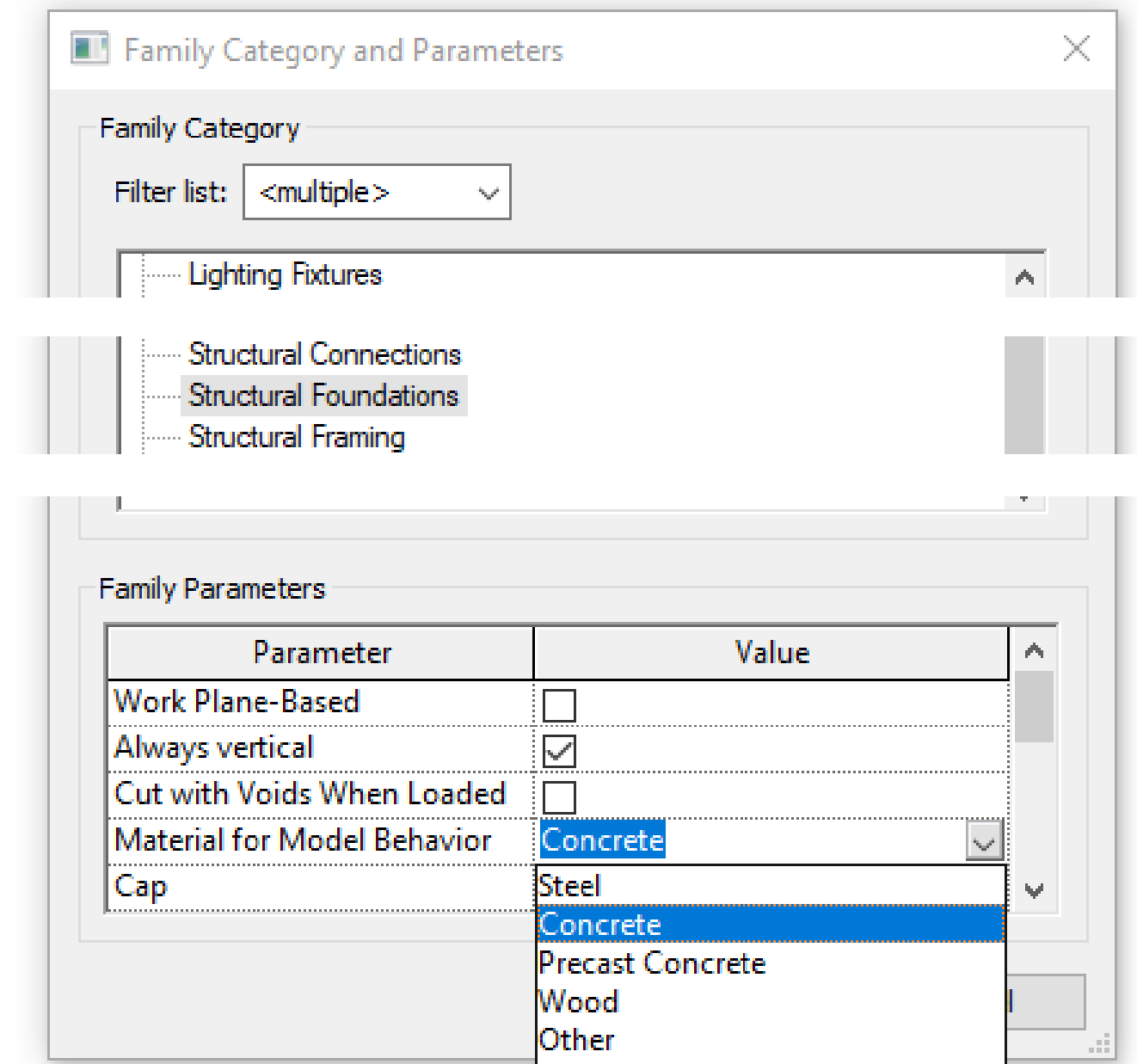
2. Valid host for rebar

- **Category**

- Structural Framing
- Structural Columns
- Structural Foundations
- Structural Connections
- Floors
- Walls
- Foundation Slab
- Wall Foundation
- Slab Edge

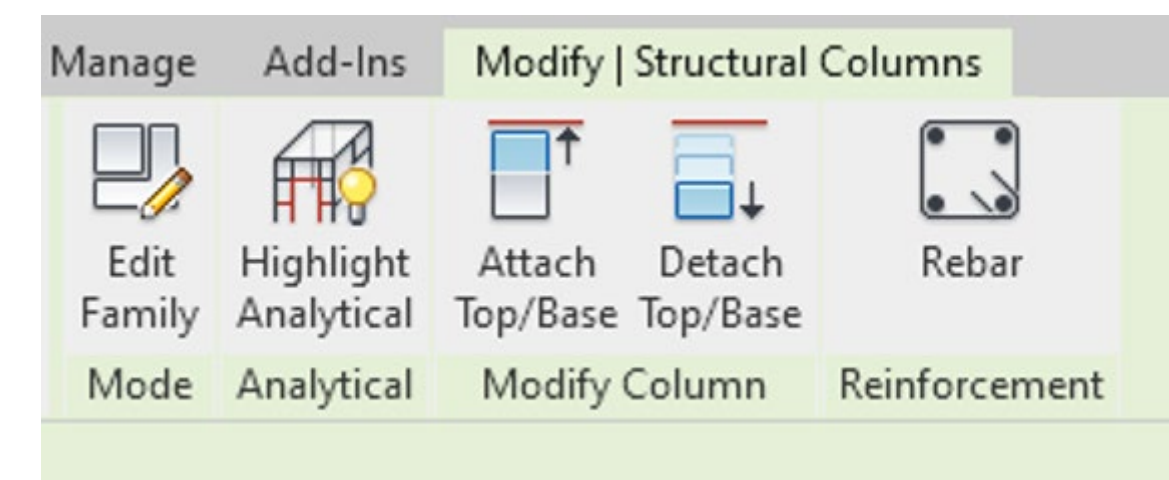
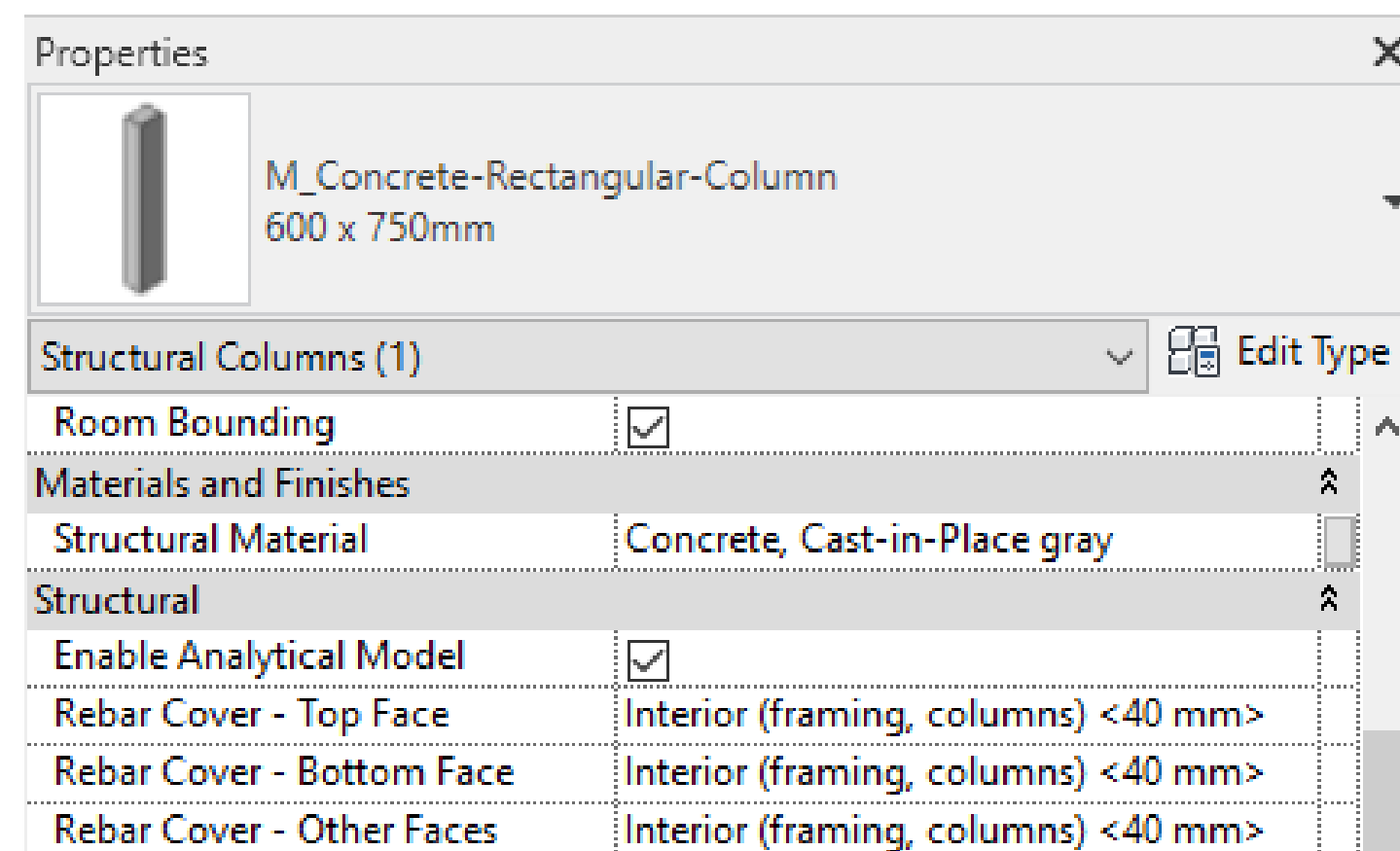
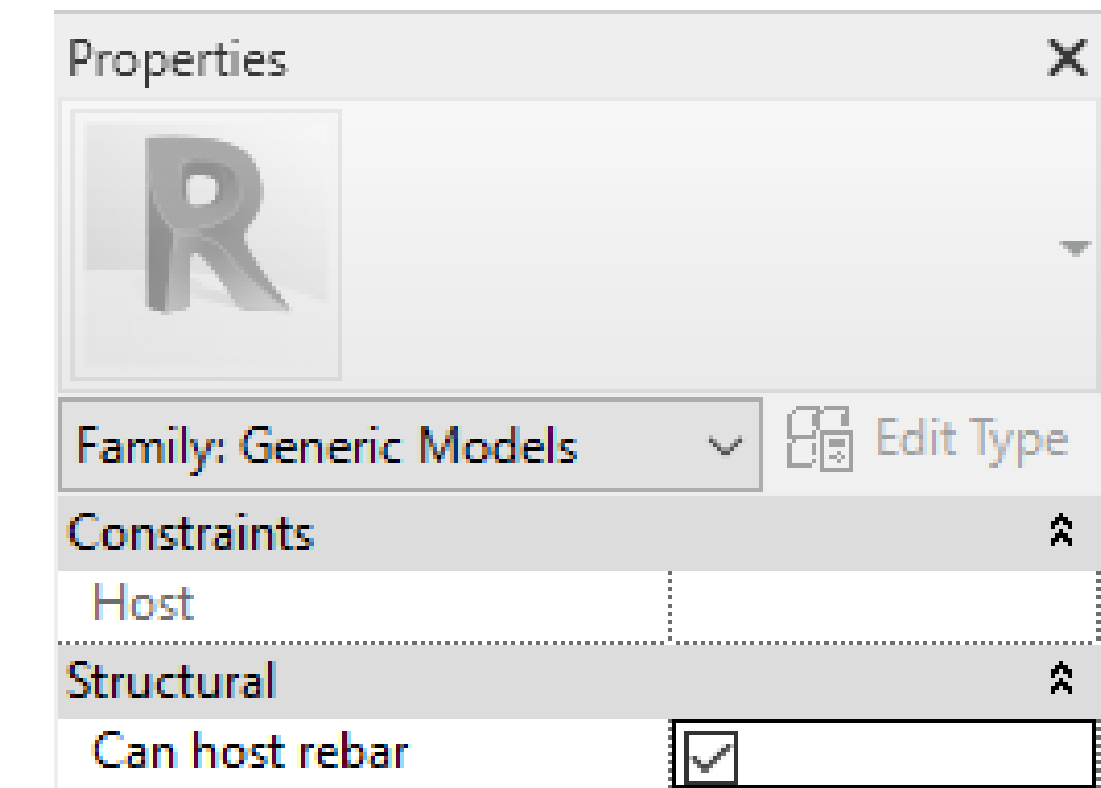
- **Material for Model Behavior**

- Edit the family
- Go to the Family Category and Parameters
- Change the Material for Model Behavior to Concrete, Precast Concrete or Other



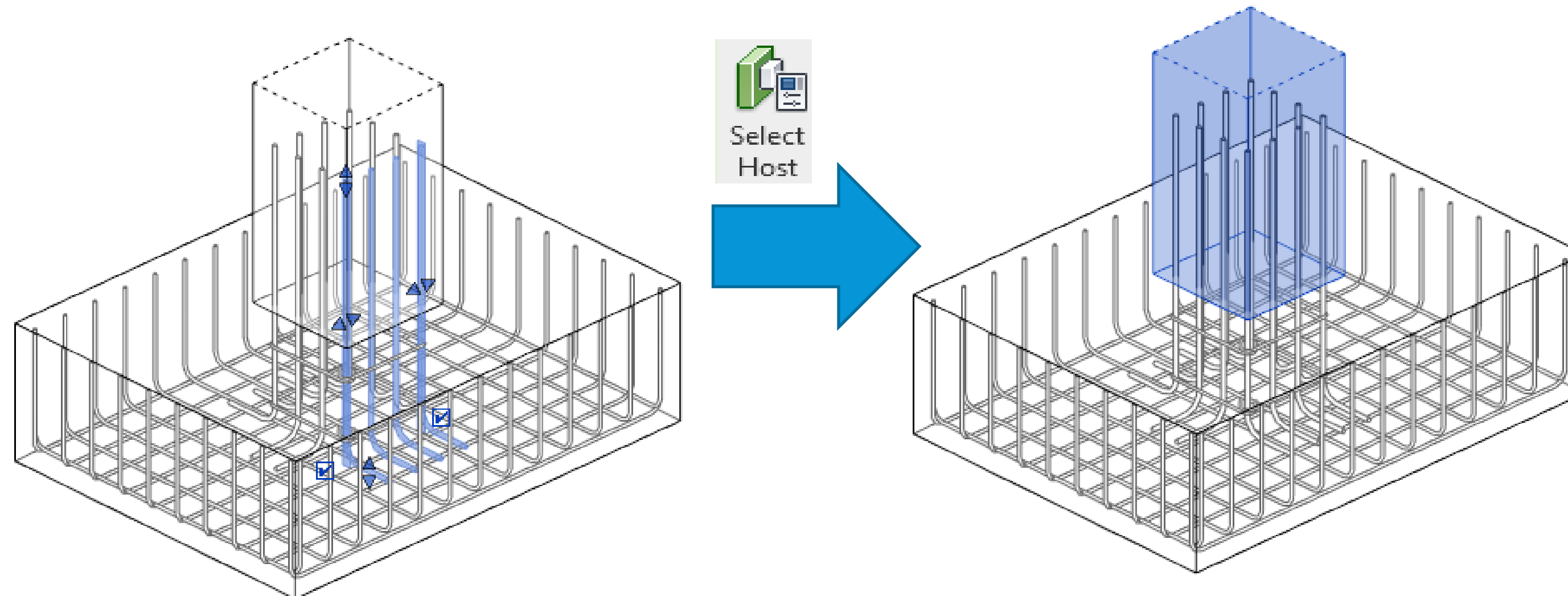
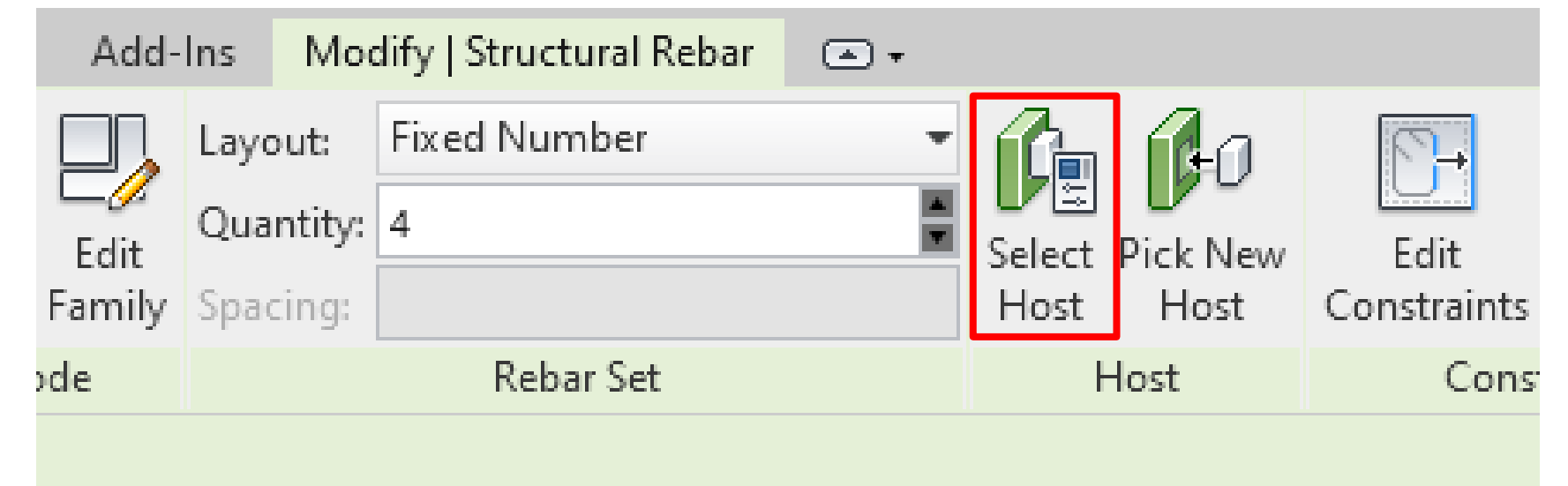
2. Valid host for rebar

- Make a Generic Model a Rebar Host
 - Edit the family
 - Check the “Can host rebar” option in the Properties Palette
- Check if an element is a valid host



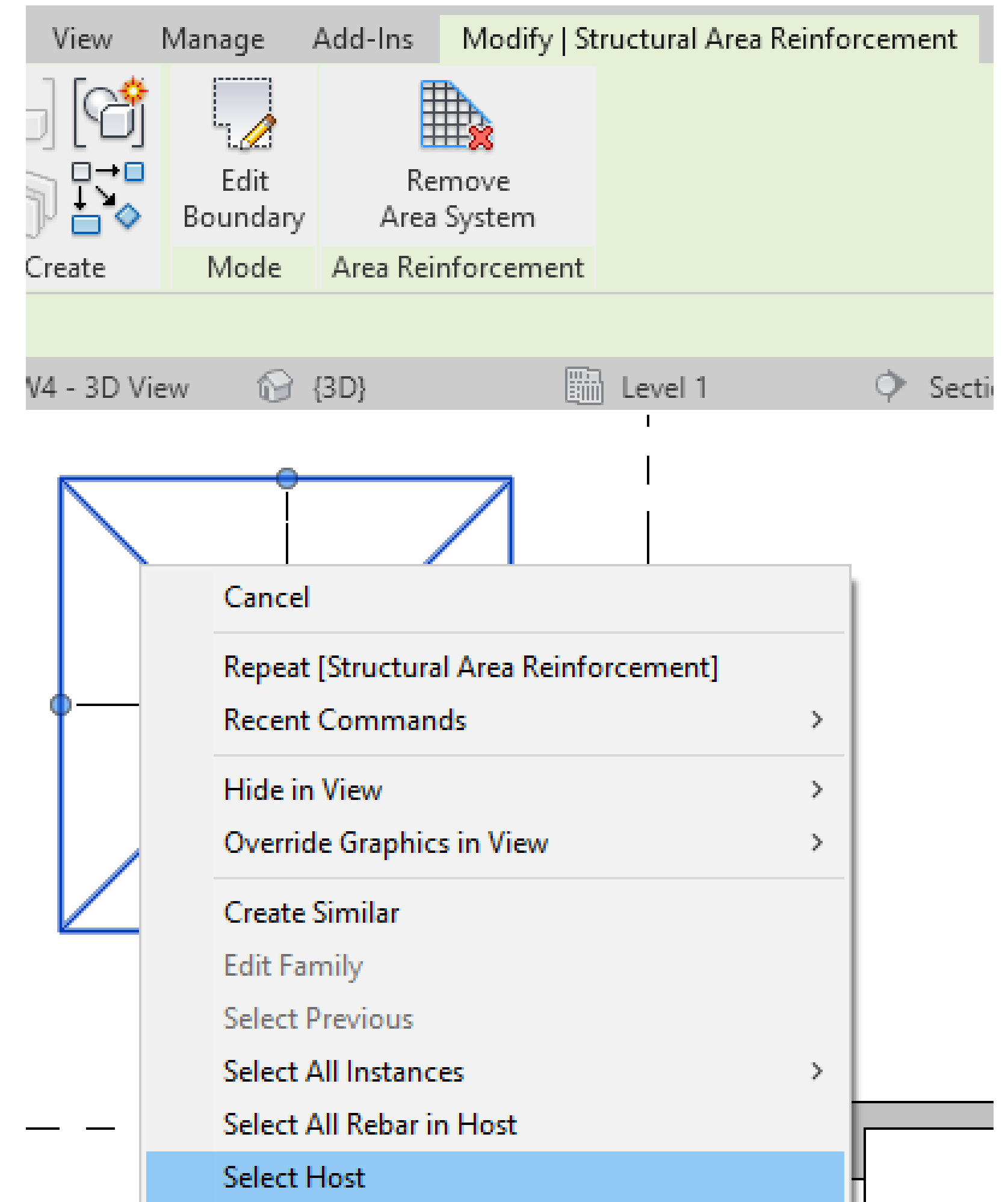
3. Find the rebar host

- Select one or more rebar sets
 - In the contextual ribbon, click the Select Host command



3. Find the rebar host

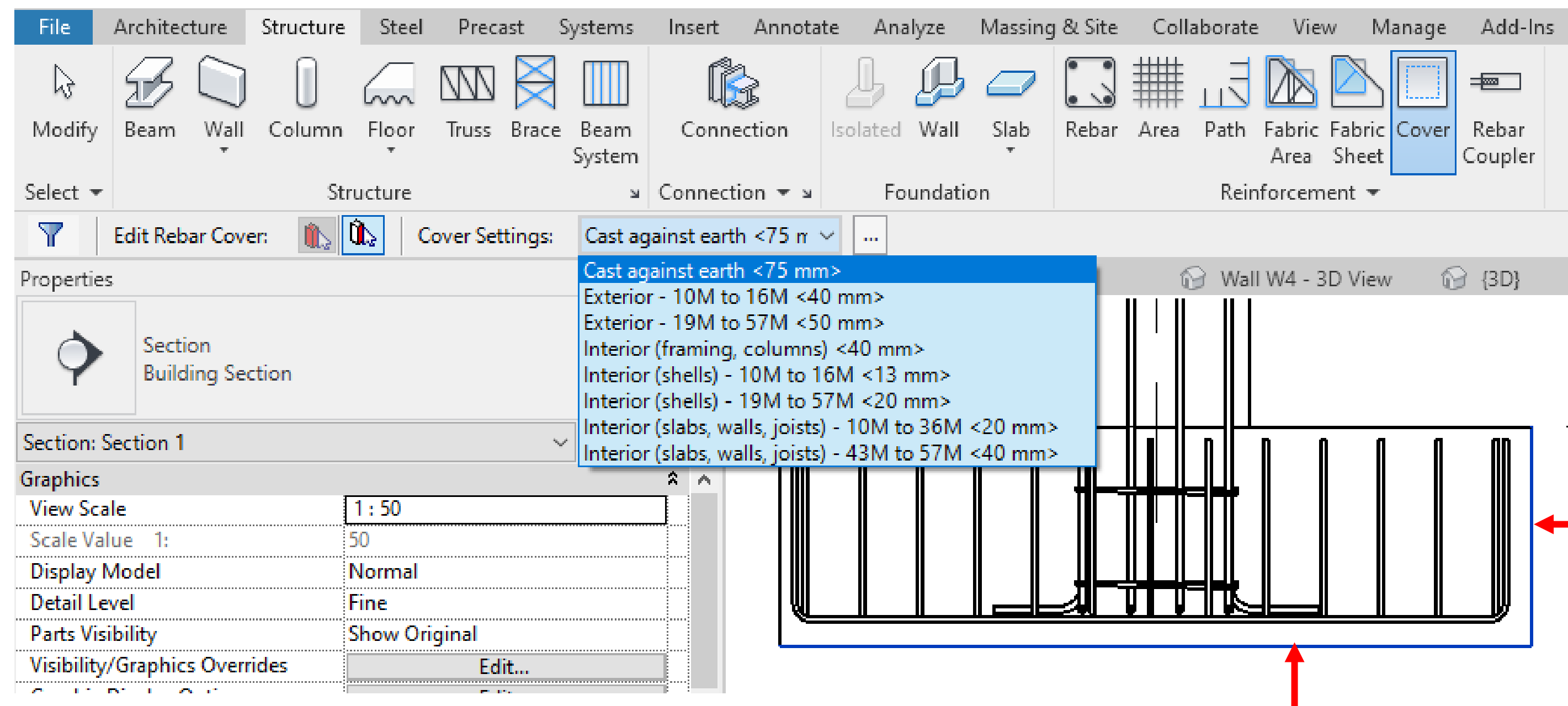
- Select Rebar, Area or Path Reinforcement
 - Right click > Select Host



4. Control the concrete cover by element face

To set the cover for the entire element or just a specific face, use the Cover tool:

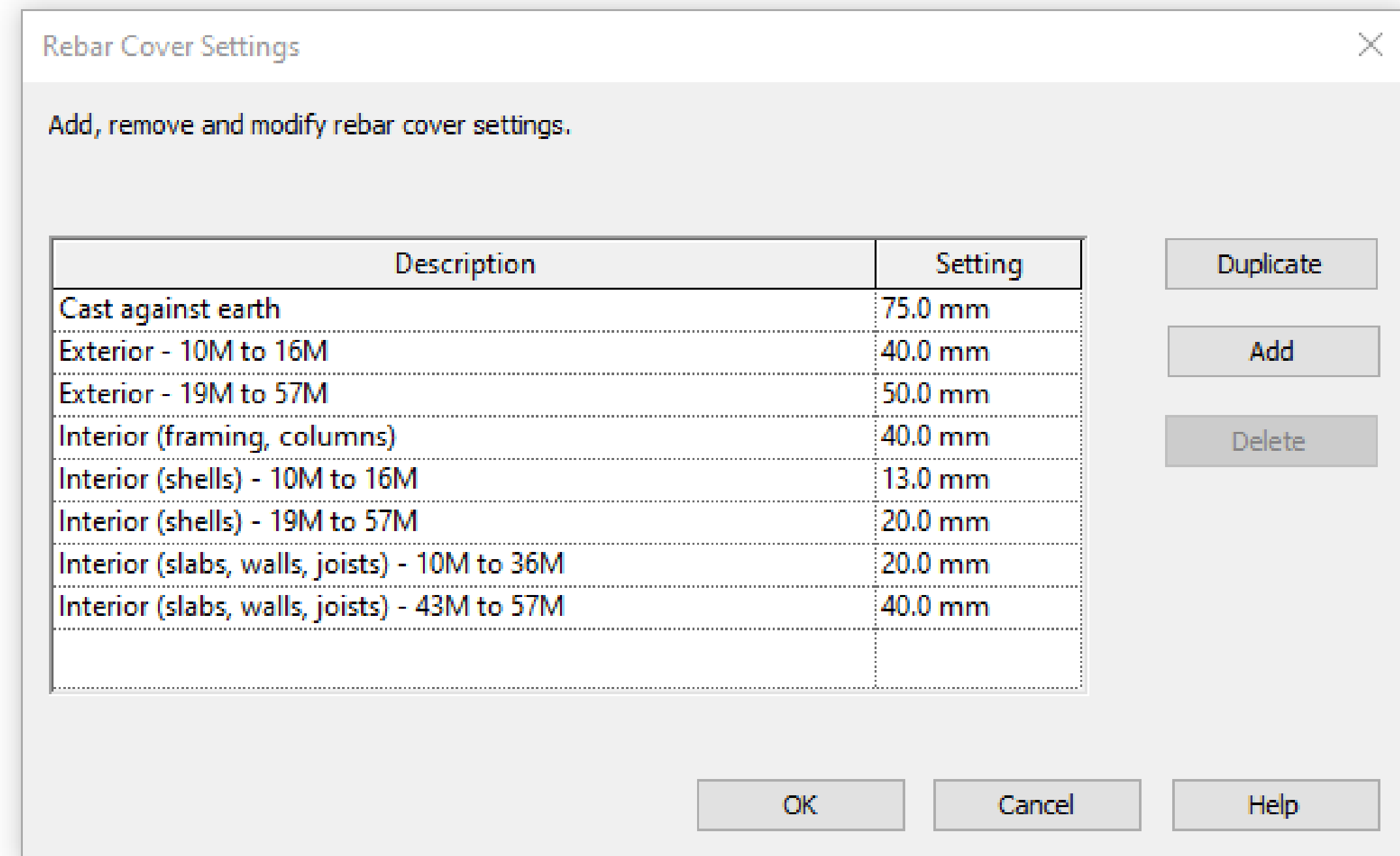
- Click Structure tab > Reinforcement panel > Cover
- In the options bar select the Pick Faces command
- Click one or more element faces (Ctrl to add to the selection) for which you want to adjust the cover
- Select the cover setting from the drop-down in the Options Bar



4. Control the concrete cover by element face

Rebar Cover Settings

- Click  on the options bar



Rebar Cover Settings

Add, remove and modify rebar cover settings.

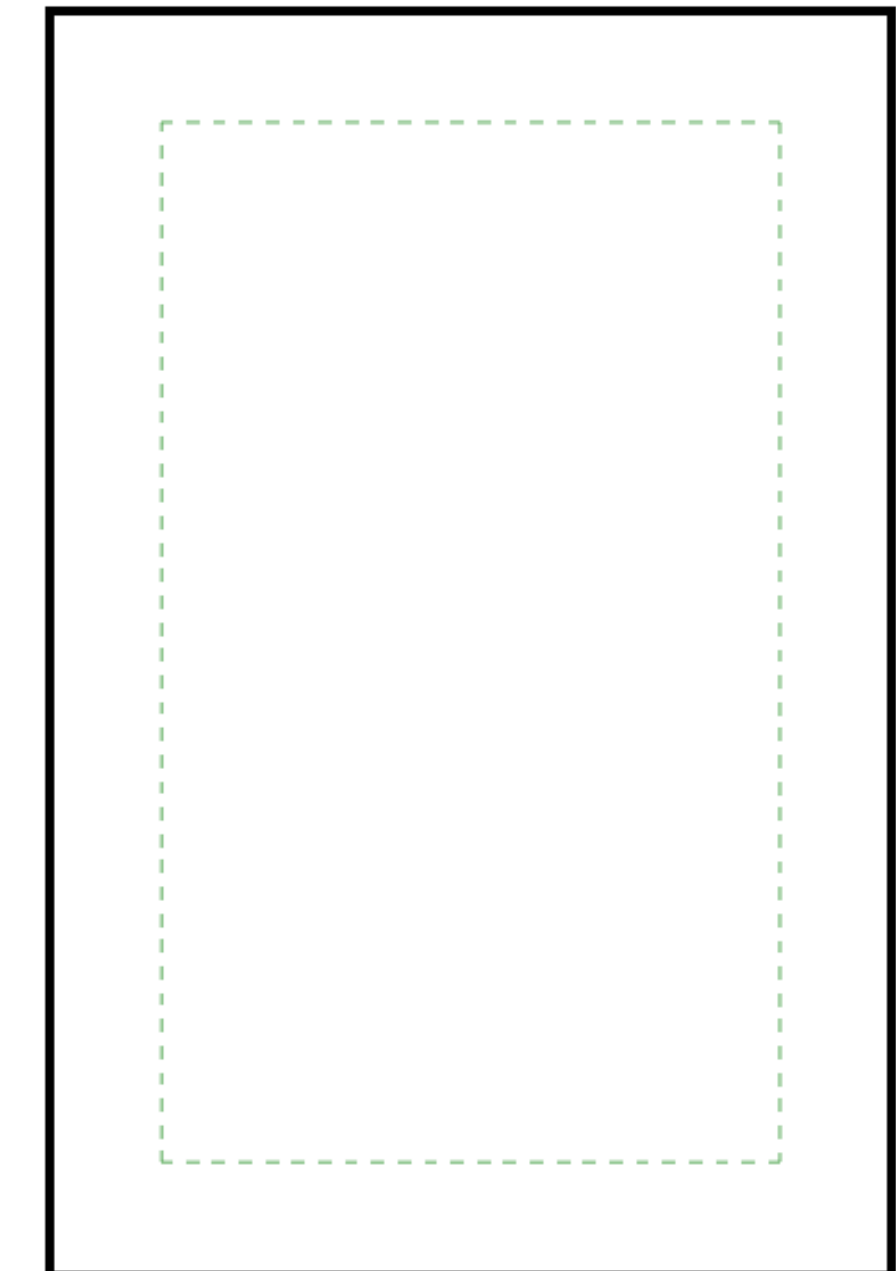
Description	Setting
Cast against earth	75.0 mm
Exterior - 10M to 16M	40.0 mm
Exterior - 19M to 57M	50.0 mm
Interior (framing, columns)	40.0 mm
Interior (shells) - 10M to 16M	13.0 mm
Interior (shells) - 19M to 57M	20.0 mm
Interior (slabs, walls, joists) - 10M to 36M	20.0 mm
Interior (slabs, walls, joists) - 43M to 57M	40.0 mm

Buttons: Duplicate, Add, Delete, OK, Cancel, Help

5. Edit the appearance of concrete cover lines

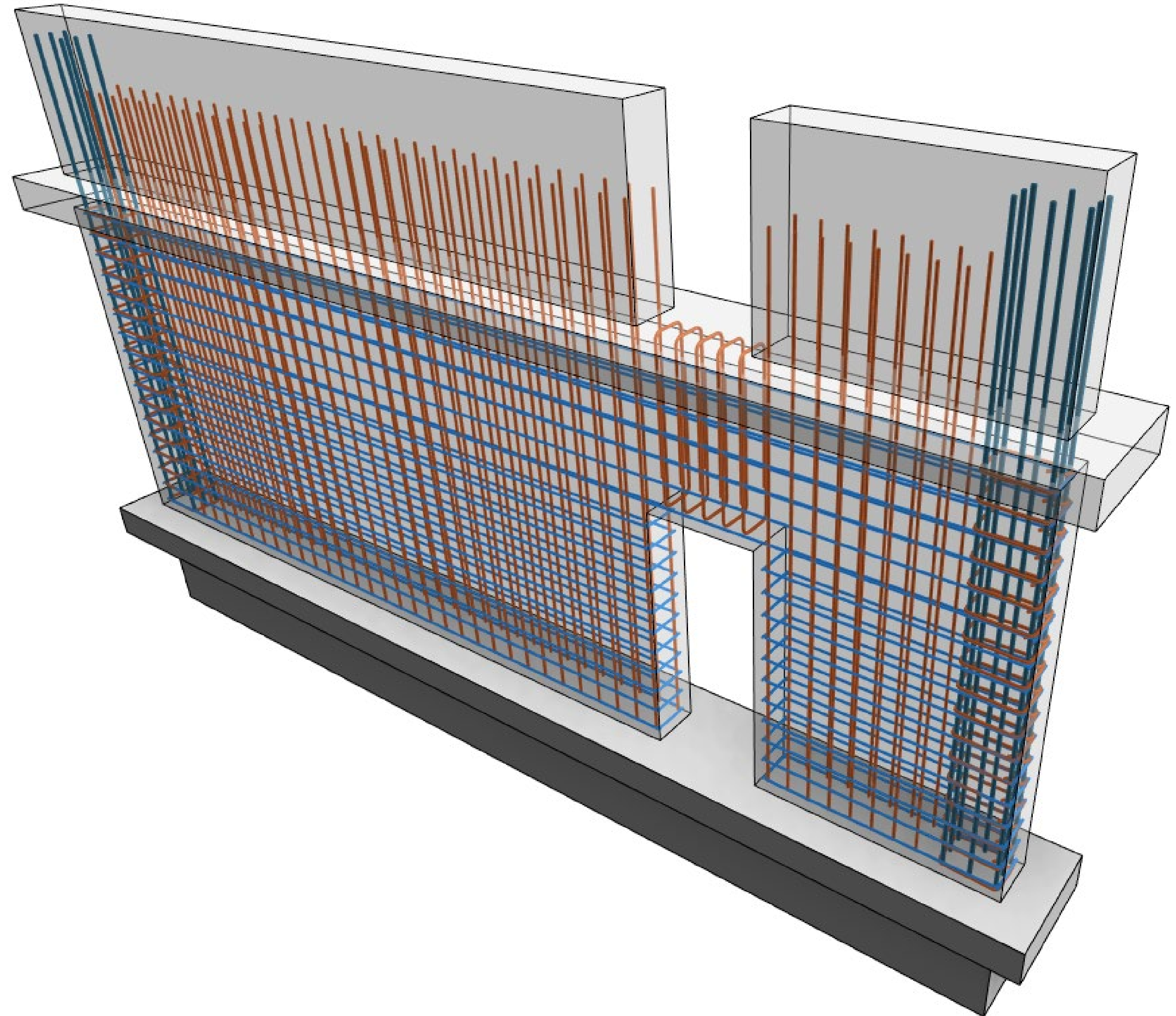
- Manage > Object Styles > Annotation Objects tab, find the Rebar Cover References category and edit the line weight, color and pattern

Object Styles			
<div>Model ObjectsAnnotation ObjectsAnalytical Model ObjectsImported Objects</div>			
Filter list: <multiple> ▾			
Category	Line Weight Projection	Line Color	Line Pattern
..... Railing Tags	1	■ Black	
..... Rebar Cover References	2	■ RGB 000-127-000	Rebar Cover Lines
..... Reference Lines	1	■ RGB 000-127-000	Solid



6. Presenting 3D rebar

- Add transparency to the concrete elements



6. Presenting 3D rebar

- Show the bars as solid and uncheck show unobscured
 - Set view level of detail to Fine

The screenshot shows the Revit software interface. On the left, the Properties panel is open, displaying the 'Rebar Bar 16M' properties. The 'Structural Rebar (1)' section is expanded, showing various hook and treatment settings. The 'Graphics' section is also expanded, showing 'View Visibility States' with an 'Edit...' button highlighted by a red rectangle. Below the Properties panel is the Project Browser showing a hierarchy of levels (Level 0 to Level 4).

