

Parabuild exercises

Inhoudstafel

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Quick start : Using the Context Modeler

All drawings that you need to perform the exercises are located in the installation directory of Parabuild.
For example: C:\Parabuild v3\Exercises\English\

In the first exercise we look at some basic skills that help you to view a 3D drawing and the use of icons.

Navigating the 3D model

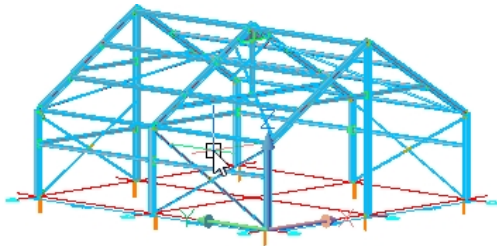
◀ Step 1 ▶

? In this exercise we will learn the following :

- Zooming in and out
- Taking another viewpoint (pivoting the 3D model)
- Panning the view
- Using the AutoCAD/BricsCAD icons



- Open the drawing  3D Visualisation.dwg



- Move the cursor to the drawing, and scroll the mousewheel in both directions



? If you scroll the wheel forward, then you will zoom in on the location of the cursor.
If you scroll backwards then you are zooming out.




- Press and hold the mouse wheel, and meanwhile move the mouse.
Panning of the view will stop as soon as you release the mouse wheel button.



? Keeping the mouse wheel button pressed is a 'Panning' function.



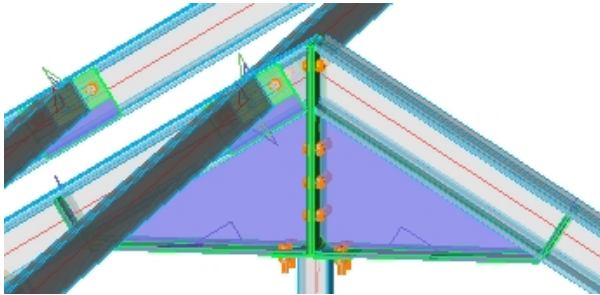
- 1) Press and hold the **SHIFT**  button
- 2) At the same time press and hold the mouse wheel button



3) Move the mouse. You are now pivoting the 3D model.



As soon as you release the **SHIFT** button or the mouse wheel, then the pivot mode stops and the view stays on it's last position.





? This tool allows us to orbit the 3D model in seconds. You can also use this tool inside commands while selecting parts.

Step 2

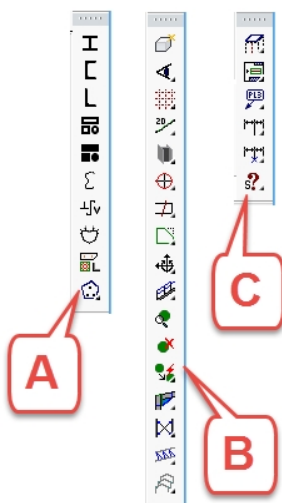


? Introduction to icons

The Parabuild functions are among other available through these 3 icon toolbars.

Some of these icons have a small triangle at the bottom (), and others don't ().

The triangle means that there is a toolbar hidden behind the icon. In the following steps we will show you how to open the hidden toolbars.

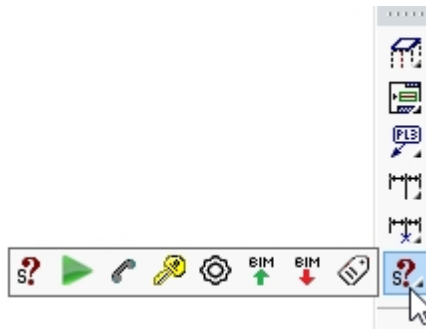


? Parabuild has 3 main toolbars :

A : Access to the profile sections library, parts library and plates

B : This toolbar contains all functions for drawing and modifying 3D parts

C : This toolbar contains all functions for generating data from the 3D model such as bills, workshop drawings, General Arrangement drawings, CNC files, ...



- Move the cursor to above an icon that has a small rectangle, click and hold the left mouse button.

The new toolbar appears.

- Move the cursor to above one of the icons.

- Release the mouse button to start the command that this icon represents




- Press the **<Escape>** key to close the window or command that you just opened.

❓ All windows and commands can be cancelled with the escape key.

This allows you to to cancel the command in case you made a mistake.


Grids and levels

Step 1


 You can close the drawing of the previous exercise.

For each exercise there is a drawing provided so that anyone can start anywhere in the exercises book.



- Open the drawing  *Grids and levels.dwg*



- Click on the icon  **Grid**

Draw grid

Grid line in X direction

Number of grid lines

12

Distance between grid lines (one or more)

4500

Letter or number to start with

A

Grid line in Y direction

Number of grid lines

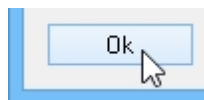
12

Distance between grid lines (one or more)

4500

Modify the number of grids and the distances between them as follows :

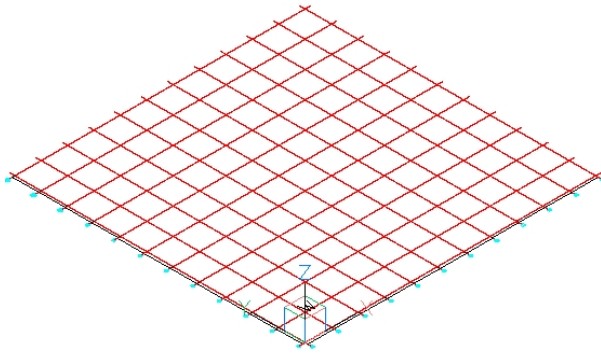
- Number of grid lines in X direction : **12**
- Distance between grids in X direction : **4500**
- Number of grid lines in Y direction : **12**
- Distance between grids in Y direction : **4500**



- Click on 



- Move the cursor to the **LookFrom** circle, and click on the point bottom left (Top Front Left)

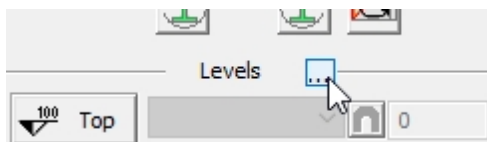



? It is also possible to draw grid lines manually.

Step 2



- Click on the icon  **Context Modeler**



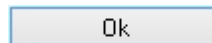
- In the middle of the **Context Modeler** window, click on the button  next to **Levels**



- Click the button  to add a new level



- Enter **Attic Floor** for the name and click on



Properties

Name: Attic Floor

Base level: World (WCS)

Height: 3300

- Enter **3300** for the height of the attic floor

Modify levels

World (WCS)

+

- Click the button **+** to add a new level

Name

Enter the name for the new level:

Eave

Ok Cancel

- Enter **Eave** for the name and click on

Ok

Properties

Name: Eave

Base level: World (WCS)

Height: 6000

- Enter **6000** for the height of eaves

Modify levels

World (WCS)

+

- Click the button **+** to add a new level

Name

Enter the name for the new level:

Apex

Ok Cancel

- Geef als naam **Apex** in en klik op

Ok

Properties

Name	Apex	...
Base level	World (WCS)	▼
Height	9500	

- Enter **9500** for the height of the apex

- Then press

Ok

🔗 We just added new levels that can be used as a reference for new parts.

Drawing columns

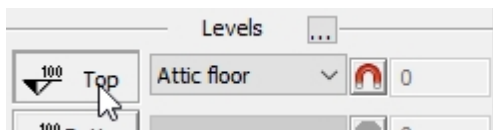
◀ Step 1 ▶



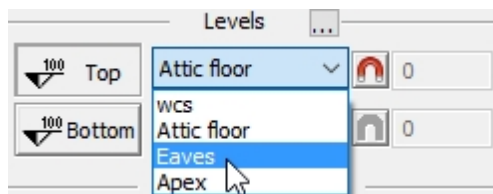
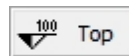
- Open the drawing *Drawing columns.dwg*



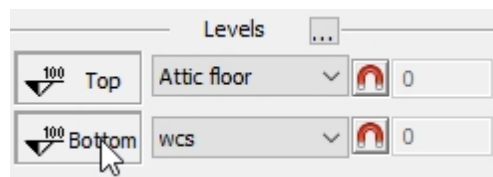
- If the *Context Modeler* is not yet open, then click on the icon **Context Modeler**



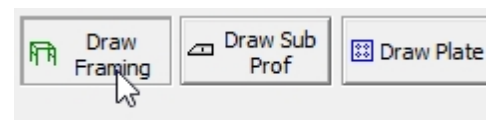
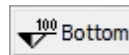
- In **Context Modeler**, click on the level symbol



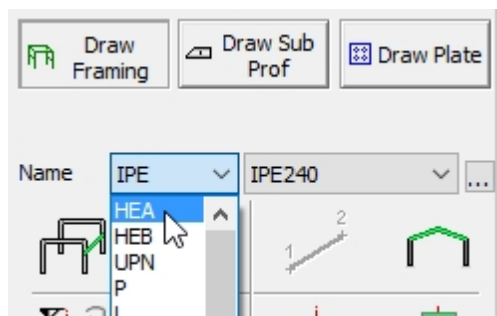
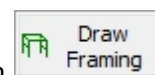
- Choose **Eaves** for the top level



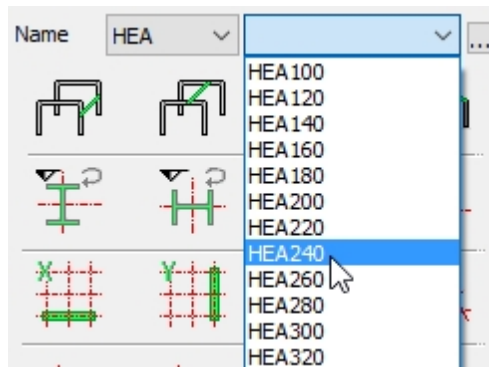
- In **Context Modeler**, click on the level symbol



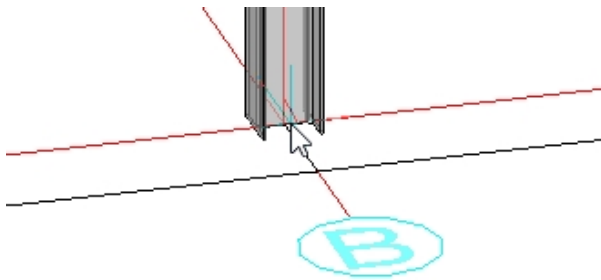
- Click on the button



- Choose **HEA** from the list of profile types

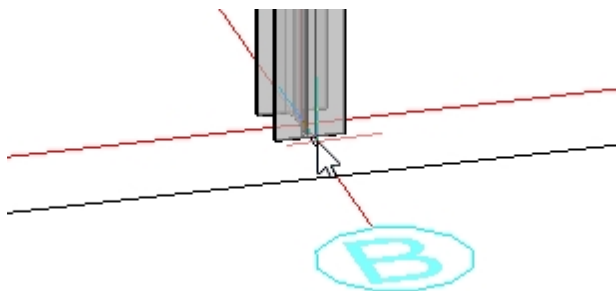


- Select the section **HEA240**

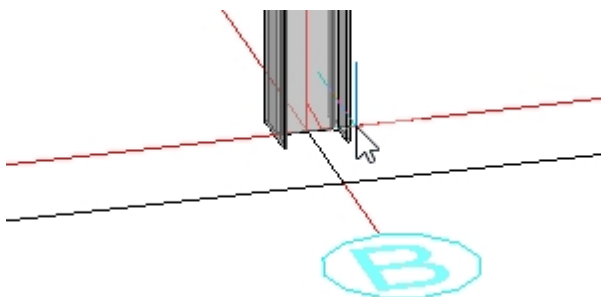


- Move the cursor to the intersection of 2 grid lines.

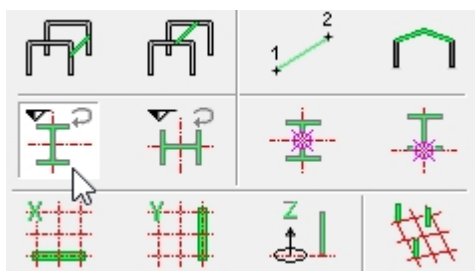
Meet the system by moving the cursor around the intersection point, without clicking.
Then continue to the next step.



- Now move the cursor over a vertical grid line. The column is now drawn parallel to this grid line.
Go to the next step without clicking.

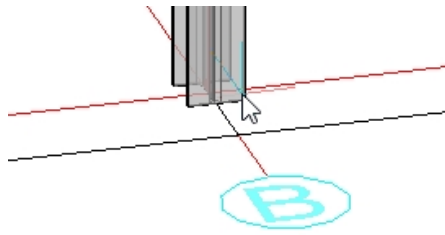


- Now move the cursor over a horizontal grid line. The column is now drawn parallel to this grid line.
Go to the next step without clicking




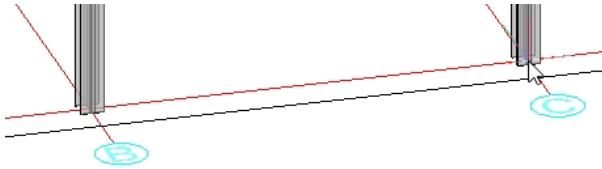
- Activate the button **Parallel to World Y**



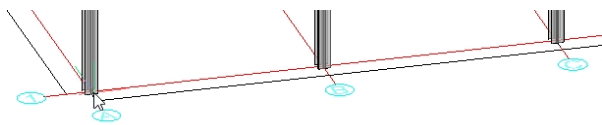


- Move the cursor to intersection **B1**, and click the left mouse button to draw the column

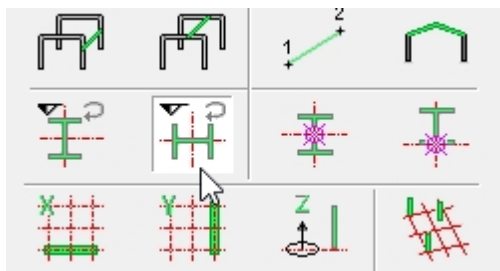
Because of the context button  the column won't rotate any more while we move the cursor. This makes it easier to draw multiple columns with the same rotation.