On the right, the 'Rebar Element View Visibility States' dialog box is open. It contains a table with columns: 'View Type', 'View Name', 'View unobscured', and 'View as solid'. The dialog box has a title bar with a question mark and a close button. Below the title bar, there is a text box stating 'Show rebar element unobscured and/or as a solid in 3D views (in fine level of detail).' and a note 'Click on column headers to change sort order.' The table lists various views and their corresponding settings. The row for '3D View' with 'Wall W4 - 3D View' is highlighted with a red rectangle, showing 'View unobscured' as unchecked and 'View as solid' as checked. The 'OK' and 'Cancel' buttons are at the bottom right of the dialog box.

View Type	View Name	View unobscured	View as solid
3D View	Spiral Ramp L-1	<input type="checkbox"/>	<input type="checkbox"/>
3D View	Wall W4 - 3D View	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3D View	3D Structure	<input type="checkbox"/>	<input type="checkbox"/>
Detail View	Wall W4 - Detail 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Detail View	Column C8-F - Elevati	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Detail View	Column C8-F - Section	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Elevation	South	<input type="checkbox"/>	<input type="checkbox"/>
Elevation	East	<input type="checkbox"/>	<input type="checkbox"/>
Elevation	North	<input type="checkbox"/>	<input type="checkbox"/>
Elevation	West	<input type="checkbox"/>	<input type="checkbox"/>
Section	Section 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Section	Section 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Section	Ramp L-1 - Section S1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Section	Wall W4 - Elevation	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Structural Plan	Level 0	<input type="checkbox"/>	<input type="checkbox"/>

6. Presenting 3D rebar

- Use filters to add color based on diameter or other property

Filter Rules

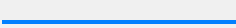

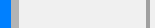









AND (All rules must be true) Add Rule Add Set

Structural R... Type Name

equals 13M —

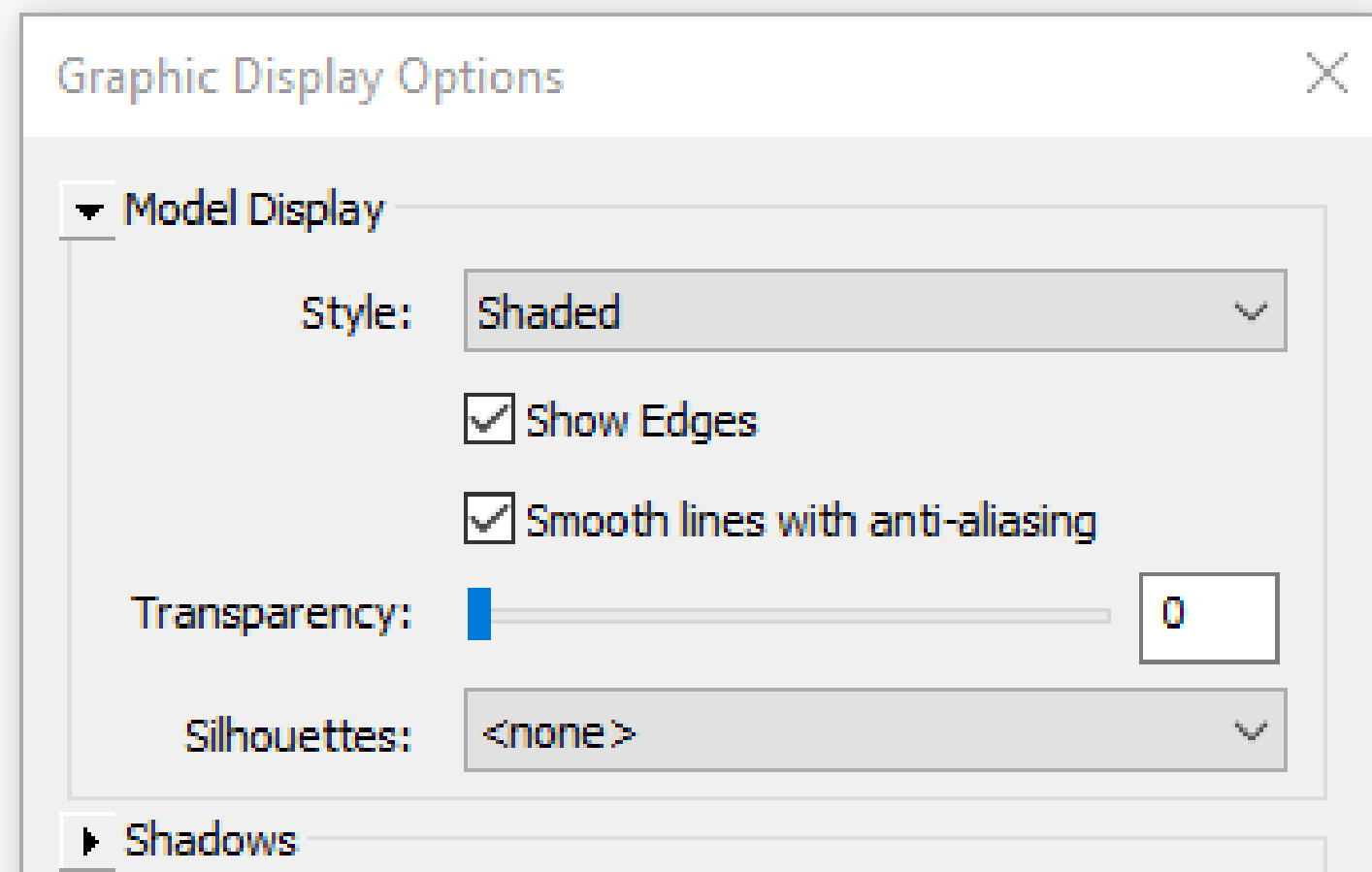
Visibility/Graphic Overrides for 3D View: Wall W4 - 3D View

Model Categories Annotation Categories Analytical Model Categories Imported Categories **Filters**

Name	Enable Filter	Visibility	Projection/Surface			Cut		Halftone
			Lines	Patterns	Transpare...	Lines	Patterns	
13M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Override...	Override...	<input type="checkbox"/>
16M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						<input type="checkbox"/>
19M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						<input type="checkbox"/>
25M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						<input type="checkbox"/>

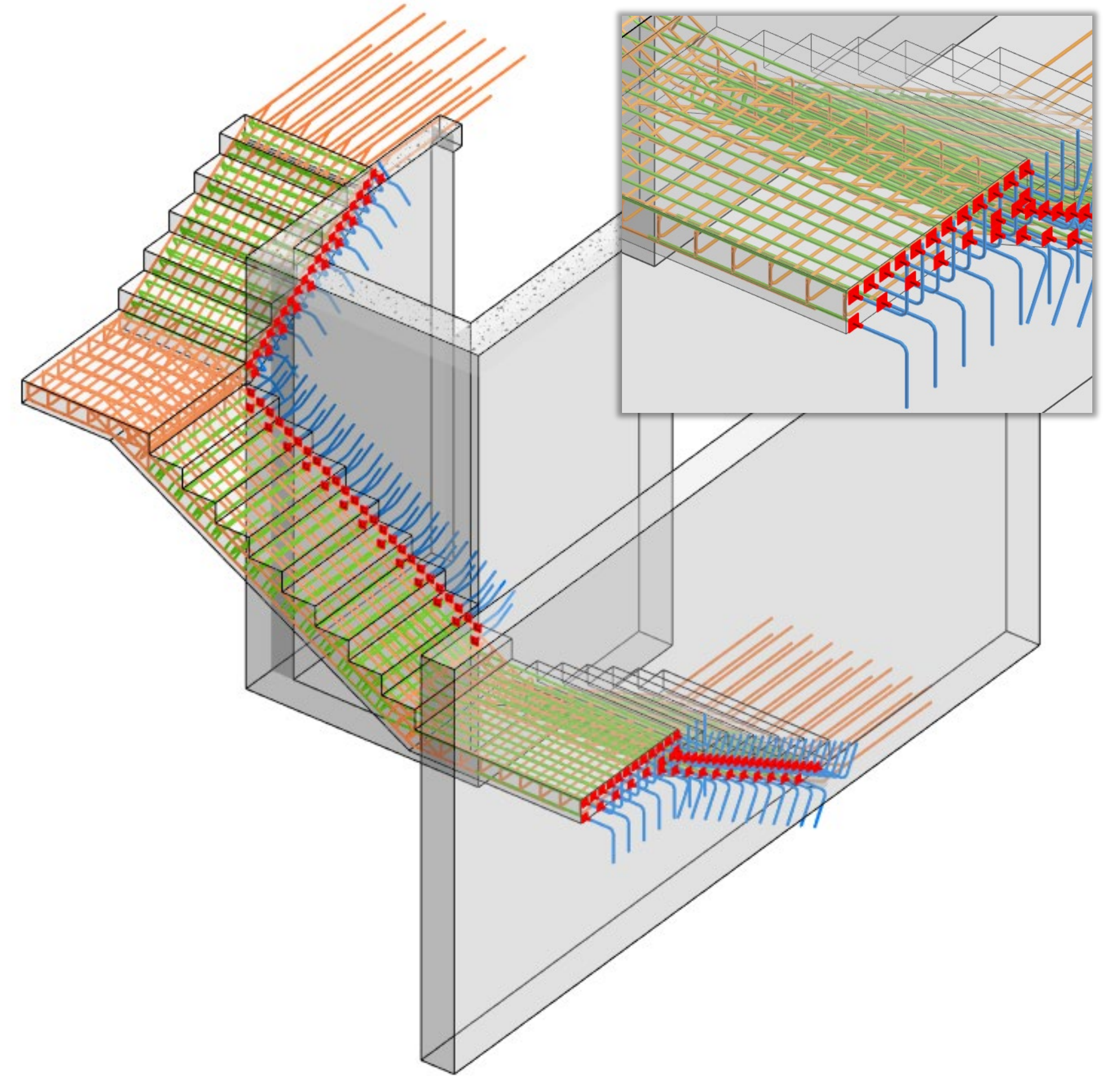
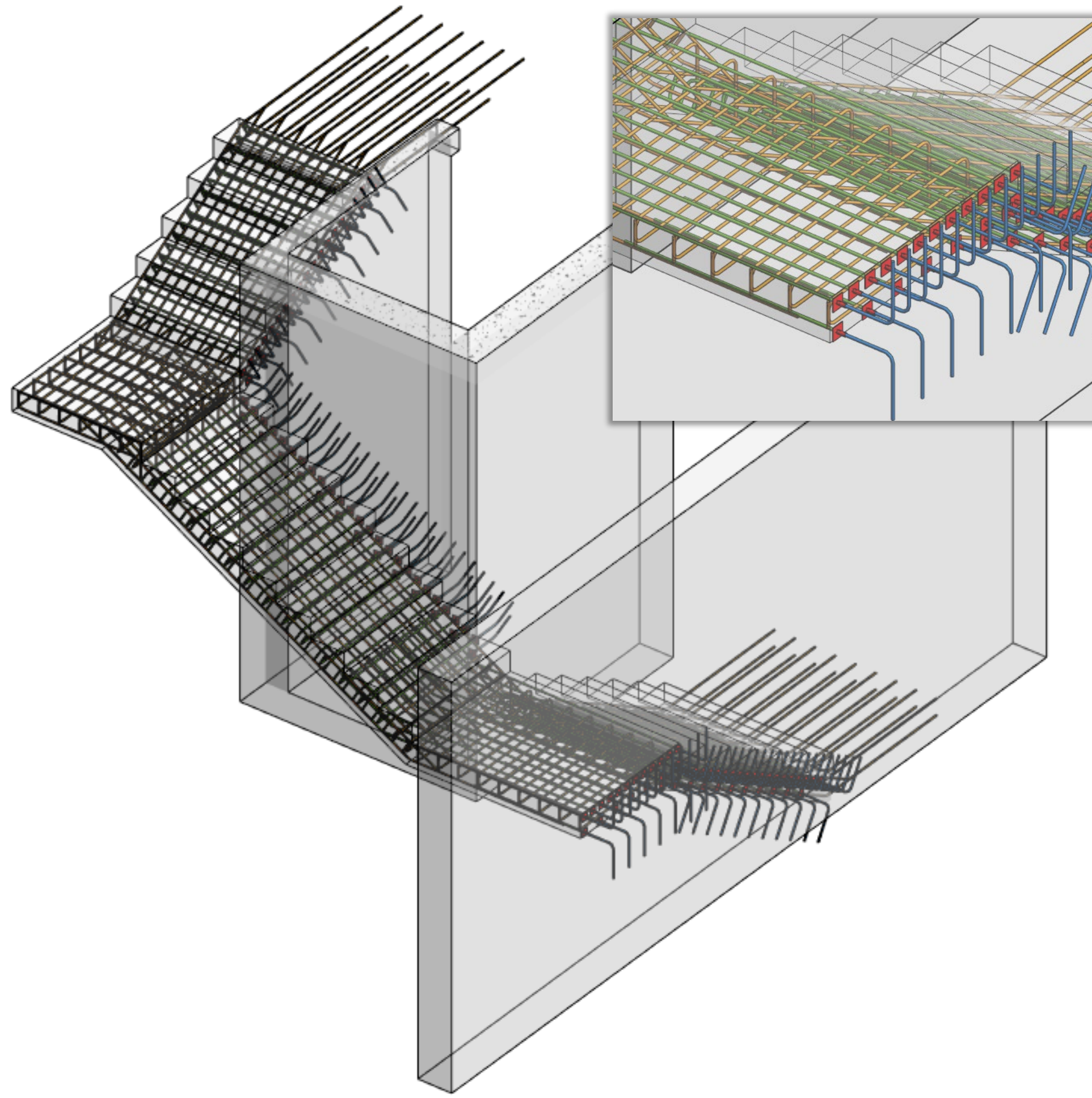
6. Presenting 3D rebar

- Smooth lines with anti-aliasing in the 3D view



6. Presenting 3D rebar

- Add color to the projection lines



7. Setting the color for rebar cut by views

Set the color property for cut lines to add color to the circle resulting from the rebar being cut by the view

Visibility/Graphic Overrides for Detail View: Wall W4 - Detail 1

Model Categories

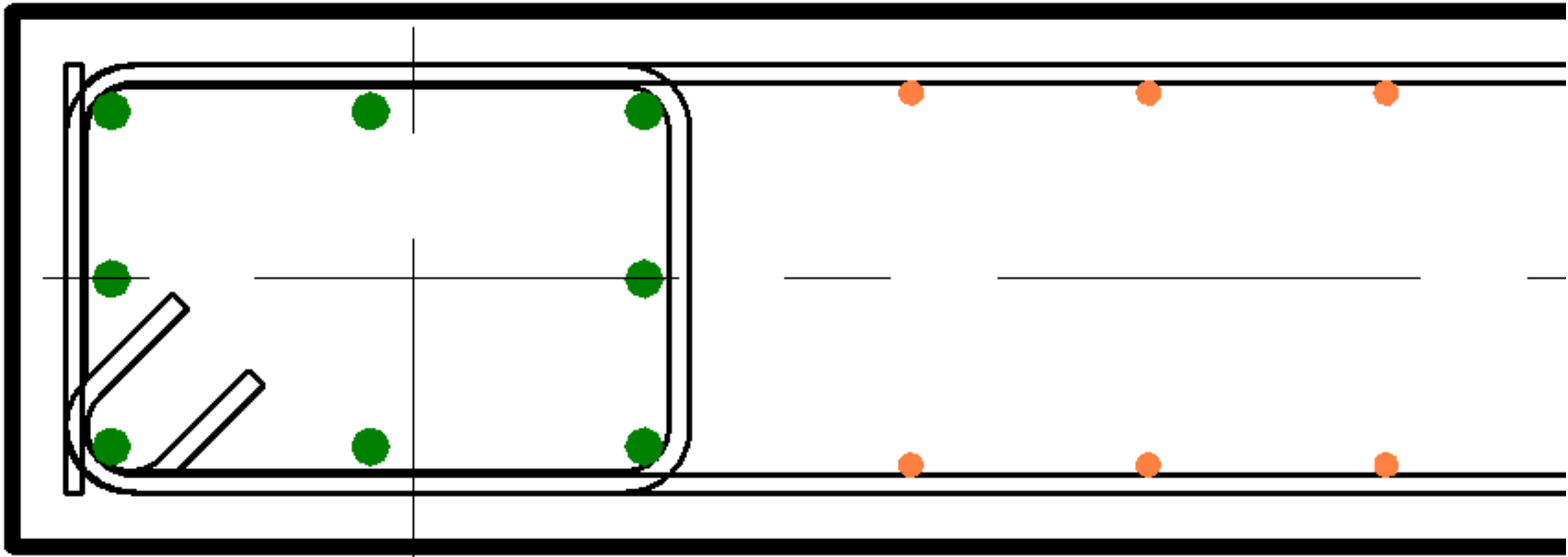
Annotation Categories

Analytical Model Categories

Imported Categories

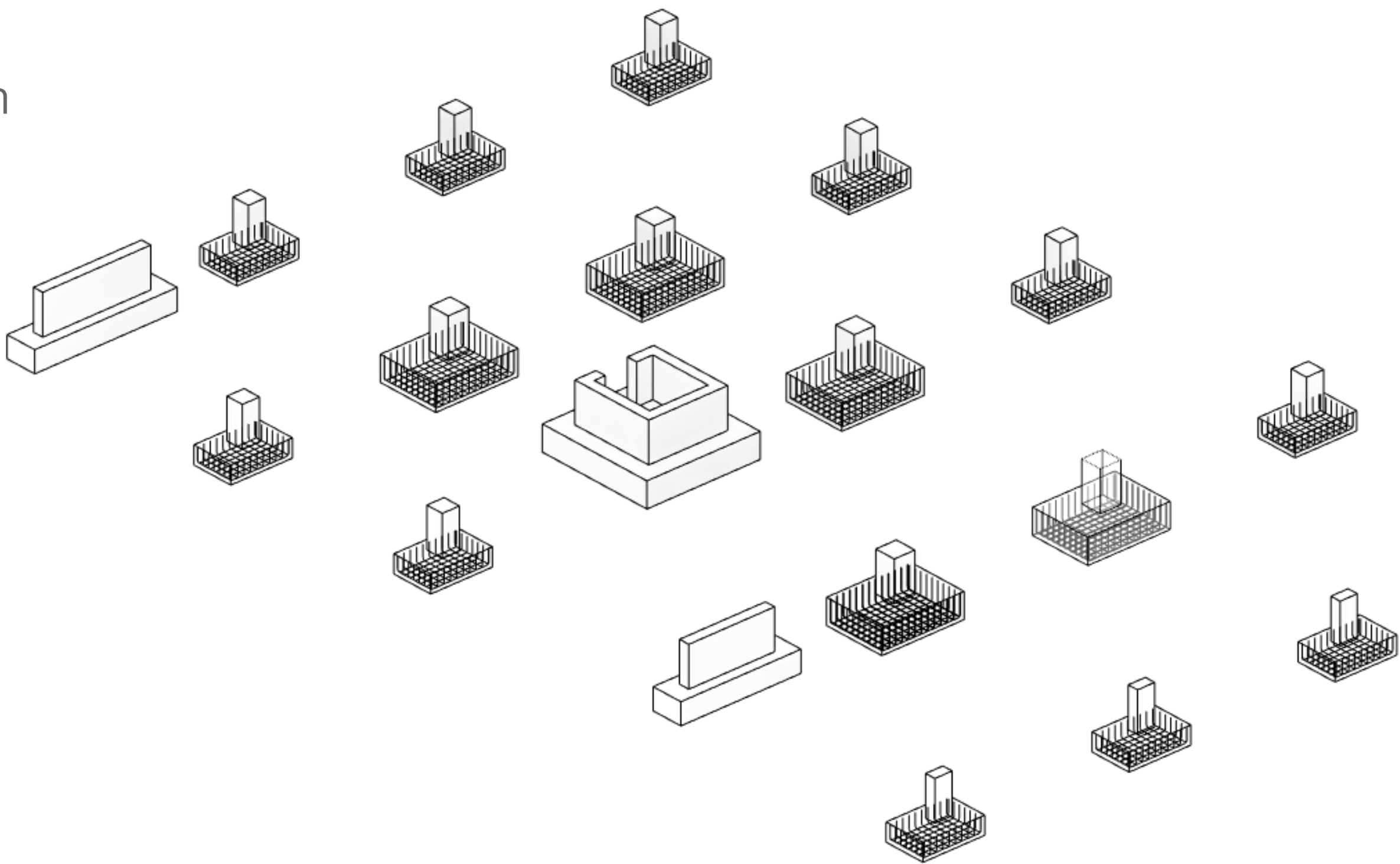
Filters

Name	Enable Filter	Visibility	Projection/Surface			Cut		Halftone	
			Lines	Patterns	Transpare...	Lines	Patterns		
16M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<div></div>		<input type="checkbox"/>	
25M	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				<div></div>		<input type="checkbox"/>	



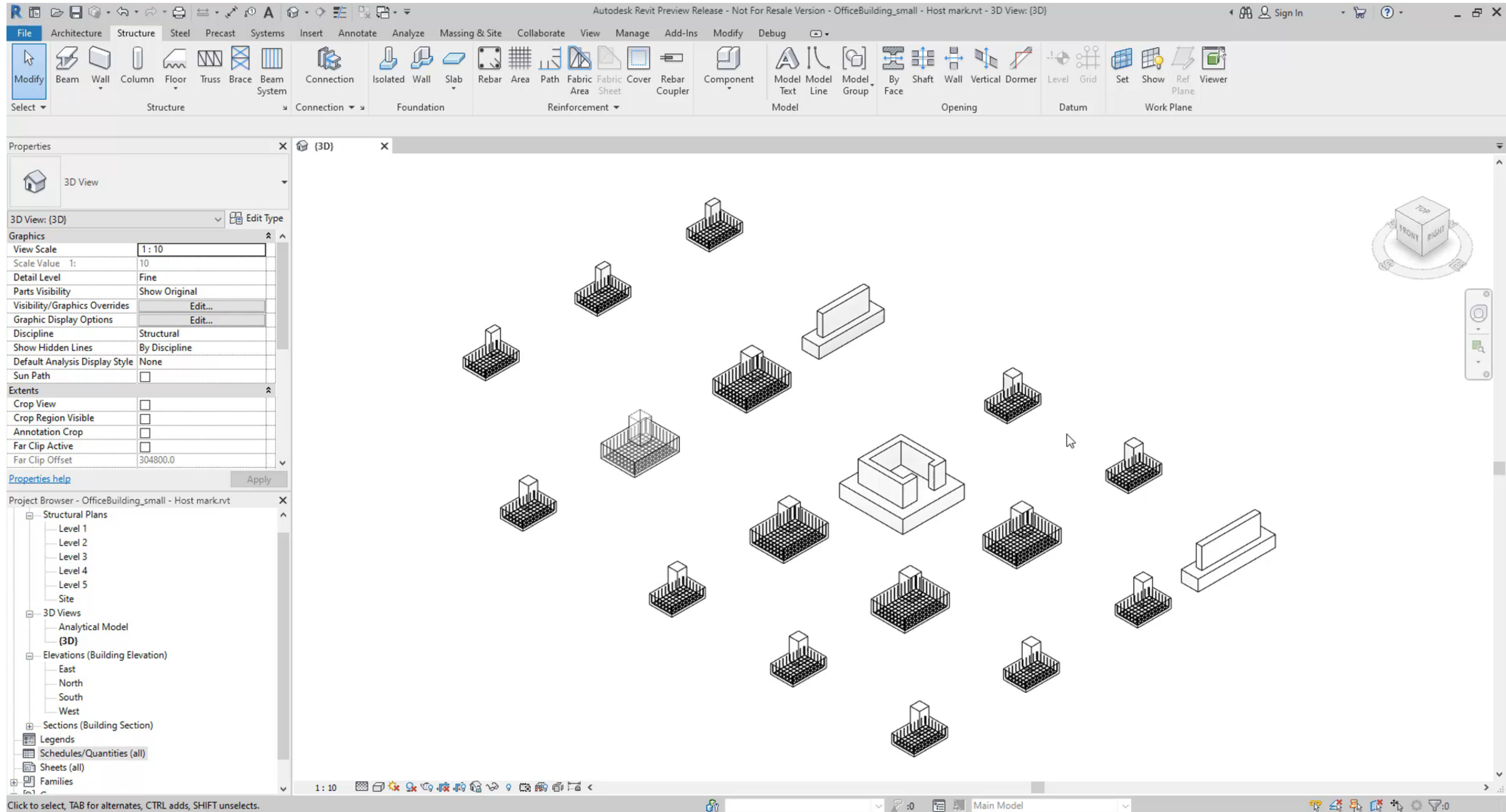
8. Count the number of bars per host

- Add identical Mark values to identical elements in your project
- Create a rebar schedule
 - Include *Host Mark*, *Host Count*, *Quantity* and other relevant parameters
- Create a calculated value called *Quantity by element* = $Quantity / Host Count$



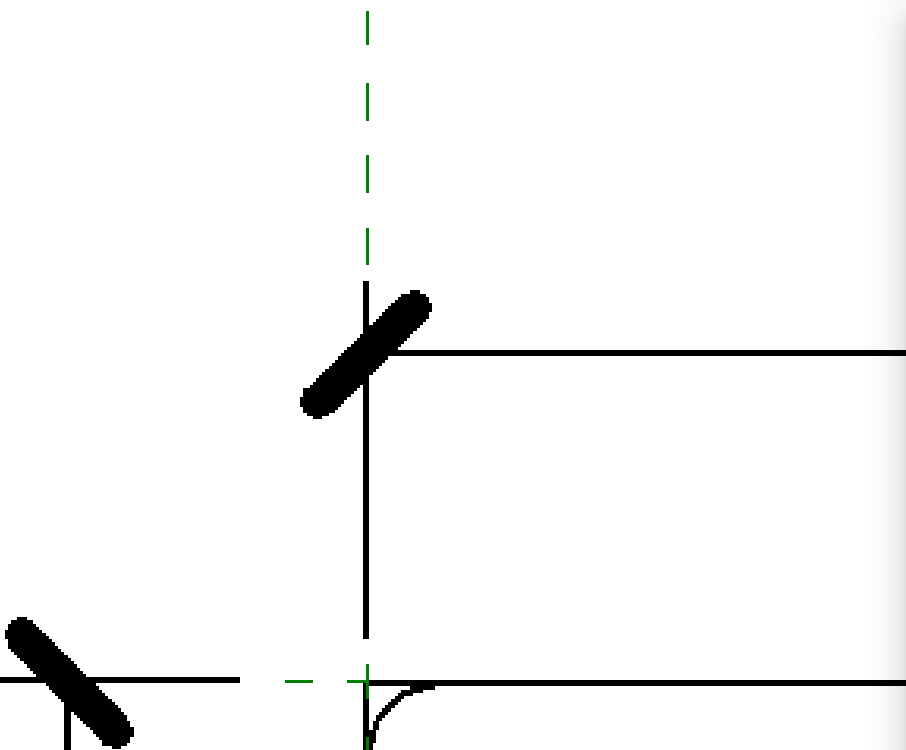
Rebar Number	Host Mark	Host Count	Shape	Bar Length	Quantity by Element	Quantity	A	B	C	D	E
1	F1	11	M_17	1840 mm	10	110	0 mm	400 mm	1120 mm	400 mm	0 mm
2	F1	11	M_17	2480 mm	7	77	0 mm	420 mm	1720 mm	420 mm	0 mm
3	F2	5	M_17	2840 mm	13	65	0 mm	600 mm	1720 mm	600 mm	0 mm
4	F2	5	M_17	3480 mm	10	50	0 mm	620 mm	2320 mm	620 mm	0 mm

8. Count the number of bars per host



9. Show the shape image in schedules

- Edit the rebar shape family
- Go to Rebar Shape Parameters
- Edit the Image parameter and load the adequate shape image
 - The image should be generic, as it will be displayed for all bars using that shape

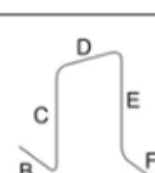


Rebar Shape Parameters

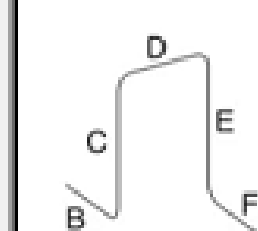
Search parameters

Parameter	Value	Formula
Construction		
Style	Standard	=
Start Tangent Hook Length (115.0 mm	=
Start Hook Offset Length (def	80.0 mm	=
Start Hook Length (default)	115.0 mm	=
Shape Image	<None>	=
Hook Rotation At Start	0.00°	=

Rebar Schedule

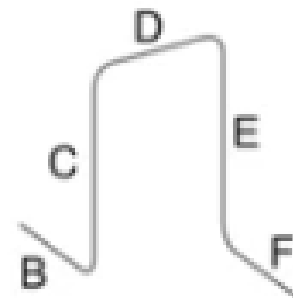
Rebar Number	Type	Shape	Bar Length	Quantity By Rebar Set	Total Bar Length	A	B	C	D	E	Shape Image
57	16M	28	1.98 m	193	382.14 m	250 mm	540 mm	560 mm	540 mm	250 mm	

Manage Images

Raster Image	Name	Count	Path	Path Type
	28.png	0	D:\OneDrive - autodesk\AU2020\videos\Shape image in schedules\28.png	Absolute

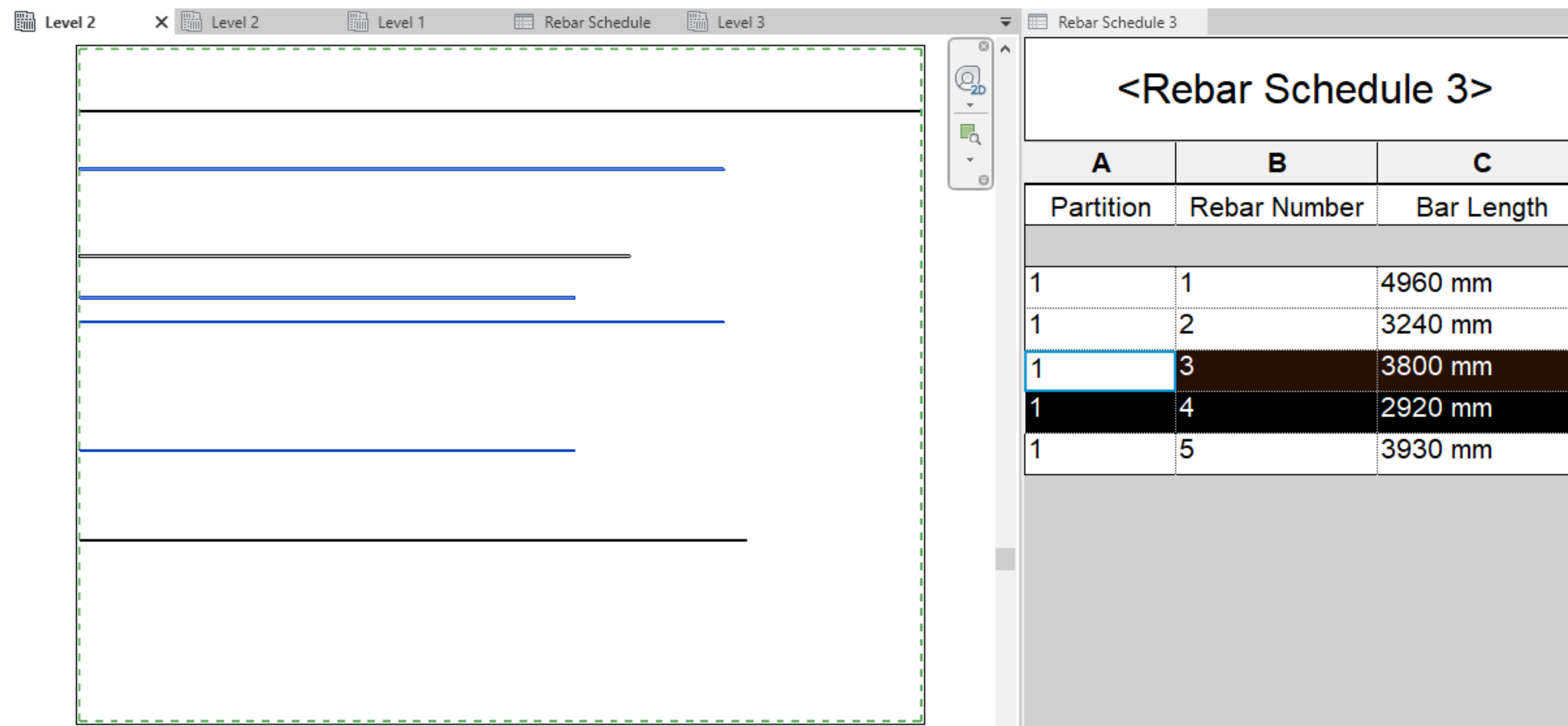
9. Show the shape image in schedules

- Reload into the project
- Create a rebar schedule that references the Image type parameter

Rebar Schedule											
Rebar Number	Type	Shape	Bar Length	Quantity By Rebar Set	Total Bar Length	A	B	C	D	E	Shape Image
57	16M	28	1.98 m	193	382.14 m	250 mm	540 mm	560 mm	540 mm	250 mm	

10. Select / Delete bars by rebar number using filters

- Open a schedule and a model view side by side
- Filter by the rebar numbers you want to remove
- Select the rows in the schedule and switch to the model view
- Delete the selected bars