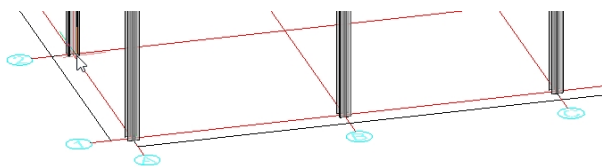
- Move the cursor to intersection **C1**, and click the left mouse button to draw the column



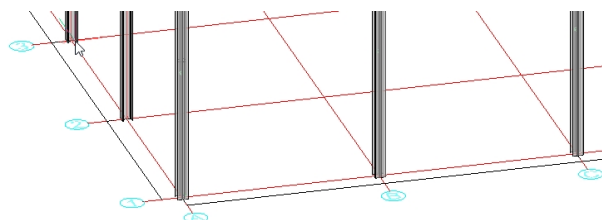
- Move the cursor to intersection **A1**, and click the left mouse button to draw the column



- Activate the button **Parallel to World X**



- Move the cursor to intersection **A2**, and click the left mouse button to draw the column



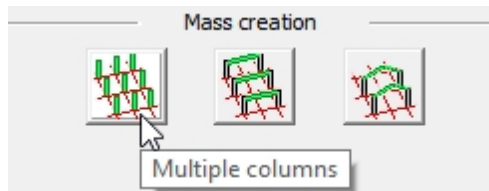
- Move the cursor to intersection **A3**, and click the left mouse button to draw the column
- Then press **<Enter>** to end the command


Step 2

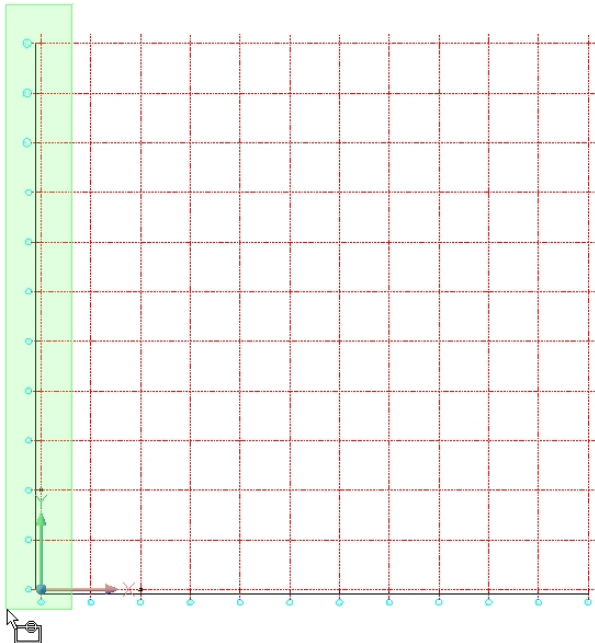


We will now draw multiple ranges of columns on the grid line intersections by selecting the grid lines.

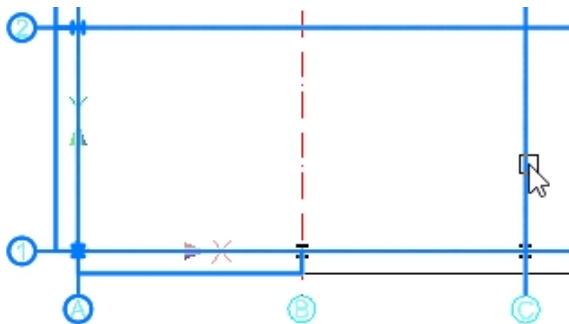
- Choose the top view by clicking in the middle of the chair in the **LookFrom** tool



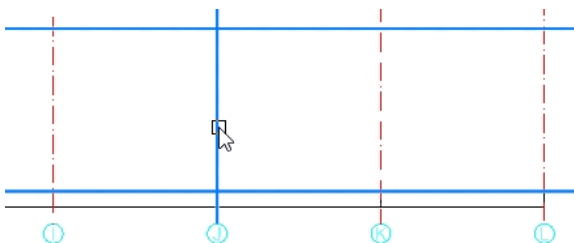
- In *Context Modeler*, click on the icon **Multiple columns** 



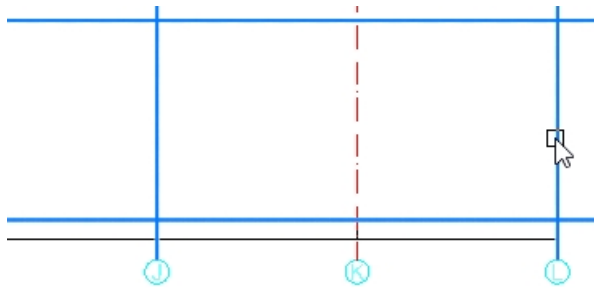
- Select alle **horizontal grid lines** using a frame by creating the illustrated frame like, from top to bottom left. While you do this make sure you do not select all vertical lines.



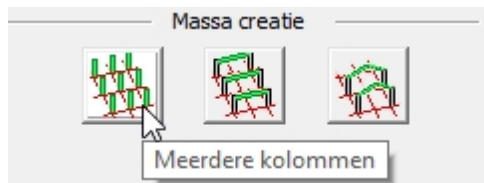
- Now also select the grid line **C** by clicking on it



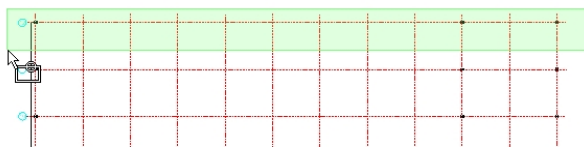
- Also select the grid line **J** by clicking on it



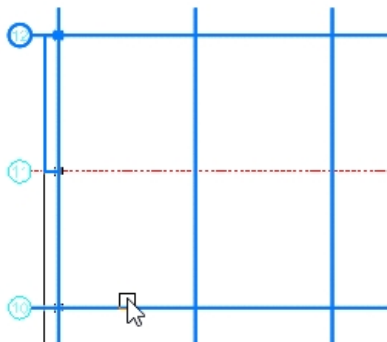
- Also select the grid line **L** by clicking on it
- Now also press **<Enter>** to end the selection



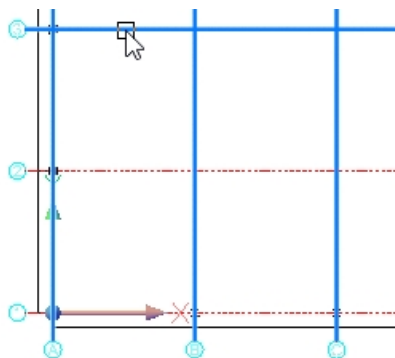
- Click on the icon **Multiple columns**



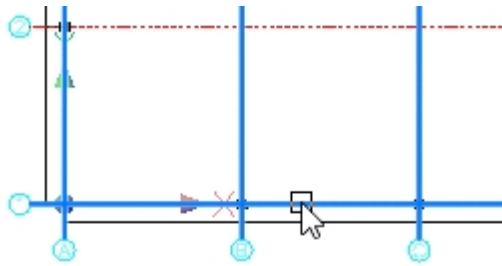
- Select alle **vertical grid lines** using a frame by creating the illustrated frame like, from top right to left. While you do this make sure you do not select all vertical lines.



- Also select the grid line **10**



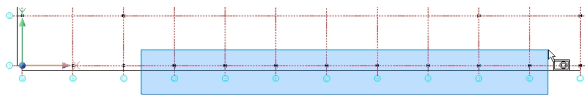
- Also select the grid line **3**



- Also select the grid line **1**
- Also press **<Enter>** to end the selection
- ② A column was drawn on all intersections of the selected lines, if there wasn't one already.

← **Step 3** →

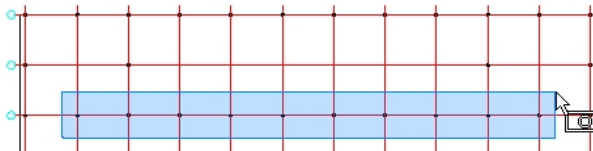
② The columns on the horizontal grid lines almost all have the wrong orientation. We will now correct this.



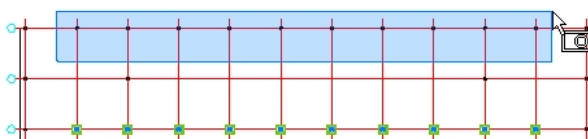
- Select the columns on intersections **D1 to K1** using a frame from bottom left to right (we are not starting a command this time)



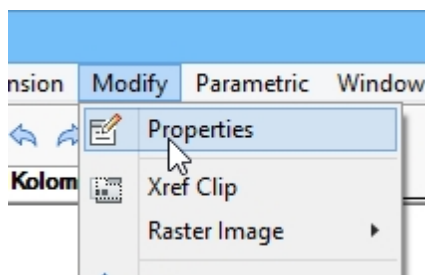
- Select the columns on intersections **B3 to K3** using a frame from bottom left to right



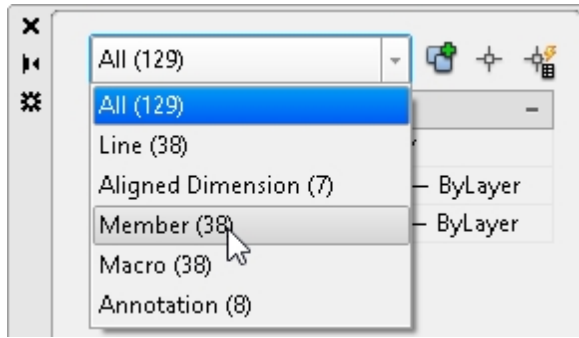
- Select the columns on intersections **B10 to K10** using a frame from bottom left to right



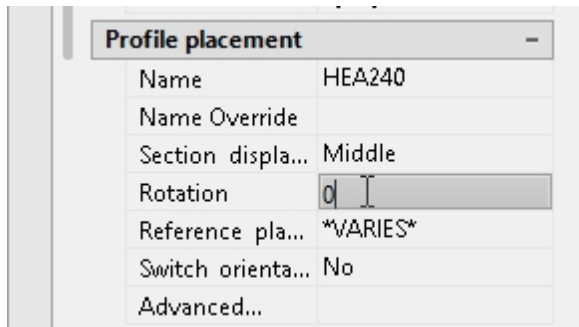
- Select the columns on intersections **B12 to K12** using a frame from bottom left to right.



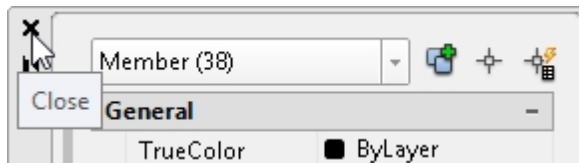
- Open the properties using the menu : **Modify > Properties**



- In the Properties window at the top, click on **All (XX)** to show the objects underneath.
- Then select **Member (38)** from the list so that we can modify the properties of these profiles

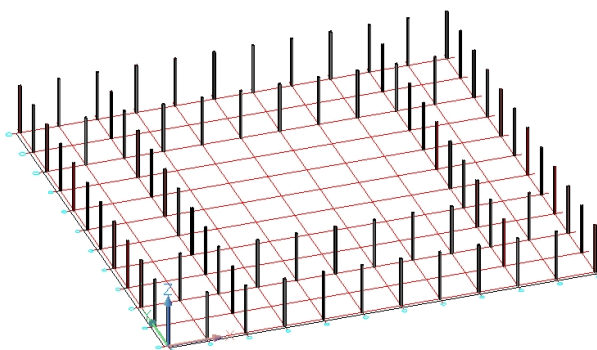


- Change the value of **Rotation** to **0**




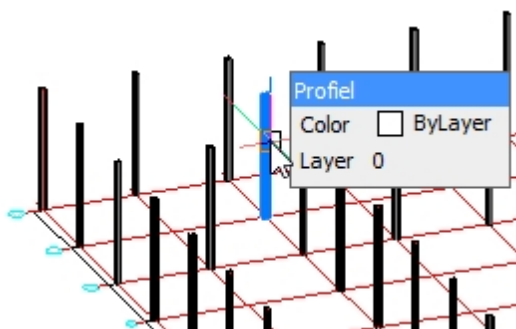
- Close the Properties window if it takes up too much space
- Then press **<Esc>** to remove the selection

Step 4

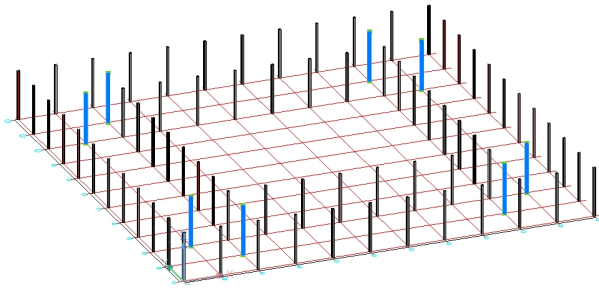


- Keep the **<SHIFT>** button pressed while pushing the **mouse wheel** button

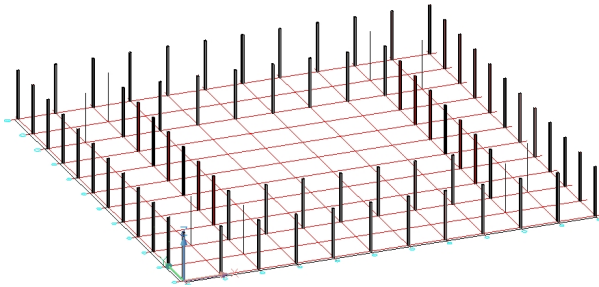
A rotation symbol appears as cursor : 
Move the cursor so that you get a 3D view.
If you reached the desired view, then release the Shift and mouse wheel buttons.



- Select the column on intersection **C11** by clicking on it



- Select the other columns on intersections **B10**, **J11**, **K10**, **K3**, **J2**, **C2** and **B3**
- Then press the **<Delete>** key to remove these 8 columns



- ⓘ These 8 columns were unnecessarily drawn by the command **Multiple columns**.