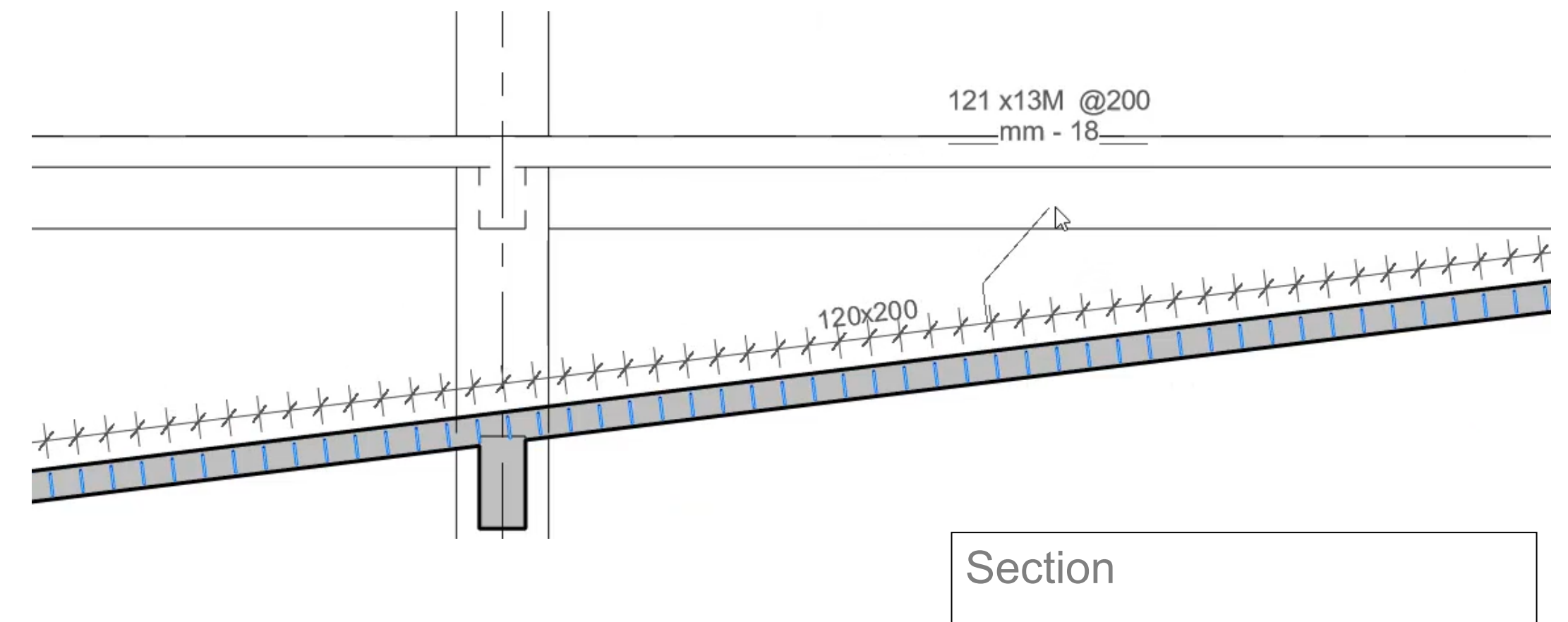
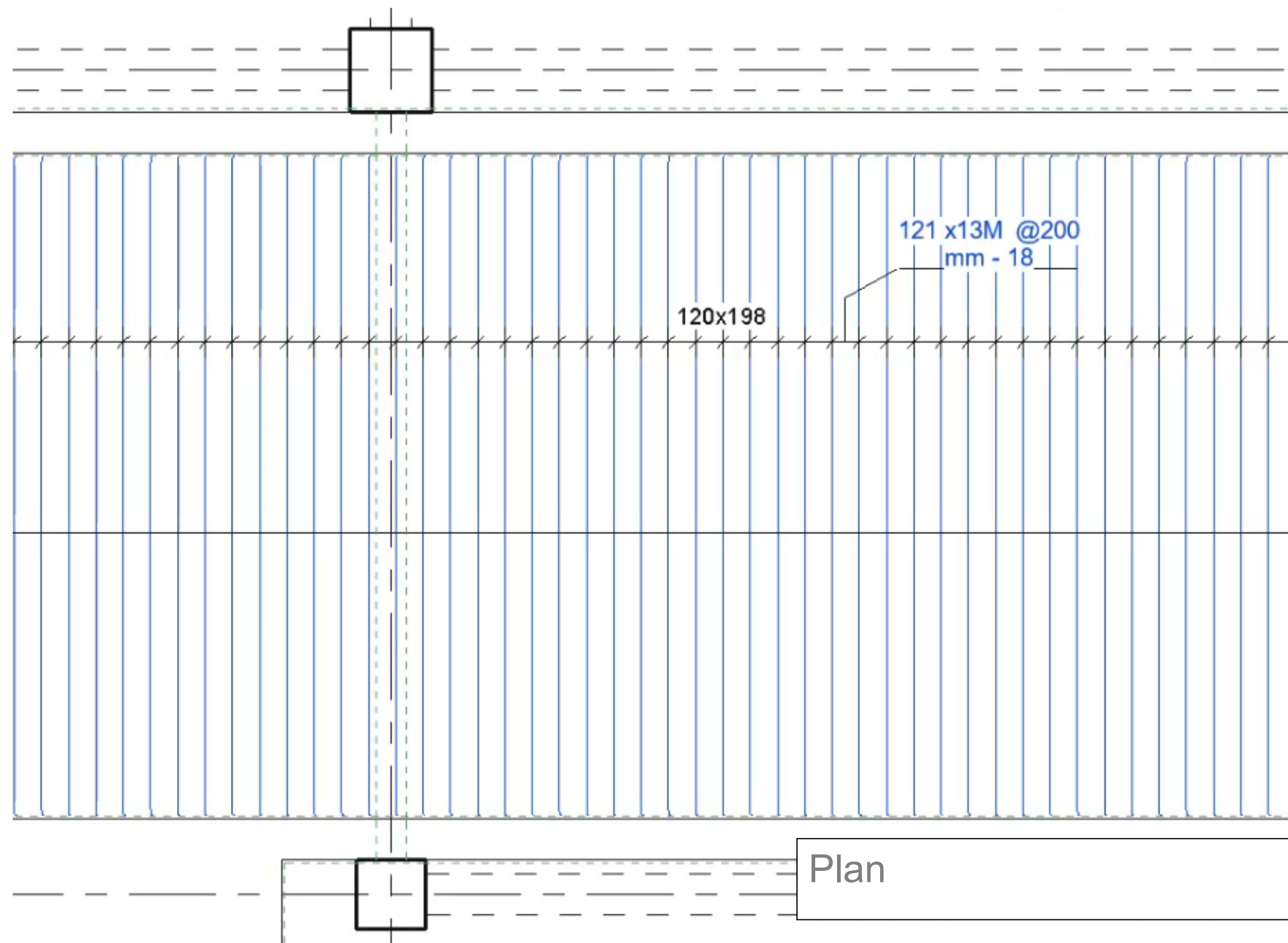
The screenshot displays a software interface with two main panels. The left panel, titled 'Level 2', shows a model view with several horizontal rebar lines. The right panel, titled 'Rebar Schedule 3', shows a table with the following data:

<Rebar Schedule 3>		
A	B	C
Partition	Rebar Number	Bar Length
1	1	4960 mm
1	2	3240 mm
1	3	3800 mm
1	4	2920 mm
1	5	3930 mm

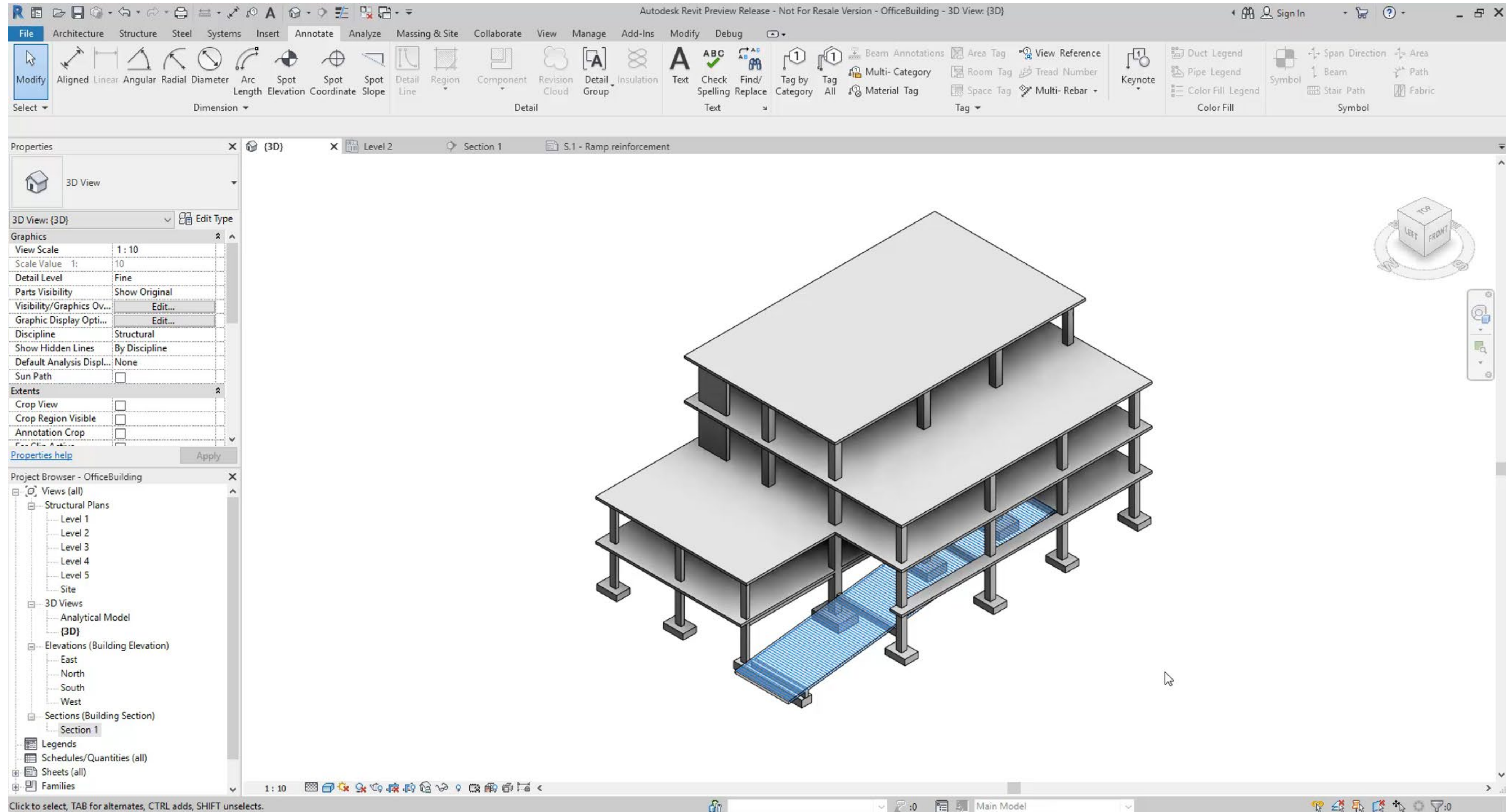
The row with Rebar Number 3 is highlighted in dark brown, indicating it is selected. The interface also shows tabs for 'Level 2', 'Level 1', 'Rebar Schedule', and 'Level 3' at the top.

11. Multi-Rebar Annotations to sloped bars

Annotate single segment bars at any orientation, in 2D views by using Multi-Rebar Annotations

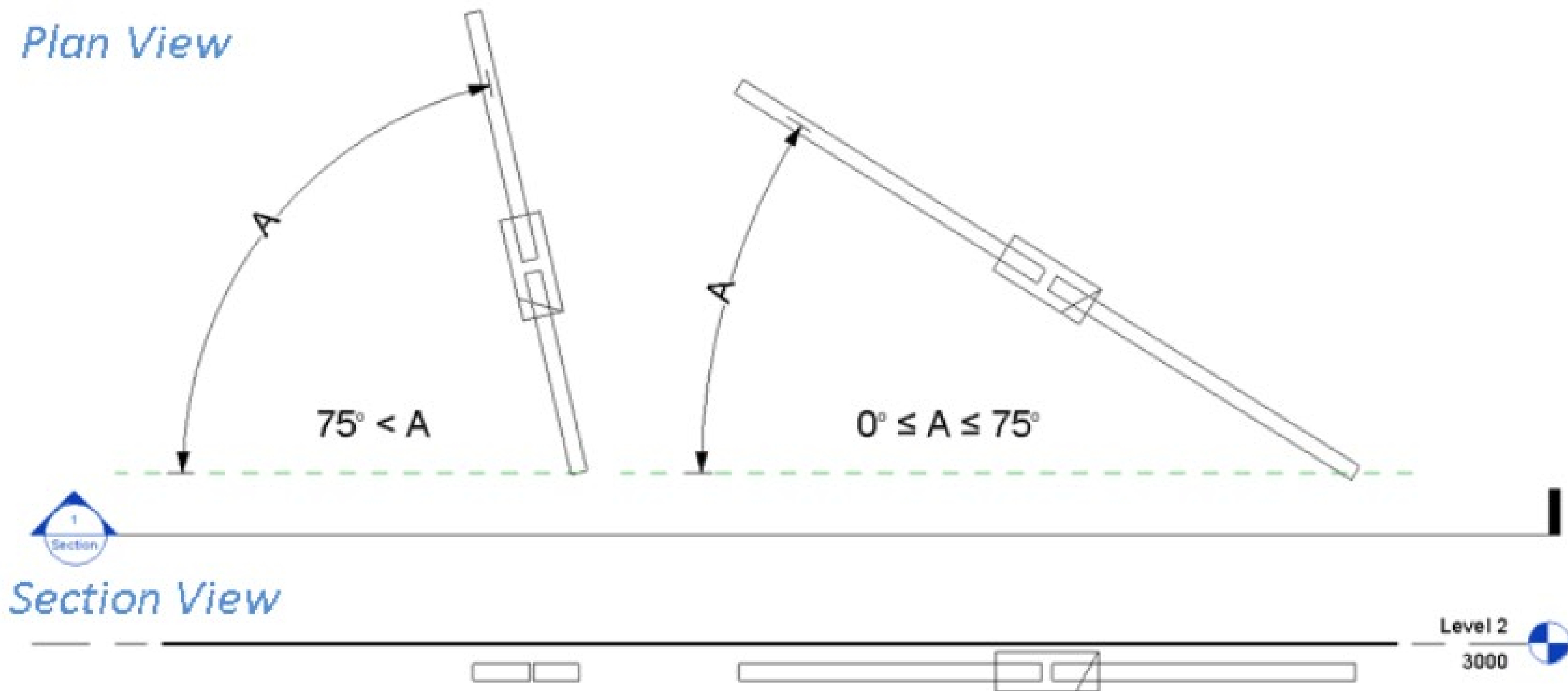


11. Multi-Rebar Annotations to sloped bars



12. Rebar couplers visibility in sections

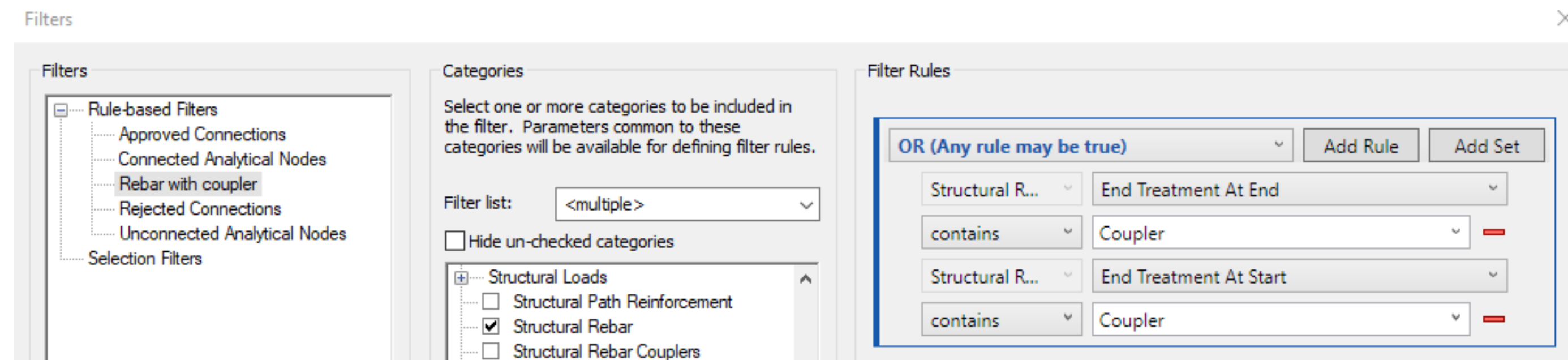
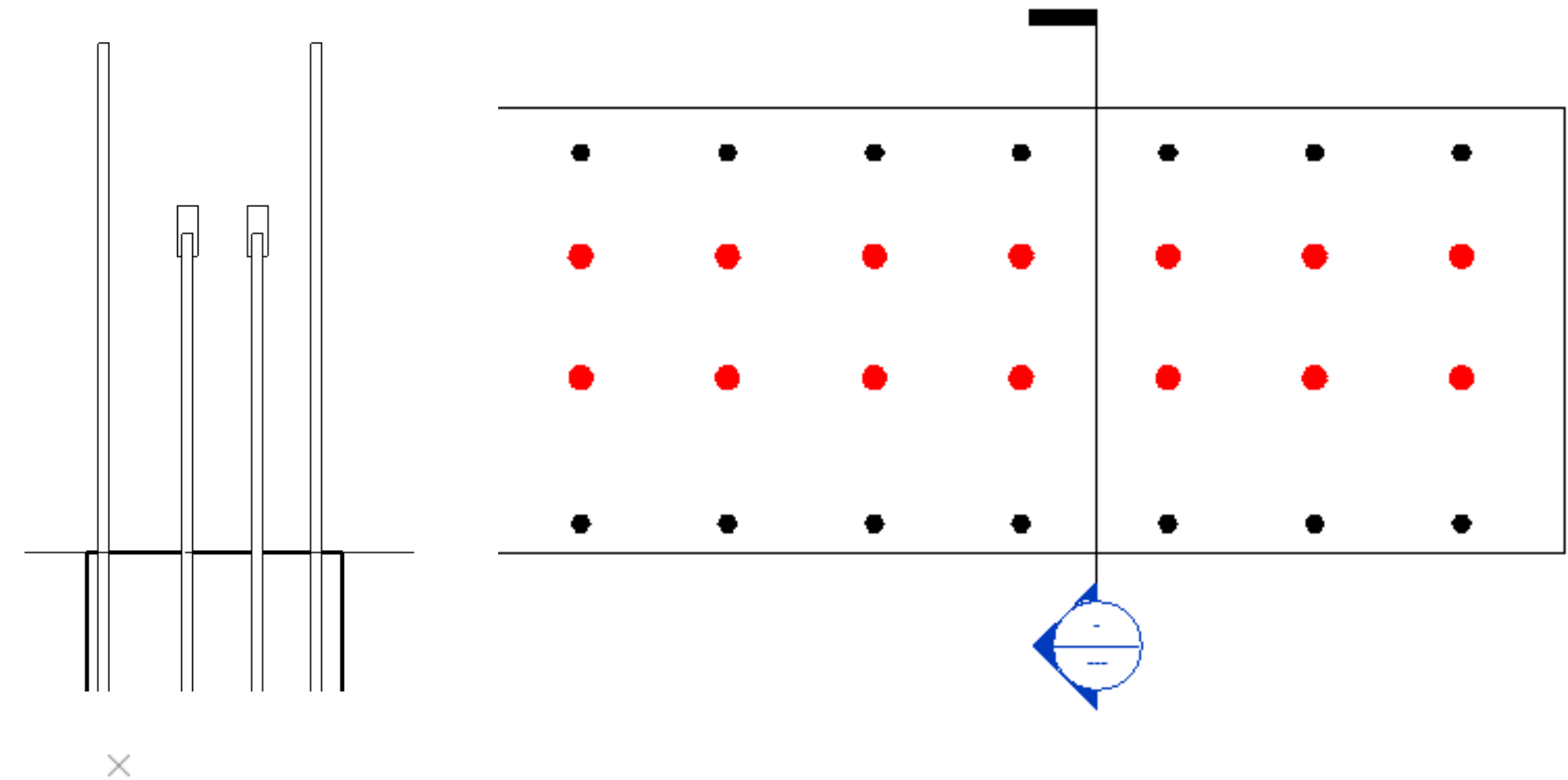
Couplers are only visible when the angle between the coupler axis and the view is below 75 degrees.



13. Define rebar shapes with attached rebar couplers

Specify if bars will be delivered with couplers already attached

- Configure the end treatment to also include coupler for Bar 1 (1st bar clicked)
- Add filters for bars containing Coupler in End Treatment
- Identify the bars in plan views and when cut by the view as having couplers



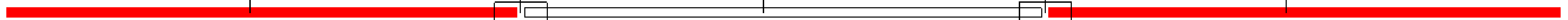
16M
Rebar Shape 1
ET Start: None
ET End: Coupler + Threaded

CPL16M

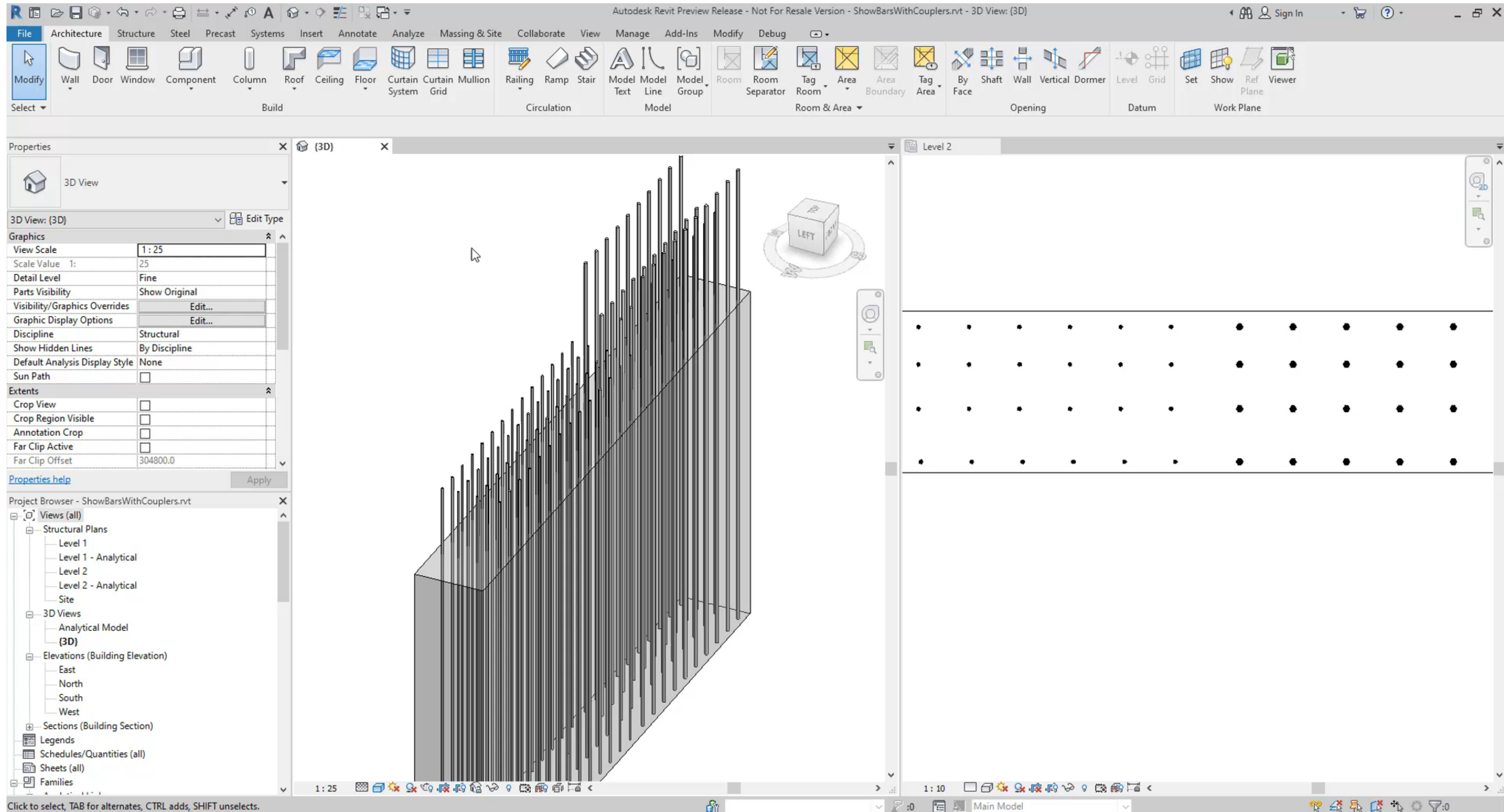
16M
Rebar Shape 3
ET Start: Threaded
ET End: Threaded

CPL16M

16M
Rebar Shape 1
ET Start: None
ET End: Coupler + Threaded

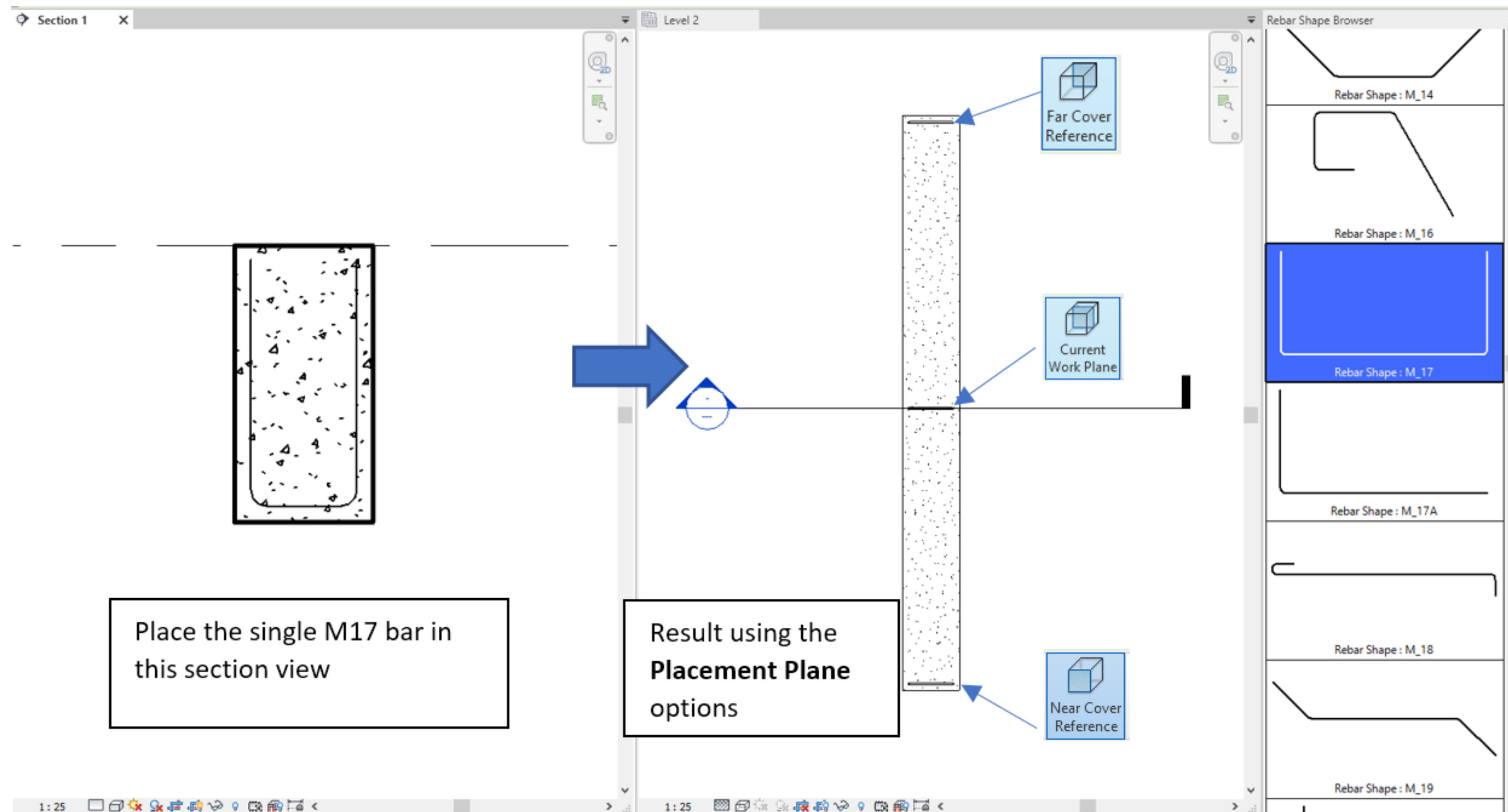


13. Define rebar shapes with attached rebar couplers



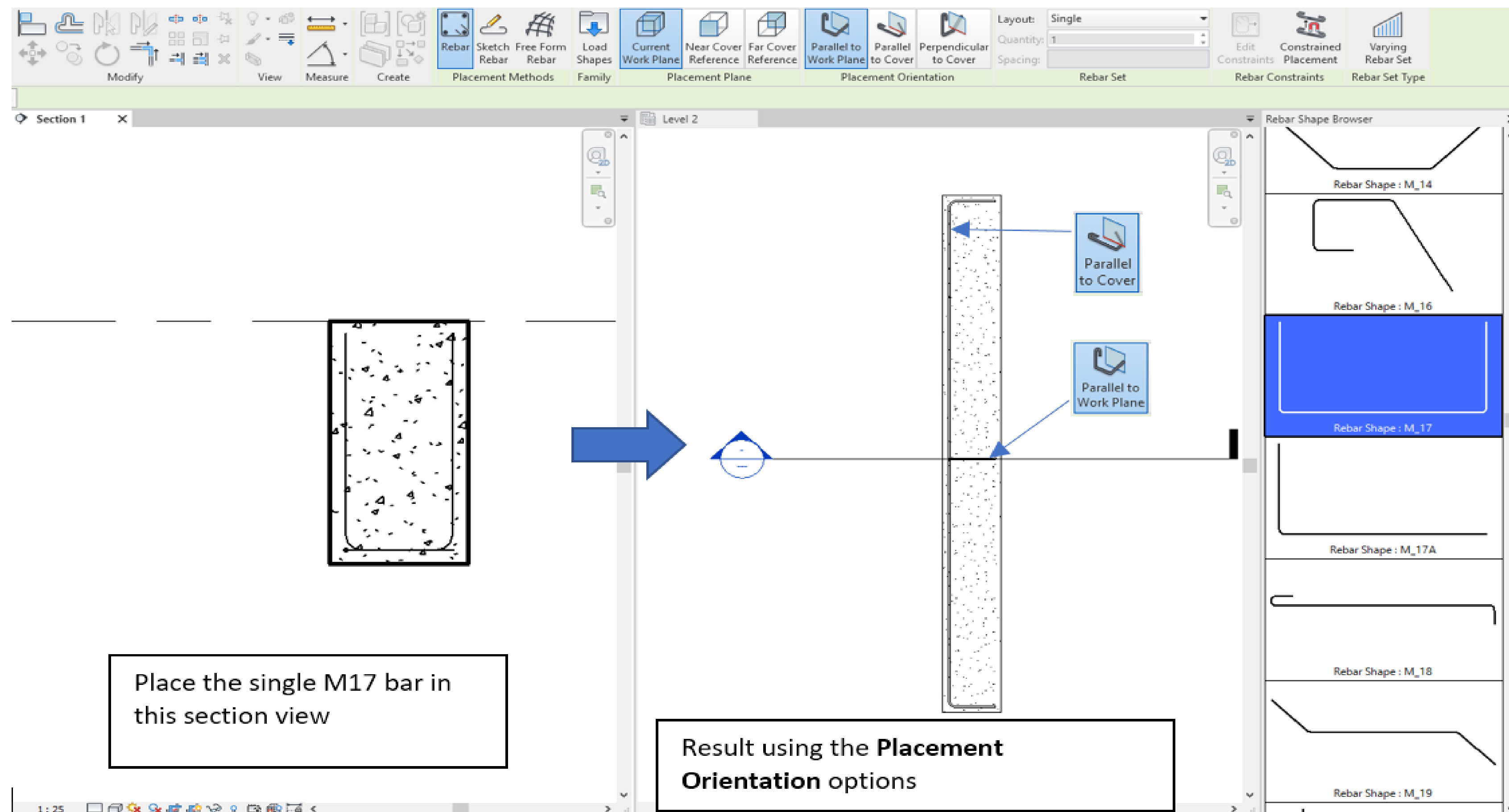
14.Placement Plane and Orientation of shape driven rebar

Placing a single bar in the section view positions within the element according to the placement plane setting



14.Placement Plane and Orientation of shape driven rebar

Placement orientation selects how the bar is positioned in the element with respect to the concrete faces and bar plane



15. Use “Shift” to lock the bar orientation to an element face

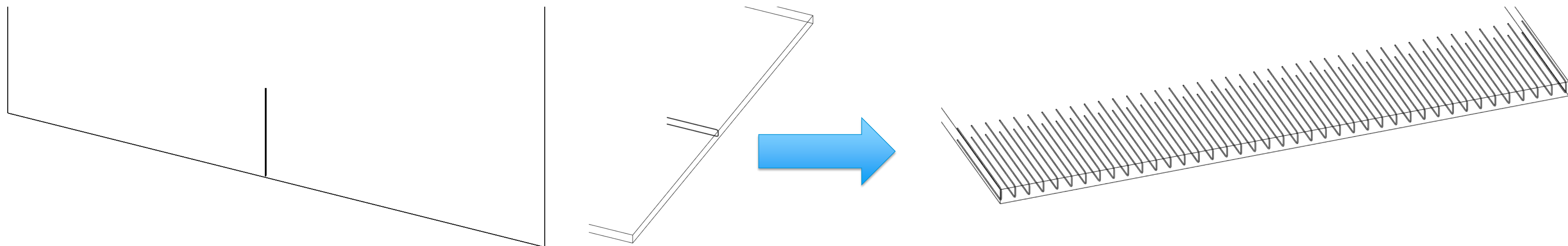
Press and hold Shift to keep the bar parallel to the highlighted face



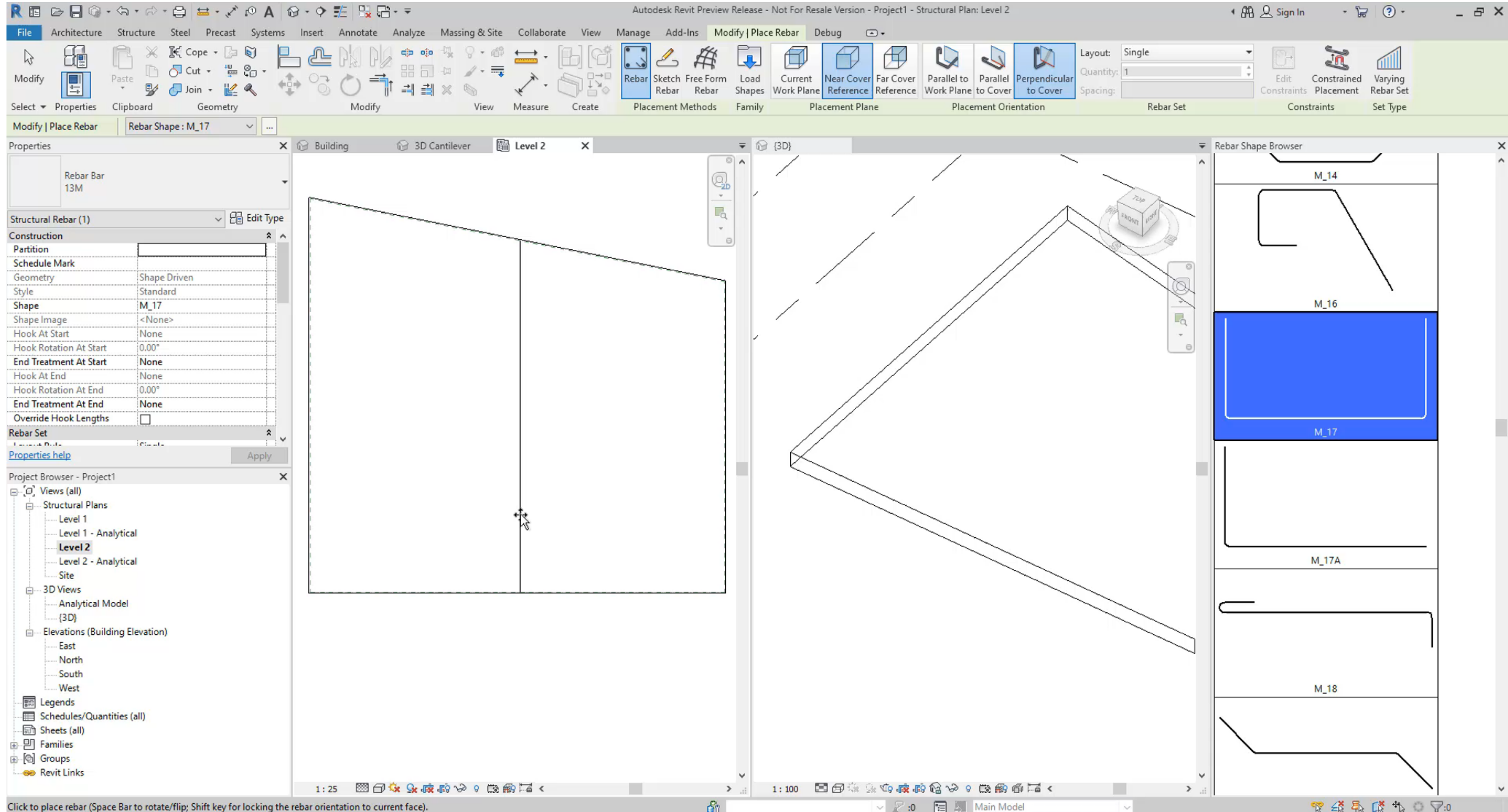
16. Place an inclined distribution in a slab

Use the Varying Rebar Set and constrain both ends to the same inclined edge of the slab

- Place a single bar at the desired angle with respect to a face
- Select the bar and click the Varying Rebar Set option
- Edit the bar constraints and constrain the far end(s) to the same face
- Change the layout to something like Maximum Spacing and adjust the set extents



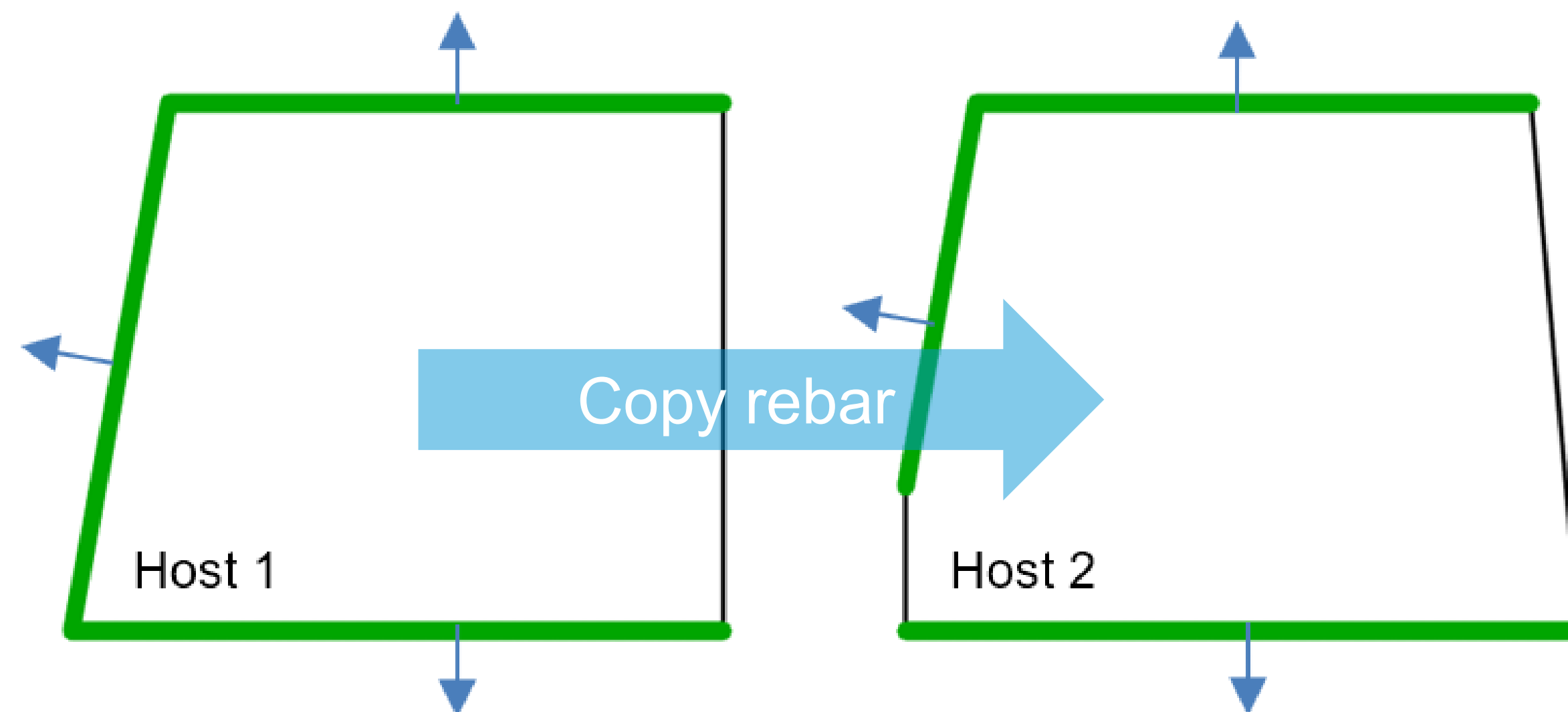
16. Place an inclined distribution in a slab



17. Preserve preferred constraints when copying bars

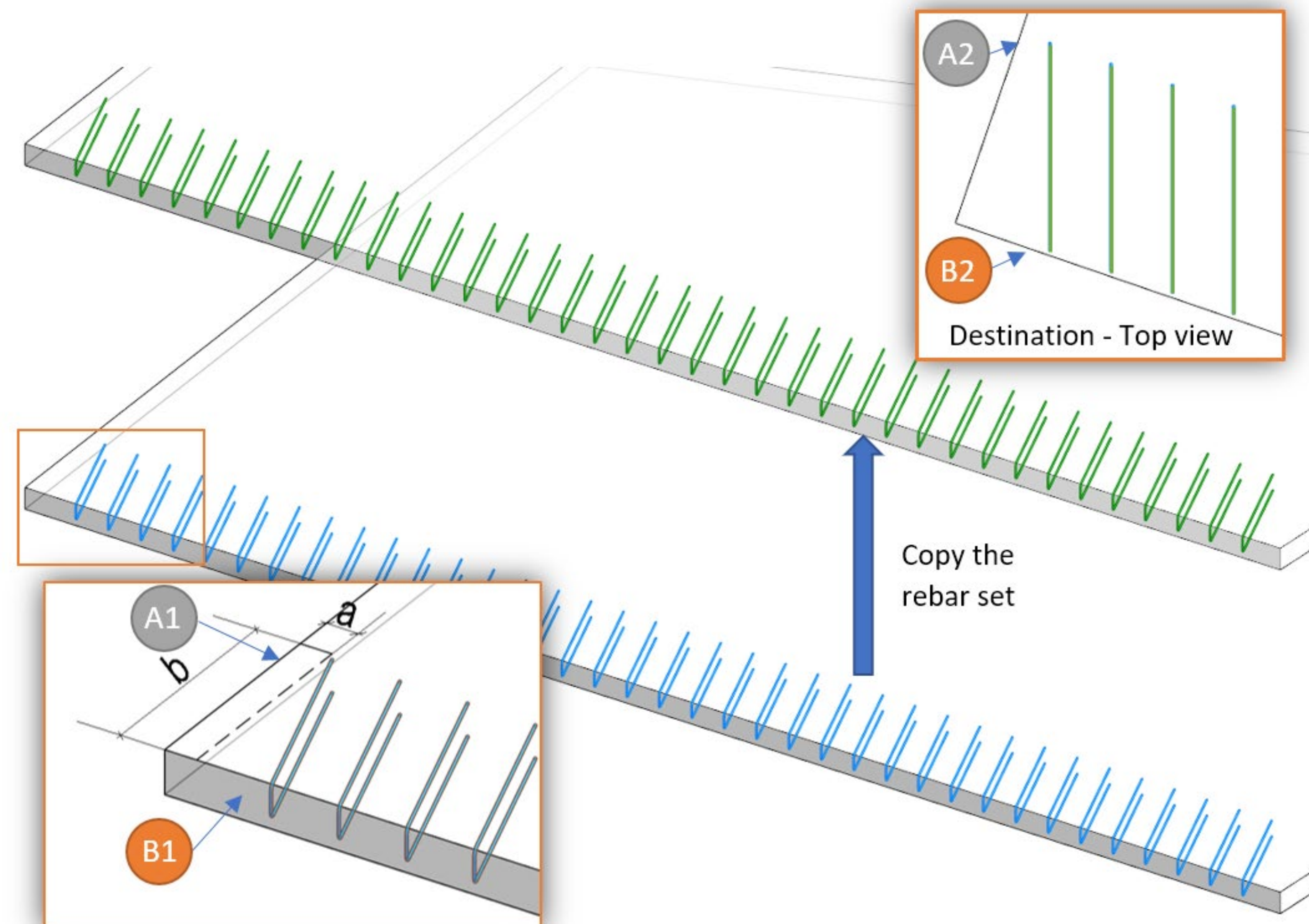
When copying rebar with preferred constraints between two hosts, the constraints are matched to similar faces in the destination host.