Drawing an apex

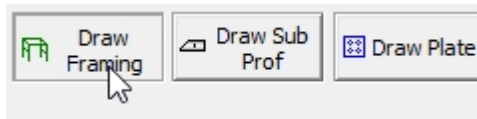
Step 1



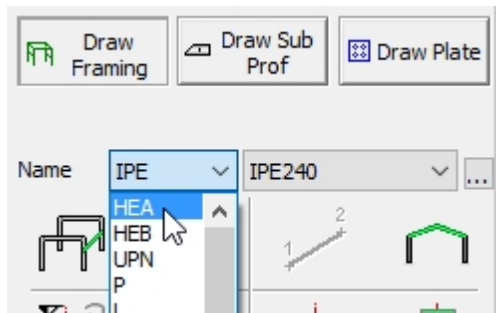
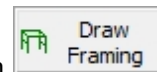
- Open the drawing  *Drawing an apex.dwg*



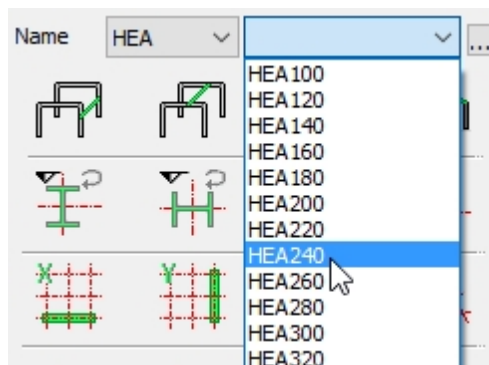
- If the *Context Modeler* is not yet open, then click on the icon  **Context Modeler**



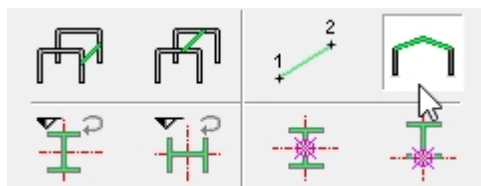
- Click on the button



- Choose **HEA** from the list of section types

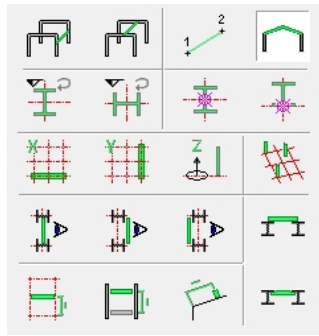


- Select the profile section **HEA240**

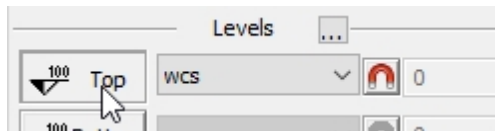


- Activate the button **Apex**

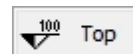




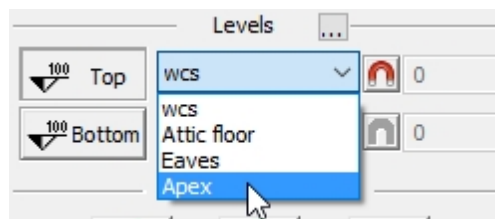
- Make sure all the other context buttons are deactivated, these were possibly still active for the previous exercise!



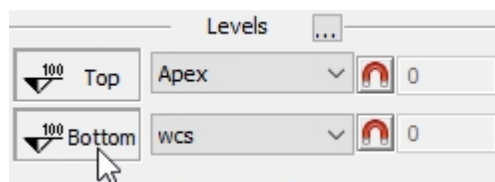
- In **Context Modeler**, click on the level symbol



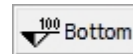
in case it is not yet active



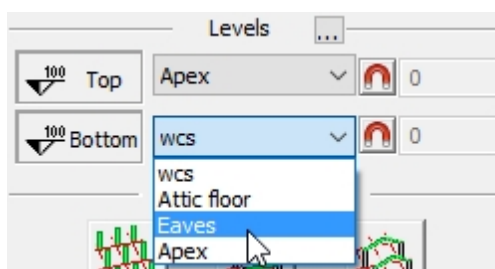
- Choose **Apex** for the top level



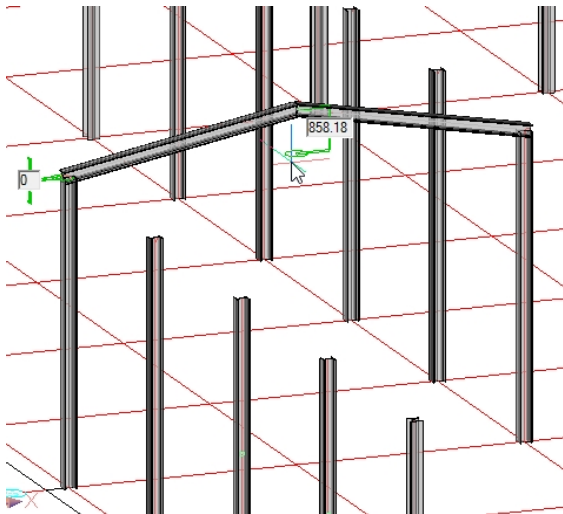
- In **Context Modeler**, click on the level symbol




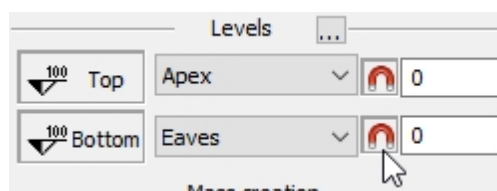
in case it is not yet active




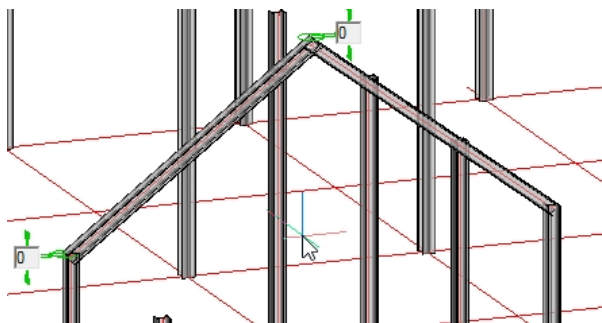
- Choose **Eaves** for the bottom level



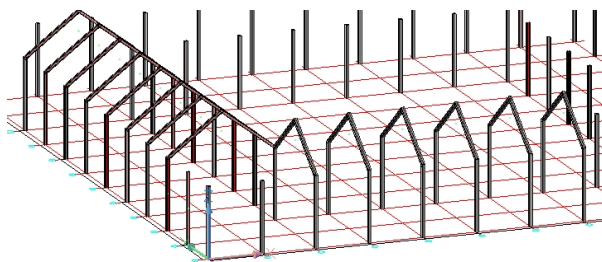
- Move the cursor between two columns without clicking.
- We see that Parabuild suggests other slopes for the rafters that are not connected to the levels that we activated.
- The levels that we choose are suggestive.
- To force the levels we need to use the magnet function .



- Activate the magnet  button for both **Top** and **Bottom** levels



- Now move the cursor to the highest point in the middle of 2 columns, and click the left mouse button to draw the apex.



- Do the same for some more apex rafters
- Then press **<Enter>** to end the command

Drawing beams

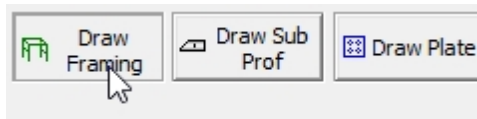
Step 1



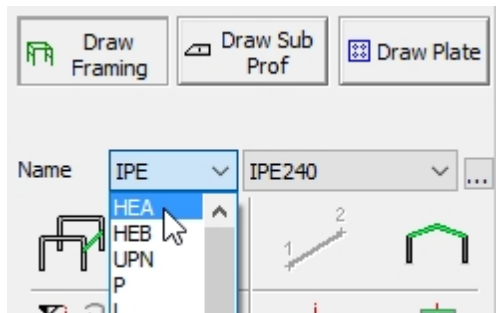
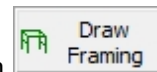
- Open the drawing *Drawing beams.dwg*



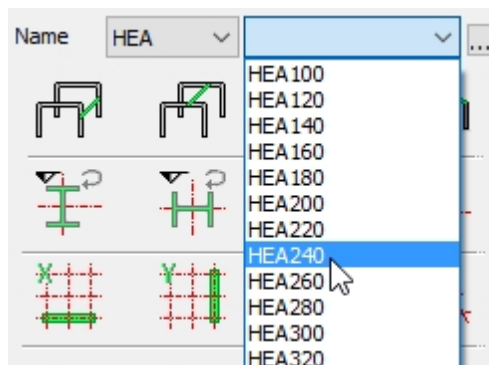
- If the *Context Modeler* is not yet open, then click on the icon **Context Modeler**



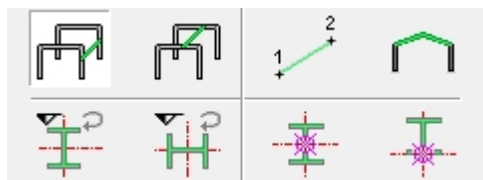
- Click on the button



- Select **HEA** as section type

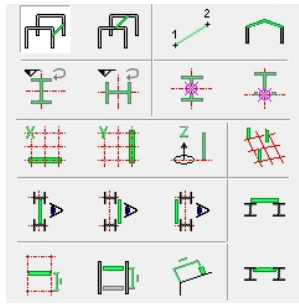


- Select the profile section **HEA240**

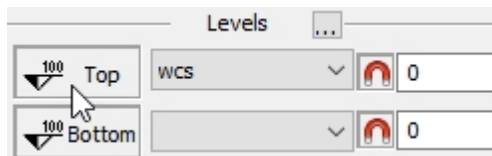


- Activate the button **Between columns**

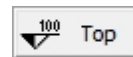




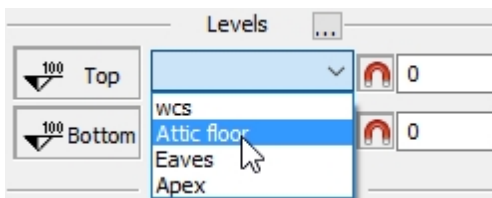
- Make sure that all the other context buttons are deactivated, these were possibly still active for the previous exercise.



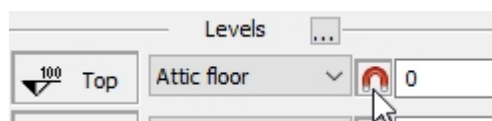
- In **Context Modeler**, click on the symbol




in case it is not yet active

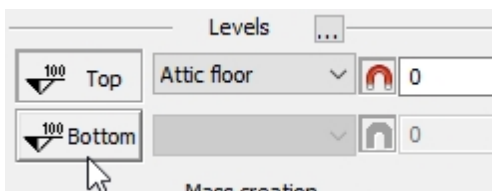


- Choose **Attic floor** for the top level

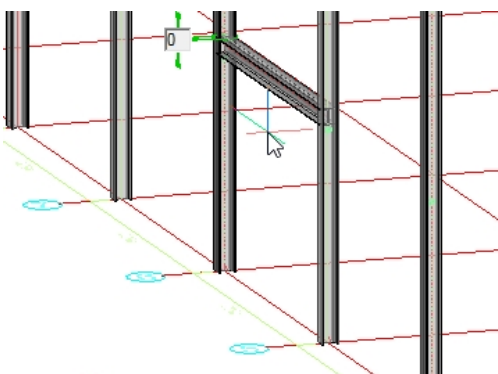


- Activate the magnet  for the **Top** level

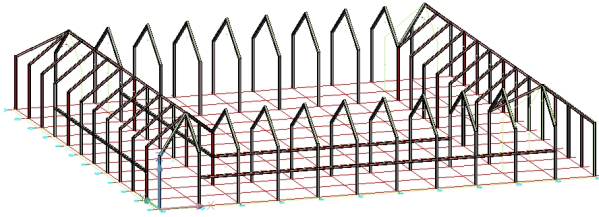
Because of the active magnet  Parabuild will not propose alternative heights.



- Make sure that the bottom level is inactive by clicking on it if necessary

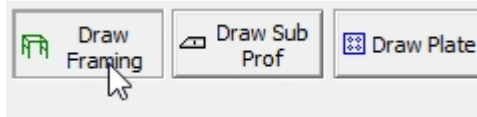


- Move the cursor to between 2 columns and click on the left mouse button if the desired girder appears.

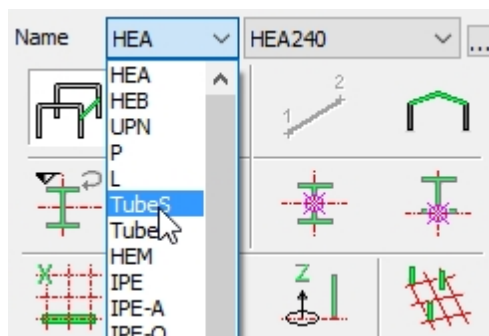
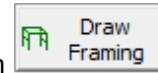


- Do the same for some other girders
- Then press **<Enter>** to end the command

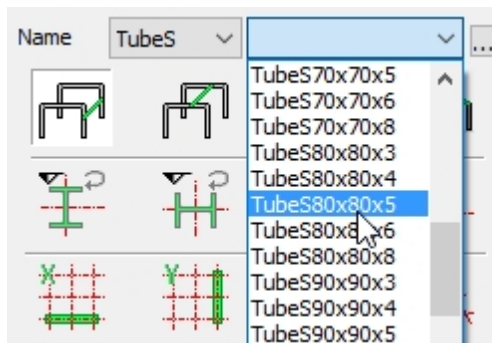
← **Step 2** →



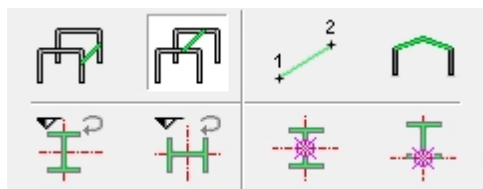
- Click on the button



- Select **TubeS** as section type

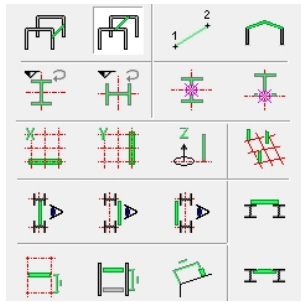


- Select the profile section **TubeS80x80x5**

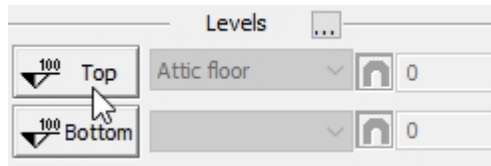


- Activate the button **Tussen liggers**

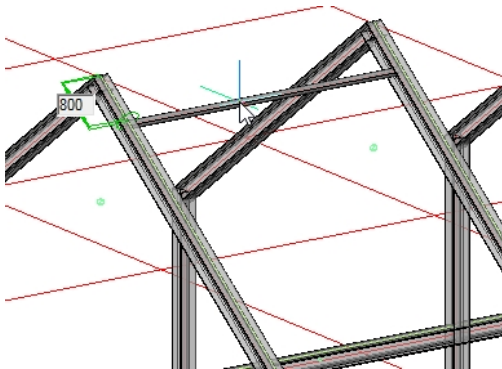





- Make sure that all the other context buttons are deactivated, these were possibly still active for the previous step

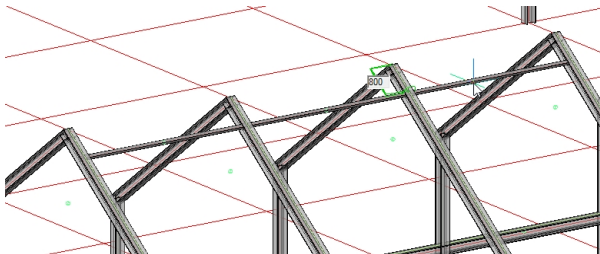


- Make sure that both levels **Top** and **Bottom** are deactivated




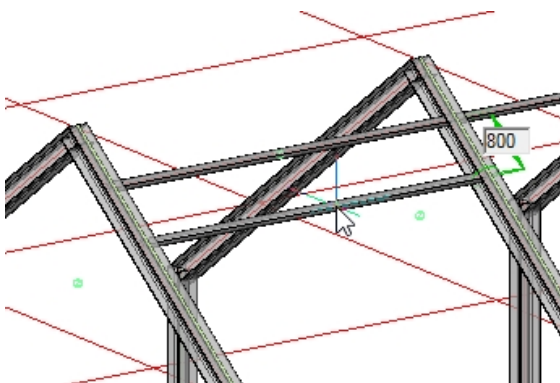
- Move the cursor to between two rafters, and press the left mouse button as soon as you can see the stringer.

 The distance between the apex and the stringer (800 on the image) is modifiable afterwards, look at the exercise *Modifying objects drawn with the Context Modeler* for this.

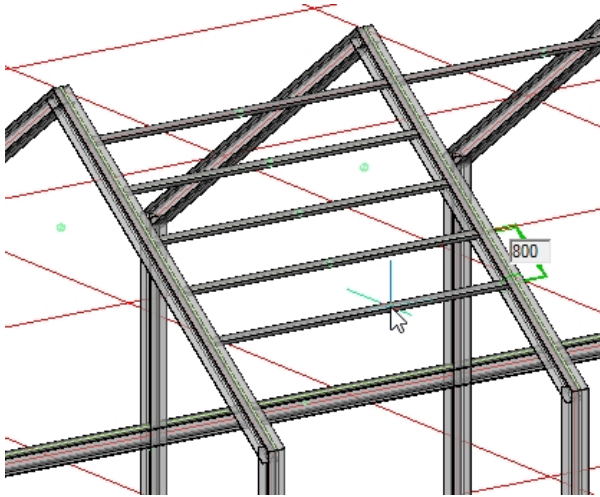


- Now draw some more stringers between other rafters

 Use the zoom and pan functions of the mouse wheel to work more accurately.



- Now draw a stringer underneath another stringer



- Draw some more stringers underneath each other
- ❓ Parabuild prefers to use an existing profile that is parallel to the new profile as a reference!
- Press the **<Enter>** key to end the command

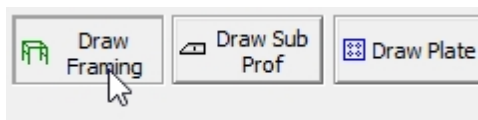
Step 3



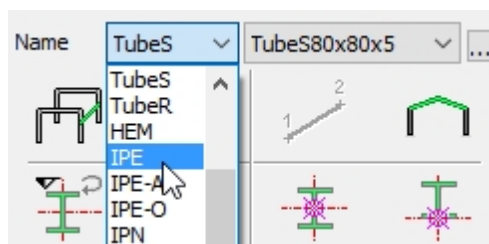
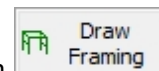
- Open the drawing *Drawing floor joists.dwg*



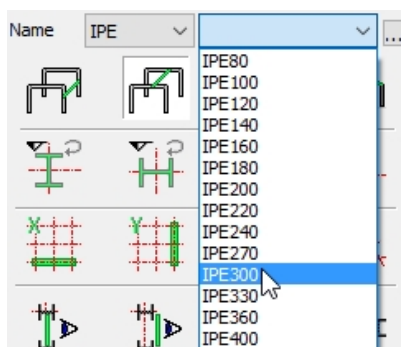
- If the *Context Modeler* is not yet open, then click on the icon **Context Modeler**



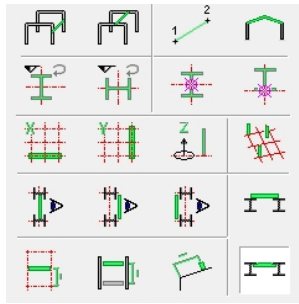
- Click on the button



- Choose **IPE** as section type



- Select the section **IPE330**

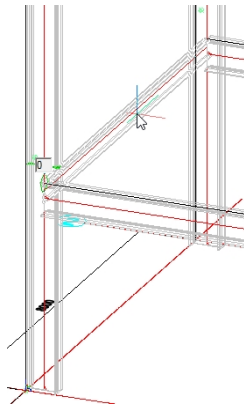


- Activate the button **New beam aligned with top**

of beams

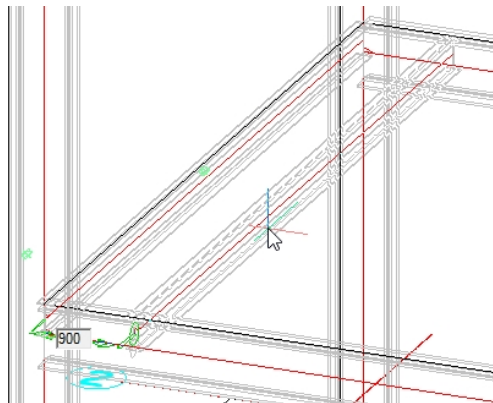


- Also make sure that the other context buttons are deactivated.

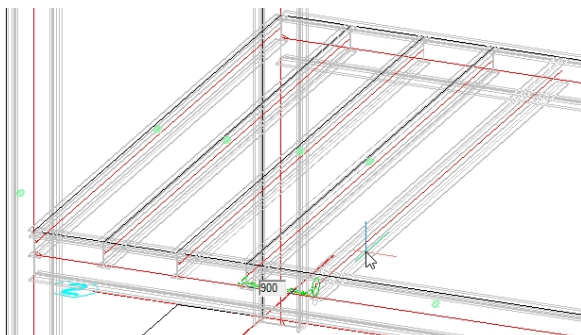


- Move the cursor to between the two beams close to the columns on **A1** and **B2**.

Press the left mouse button to draw the joist as soon as you see it appear

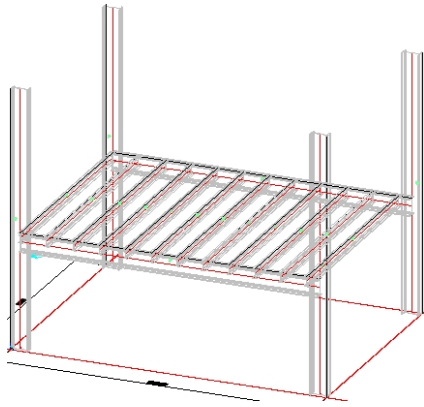


- Move the cursor a little to the right, and draw the next joist at a distance of 900 from the previous joist



- Also draw some of the next joists

- Then press **<Enter>** to end the command



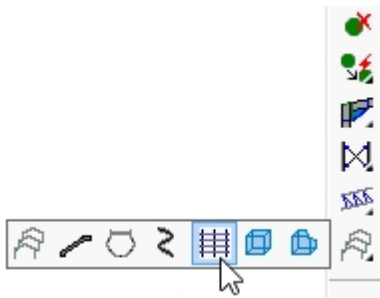
? The distances between the stringers are adjustable, look at the exercise *Modifying objects drawn with the Context Modeler* for this.

Step 4

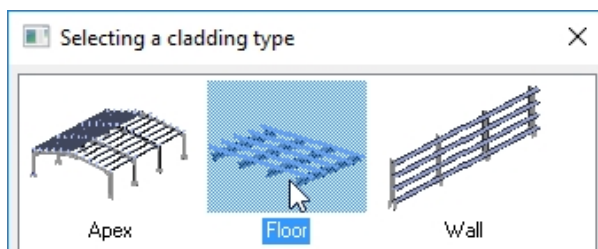
? We will now draw the same joists using a different tool.



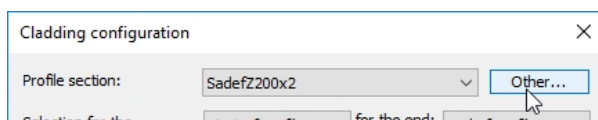
- Click several times on the **Undo** icon so that all the joists that we just drew are gone. We need to press the Undo button once per joist.



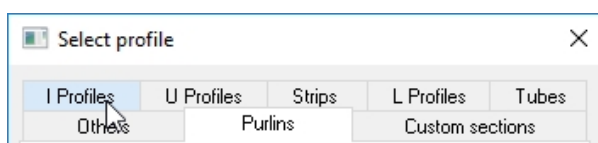
- Click on the icon **Draw Cladding**



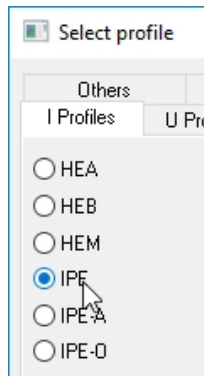
- Double-click the type **Floor**



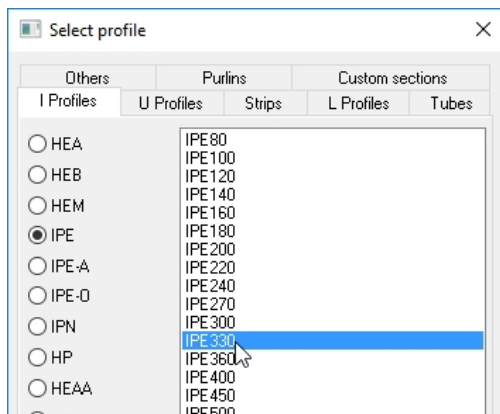
- Press the button **Other...** next to profile section



- Click on the tab **I Profiles**



- Select the section type **IPE**



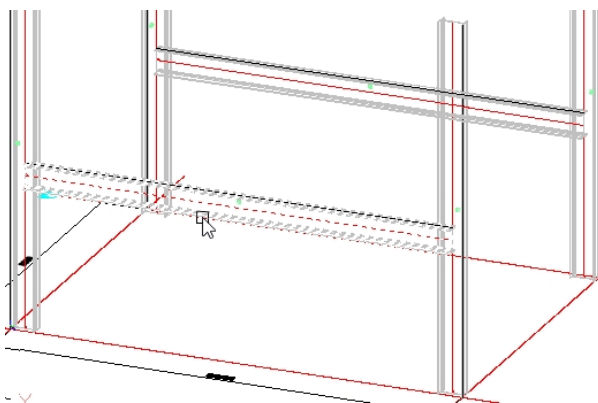
- Select the section **IPE330**



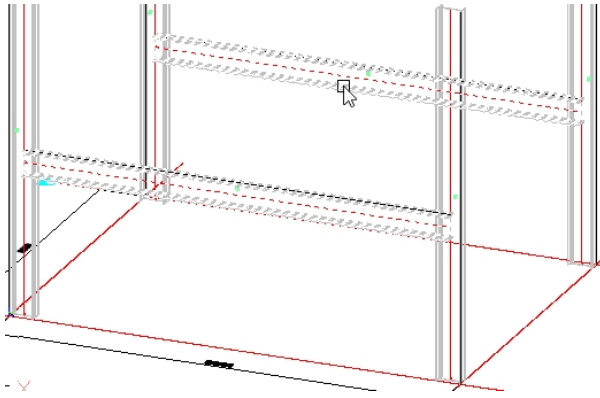
- Click on **Ok** in het profiles library window



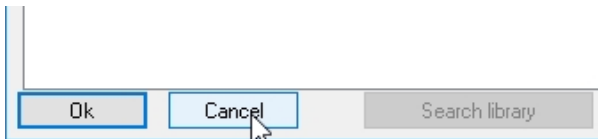
- Click again on **Ok** in the purlins window



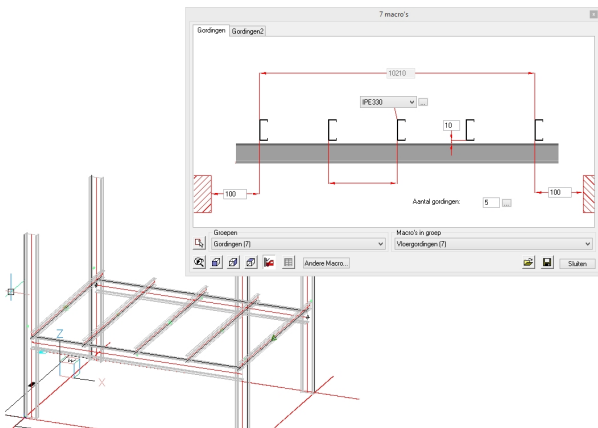
- Select the front beam



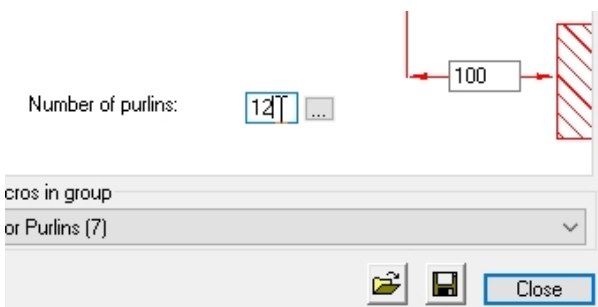
- Select the other beam and then press **<Enter>** to end the selection



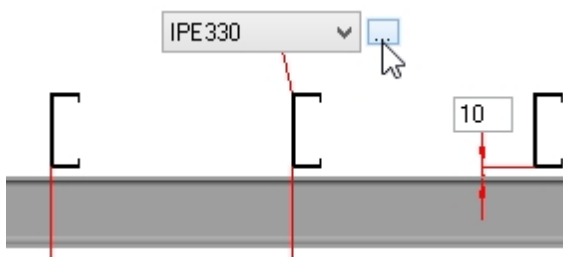
- Click on **Cancel** in the window for the choice of connection



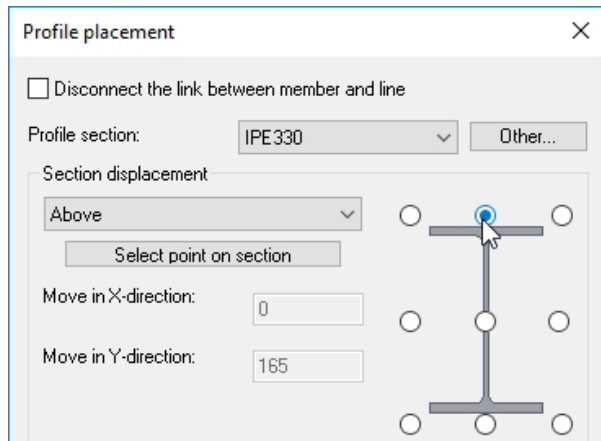
- By default the joists were drawn on top of the beams. However this can be modified easily.