- To set a preferred constraint:
 - Select a rebar or rebar set > Edit Constraints
 - Select the desired handle and click a new concrete face or change the offset to that face; that handle will now follow that concrete face and not try to find a new target

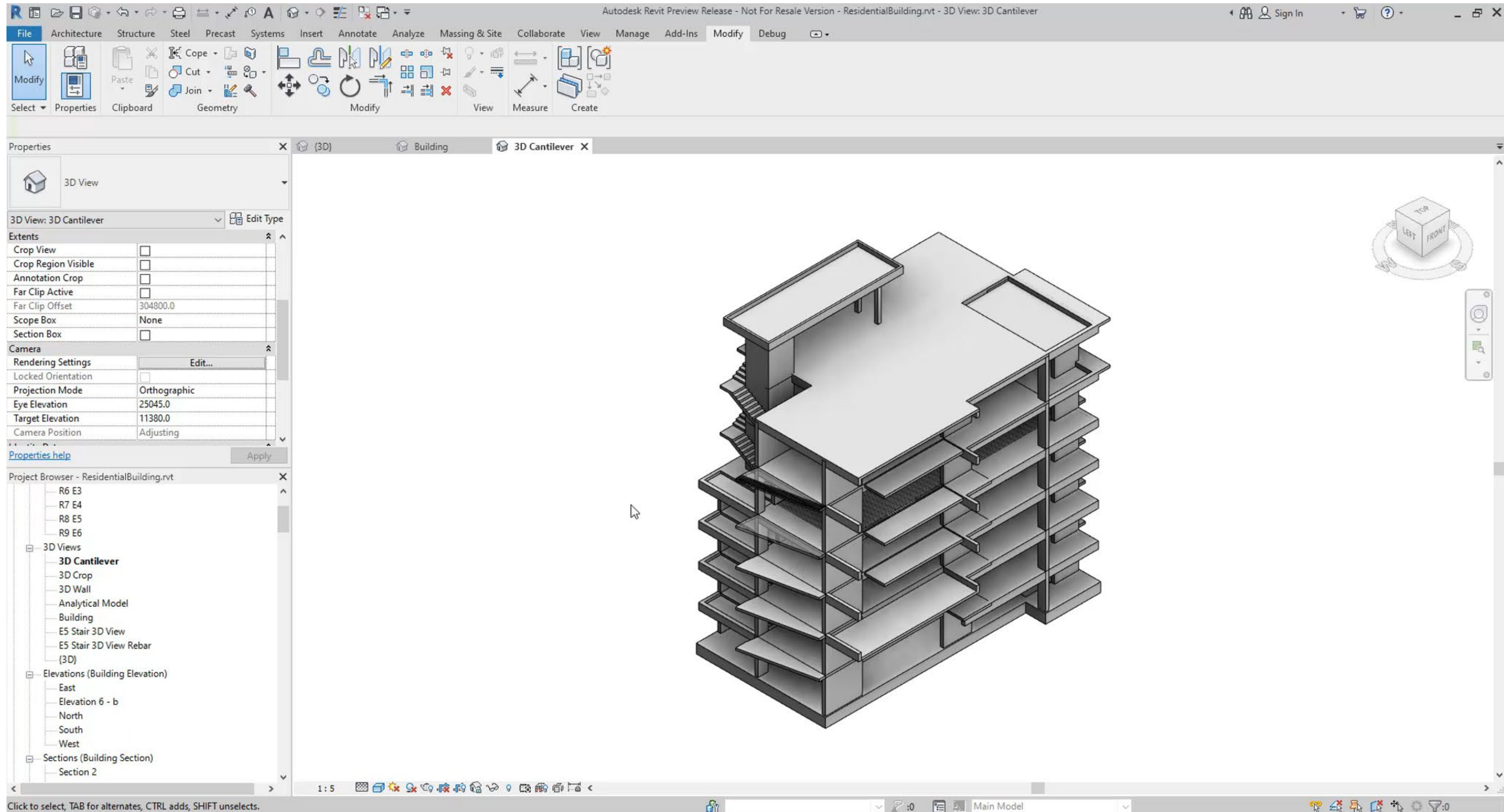


17. Preserve preferred constraints when copying bars

The set is not automatically constrained to the closest face, but finds the matching preferred constraint

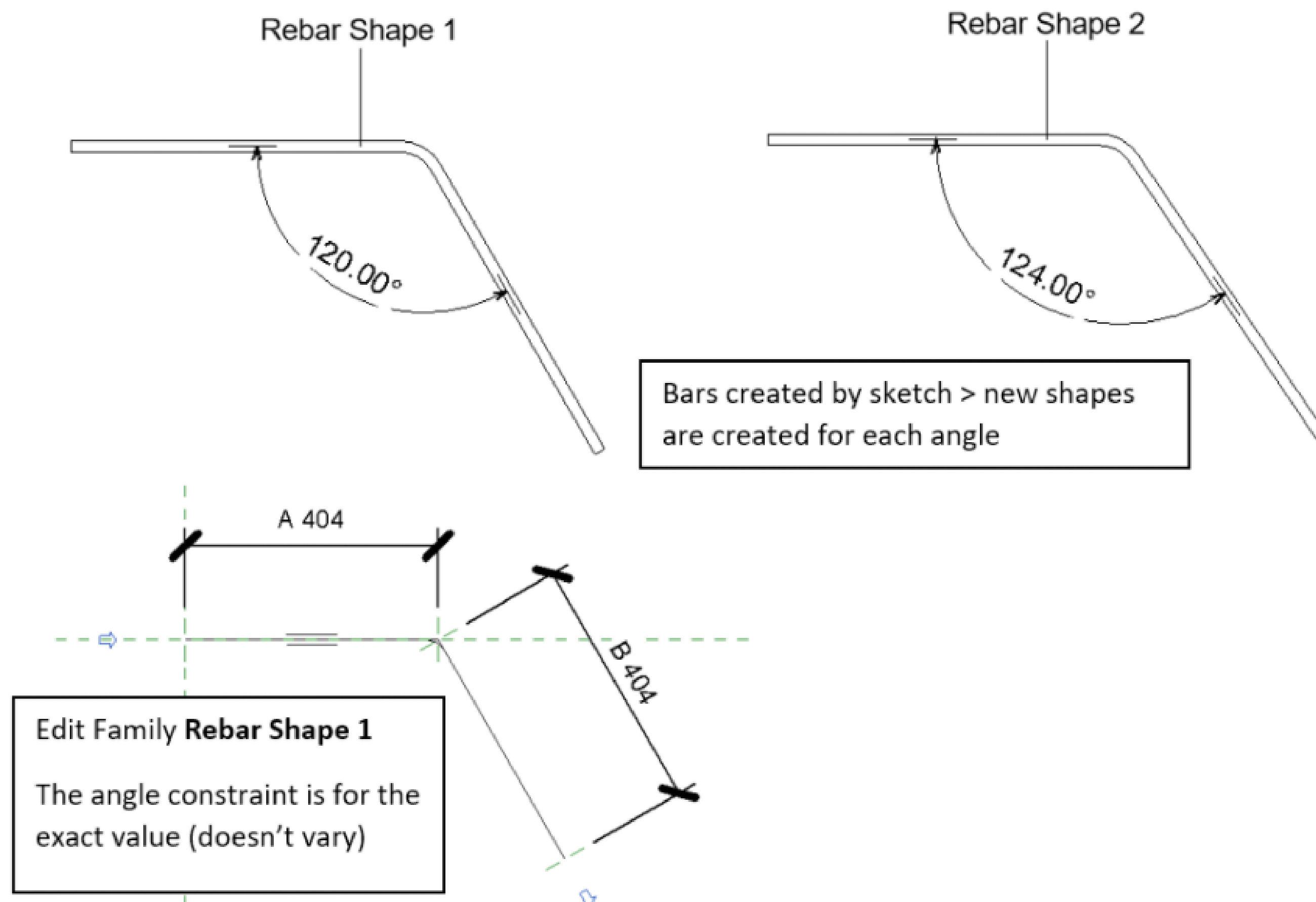


17. Preserve preferred constraints when copying bars



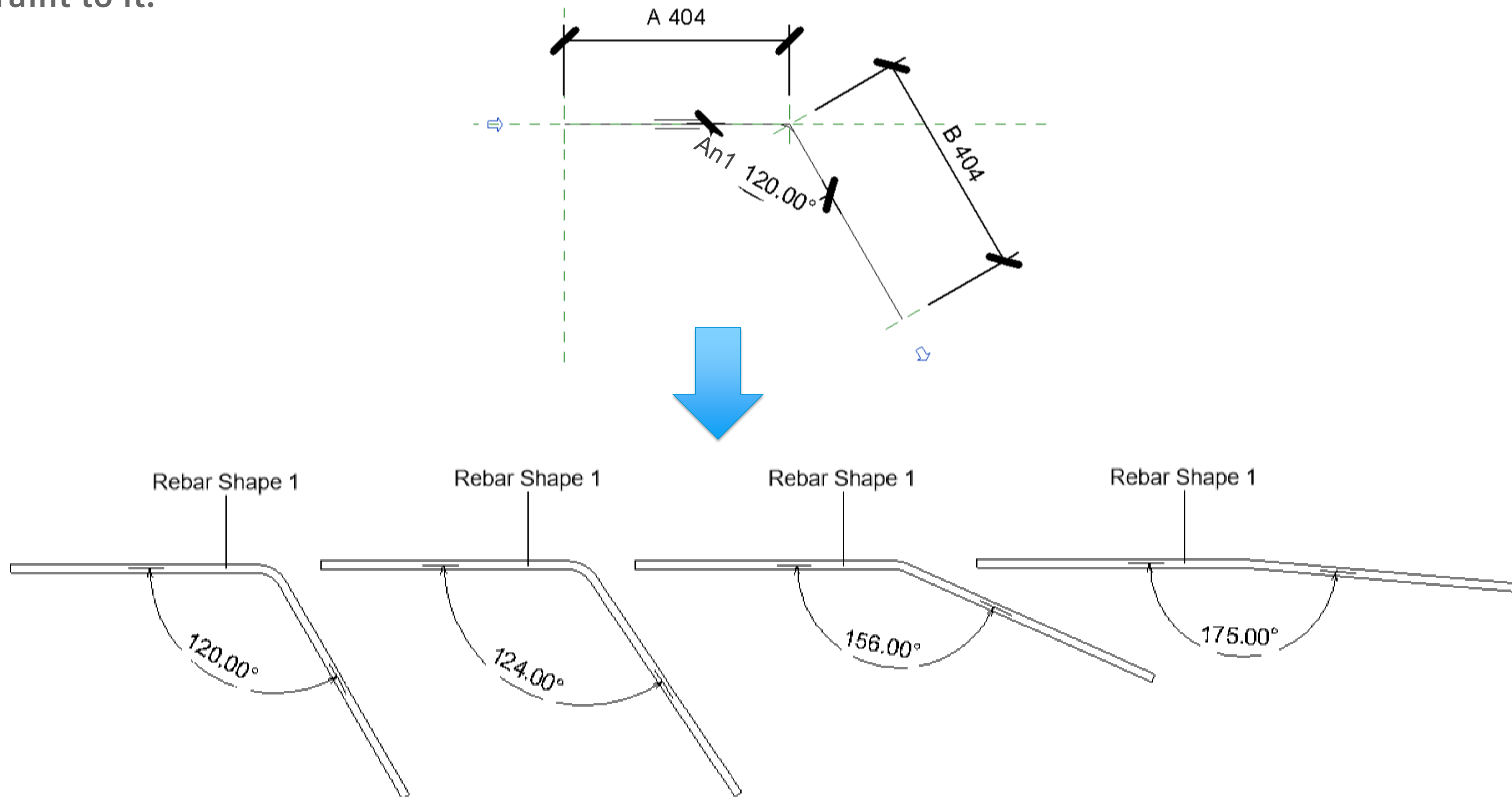
18. Change a shape angle freely

Rebar shapes have internal constraints that keep segments at an angle, so small variations will produce new shapes

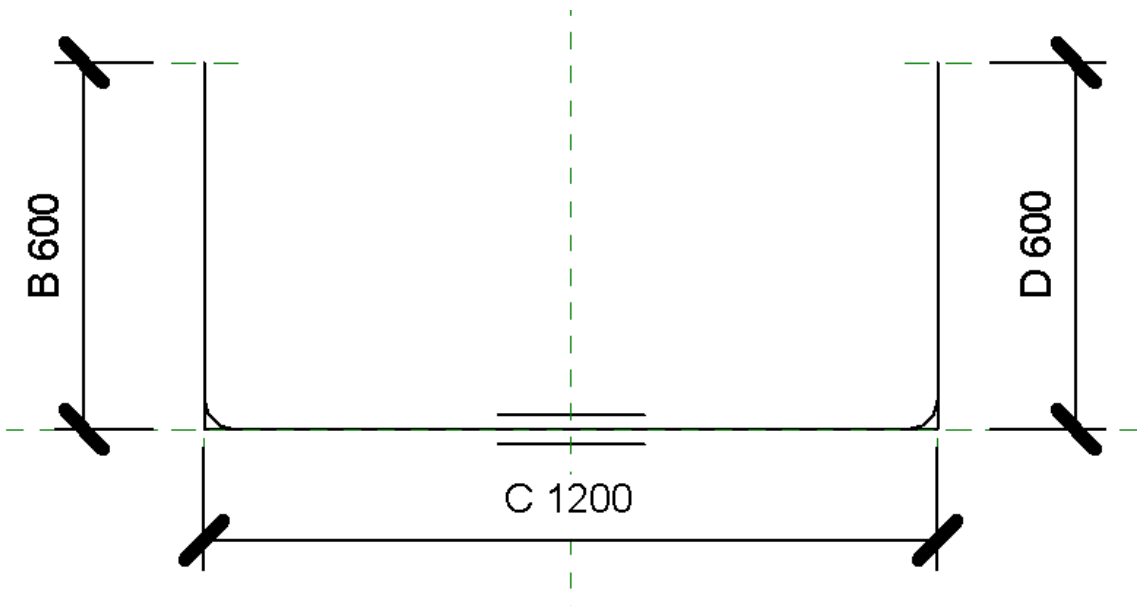


18. Change a shape angle freely

To make sure that the segment moves freely from 0 to 90 deg or 90 to 180 deg, you need to assign an angle constraint to it.



19. Define a formula to compute the bar length for a given shape



Rebar Shape Parameters		
Search parameters		
Parameter	Value	Formula
End Tangent Hook Length (default)	115.0 mm	=
End Hook Offset Length (default)	80.0 mm	=
End Hook Length (default)	115.0 mm	=
Bend Diameter (default)	100.0 mm	=
Bar Diameter (default)	10.0 mm	=
Dimensions		
R (default)	0.0 mm	=
O (default)	0.0 mm	=
Length of each bar (default)	2470.0 mm	= B + C + D - Bend Diameter / 2 - 2 * Bar Diameter
K (default)	0.0 mm	=
J (default)	0.0 mm	=

19. Define a formula to compute the bar length for a given shape

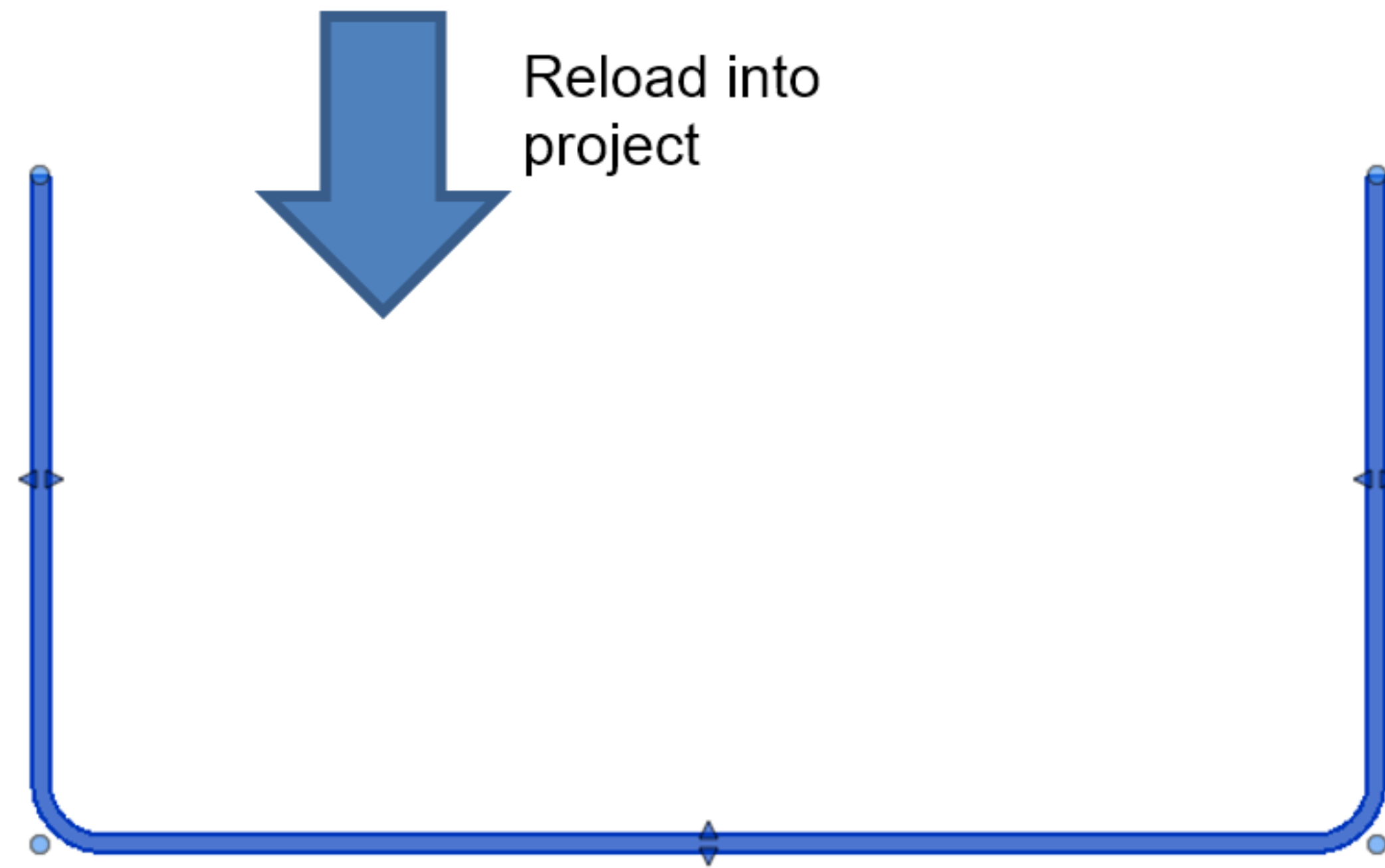
Properties

Rebar Bar
13M

Structural Rebar (1) Edit Type

A	0.0 mm (0 mm)
B	492.8 mm (490 mm)
C	985.2 mm (990 mm)
D	492.8 mm (490 mm)
E	0.0 mm (0 mm)
F	0.0 mm (0 mm)
G	0.0 mm (0 mm)
H	0.0 mm (0 mm)
J	0.0 mm (0 mm)
K	0.0 mm (0 mm)
Length of each bar	1905.5 mm (1910 mm)
O	0.0 mm (0 mm)
R	0.0 mm (0 mm)
Bar Length	1905.7 mm (1910 mm)
Total Bar Length	1910 mm

[Properties help](#) Apply



20. Check bar segment lengths

Ensure each bar has a minimum or maximum length of each segment, total bar length or other combination by adding a check for each rebar shape family in the project

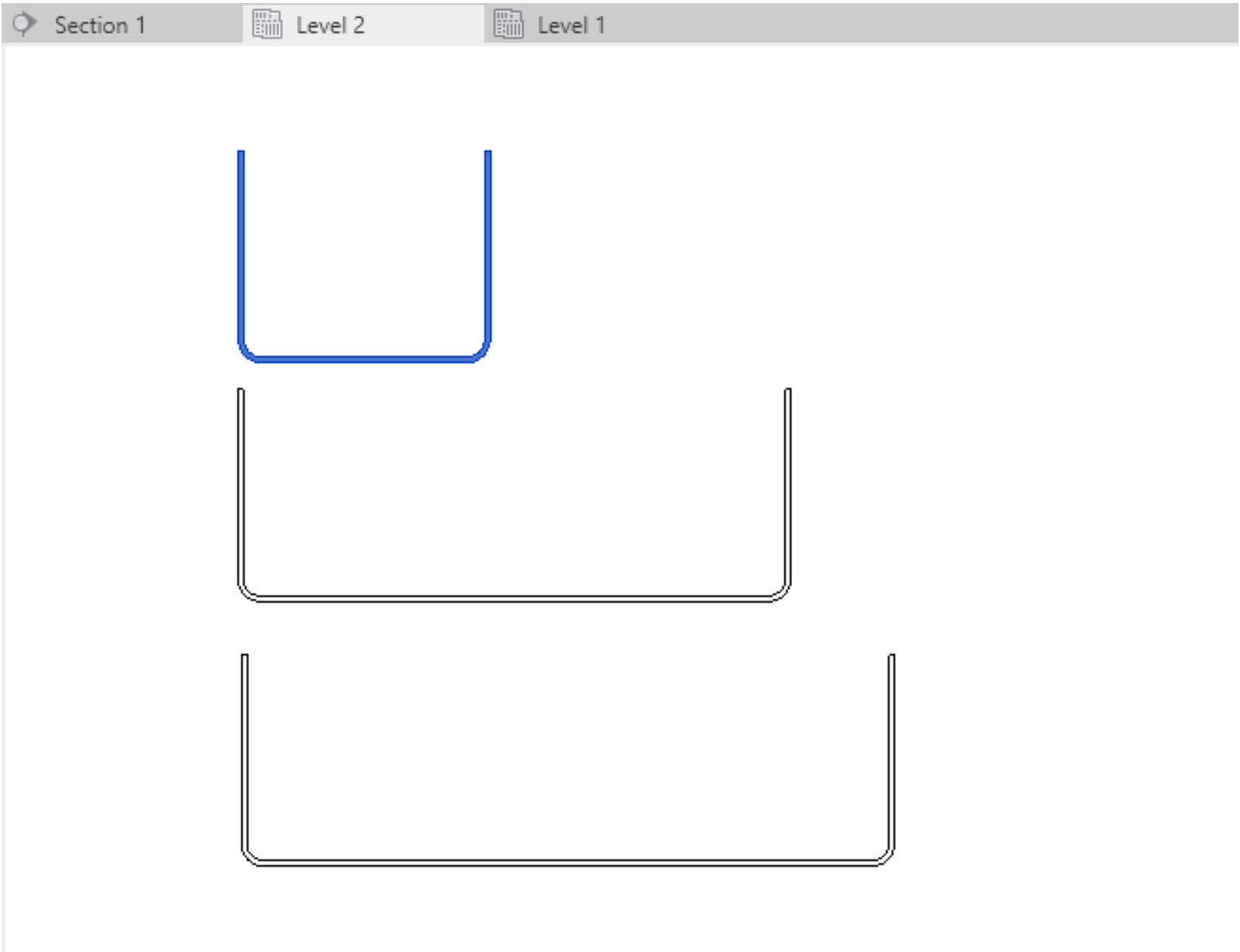
- Edit the shape family
- Define a yes/no shared parameter called Check Shape
- Add a formula to check if C is greater than or equal to 1.0 m
- We can write this as “OR (C > 1 m, C = 1 m)”
- Load into project and overwrite
- Use a schedule to check each bar

Rebar Shape Parameters

Search parameters

Parameter	Value	Formula
Other		
Check Shape (default)	<input checked="" type="checkbox"/>	= or(C > 1000 mm, C = 1000 mm)

Section 1 Level 2 Level 1



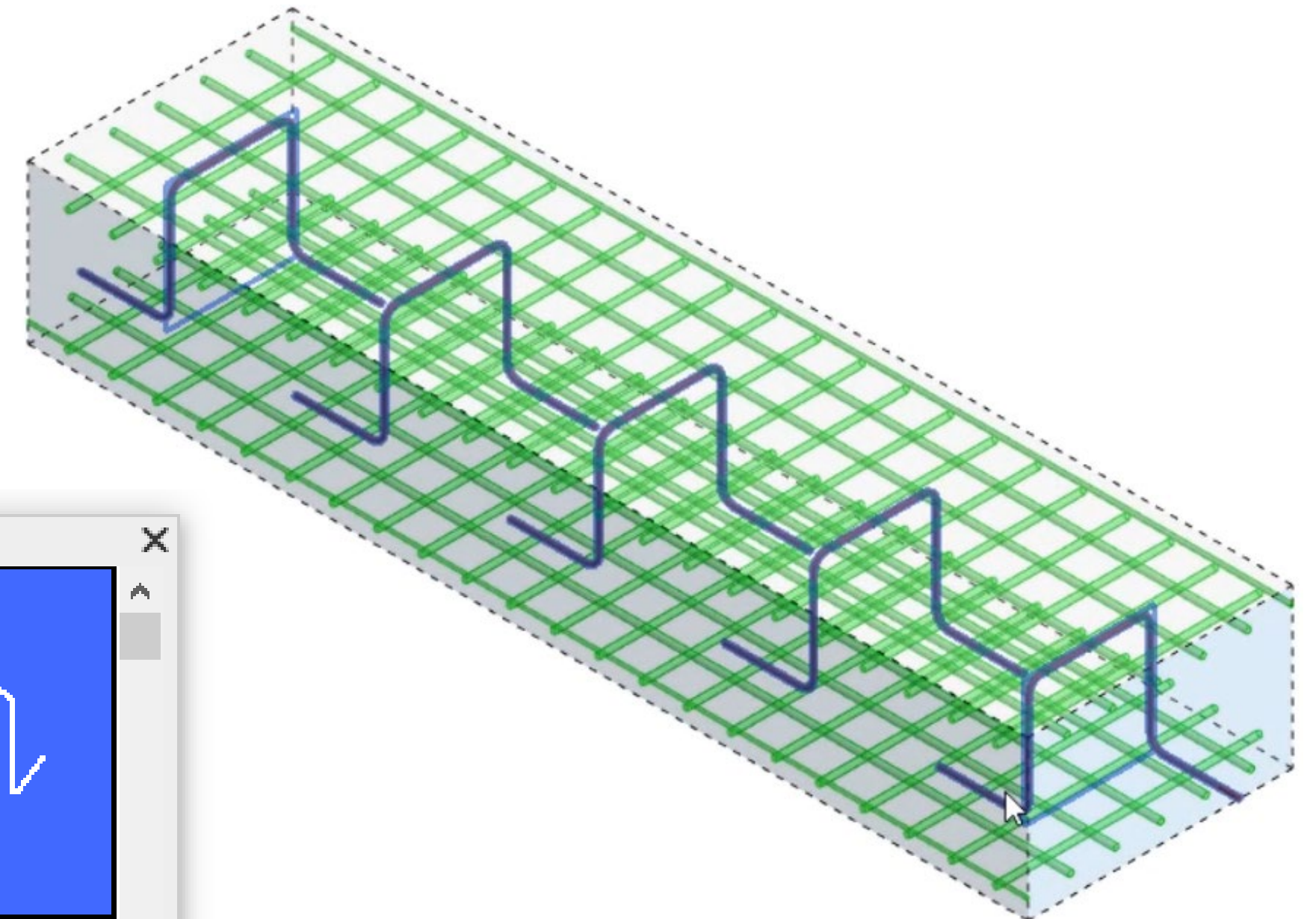
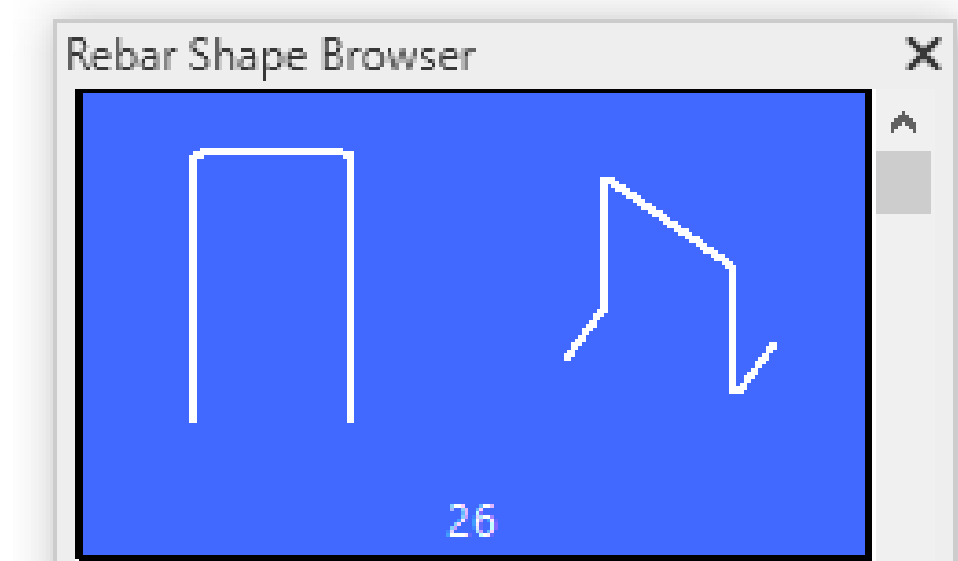
1 : 20