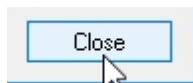
- Modify the **Number of purlins** to 12

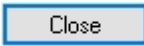


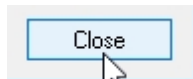
- Press the button **...** next to IPE330



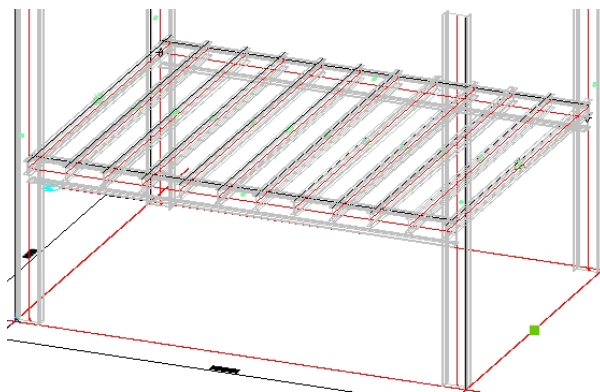
- Click on the button  at the middle top of the section




- Click on  in the *Profile placement* window



- Click on  in the *Cladding* window



 The difference with the first method (Context Modeler) is that this method allows us to draw the joists equally distributed over a distance. The number of joists is adjustable at a later time using the command *Review Macro* :




Drawing smaller parts

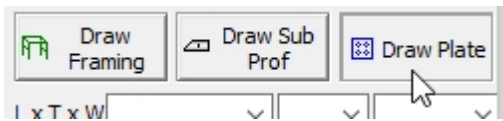
Step 1



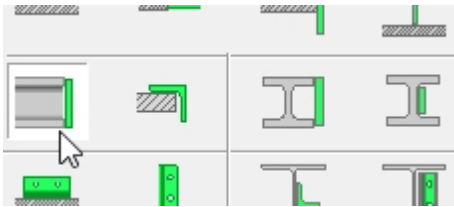
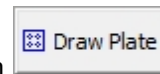
- Open the drawing  *Drawing smaller parts.dwg*



- If the *Context Modeler* is not yet open, then click on the icon  **Context Modeler**



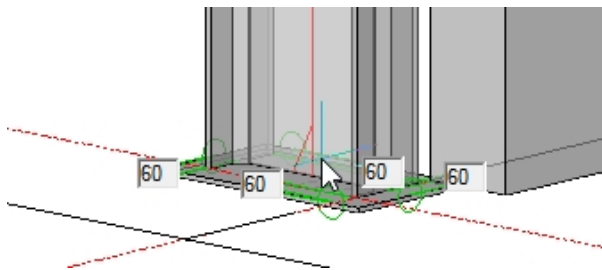
- Click on the button



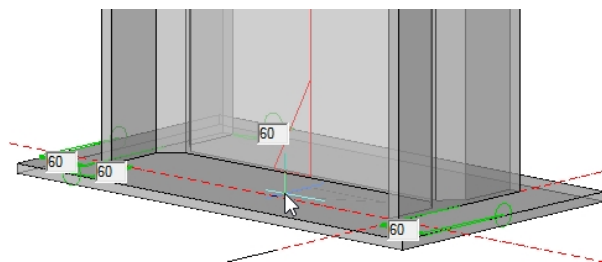
- Activate the button




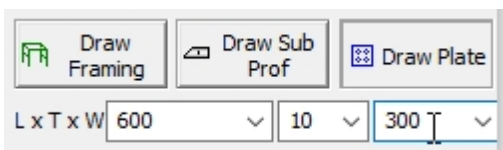
in *Context Modeler*



- Move the cursor to the underside of one of the columns so that you can see a baseplate appearing.
We will not yet draw this baseplate.

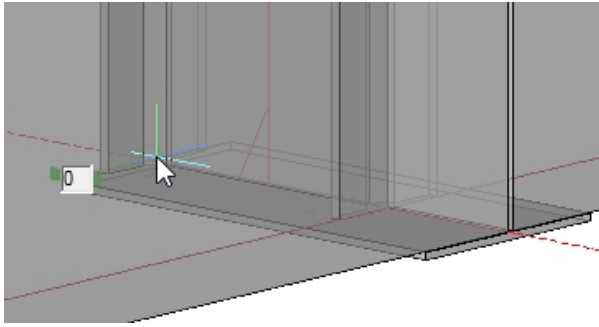


 Zoom in in order to see the distances that Parabuild chooses

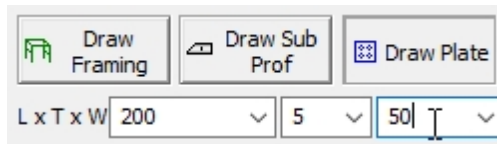


Enter the following values for the size of the plate :

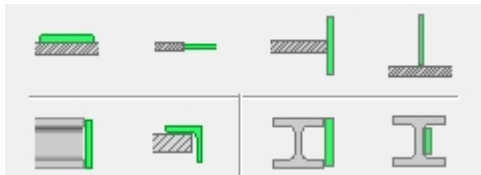
- Length : **600**
- Thickness : **10**
- Width : **300**




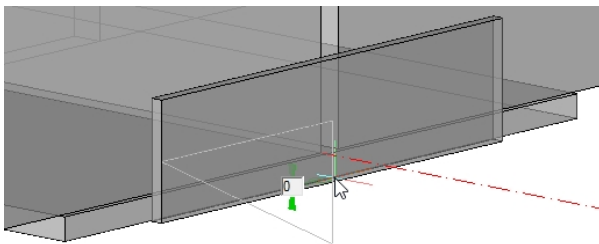
- Move the cursor to the underside of the column on intersection **F2**, and doing that choose the left side in the middle of the flange so that the plate becomes aligned to that flange. Press the left mouse button to draw the plate if the correct plate becomes visible.




- Enter the following values for the size of the plate :
- Length : **200**
 - Thickness : **5**
 - Width : **50**




- Click on the context button  so that it is deactivated



- Zoom in on the right side of the new baseplate, and move the cursor to the middle bottom of the baseplate. Press the left mouse button to draw the plate as soon as you see the same plate appear on screen.

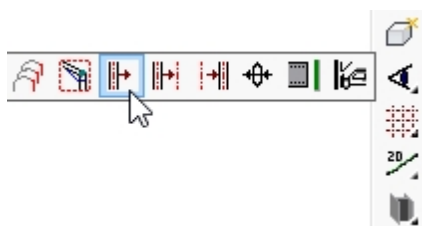
 If the plate is drawn upright instead of flat, then you can press the **Page Up** key

(alternatively you could also press the button  in *Context Modeler* to rotate the plate)

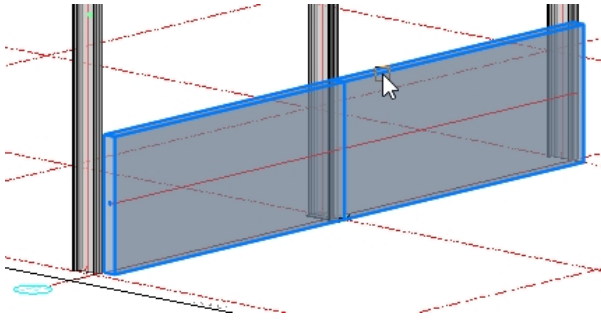


- Press **<Enter>** to end the command

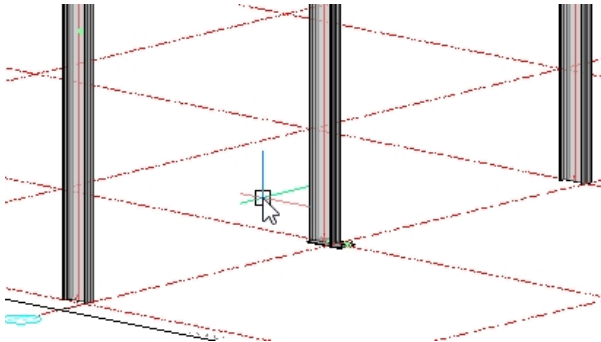
Step 2



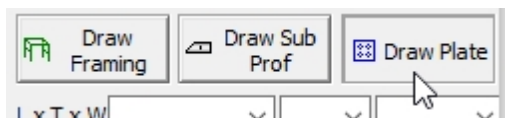
- Click on the icon  **Hide volumes**



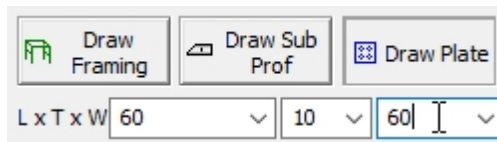
- Select the two concrete slabs, and then press **<Enter>** to confirm the selection.



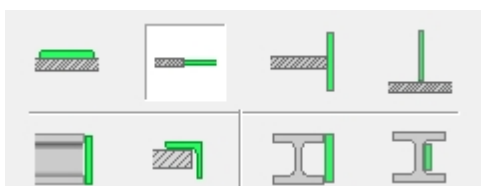
- ? The slabs were not removed but temporarily rendered invisible because they obstructed the view.




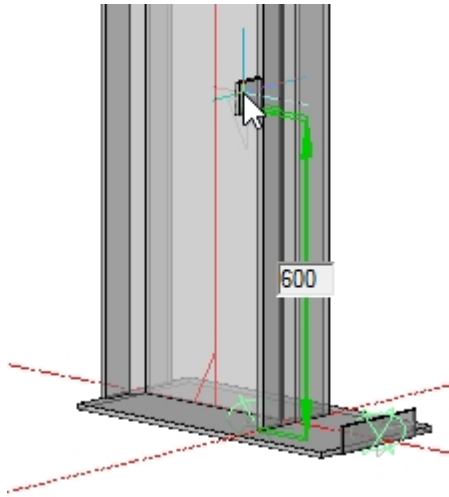
- Click on the button **Draw Plate** in the *Context Modeler*



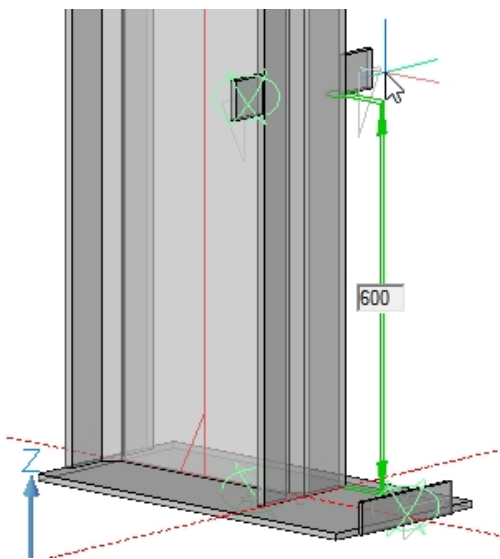
- Enter the following values for the size of the plate :
 - Length : **60**
 - Thickness : **10**
 - Width : **60**



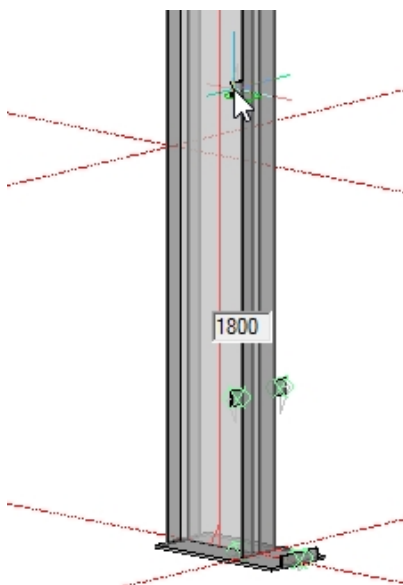
- Click on the context button  so that it becomes active



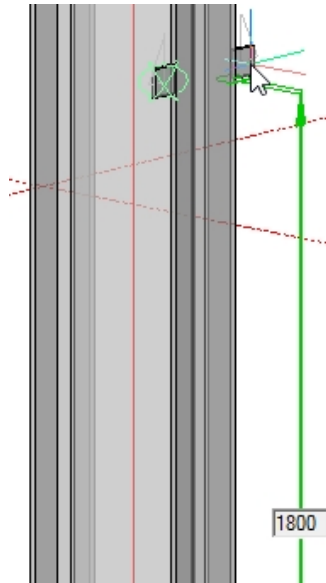
- Zoom in on the column **F2** and move the cursor to the left side of the nearest flange. Press the left mouse button to draw the plate as soon as you see the plate at a height of roughly 600.



- Also draw the plate on the other side of the same flange




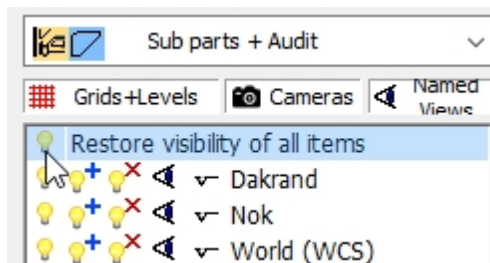
- Zoom out a little and draw the same plate but this time at a height of roughly 1800



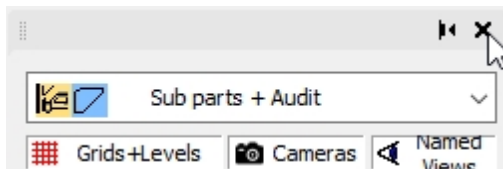
- Draw the same plate on the other side of the flange at height 1800
- Then press **<Enter>** to end the command



- If the *View manager* window is not visible anymore, then click the icon  **View manager**



- Click on the lamp  that is located on the first line : **Restore visibility of all objects**



- Close the *View Manager* window if it uses too much space.


Modifying objects drawn with the Context Modeler

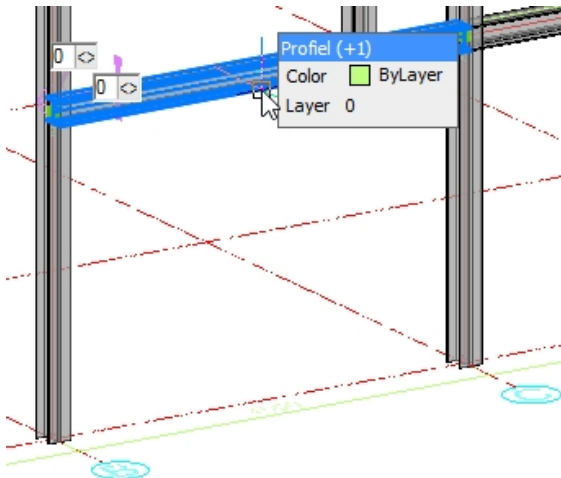
Step 1



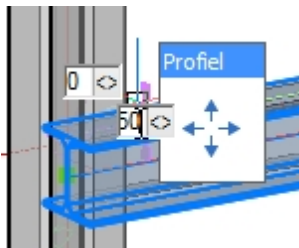
- Open the drawing  *Modifying objects drawn with the Context Modeler.dwg*



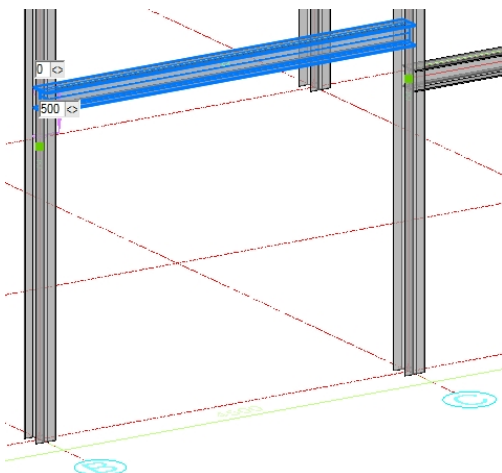
- If the *Context Modeler* is not yet open, then click on the icon  **Context Modeler**




- Select the girder between columns **B1** and **C1**



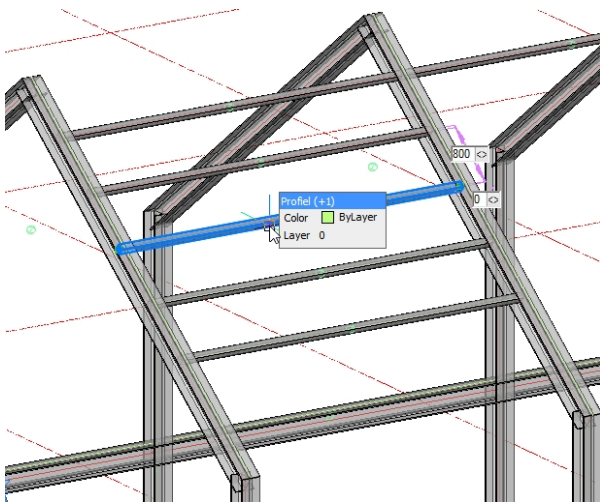
- Modify the most right value to **500** and then press **<Enter>**



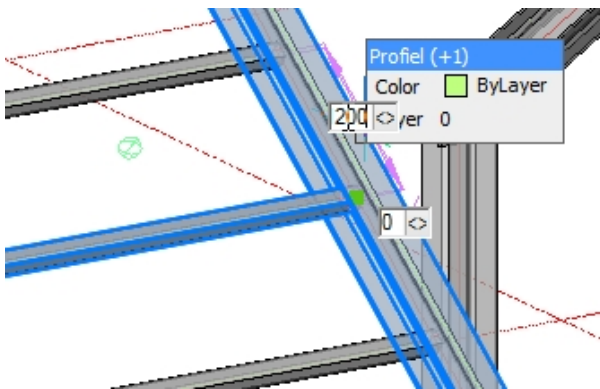
-  The girder was modified immediately. Whenever the *Context Modeler* window is visible *and* you select an object, then all the available distances of that object are shown. This tool works on all objects that are drawn using the Context Modeler, with connections or macros.



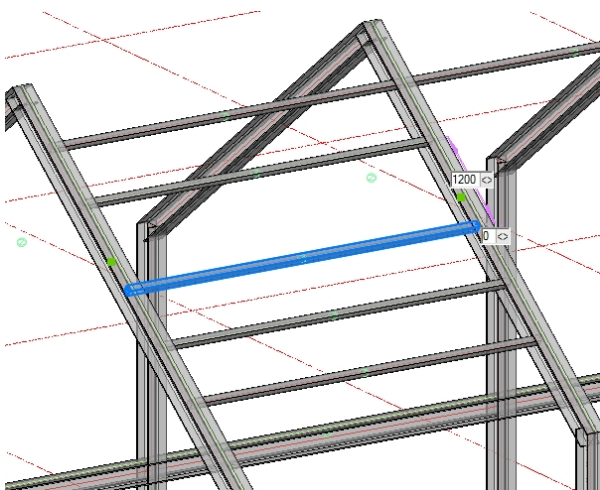
- Press the **<Escape>** key to remove the selection, and therefore also the values of the girder.



- Select the third stringer that is located in the roof between grid lines **E** and **F**



- Modify the distance 800 to **1200** and then press the **<Enter>** key

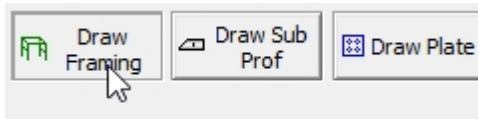


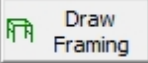
- ❓ The stringers below were also moved, because we've drawn them relative to this stringer.

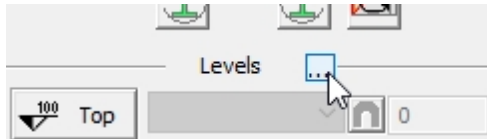
Step 2



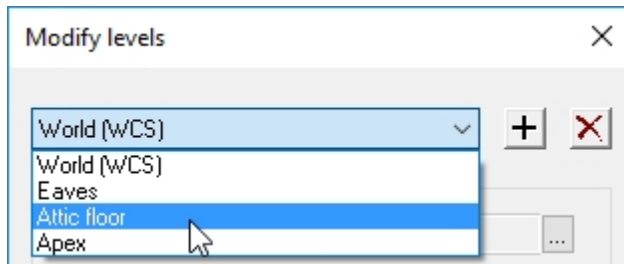
- Open the drawing  *Modifying objects drawn with the Context Modeler2.dwg*



- Click on the button  in *Context Modeler*, so that the options for structural parts appear



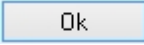
- In the middle of the **Context Modeler** window, click on the button  next to **Levels**

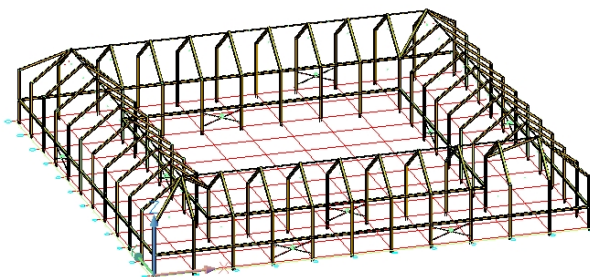


- Select **Attic floor** in the list of levels

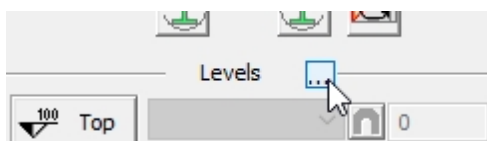


- Modify the **Height** of this level to **2500**

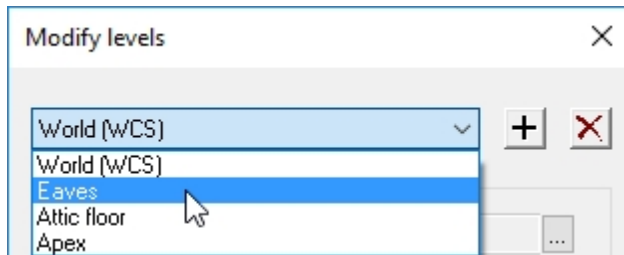
- Then press  in the *Modify Levels* window



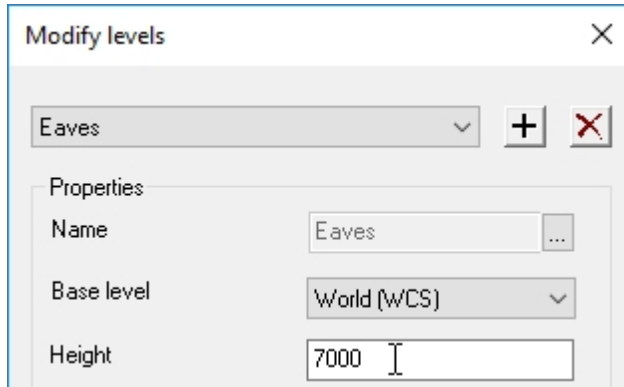
ⓘ All the girders on this level were modified, and as a consequence of this all the bracings were shortened.



- In the middle of the **Context Modeler** window, click on the button  next to **Levels**

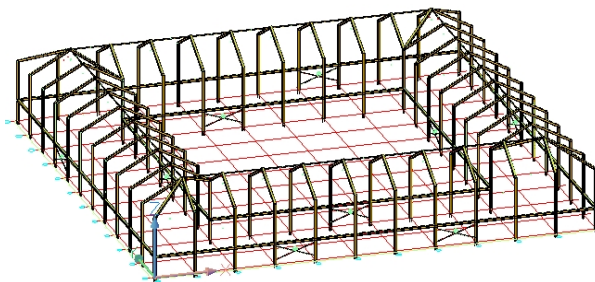


- Select **Eaves** in the list of levels

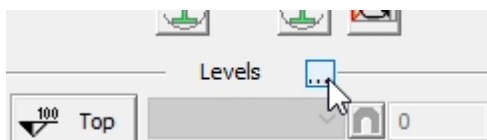


- Modify the **Height** of this level to **7000**

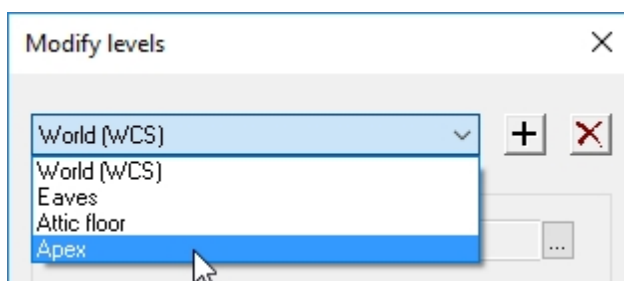
- Then press **Ok** in the *Modify Levels* window



? Alle columns were extended, and the slope of the rafters was modified because the apex was fixed to another level.



- In the middle of the **Context Modeler** window, click on the button **...** next to **Levels**

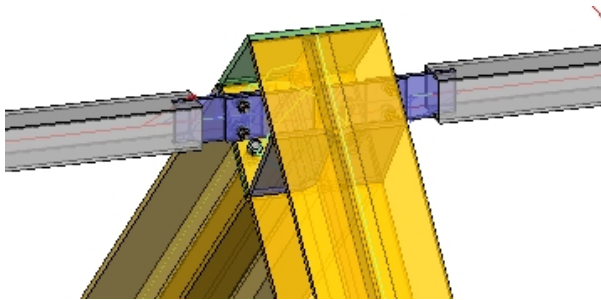


- Select **Apex** in the list of levels



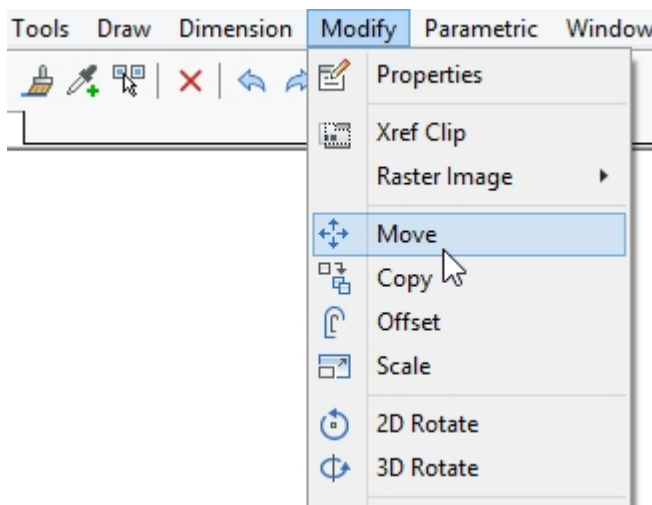
- Modify the **Height** of this level to **11000**

- Then press **Ok** in the *Modify Levels* window

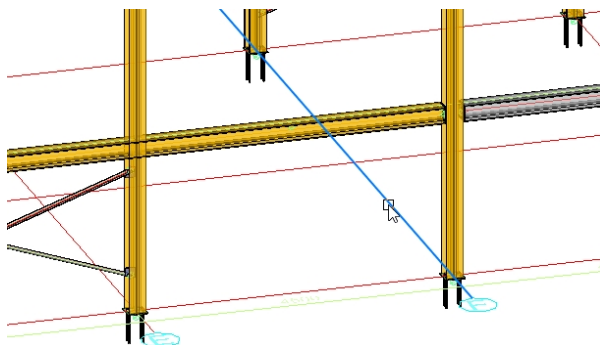


? For each modification that we apply to the levels the connections are also adapted as a consequence of the modified structural objects.

Step 3

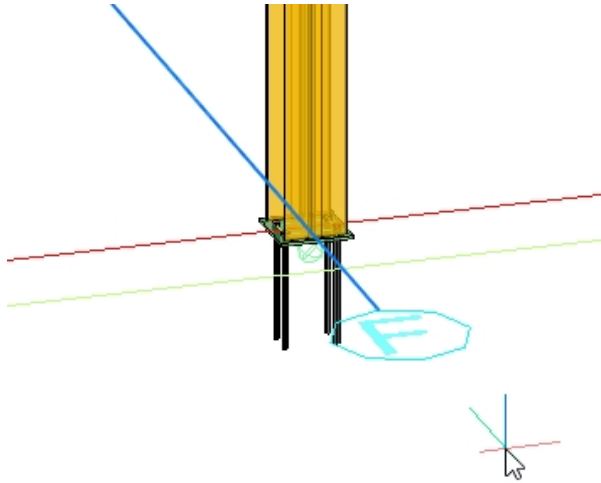


- Start the command **Move** using the menu at the top

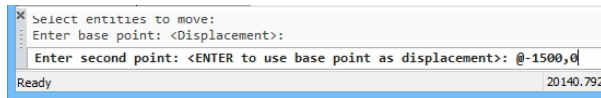


- Select the grid line **F** and it's annotation

- Then press **<Enter>** to end the selection



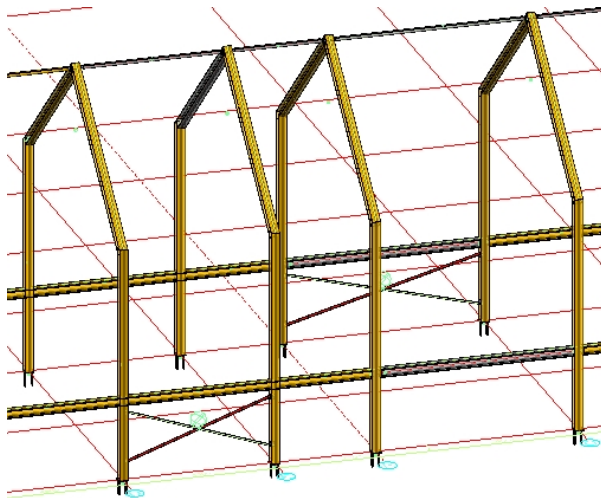
- Move the cursor to an empty spot somewhere and then click the left mouse button.