Rebar Schedule 2 X

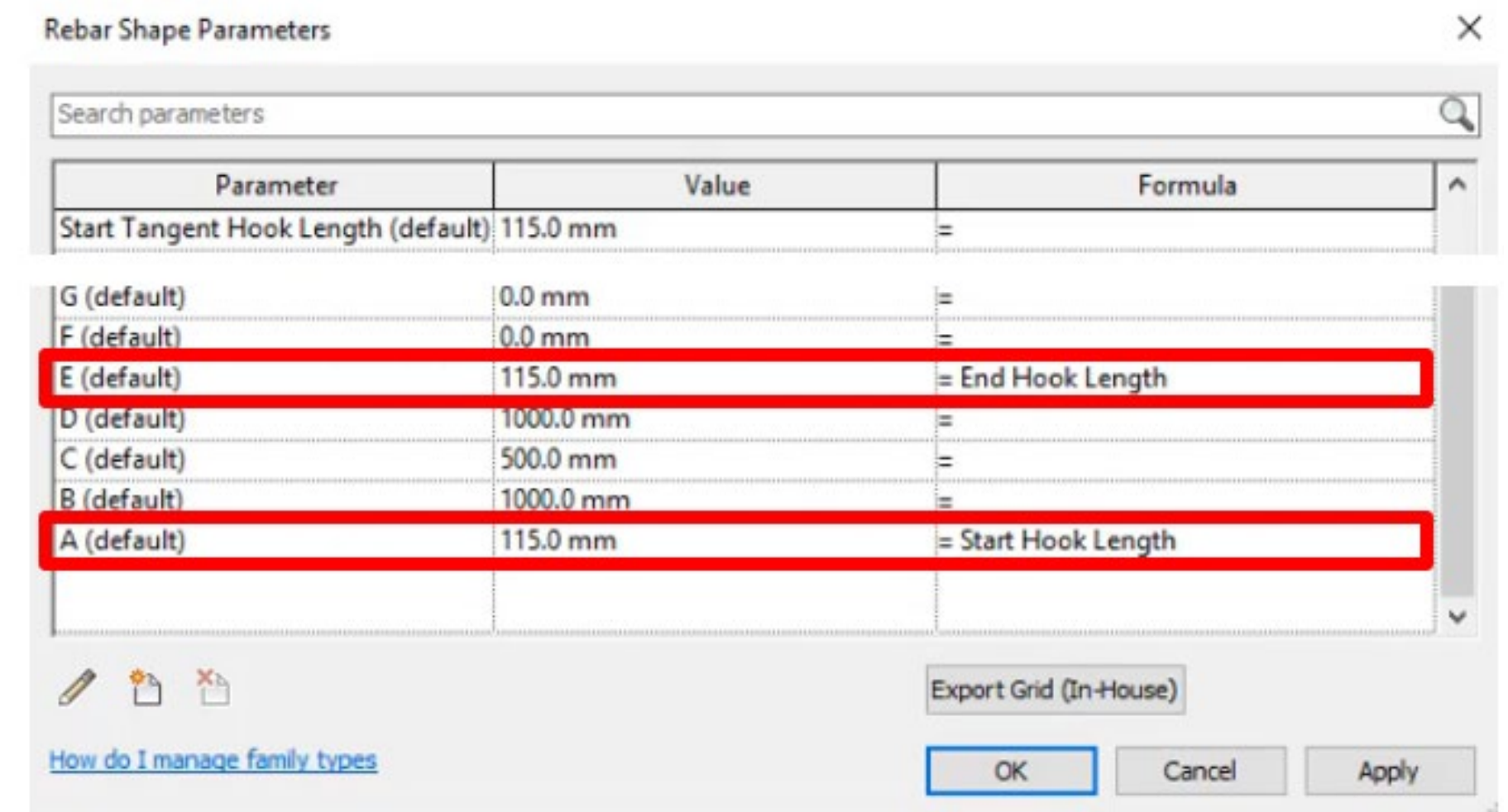
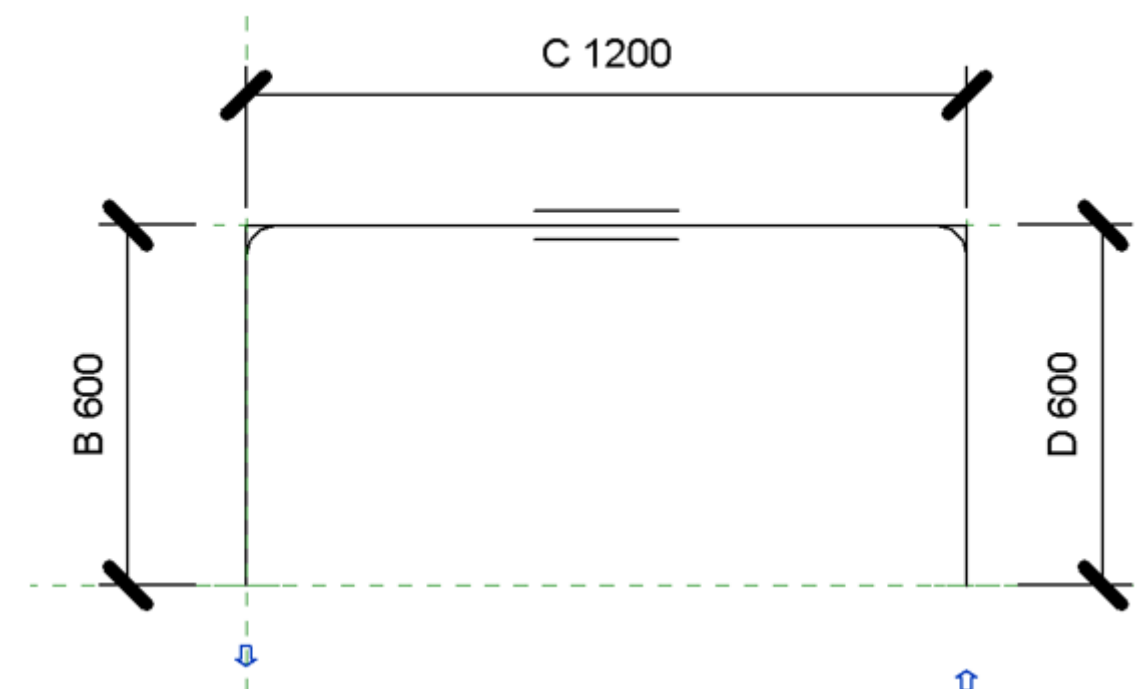
<Rebar Schedule 2>						
A	B	C	D	E	F	G
Rebar Number	Shape	Check Shape	A	B	C	D
44	M_17	Yes	0 mm	490 mm	1520 mm	490 mm
46	M_17	Yes	0 mm	490 mm	1290 mm	490 mm
45	M_17	No	0 mm	490 mm	580 mm	490 mm

21. Create a rebar chair by rotating hooks

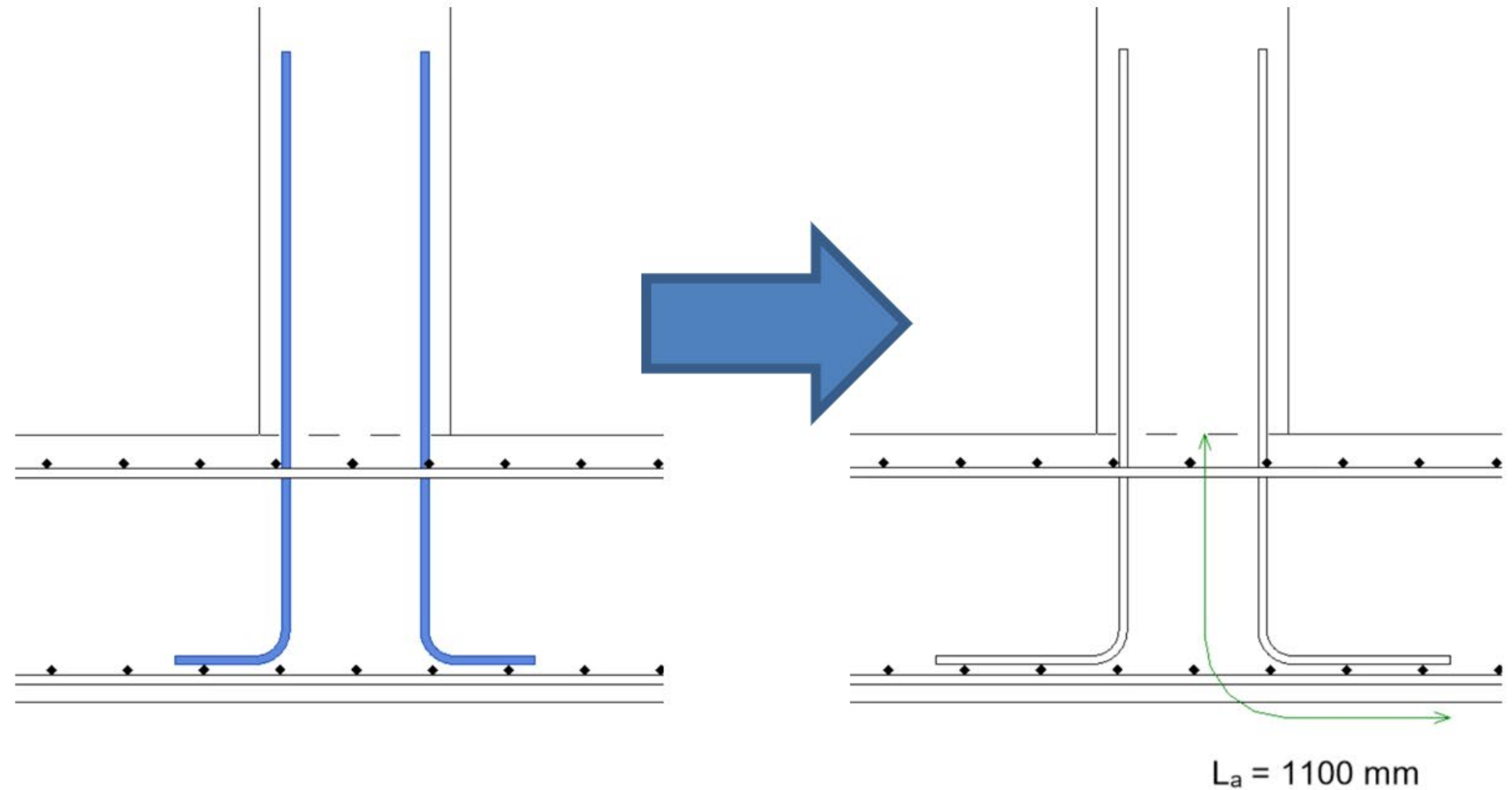
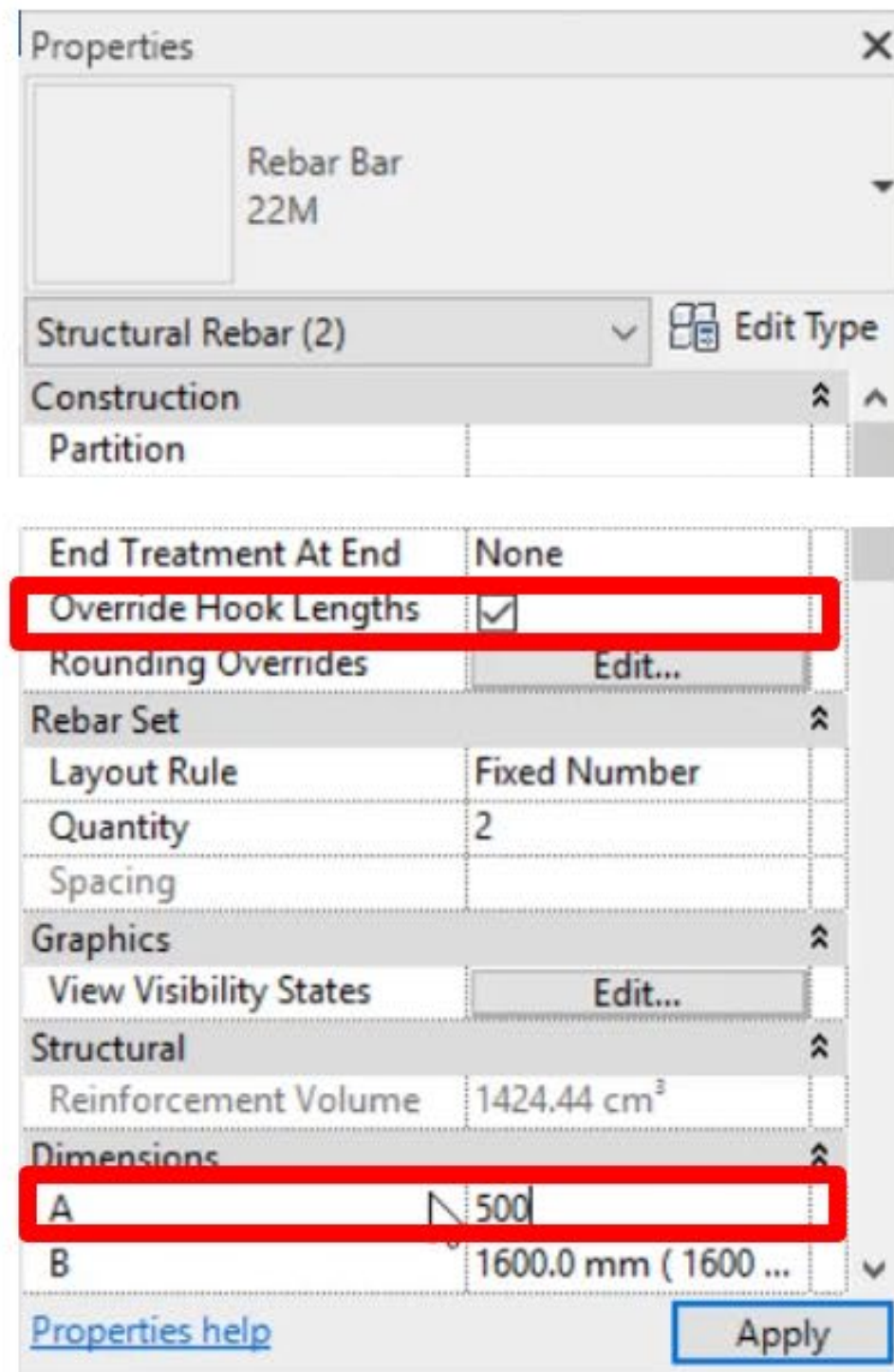
- Create a U shape bar, by sketching or placing an existing shape
- Add 90 deg hooks at each end
- Rotate one hook to 90 degrees and the other to 270 degrees



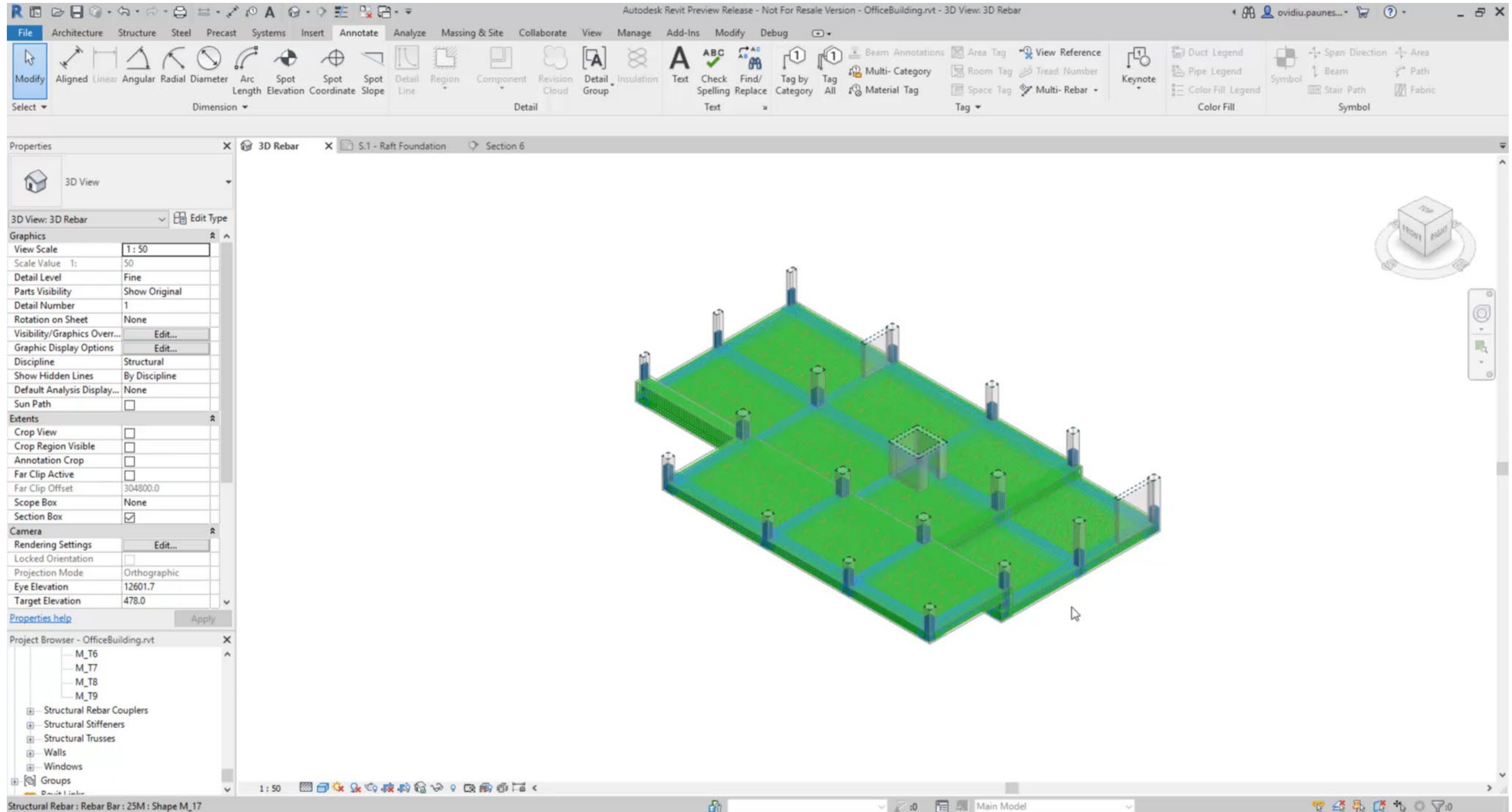
- Configure the parameters reporting the hook lengths by editing the shape family



22. Override hook lengths by instance

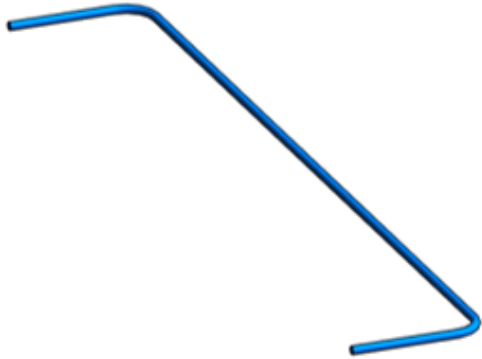
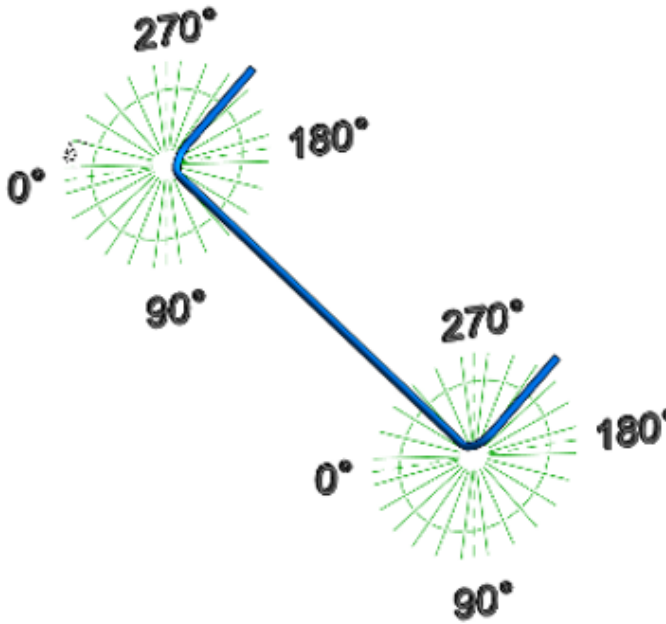
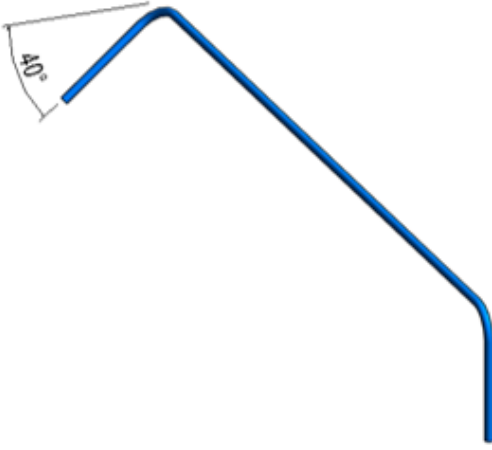
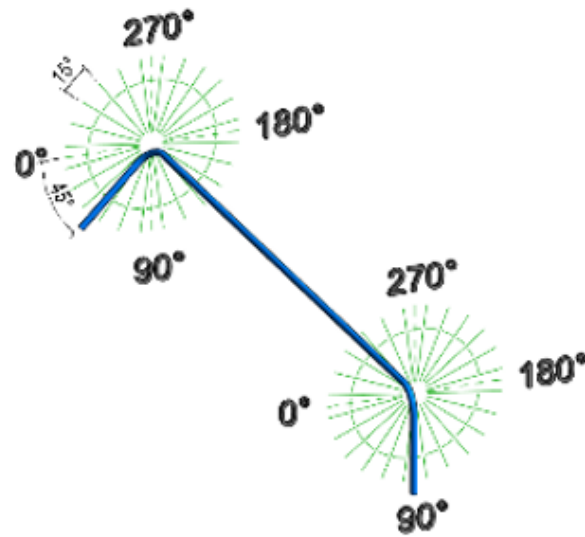


22. Override hook lengths by instance

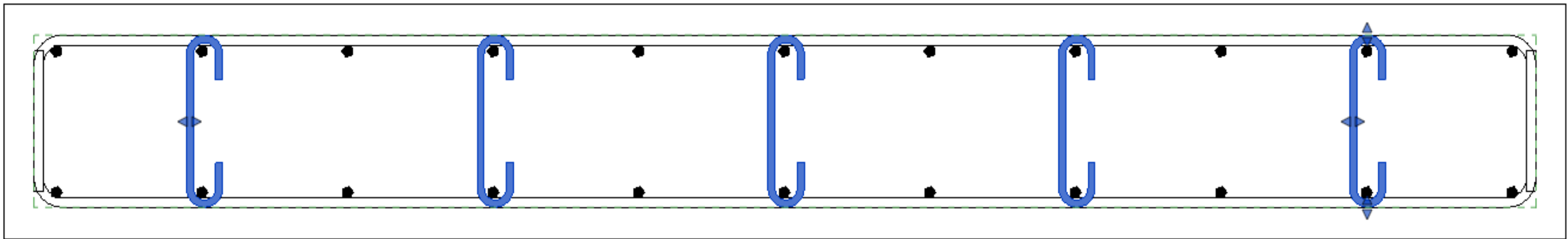


23. Hook rotations and rebar shape matching

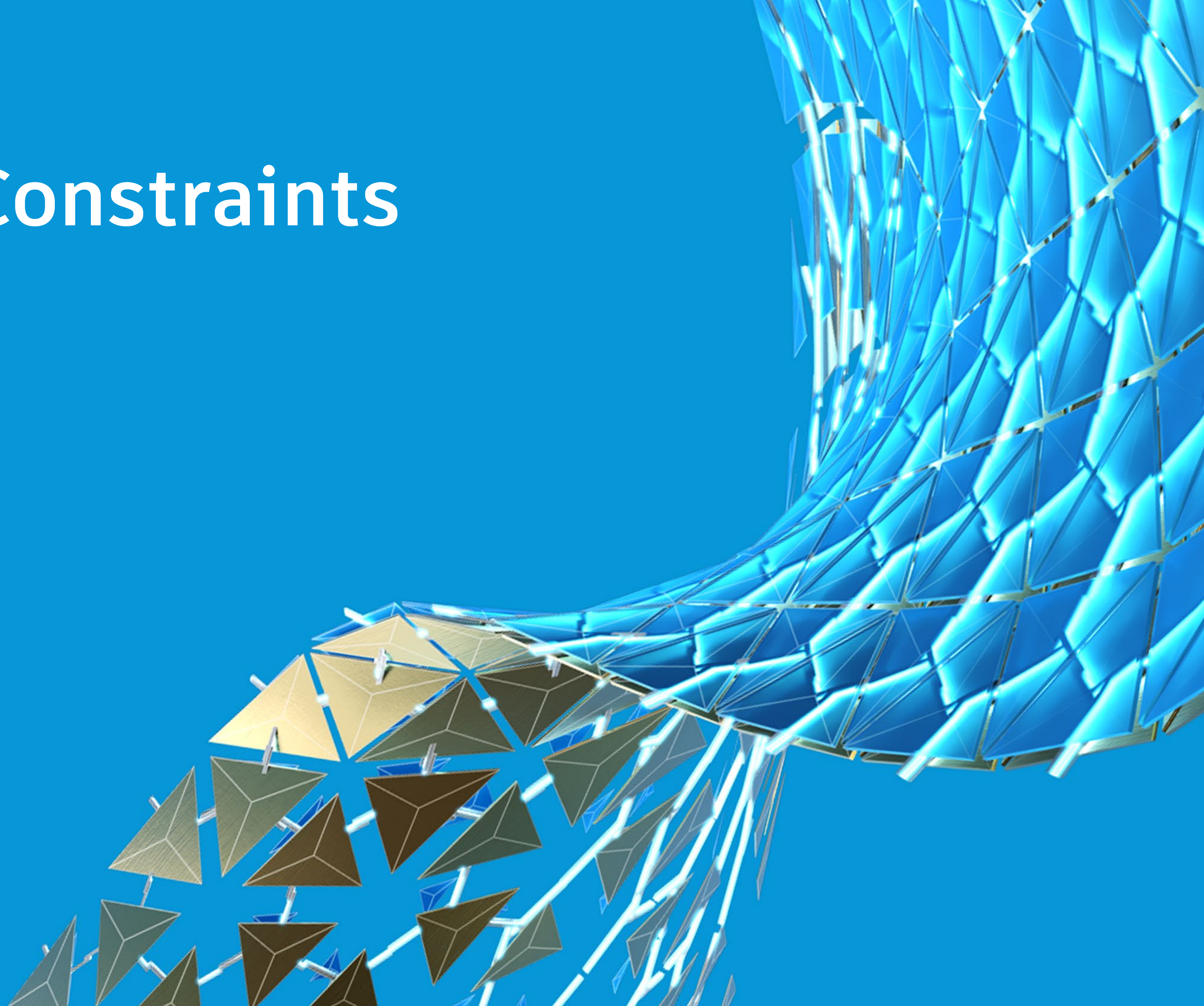
- A new shape is created at each 15-degree interval, unless the hooks have the same rotation
- The Rebar Number is updated for each change of the rotation

				
Rebar Number	1	1	3	4
Shape	02	02	Rebar Shape 1	Rebar Shape 1
Hook Rotation at Start	0°	230°	40°	45°
Hook Rotation at End	0°	230°	90°	90°

- **Example** – Wall ties to the vertical bars (hooks rotated 90 deg)

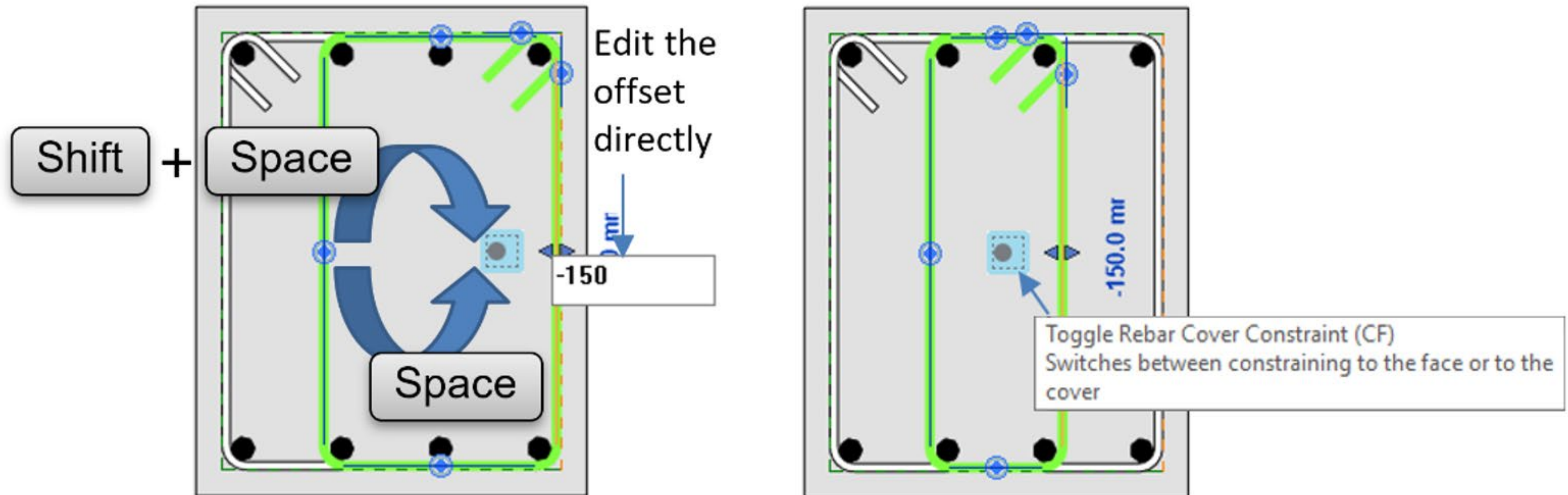


Edit Rebar Constraints

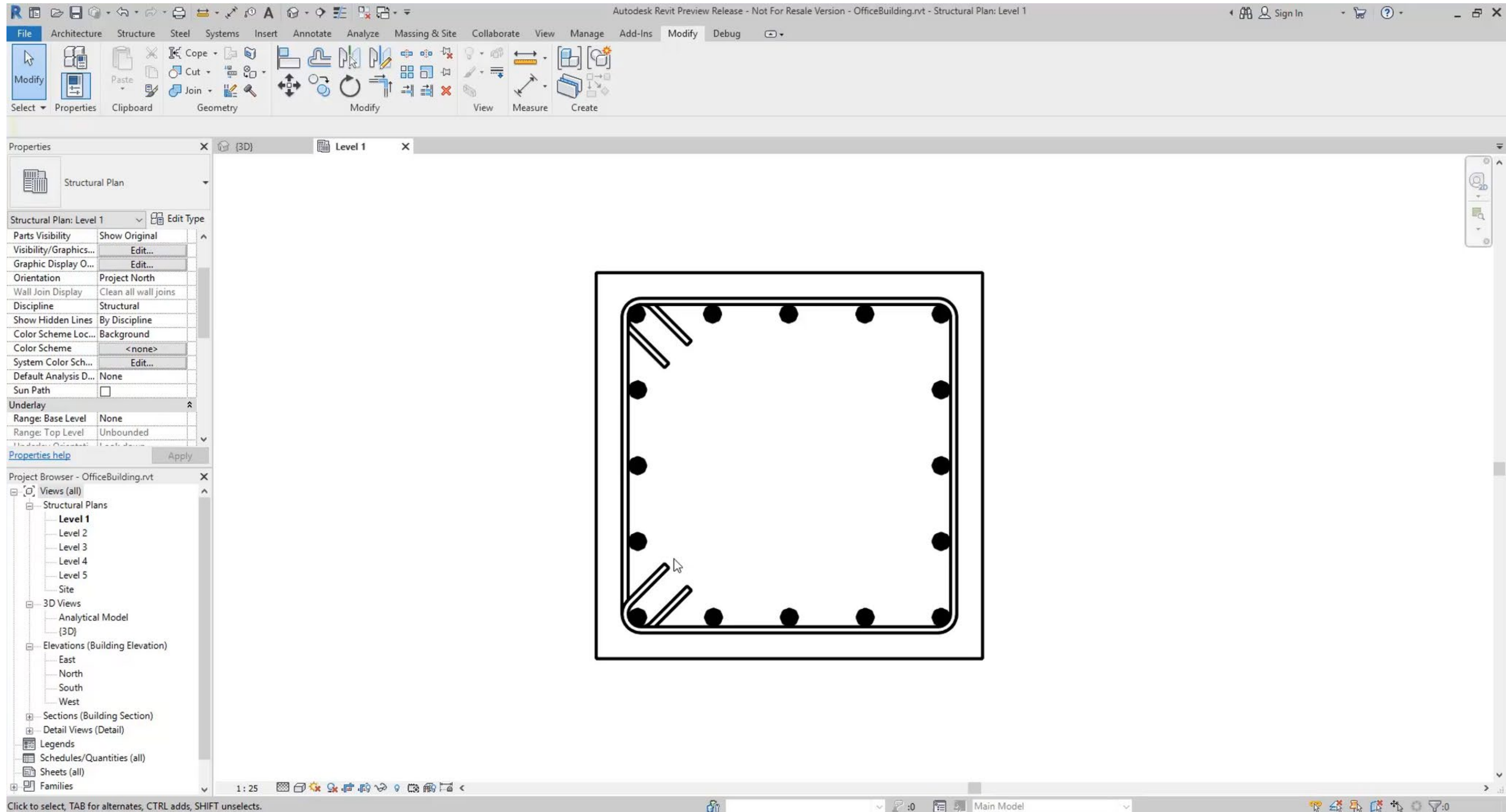


24. Navigate rebar constraints editing faster

- Space bar to cycle between the visible handles (Shift + Space cycles the opposite way),
- Enter to Finish editing. Esc to Cancel
- Shortcut keys for controls (e.g. Cover or face – CF)
- Direct input of offset



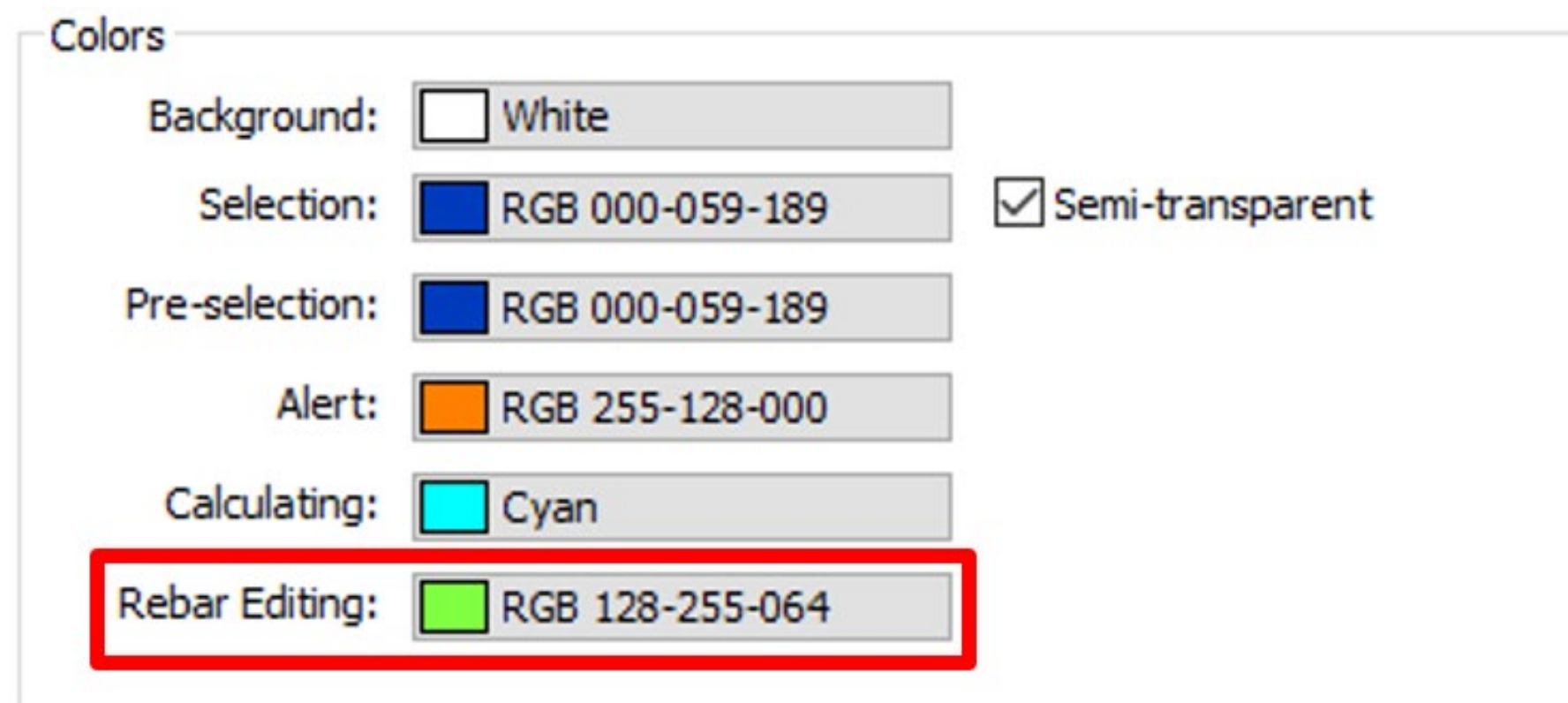
24. Navigate rebar constraints editing faster



25. Change the highlight color of the edited bar during Edit Constraints

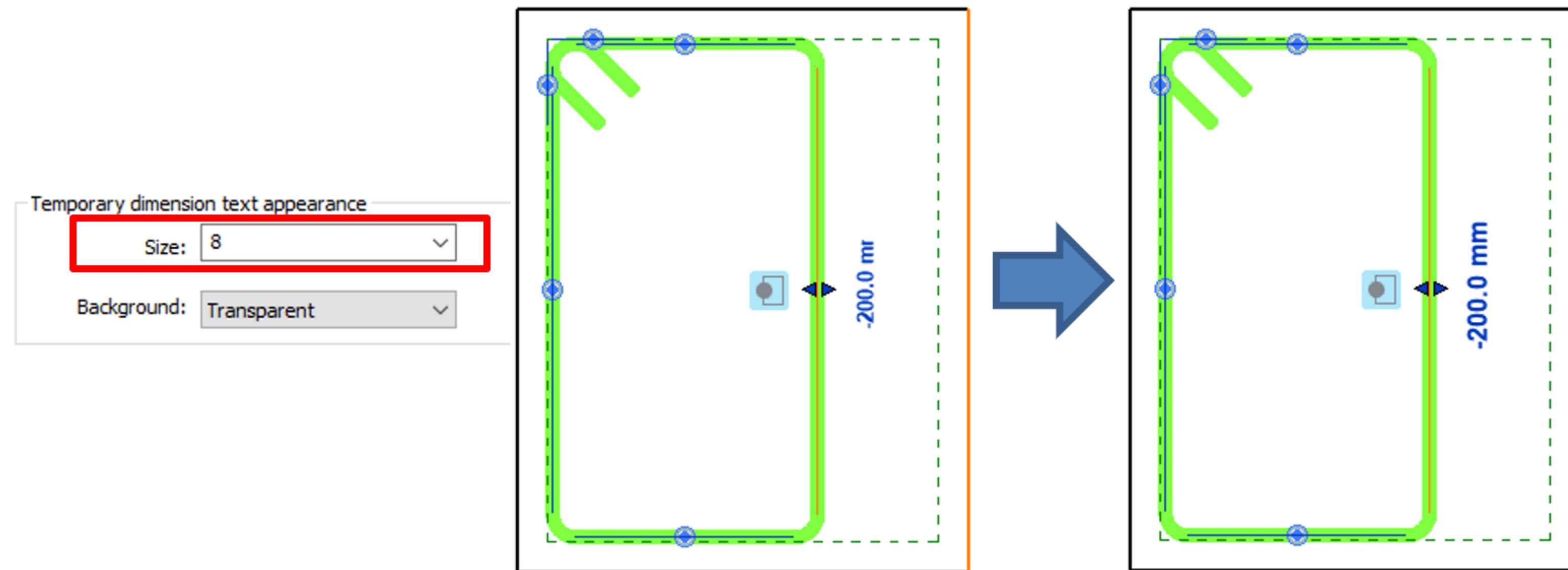
Go to Application menu > Options > select Graphics > Colors panel > Rebar Editing

The default color is **Green RGB 128-255-064** and it's stored in Revit.ini

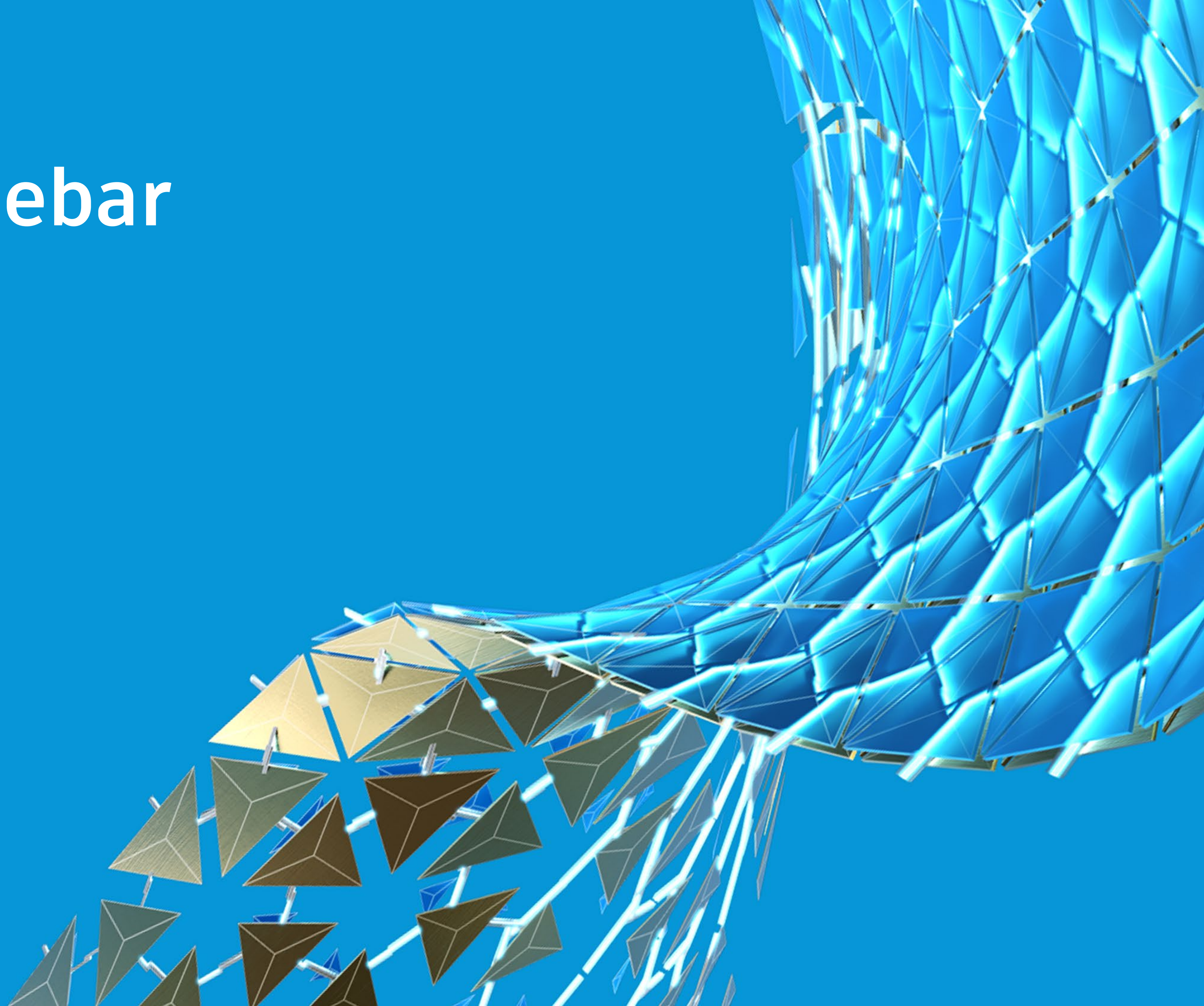


26. Change the text size of the offset control during Edit Constraints

Application menu > Options > select Graphics > Temporary dimension text appearance panel



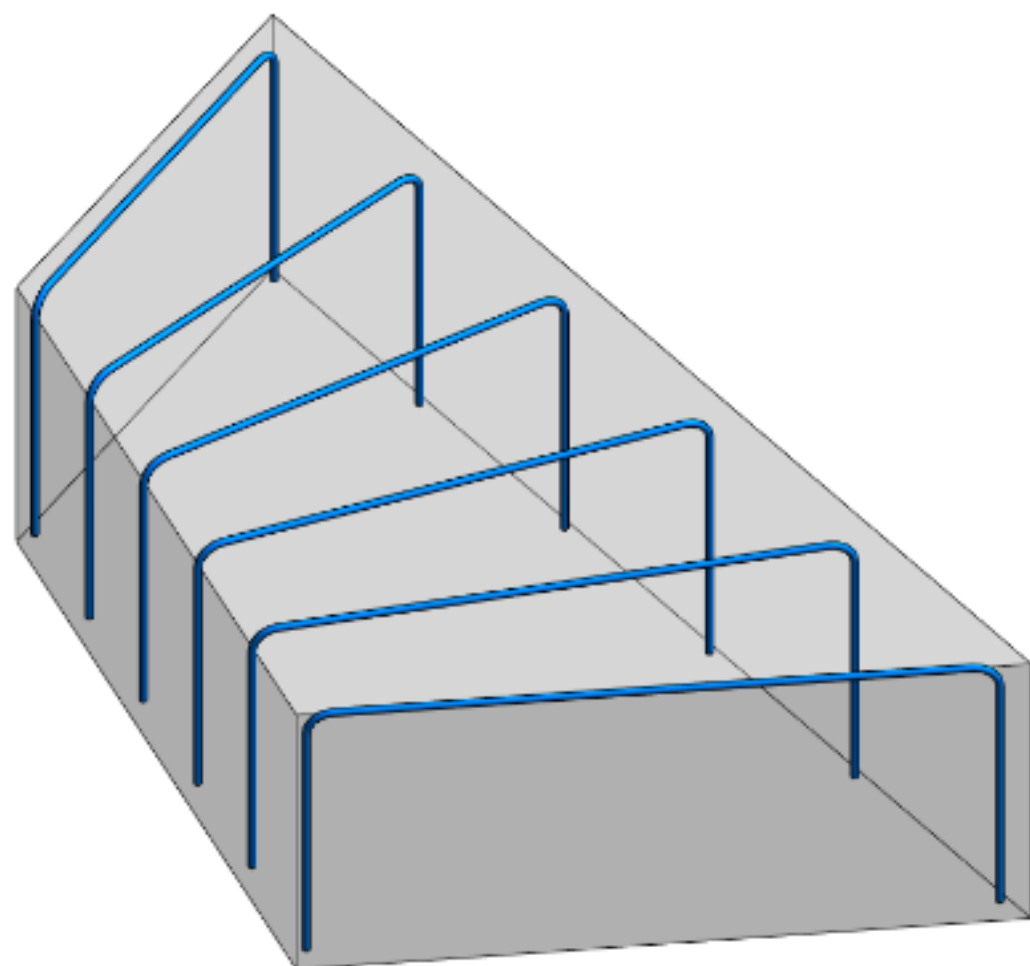
Free Form Rebar

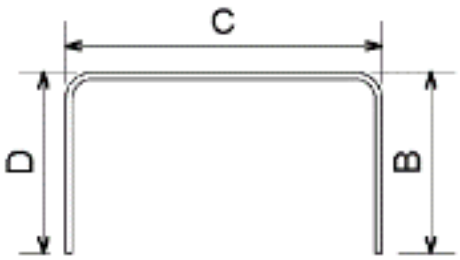


27. Matching free form rebar to regular rebar shapes

You can specify if a free form bar will be bent in the shop by changing its Workshop Instructions parameter to Bend.

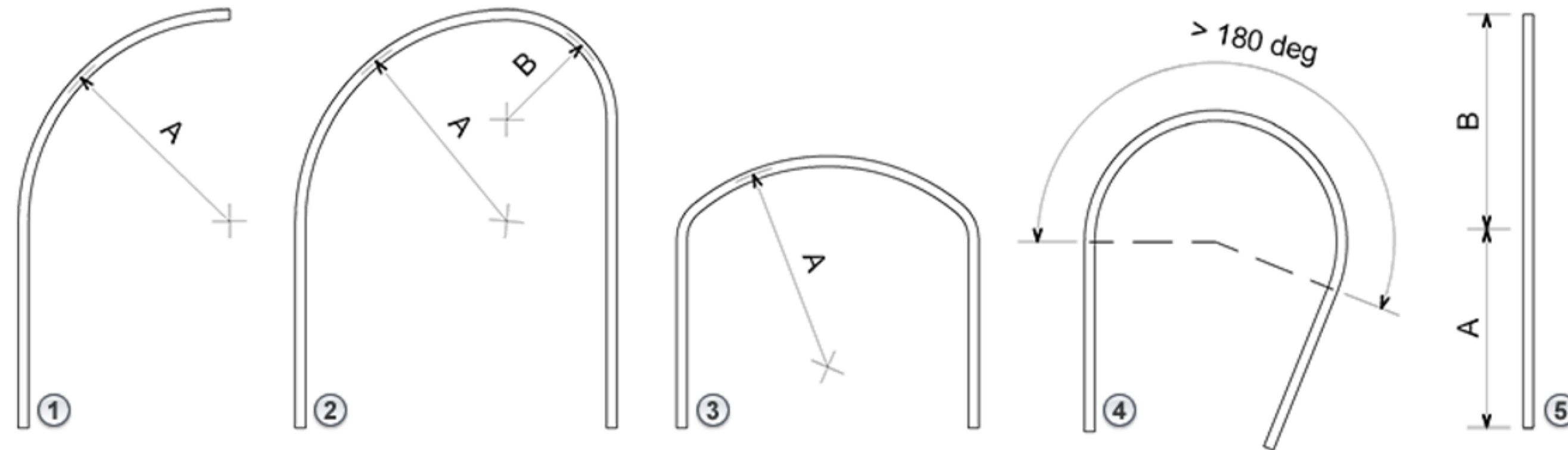
- You can edit the segment length parameters (A, B, C) of the matched rebar shape by locating the shape in the Project Browser, edit the shape family and assign the desired parameters.



Rebar Schedule									
Rebar Number	Type	Workshop Instructions	Shape	Quantity	Bar Length	Shape Image	B	C	D
1	25M	Bend	M_17	6	3530 mm ... 4410 mm		1110 mm	1450 mm ... 2320 mm	1110 mm

27. Matching free form rebar to regular rebar shapes

The free form bar will revert to Keep Straight if the bar geometry of at least one bar in the set does not follow the rebar shape family rules outlined below



Geometry that is not allowed in rebar shape families:

- ① Shaped ending in an arc.
- ② Consecutive arcs.
- ③ Arcs not tangent to adjacent segments.
- ④ Arcs greater than 180 degrees between adjacent segments.
- ⑤ Almost collinear adjacent segments.

28. One set, many different shapes

Free form bars in the same set can match to different rebar shapes.

Rebar Bar
13M

Structural Rebar (1) Edit Type

Construction

Partition

S

Rebar Number

Schedule Mark

3

Workshop Instructions

Bend

Geometry

Free Form

Style

Standard

Stirrup/Tie Attachment

Interior Face of Cover Re...

Shape

Shape Image

<None>

Hook At Start

None

Hook At End

Standard - 90 deg.

Rounding Overrides

Edit...

Hook Orientation At Start

0.00°

Hook Orientation At End

0.00°

End Treatment At Start

None

End Treatment At End

None

Rebar Set

Layout Rule

Fixed Number

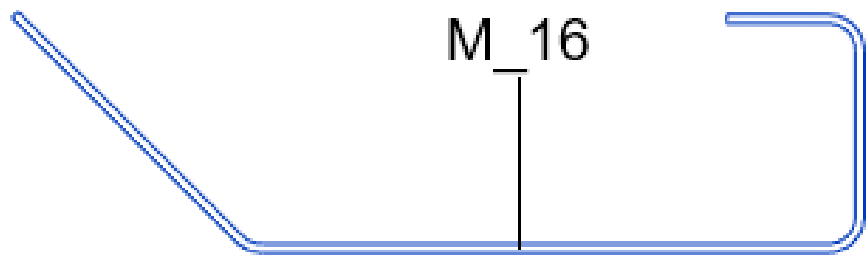
Quantity

2

Spacing

Hooks		
Shape	Hook At Start	Hook At End
M_16	None	Standard - 90 deg.
Rebar Shape 1	Standard - 90 deg.	None

Free Form Set



Non-symmetrical

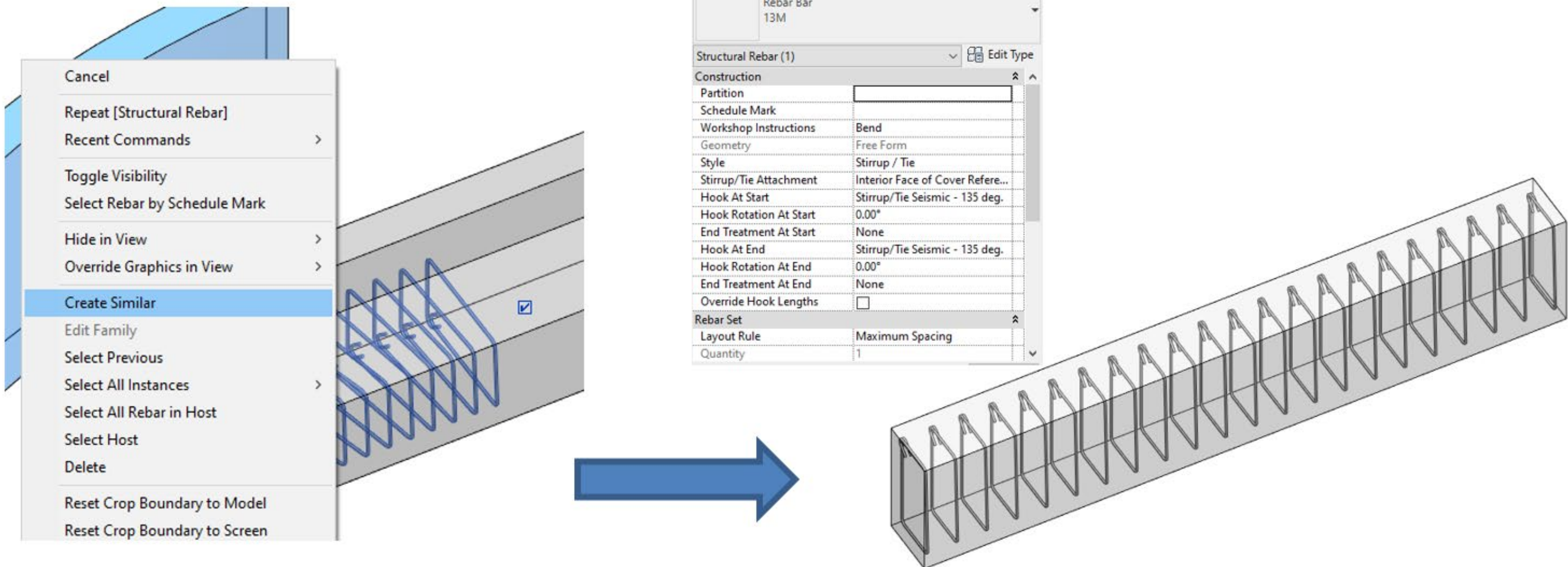


Symmetrical

29. Create Similar with all options for free form rebar

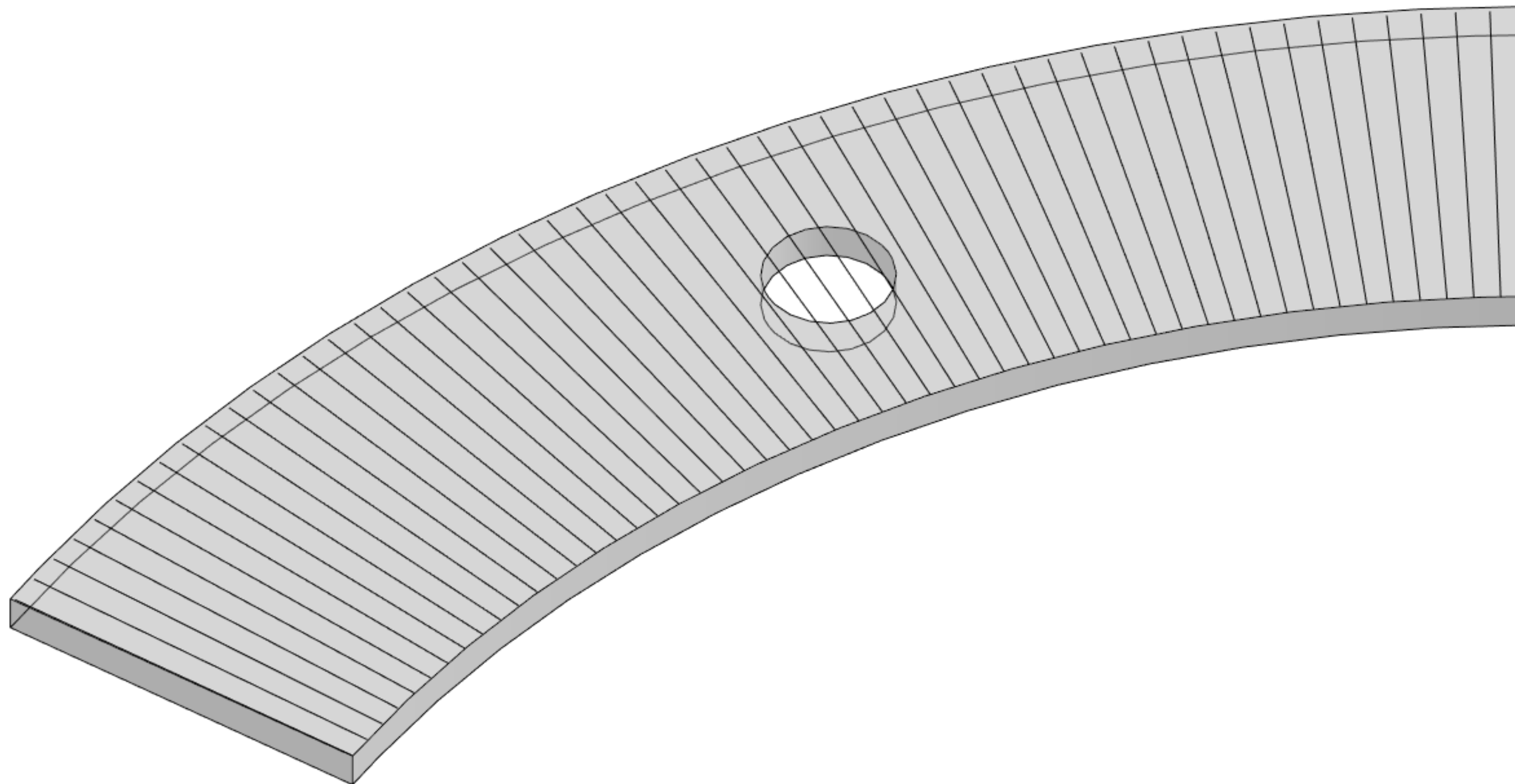
Select a free form rebar set > Create Similar

- All options are set for the new bar – Distribution type (Surface or Aligned), Rebar Type, Set Layout, Hooks



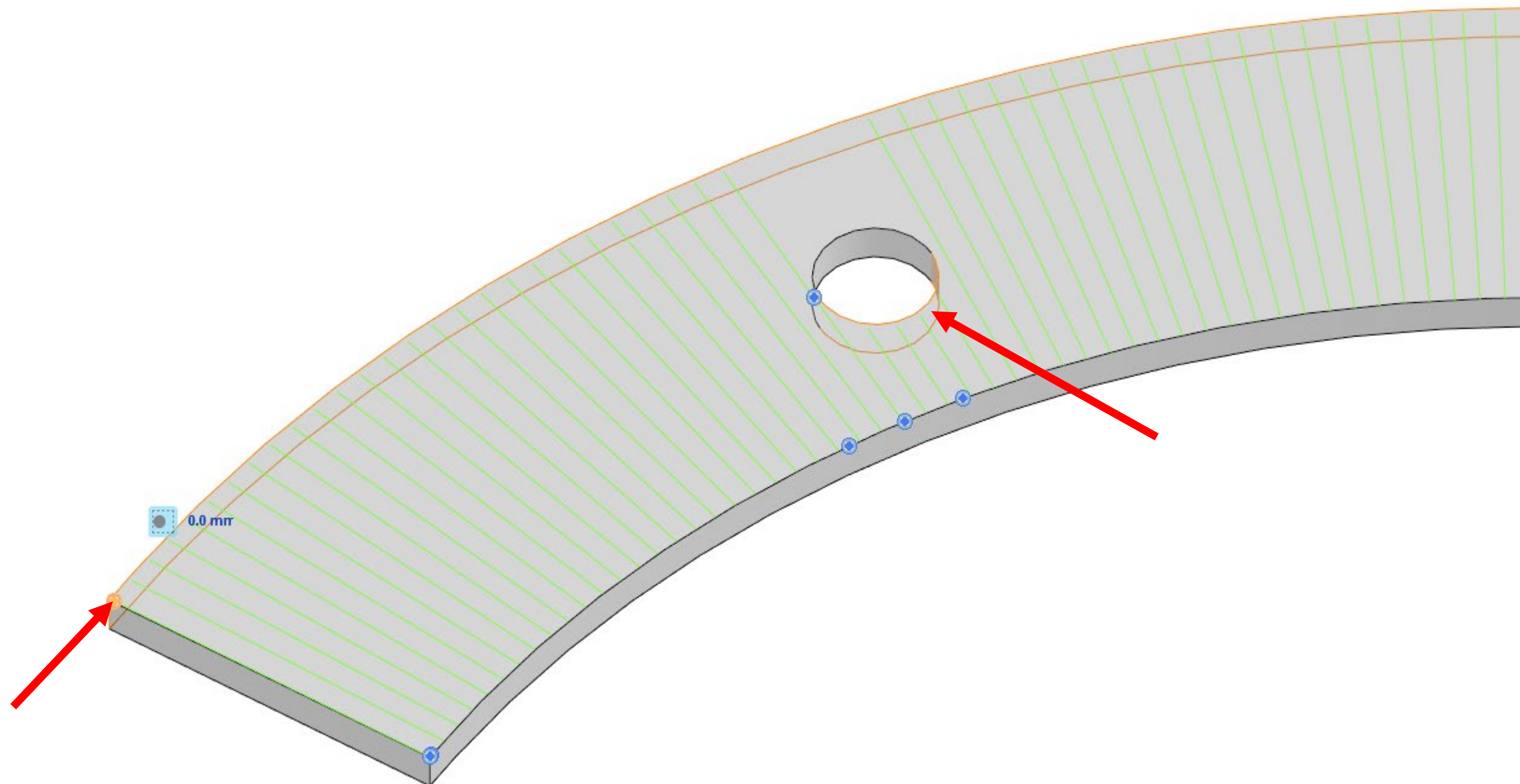
30. Free form rebar and openings

By default free form bars go through openings.



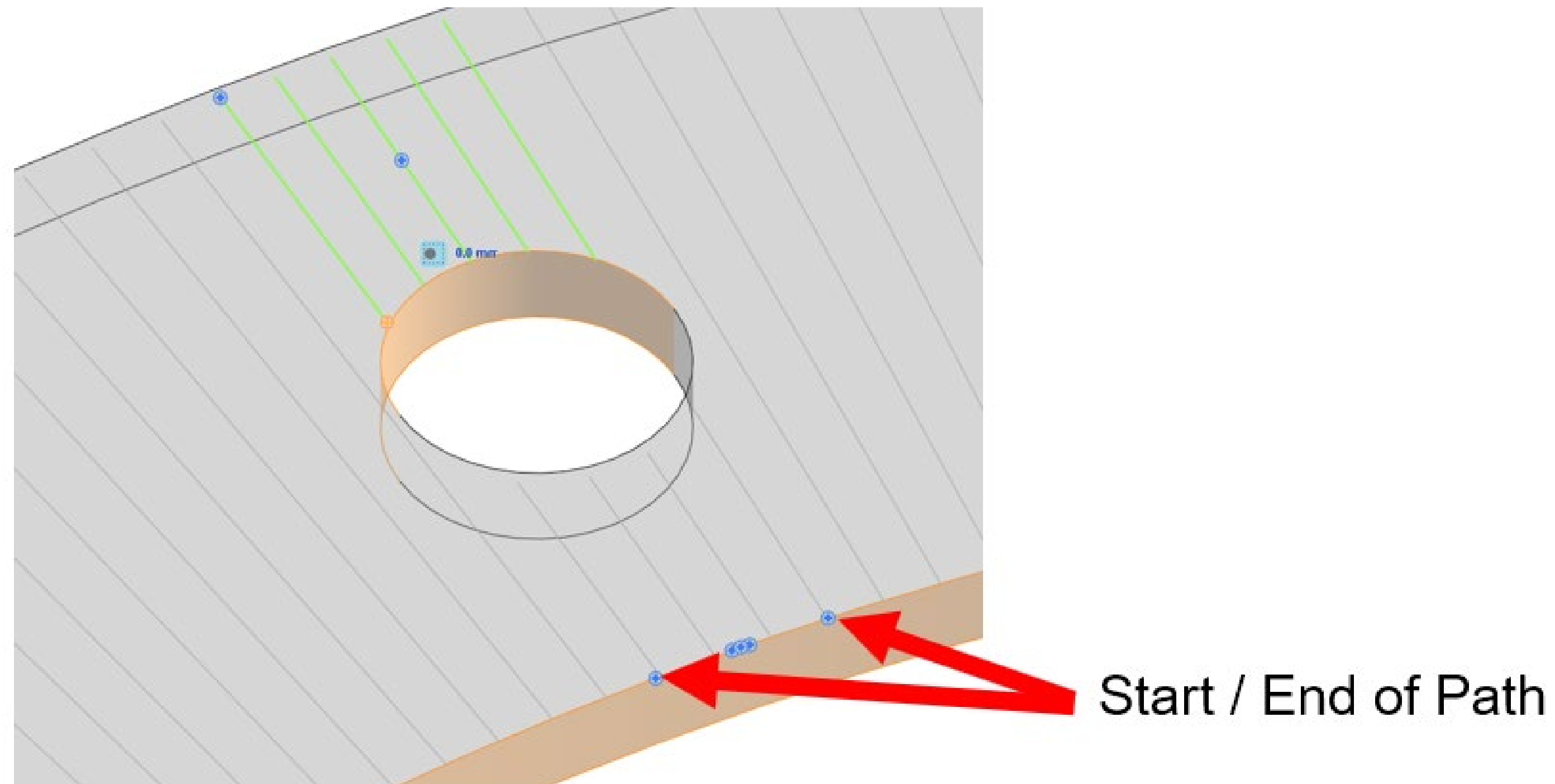
30. Free form rebar and openings

To stop the bars at the face of the opening (concrete cover), you need to trim one of the ends to the face of the opening, by using Edit Constraints



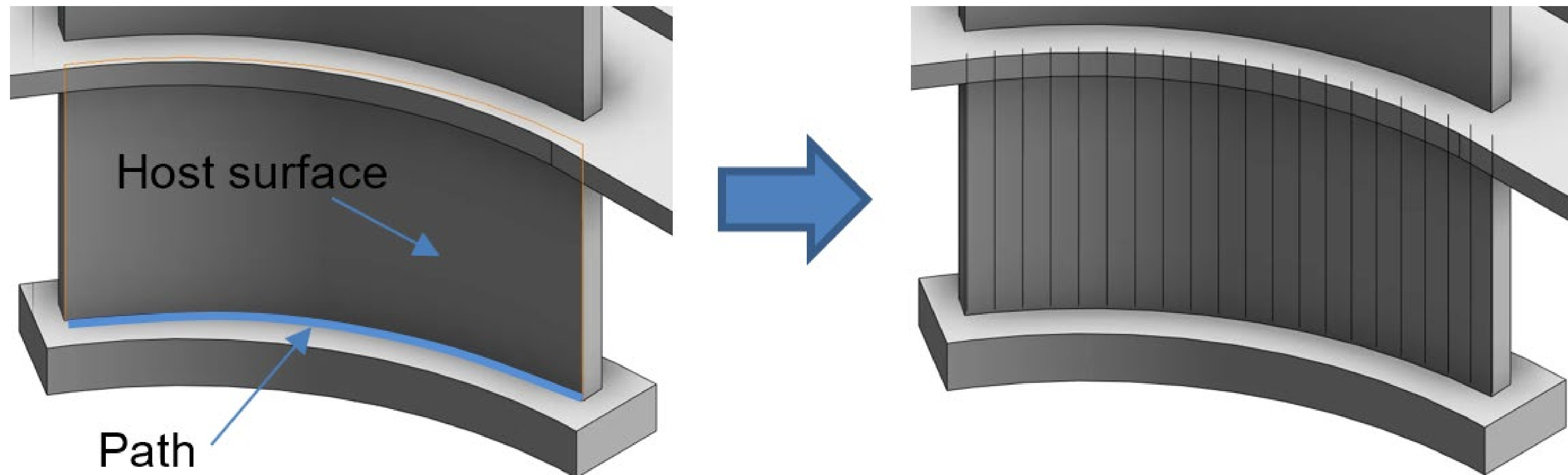
30. Free form rebar and openings

To add the missing bars, you can create another set, drag it back from the ends (of the path) or use some additional geometry to define the bars next to the opening.



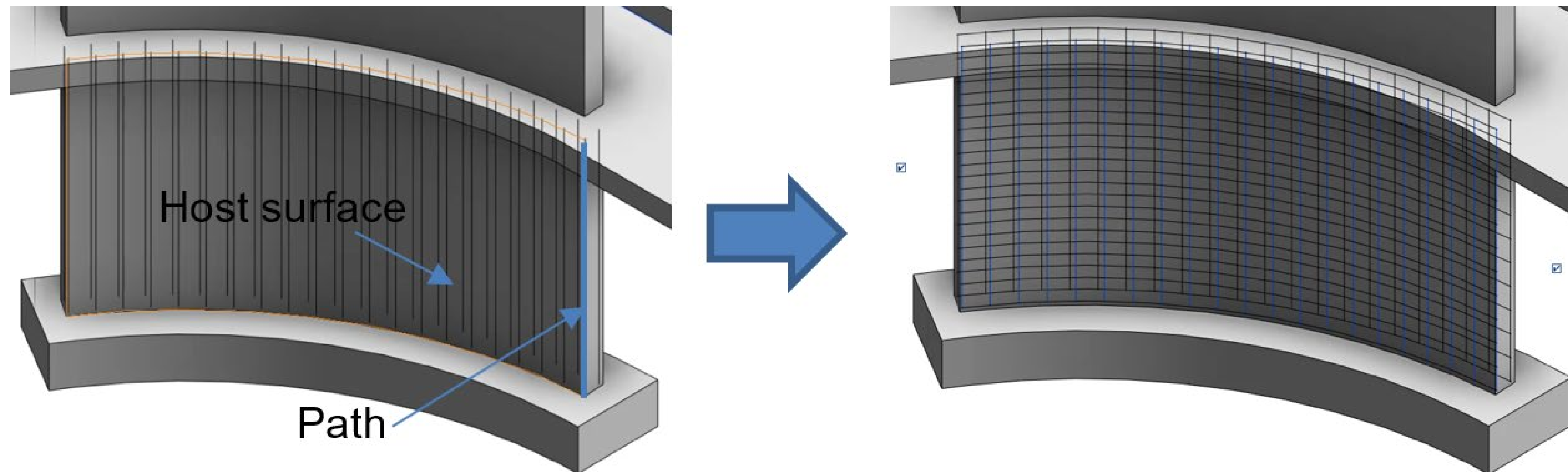
31. Use aligned distribution to create sets in curved walls

Vertical reinforcement > Horizontal path

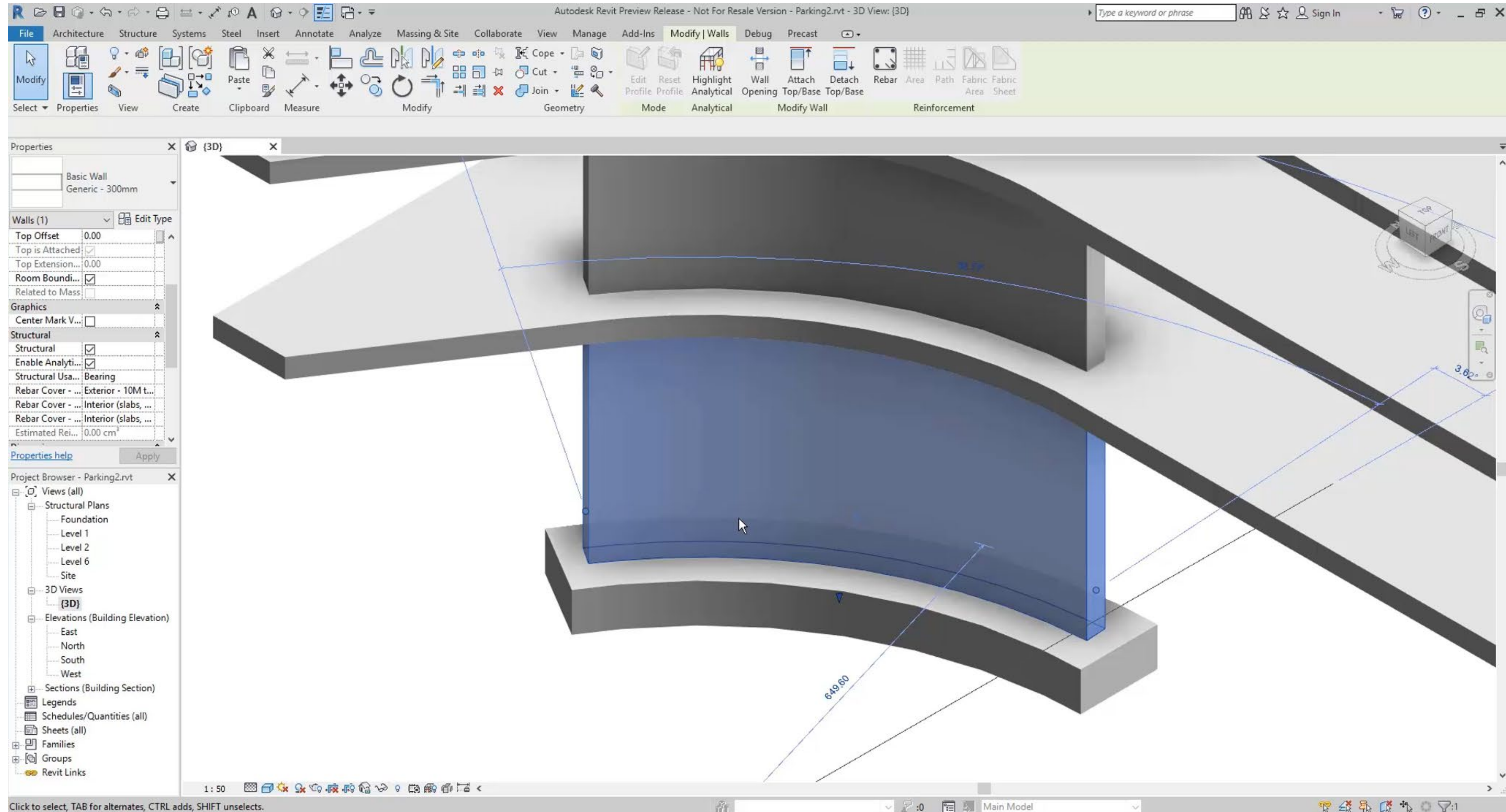


31. Use aligned distribution to create sets in curved walls

Horizontal reinforcement > Vertical Path



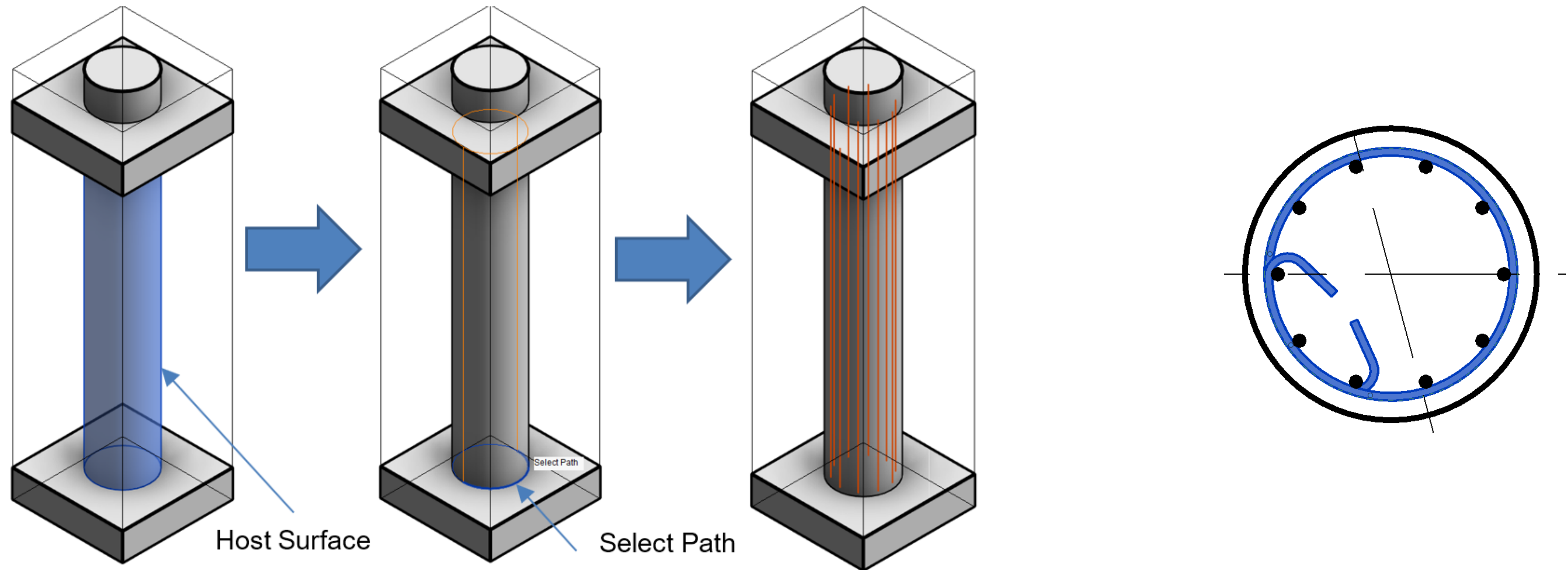
31. Use aligned distribution to create sets in curved walls