- Type in this distance : **@-1500,0**

- Then press **<Enter>** to end the command

? @ stands for relative, **-1500** is the X direction and **0** is the Y direction



? All structural members on grid F were modified because we moved it by 1500mm. As a consequence of this the connections and bracings of these structural members were also modified.

Connections and macros : Basics

These exercises are a quick introduction for drawing connections and bigger macros.

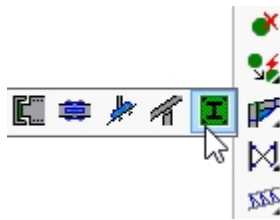
Baseplates

Step 1

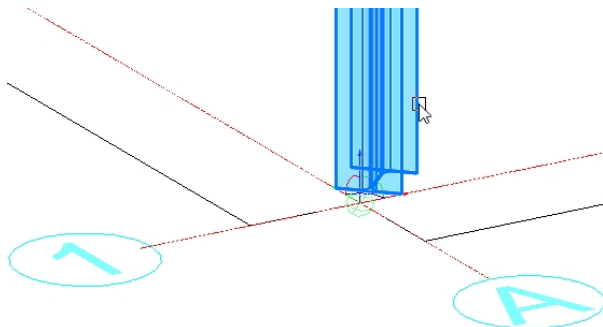


? In this exercise we will learn to draw, modify and copy baseplates.

- Open the drawing *Baseplates.dwg*

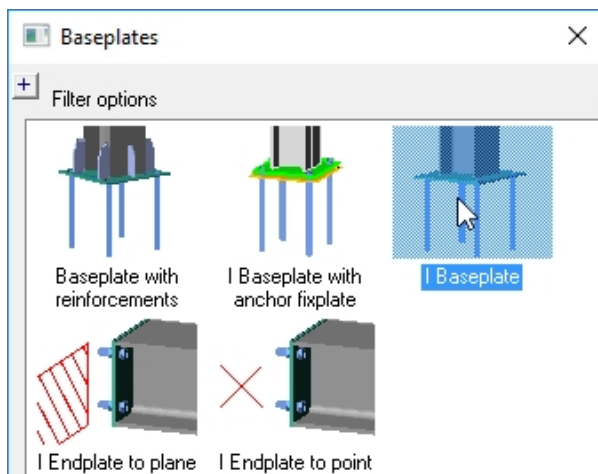


- Click on the icon **Endplates/Baseplates**



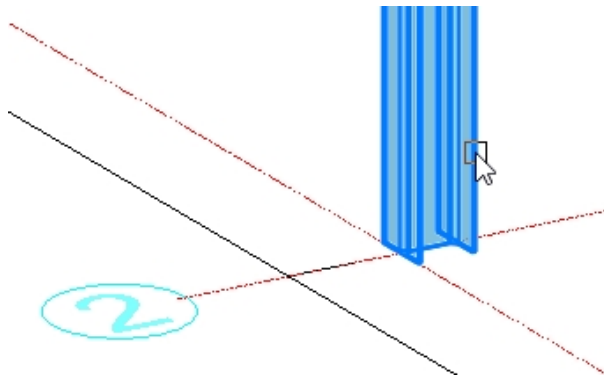
- Select the column on intersection **A1**, on the inside of the building

? Later on we will see why it is interesting to select the column on the inside of the building.

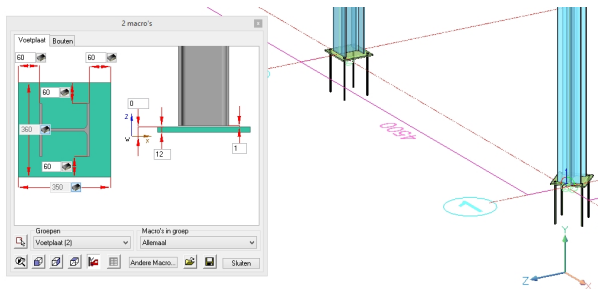


- Double-click the connection **I Baseplate**

? By double-clicking it is quicker to select the connection.

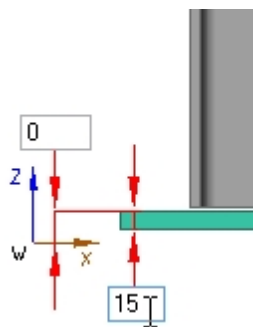


- Select the column on intersection **A2**
- Then press **<Enter>** to end the command

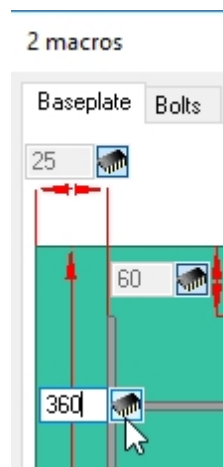


- ? Whenever you draw new connections the parameters for the new connections are shown at the end of the command.

Step 2



- Modify the thickness of the plate to **15**

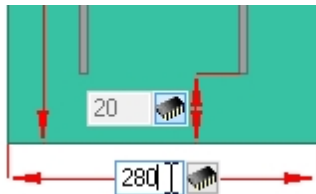



- Click on the button  next to the width 360 of the plate.

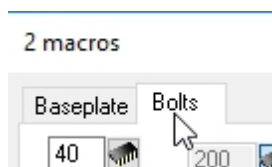
- ? By pressing this button the value becomes editable. To compensate, Parabuild has made other values uneditable to you so that Parabuild can automatically calculate the other values.



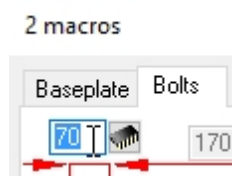
- Modify the width of the plate to **280**



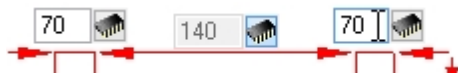
- Do the same for the other width of the plate, click on  and modify the width to **280**



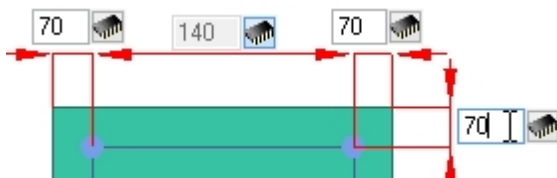
- Activate the tab **Bolts**



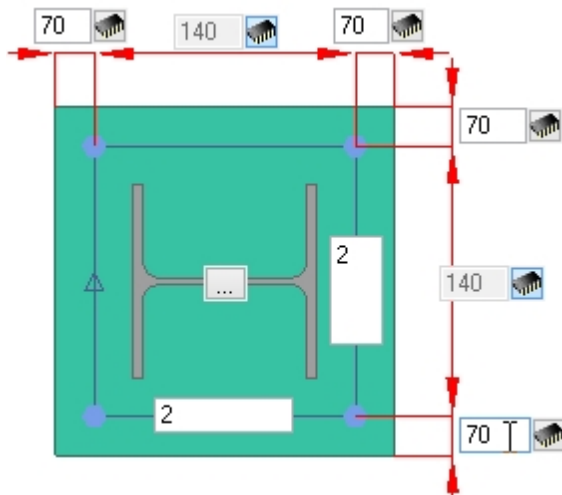
- Modify the top left edge distance to **70**



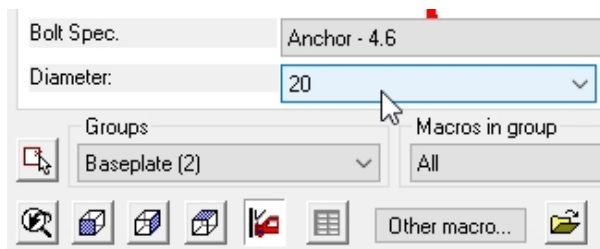
- Modify the top right edge distance to **70**



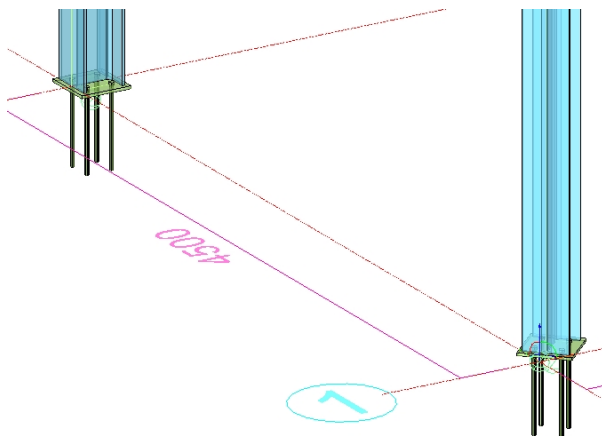
- Modify the right edge distance to **70**



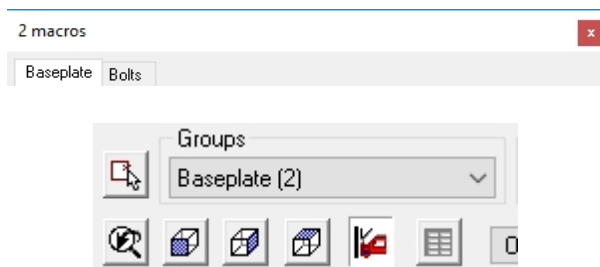
- Modify the bottom right edge distance to **70**



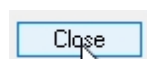
- Modify the diameter for the anchor bolts to **20**



? We modified both baseplates simultaneously.



? You can always see the number of macros that you are adjusting in the Title bar and in **Groups** of the **Review Macro** dialog box.

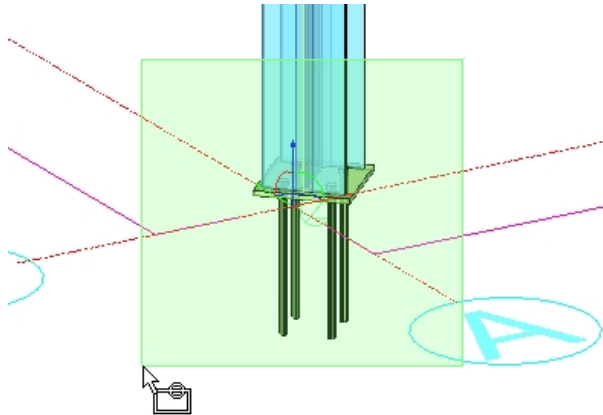


- Click on **Close**

◄ Step 3 ►



- Click on the icon  **SmartCopy**



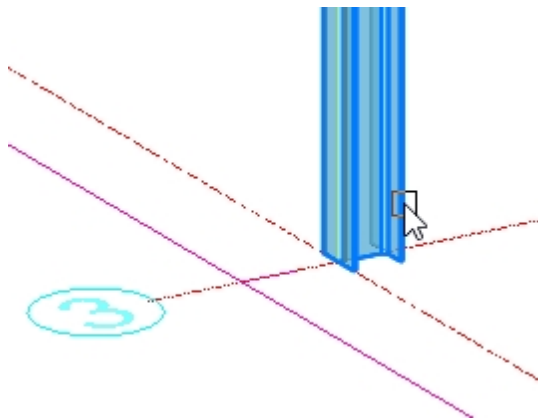
- Make a frame around the baseplate in the corner, by first clicking top right and then clicking bottom left

- Then press **<Enter>** to end the selection

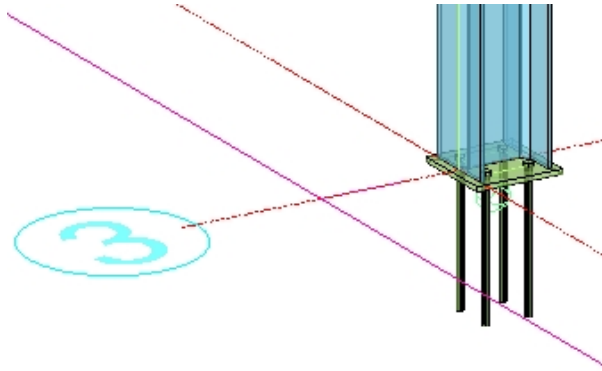
❓ We used a frame to select the sphere of the macro.

This way we do not have to zoom in in order to select the sphere.

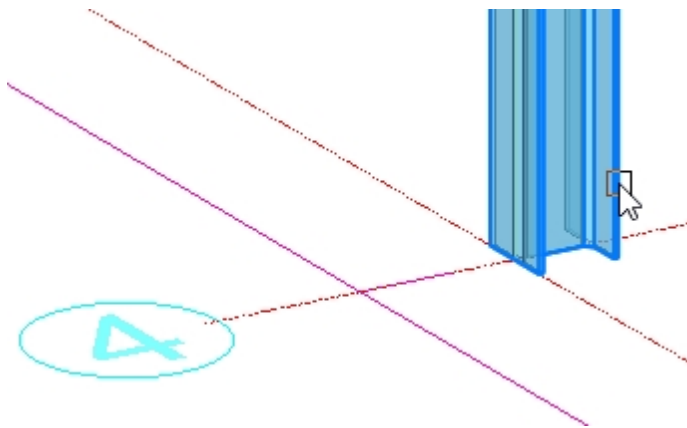
If you would select 2 macro's in the frame selection, then you're not sure which one of the 2 macro's will be copied.



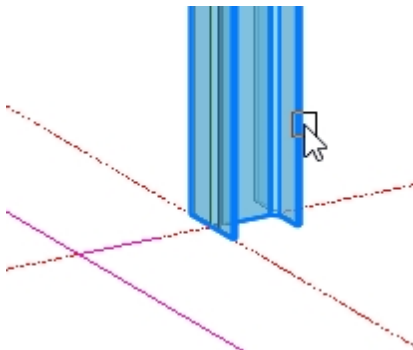
- Select the column on intersection **A3**, on the inside of the building like shown on the image



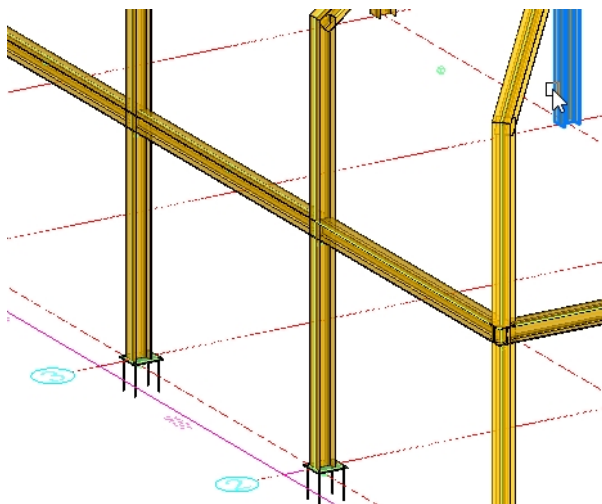
? The new macro is drawn immediately, but the command remains active so that you can keep copying the connection.