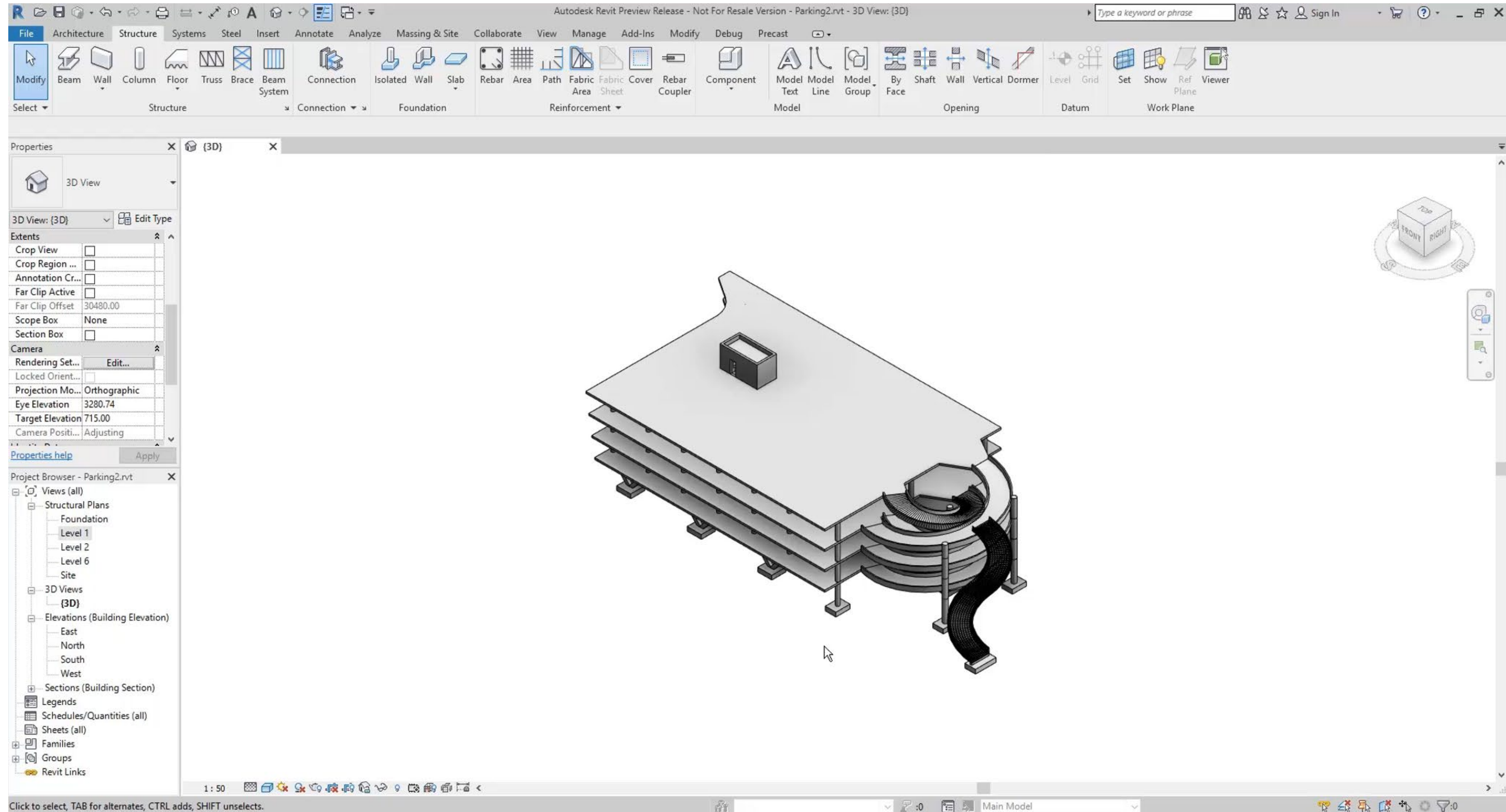
32. Place vertical bars and stirrups in round column

The vertical bars can be modeled as a set, which reacts to changes of the column size

For the stirrups, shape driven rebar also works, while for free form the vertical path needs to be selected

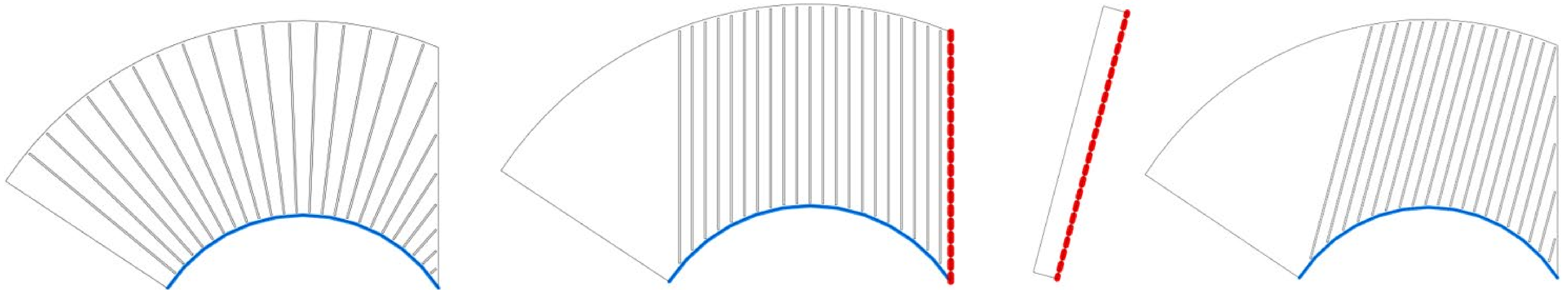


32. Place vertical bars and stirrups in round column



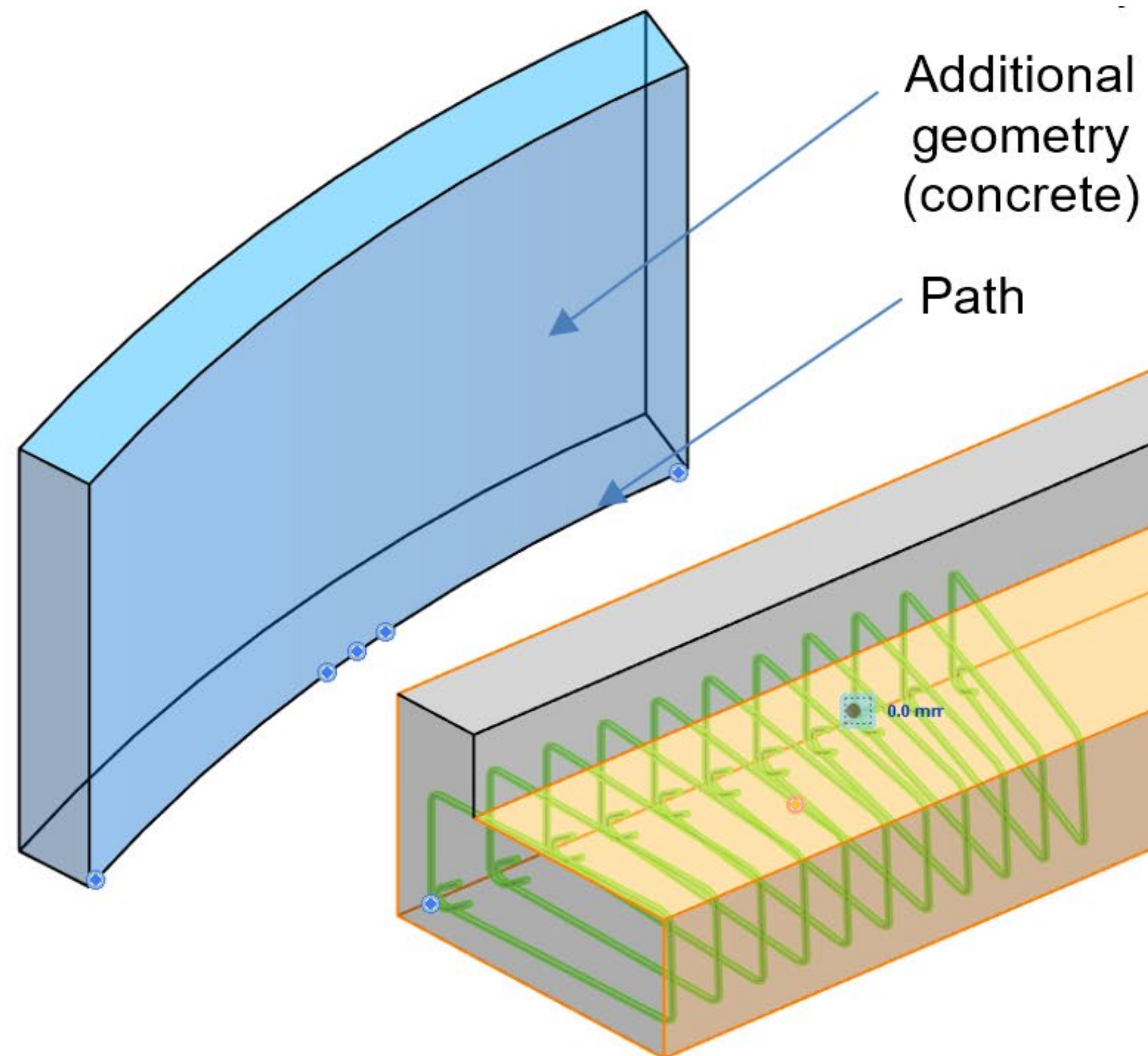
33. Make the bars in an aligned distribution parallel to a concrete face



- Select an aligned distribution set
- Edit Constraints and select the **Align / Close bar handle**
- **Click a planar face** in the model (must not be parallel or almost parallel to the distribution path)

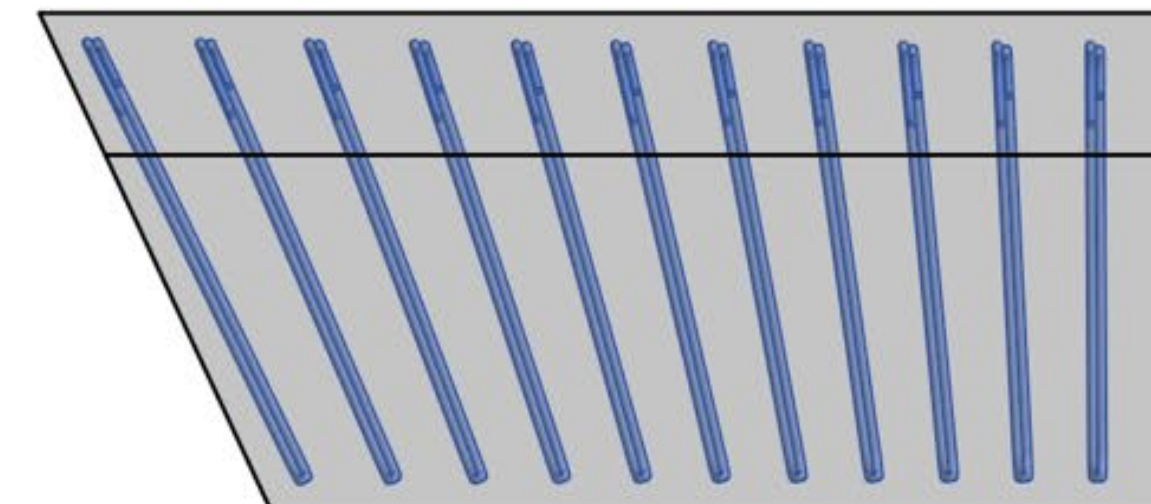


34. Use an external path to fan out bars

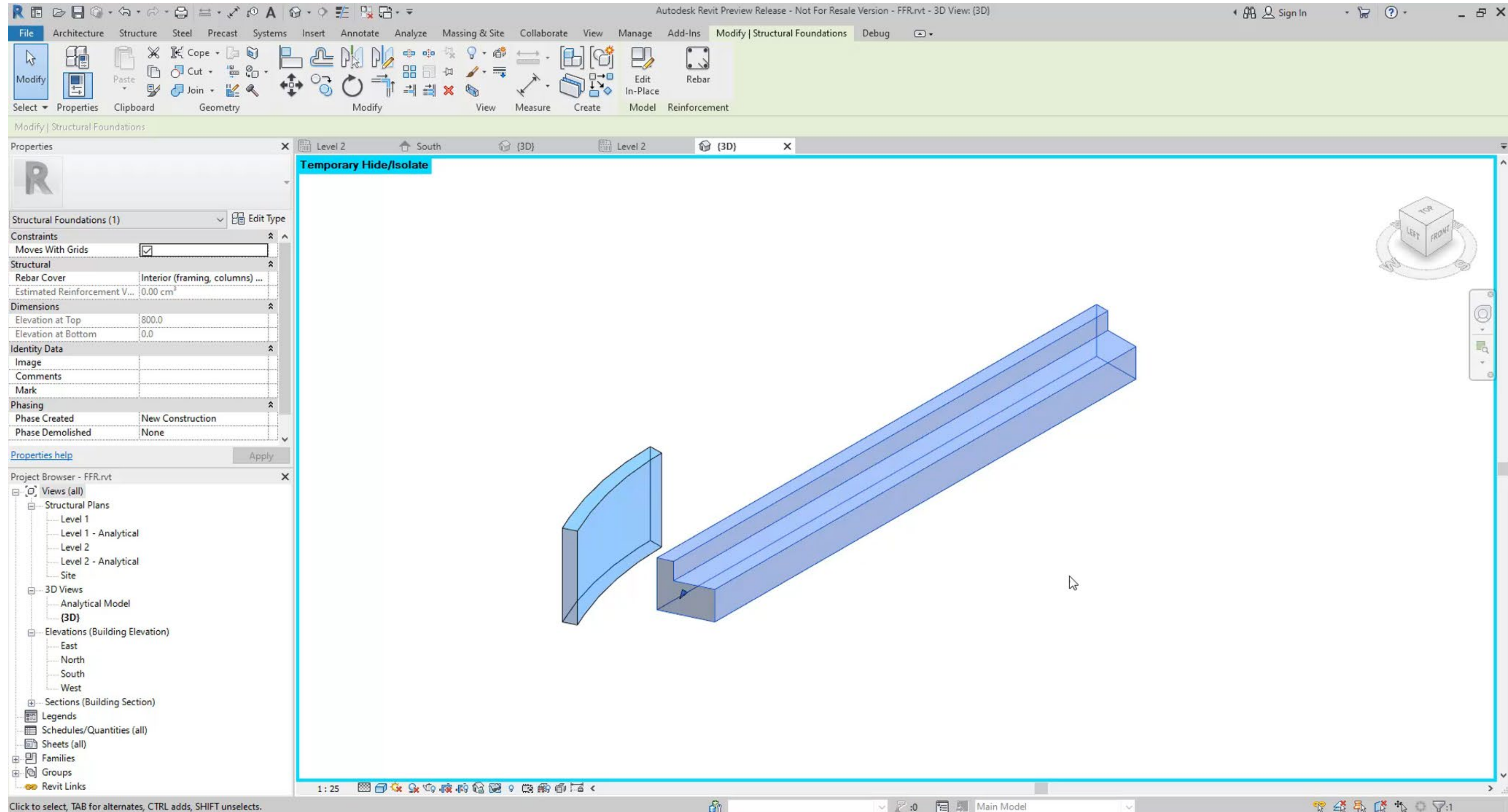
The external path must be an edge of an element that can host rebar



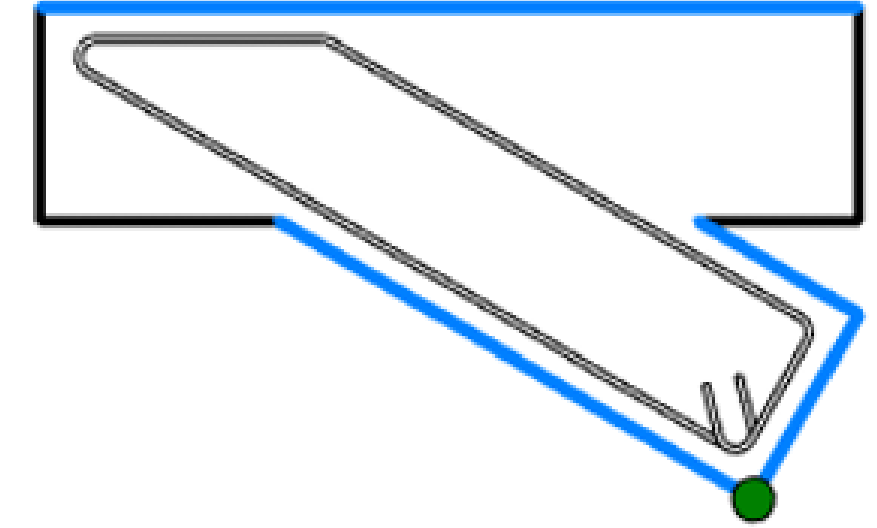
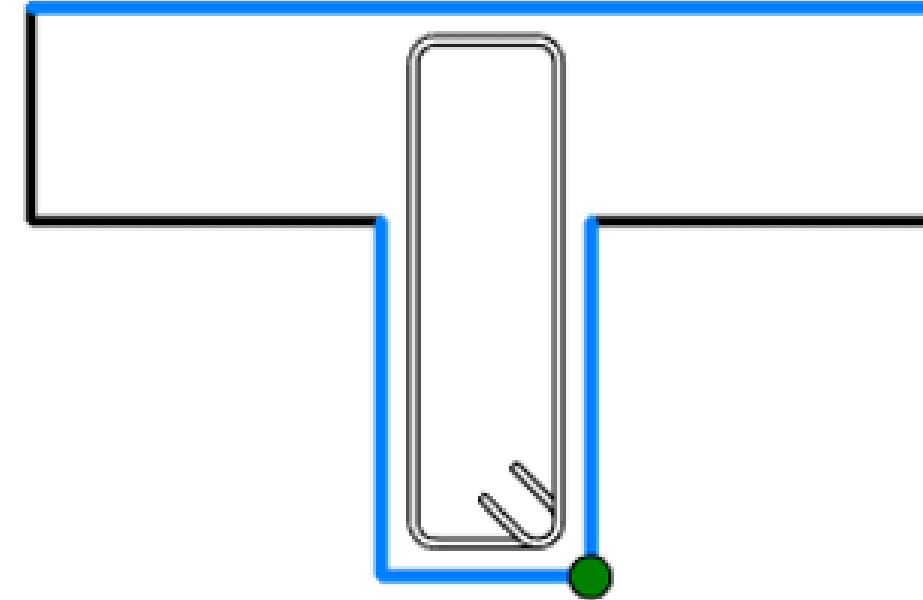
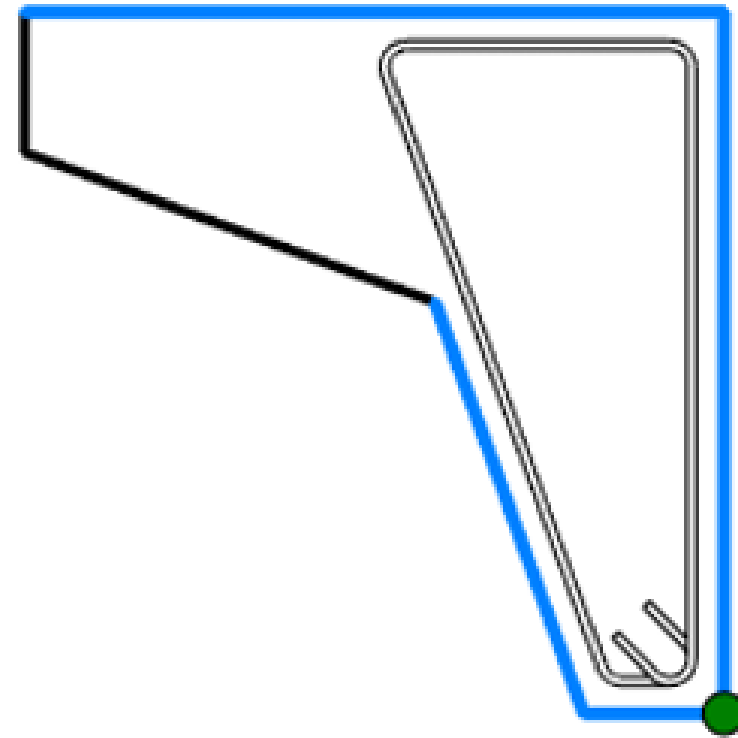
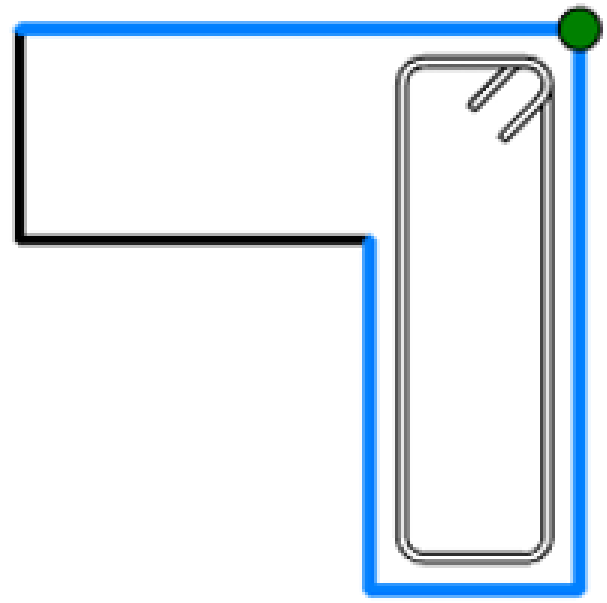
Properties	
Rebar Bar 13M	
Structural Rebar (1)  Edit Type	
Geometry	Free Form
Style	Stirrup / Tie
Stirrup/Tie Attachment	Interior Face of Cover Refere...
Shape	M_T1
Shape Image	<None>
Hook At Start	Stirrup/Tie Seismic - 135 deg.
Hook Rotation At Start	0.00°
End Treatment At Start	None
Hook At End	Stirrup/Tie Seismic - 135 deg.
Hook Rotation At End	0.00°
End Treatment At End	None
Override Hook Lengths	<input type="checkbox"/>
Rounding Overrides	Edit...
Rebar Set 	
Layout Rule	Maximum Spacing
Quantity	11
Spacing	200.0 mm



34. Use an external path to fan out bars

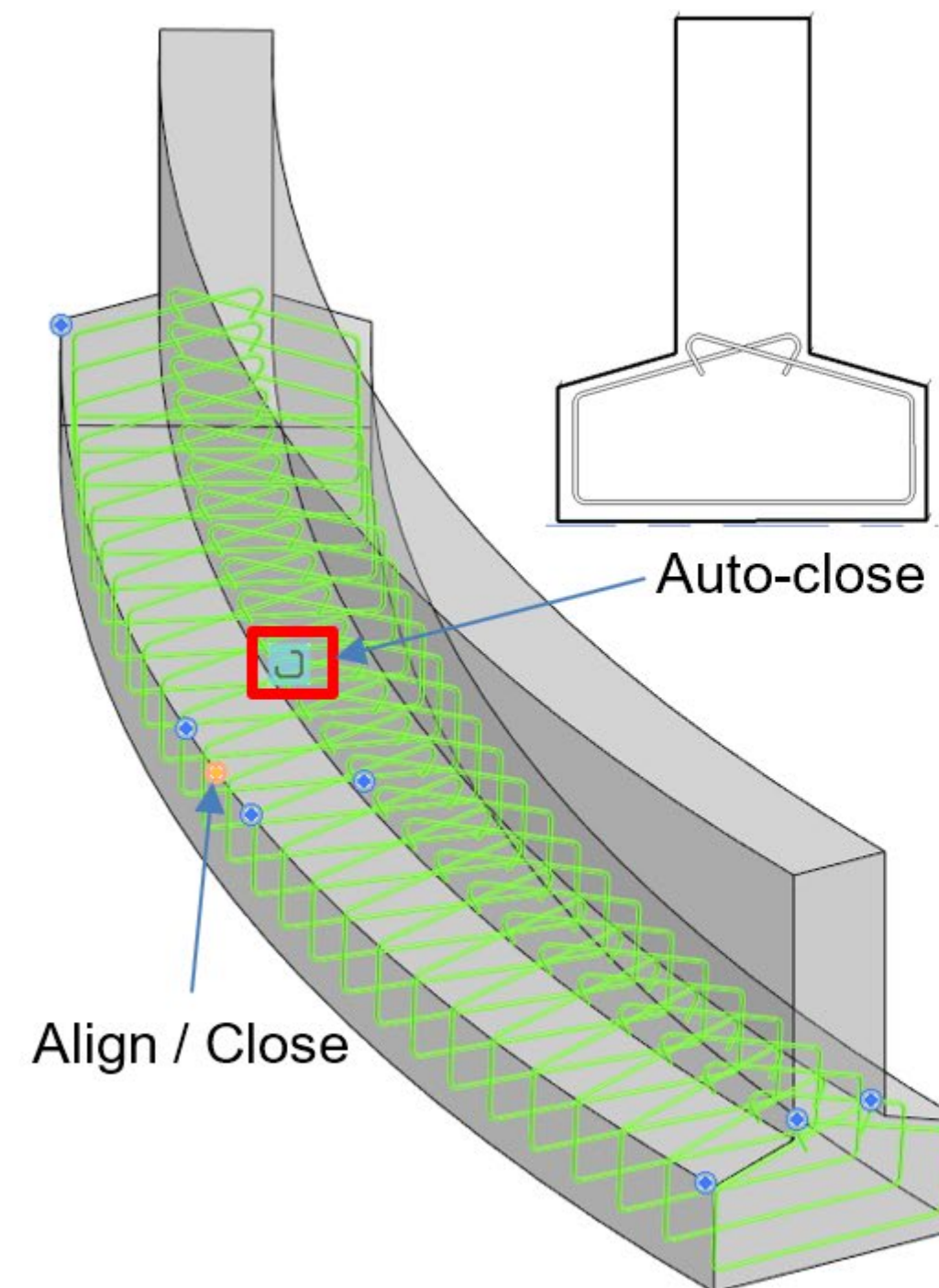


35. Create stirrups by auto-closing aligned distribution bars

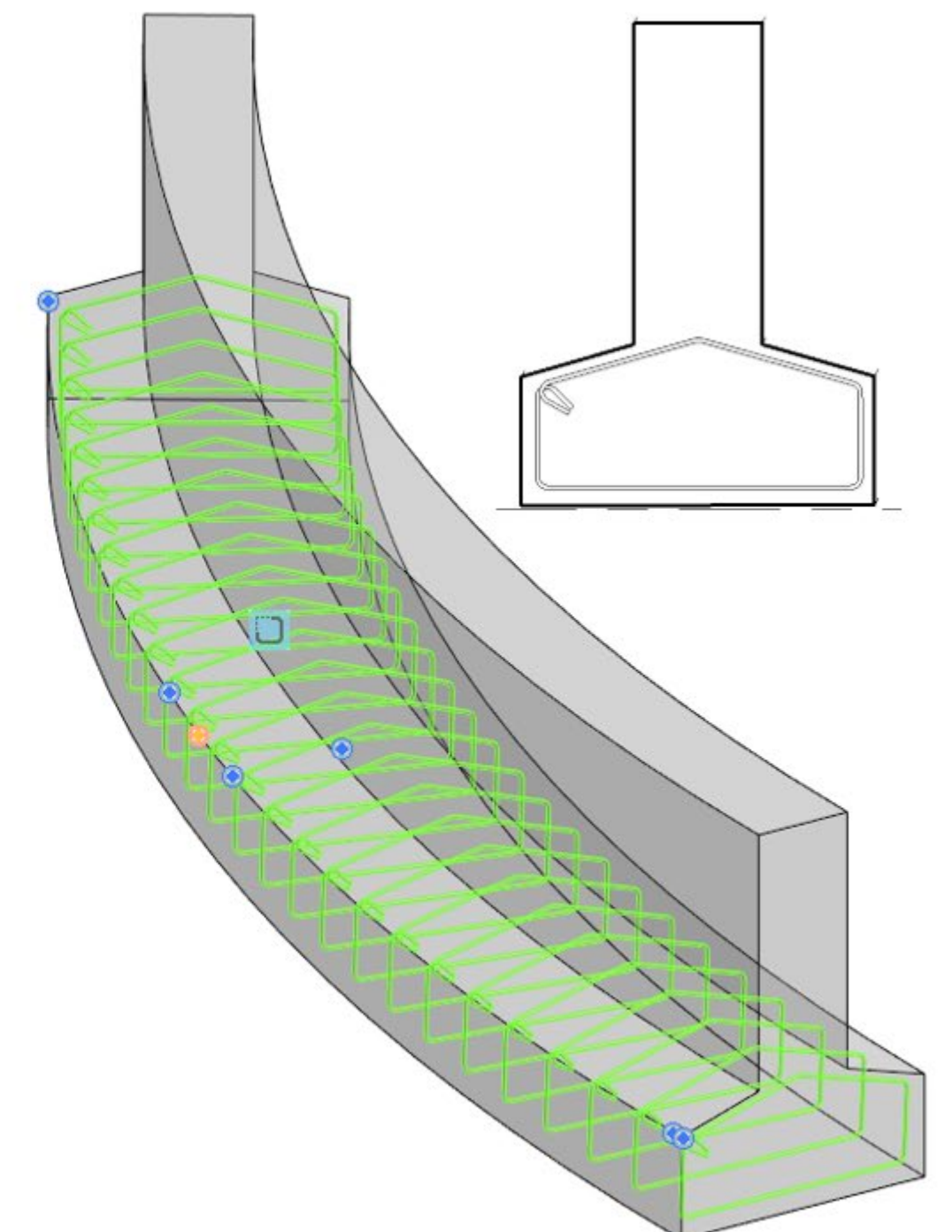
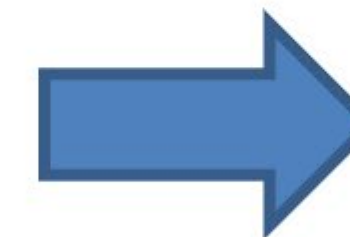


Blue – Selected faces

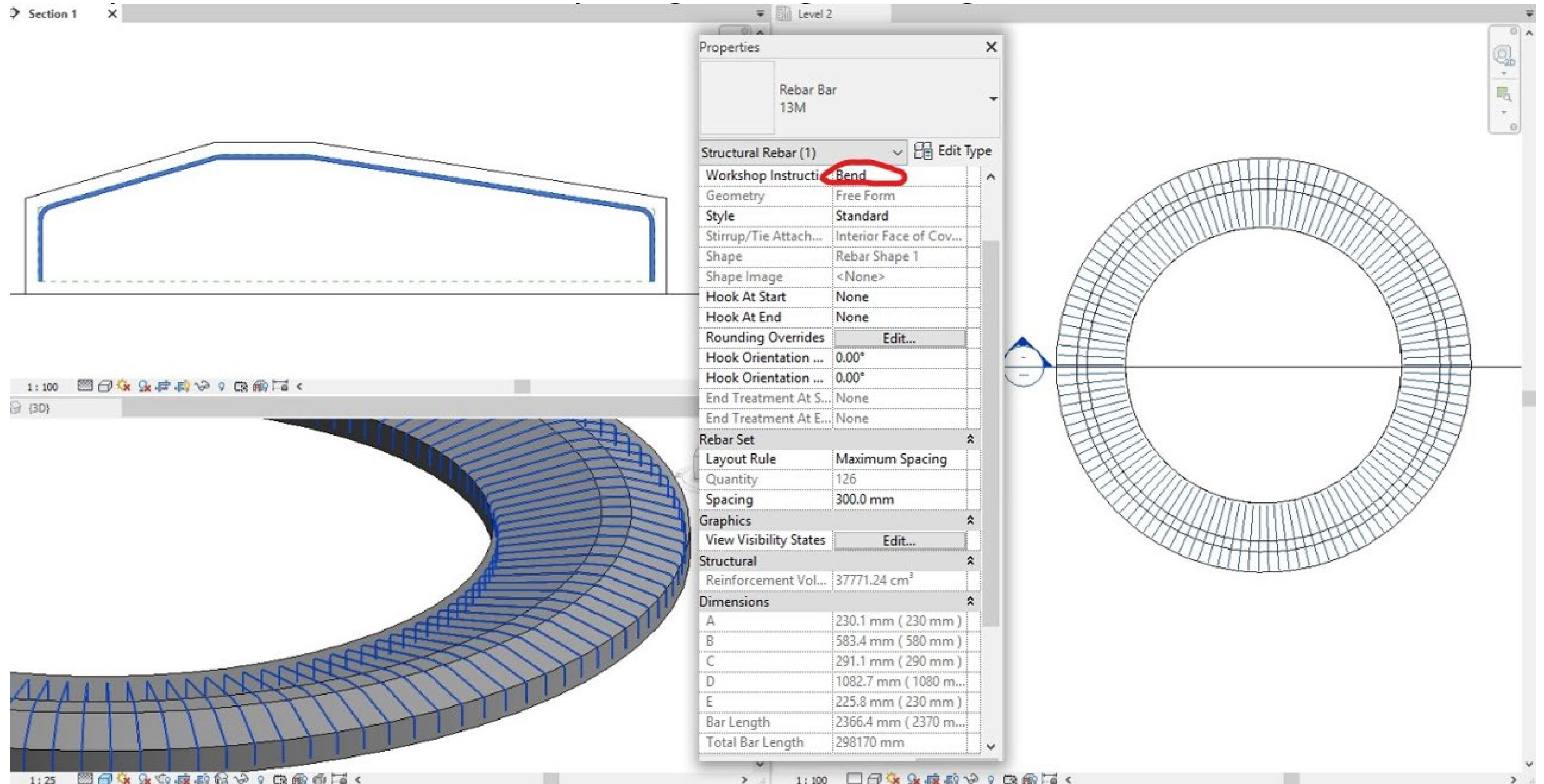
Green – Distribution path



Click
Auto-close



36.Reinforce circular foundation and extract fabrication information



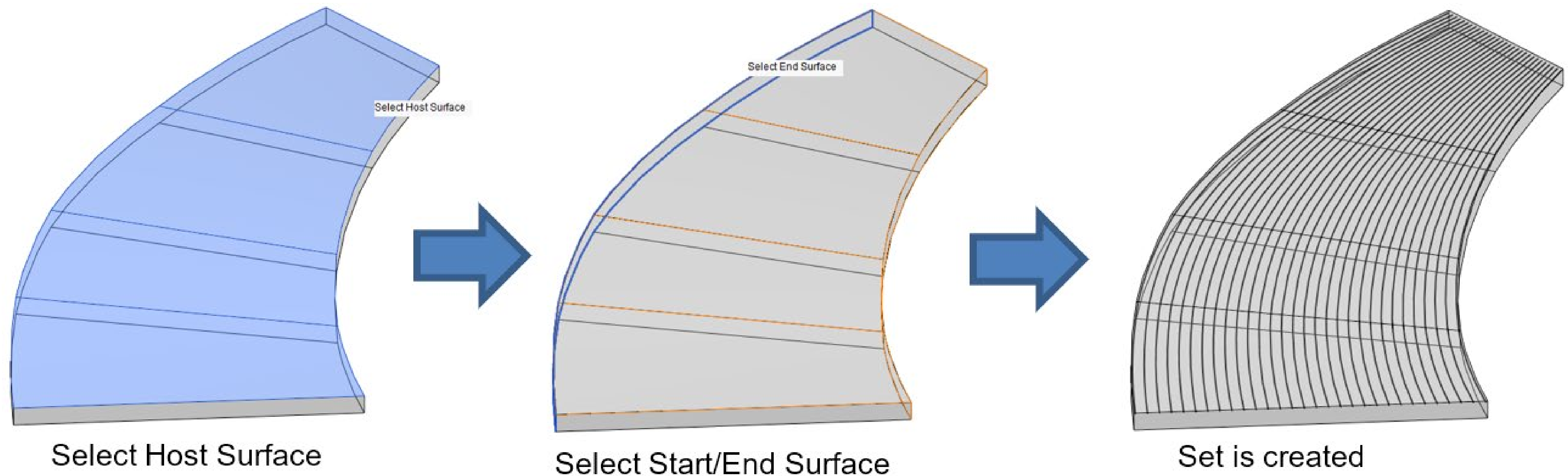
The screenshot displays a software interface for reinforcing a circular foundation. The interface includes a 2D cross-section view, a 3D perspective view, and a circular plan view. A Properties window is open, displaying various settings for the rebar, including a 'Bend' button highlighted with a red circle.

Properties Window:

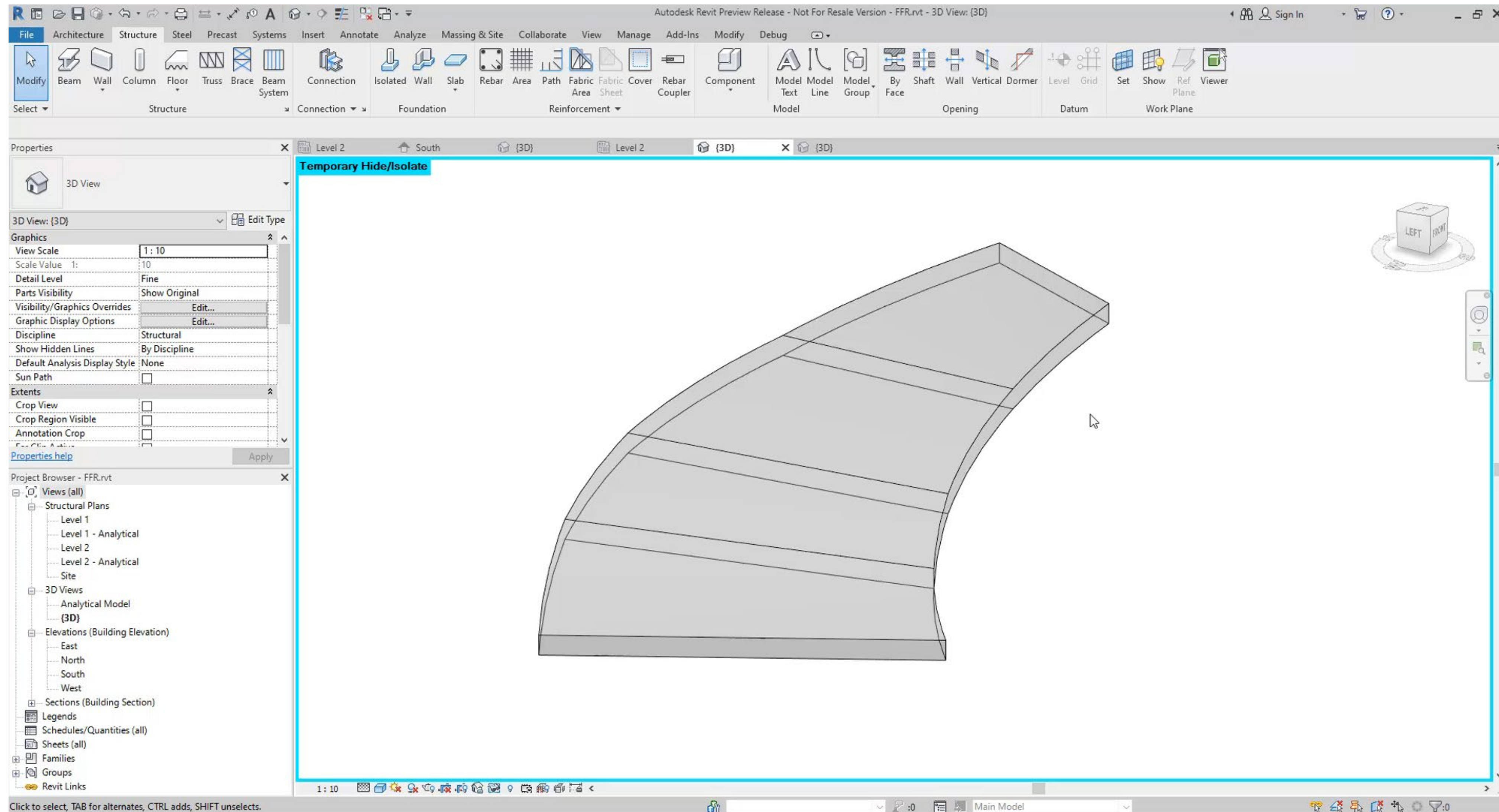
Rebar Bar 13M	
Structural Rebar (1)	Edit Type
Workshop Instructi...	Bend
Geometry	Free Form
Style	Standard
Stirrup/Tie Attach...	Interior Face of Cov...
Shape	Rebar Shape 1
Shape Image	<None>
Hook At Start	None
Hook At End	None
Rounding Overrides	Edit...
Hook Orientation ...	0.00°
Hook Orientation ...	0.00°
End Treatment At S...	None
End Treatment At E...	None
Rebar Set	
Layout Rule	Maximum Spacing
Quantity	126
Spacing	300.0 mm
Graphics	
View Visibility States	Edit...
Structural	
Reinforcement Vol...	37771.24 cm ³
Dimensions	
A	230.1 mm (230 mm)
B	583.4 mm (580 mm)
C	291.1 mm (290 mm)
D	1082.7 mm (1080 m...
E	225.8 mm (230 mm)
Bar Length	2366.4 mm (2370 m...
Total Bar Length	298170 mm

37. Place surface distribution bars across element with many faces

You can use the surface distribution free form rebar to model the longitudinal bars in a deck made up of multiple faces.

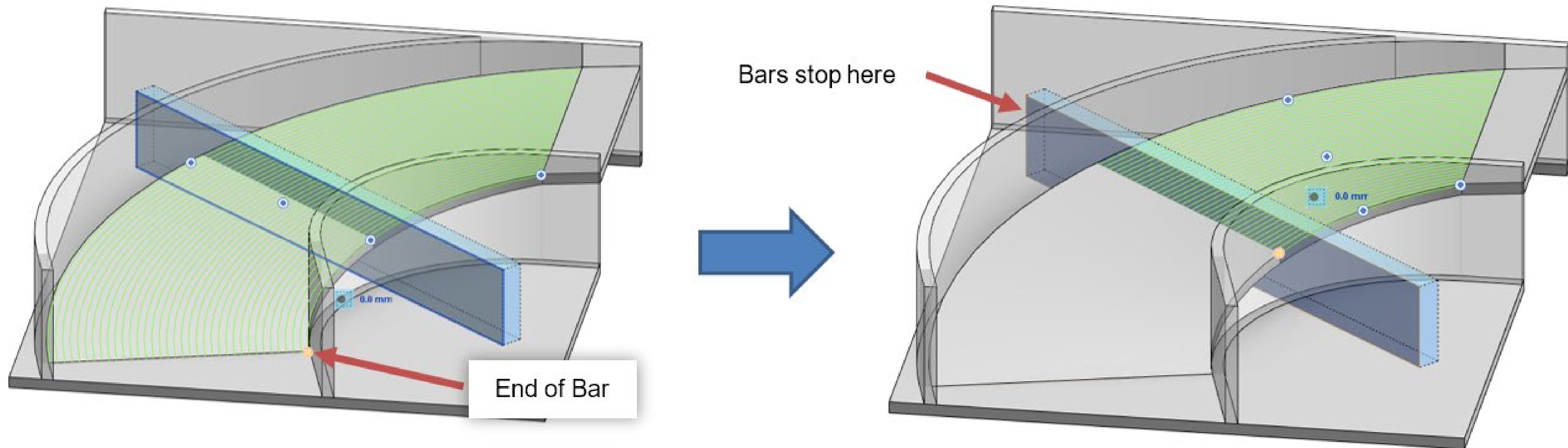


37.Place surface distribution bars across element with many faces

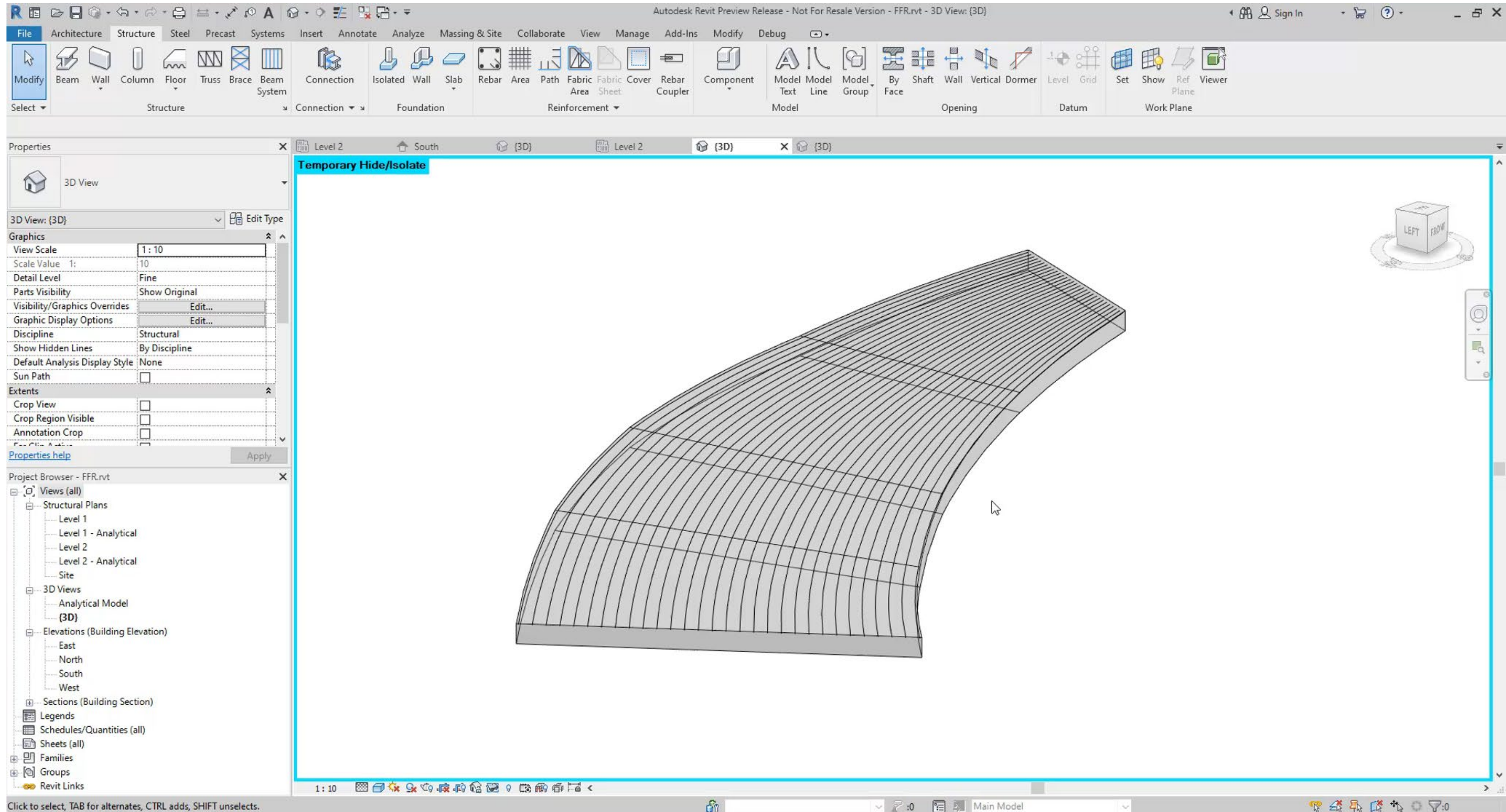


38. Splice free form bars by using additional geometry

Constrain ends to either side of additional geometry to create the splice

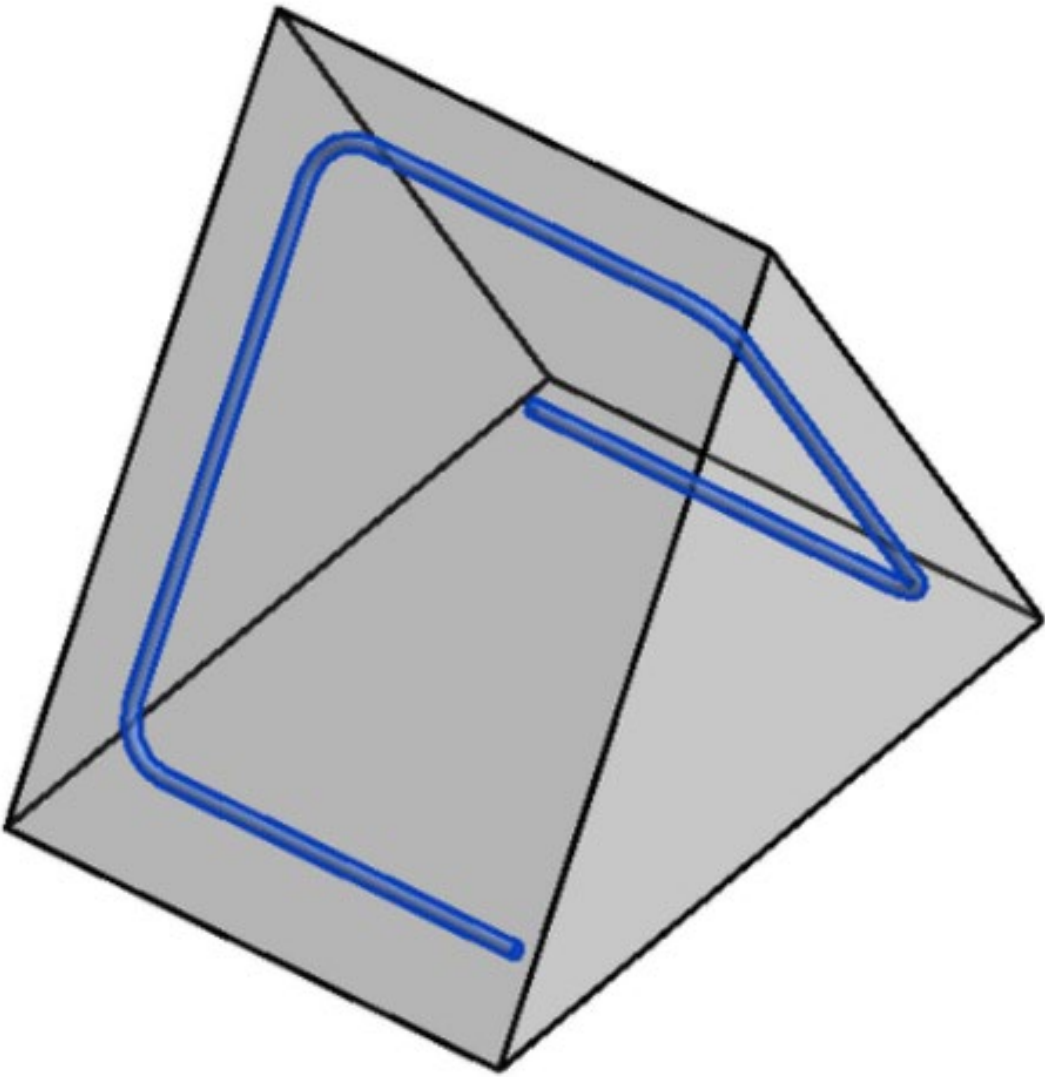
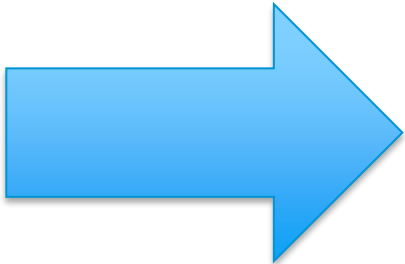
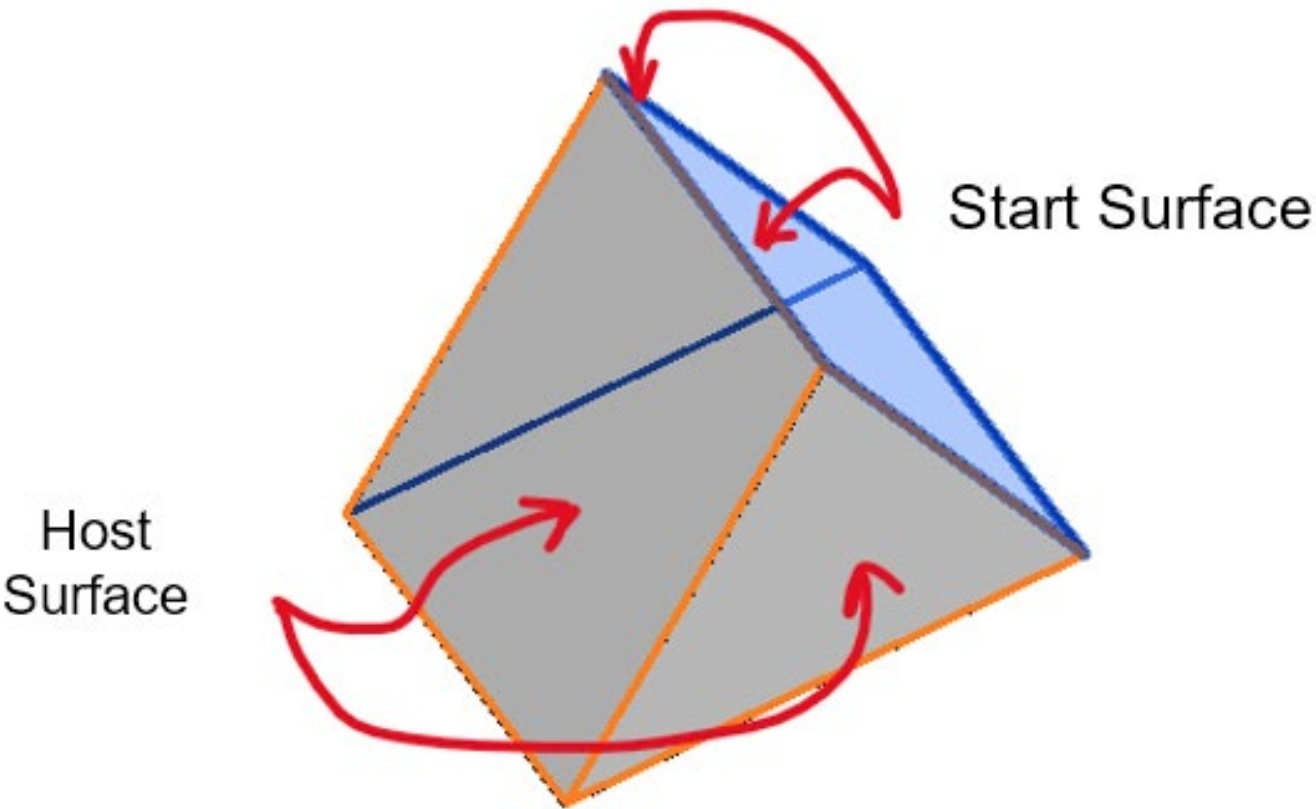
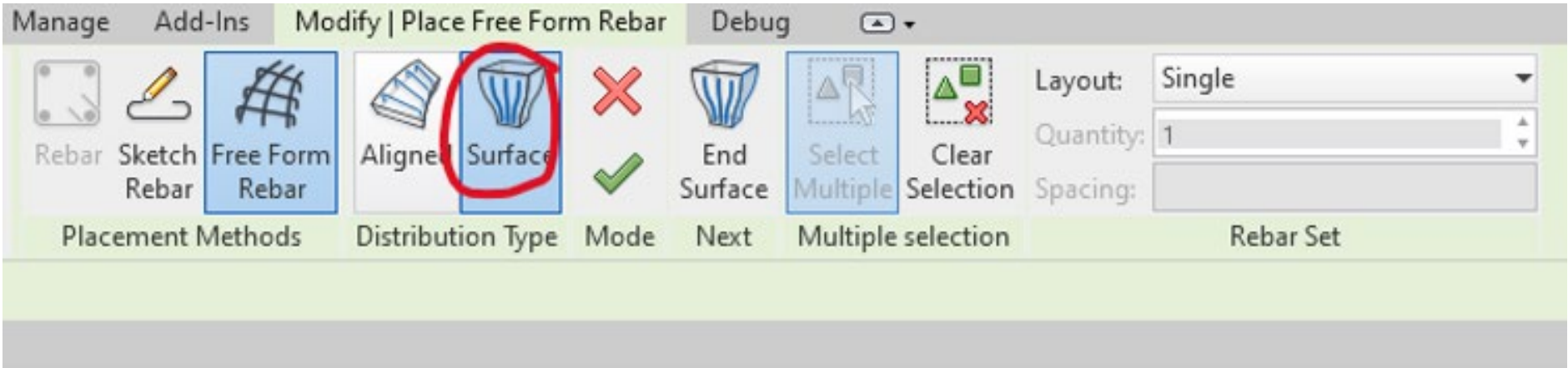
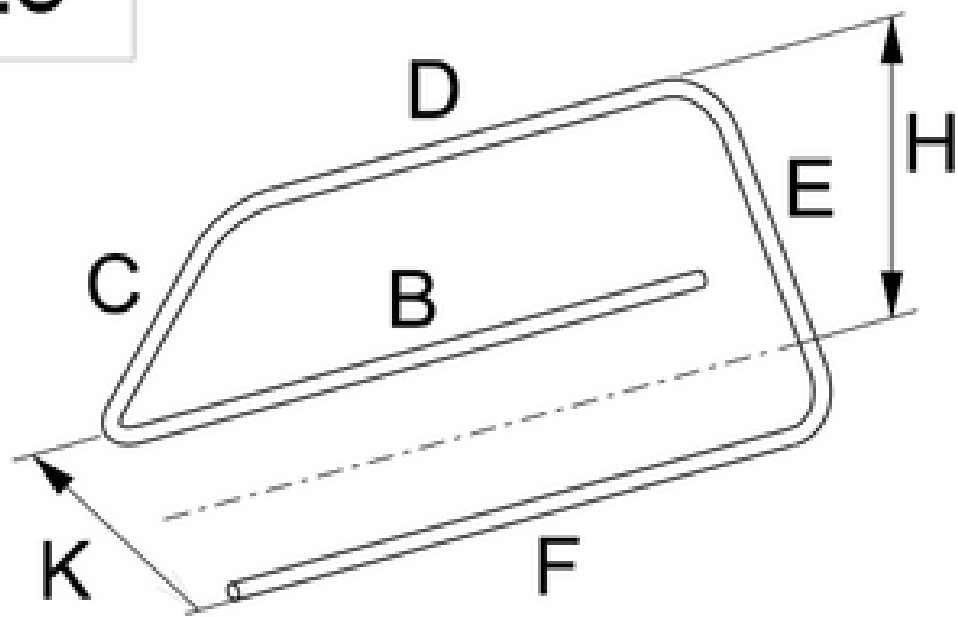


38. Splice free form bars by using additional geometry



39. Create a custom triangular rebar standee shape using free form rebar

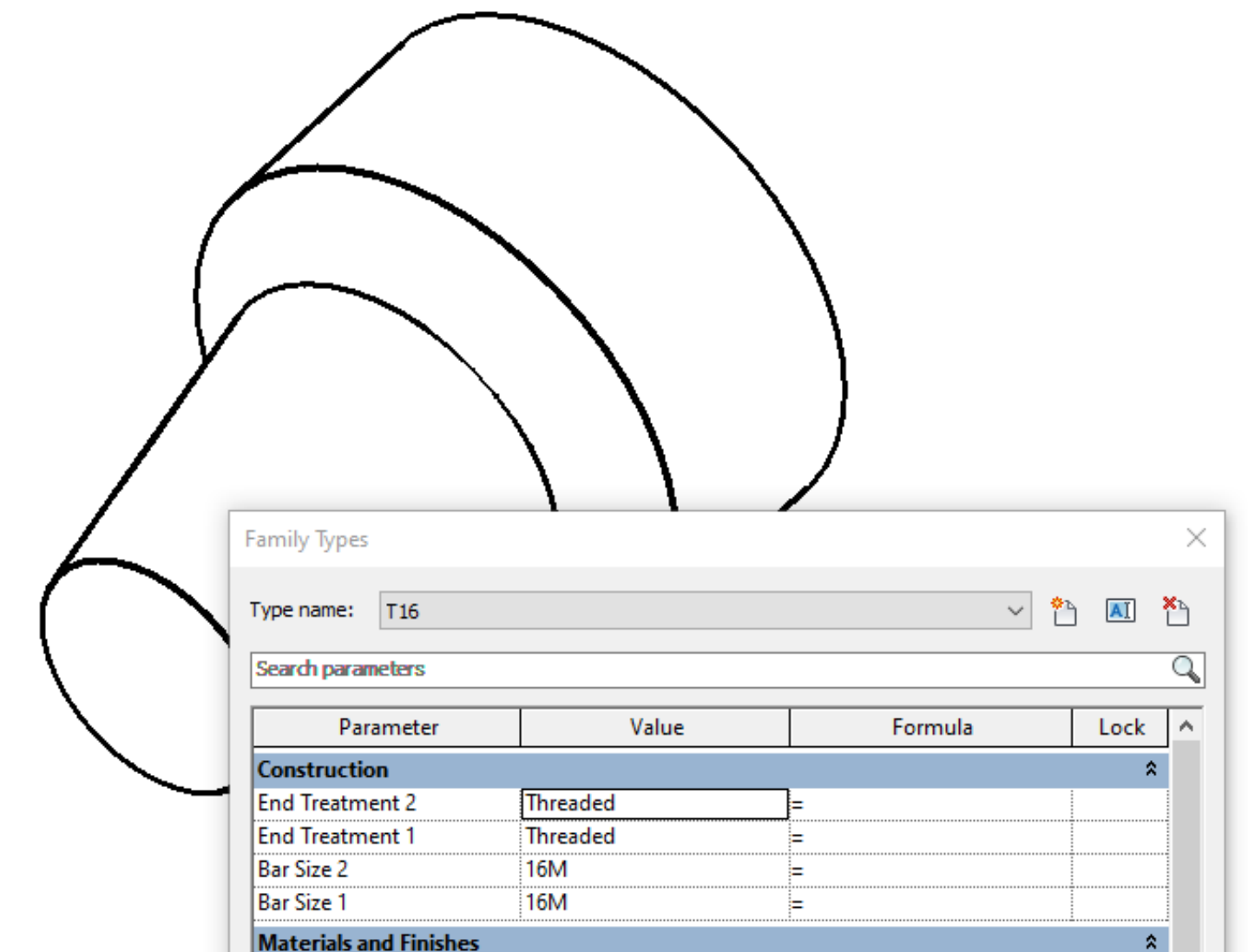
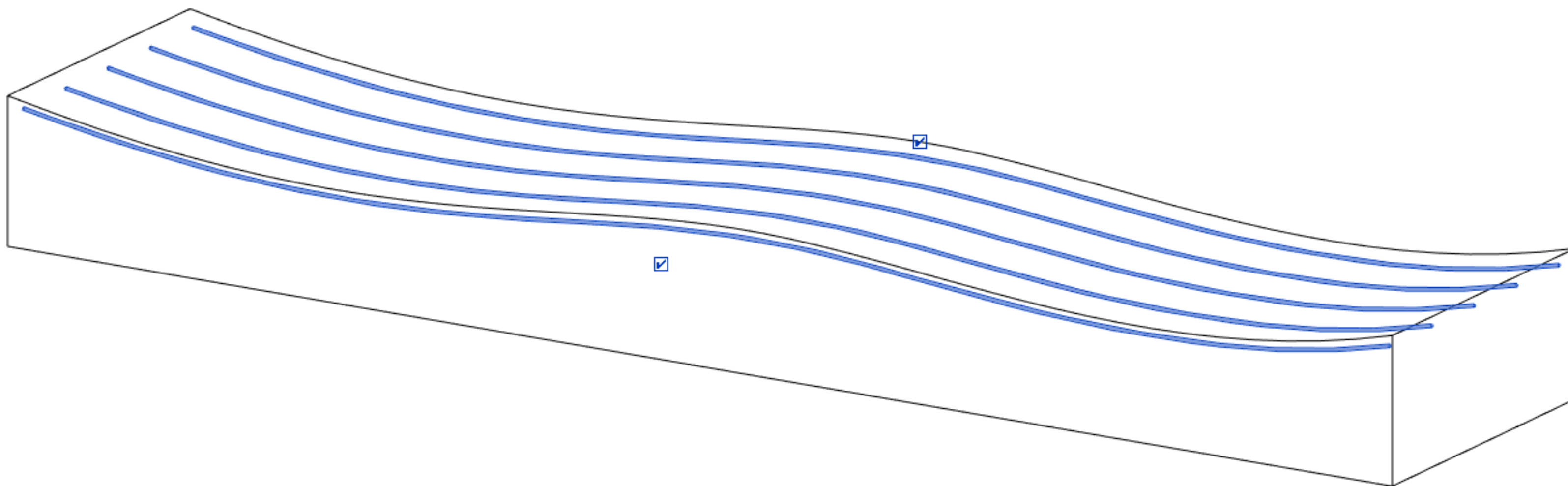
125



Rebar Bar 13M	
Structural Rebar (1) Edit Type	
Geometry	Free Form
Style	Standard
Stirrup/Tie Attachment	Interior Face of Cover Reference
Shape	M_00
Shape Image	<None>
Hook At Start	Standard - 90 deg.
Hook Rotation At Start	0.00°
End Treatment At Start	None
Hook At End	Standard - 90 deg.
Hook Rotation At End	90.00°
End Treatment At End	None
Override Hook Lengths	<input checked="" type="checkbox"/>
Rounding Overrides	Edit...
Rebar Set	
Layout Rule	Single
Quantity	1
Spacing	
Graphics	
View Visibility States	Edit...
Structural	
Reinforcement Volume	224.22 cm³
Dimensions	
A	0.0 mm (0 mm)
B	2365.3 mm (2370 mm)
C	0.0 mm (0 mm)
D	0.0 mm (0 mm)
E	0.0 mm (0 mm)
F	0.0 mm (0 mm)
G	400.0 mm (400 mm)
H	400.0 mm (400 mm)
J	0.0 mm (0 mm)
K	0.0 mm (0 mm)

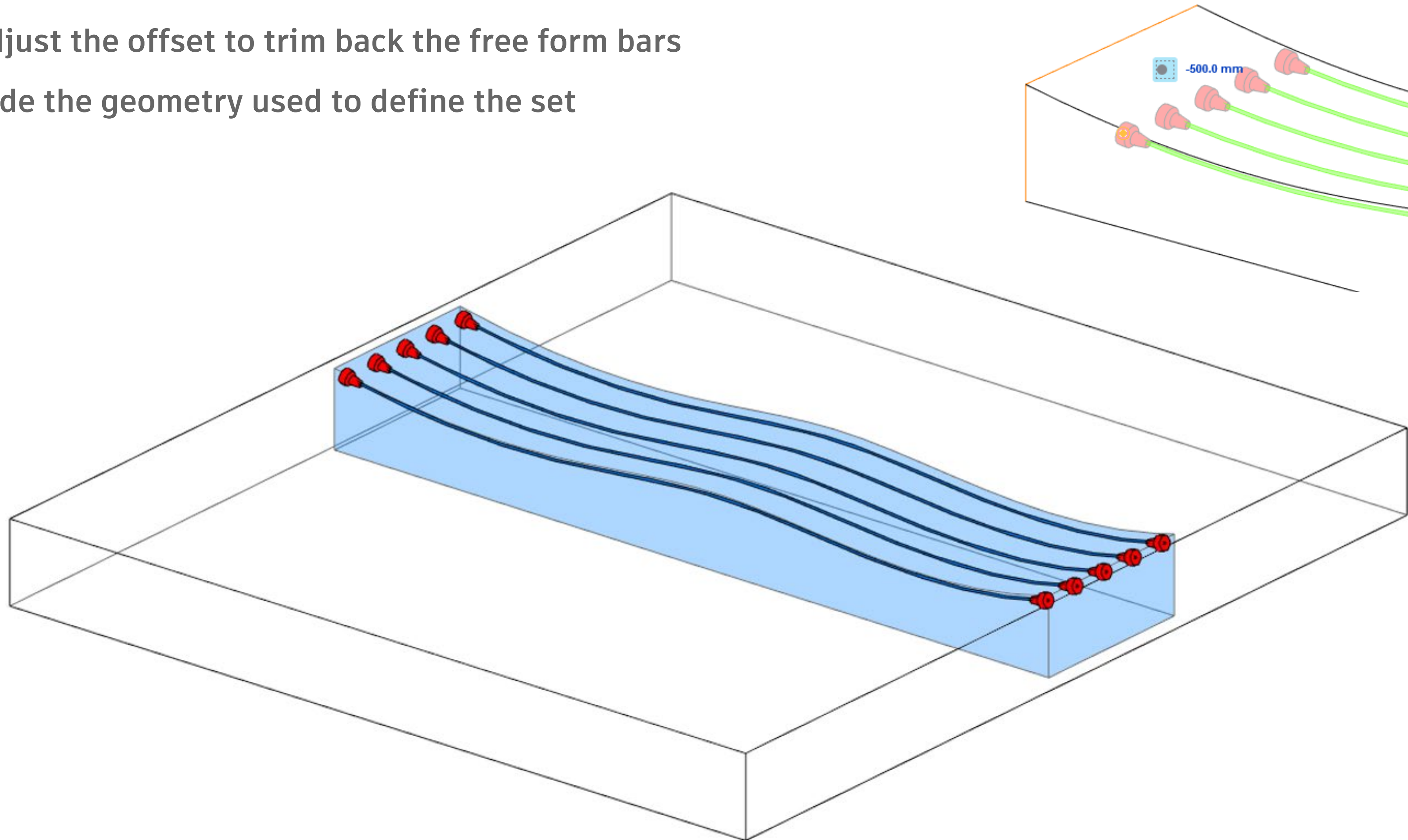
40. Model post-tensioning tendons by using free form rebar and couplers

- Bars are generated by dedicated element (valid host) – family or model-in-place
- Adjust the additional geometry to adjust the tendon geometry
- Model the anchors using couplers

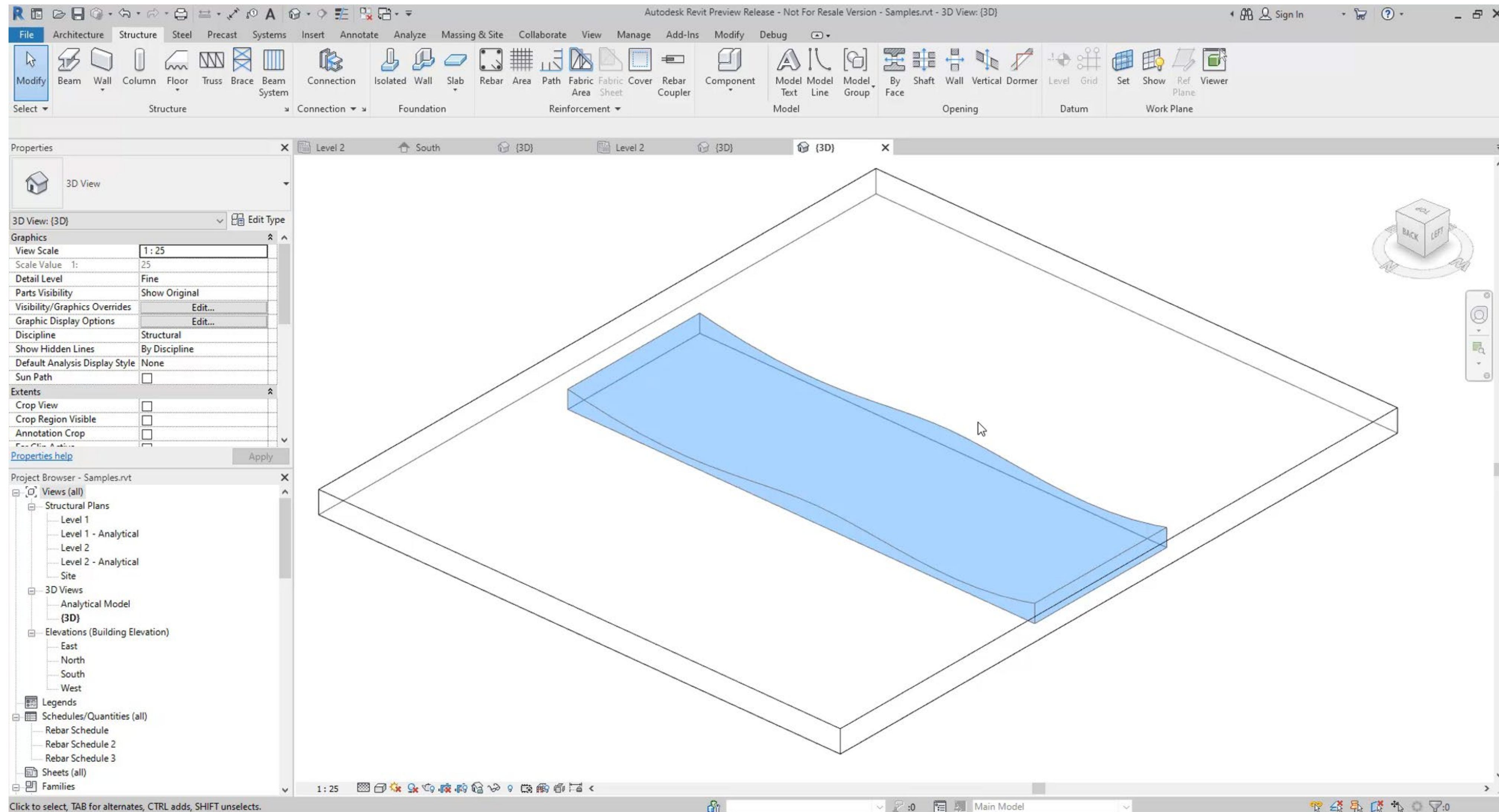


40. Model post-tensioning tendons by using free form rebar and couplers

- Adjust the offset to trim back the free form bars
- Hide the geometry used to define the set



40. Model post-tensioning tendons by using free form rebar and couplers





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