- Select the column on intersection **A4**, on the inside of the building like shown on the image



- Keep repeating this so that some more columns on grid A get their baseplate



- Select the column on intersection **C4**, on the left side (on the inside of the building)

- Then press **<Enter>** to end the command


Step 5

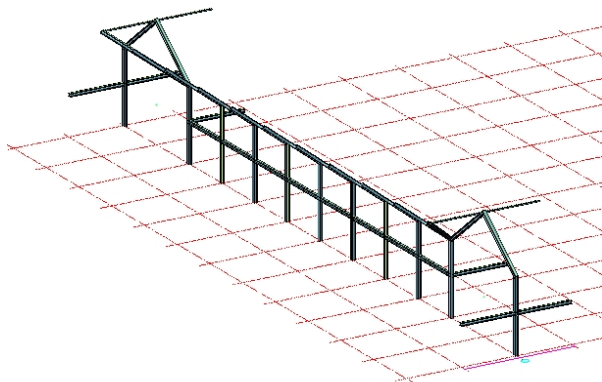
? We will now draw baseplates on grid C.
The visibility of these columns is often blocked by other columns and beams, so we will first isolate everything on grid C.



- Click on the icon  **View manager**



- Click on the lamp  that is located on the line of grid C

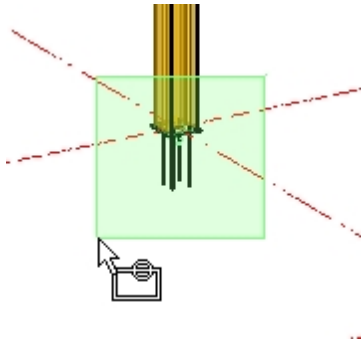


? This is the quickest way to calm a crowded drawing.

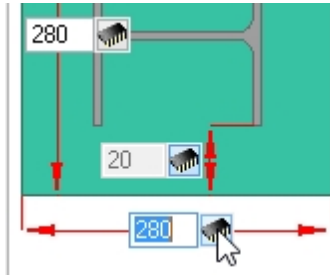
Step 6




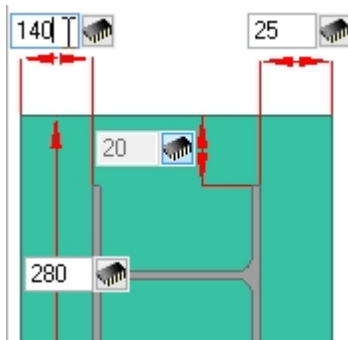
- Click on the icon  **Review macro**

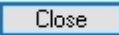


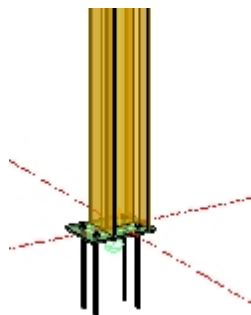
- Make a frame around the baseplate on intersection **C4**
- Then press **<Enter>** to confirm the selection




- Click on the button  next to the lower width **280** of the plate so that Parabuild calculates this value



- Modify the edge distance at top left to **140**
- Then click on 

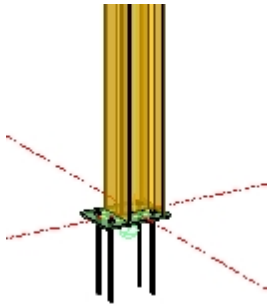


-  If you consistently selected the column on the inside, then the baseplate is drawn bigger to the inside of the building.

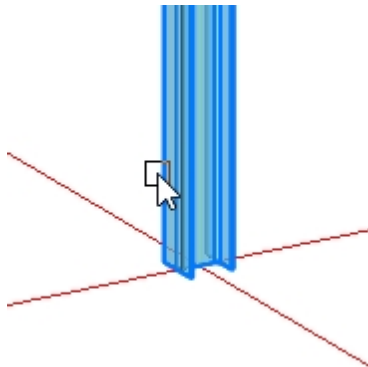
Step 7



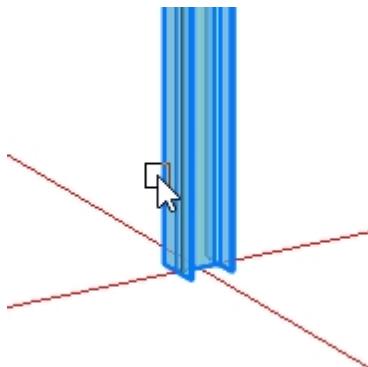
- Click on the icon  **SmartCopy**



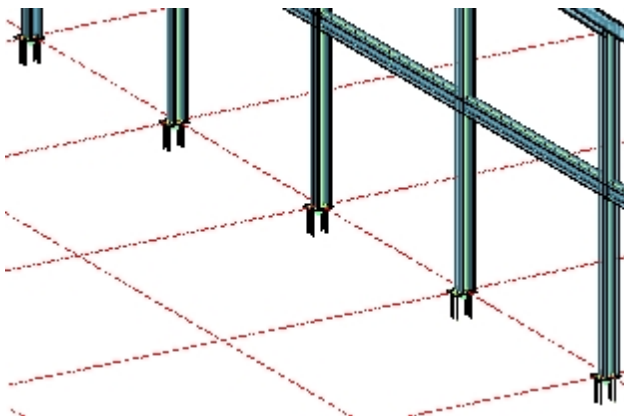
- Make a frame around the baseplate on intersection **C3**
- Then press **<Enter>** to confirm the selection



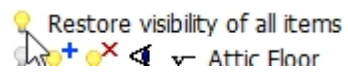
- Select the column on intersection **C4**, on the inside of the building




- Repeat this for some more columns on grid **C**
- Then press **<Enter>** to end the command




? If you always consistently selected the columns on the inside of the building, as well as during creation of the first as during copying, then all the baseplates should be aligned to the inside of the building. This rule applies to all connections in Parabuild that are not symmetric or connections that can be mirrored.



- Click on the lamp  next to the **Restore visibility** entry in the list of the *View manager* to restore the visibility of all objects.

Connections between columns and beams

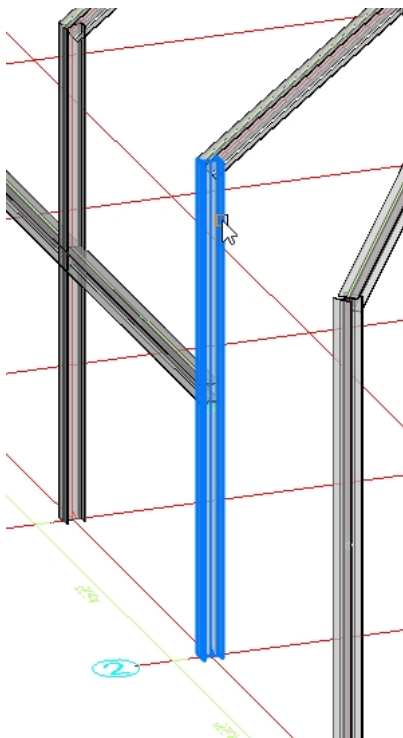
Step 1

 We will now draw a standard haunch connection.

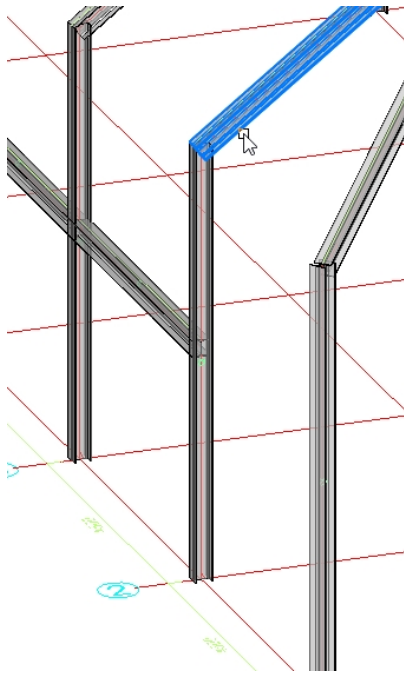
- Open the drawing  *Haunch connection basics.dwg*



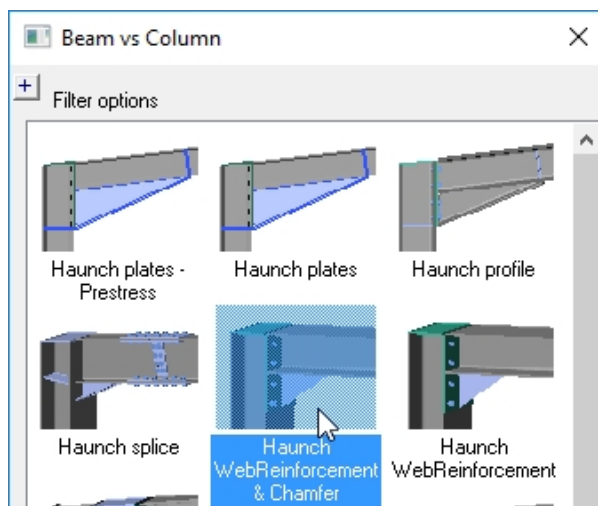
- Click on the icon  **Haunch connections**



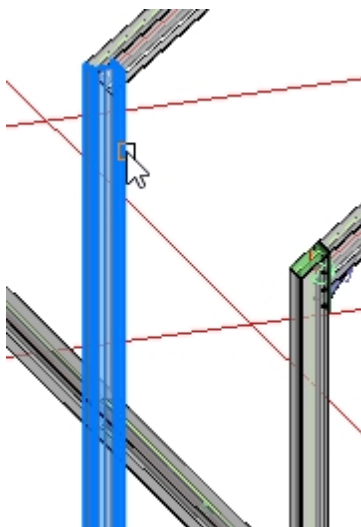
- Select the column on intersection **A2**



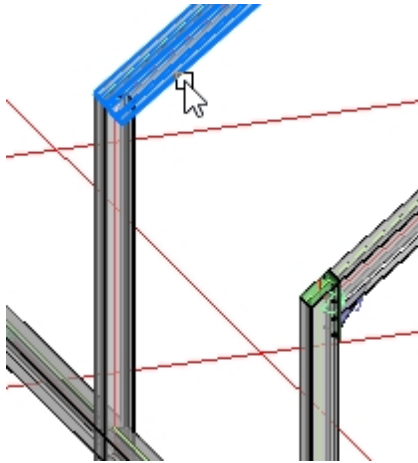
- Select the rafter of the column on **A2**



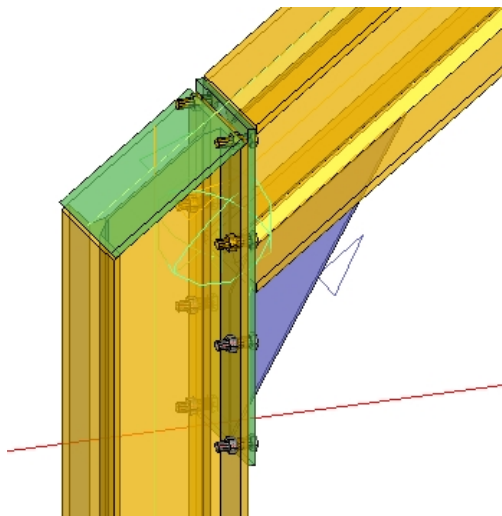
- Double-click the connection **Haunch WebReinforcement & Chamfer**



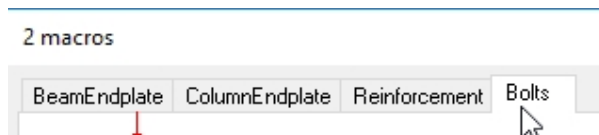
- Select the column on intersection **A3**



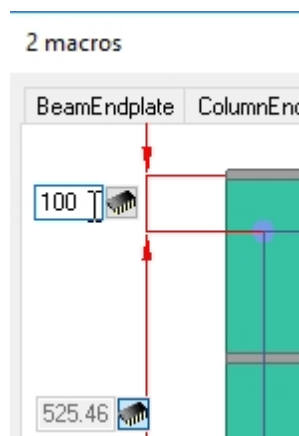
- Select the rafter of the column on **A3**
- Then press **<Enter>** to end the command



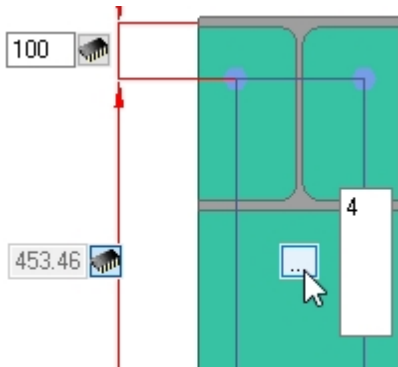
- Zoom in on one of the new connections.



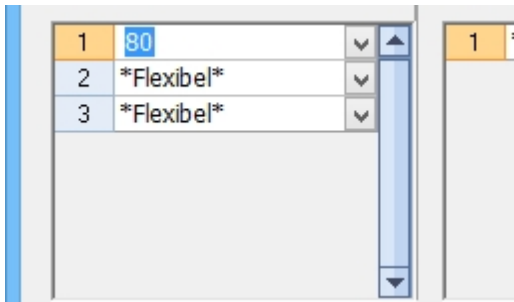
- Activate the tab **Bolts**



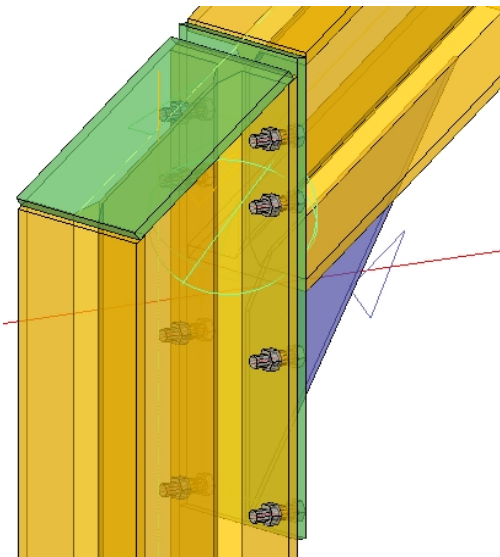
- Modify the top edge distance of the bolt pattern to **100**



- Press the button of the bolt pattern



- Enter **80** as value for the first entry of the left table
- Then press two times



- Advanced options for the bolt positions such as distance between are available in all macros using the button .

Step 2

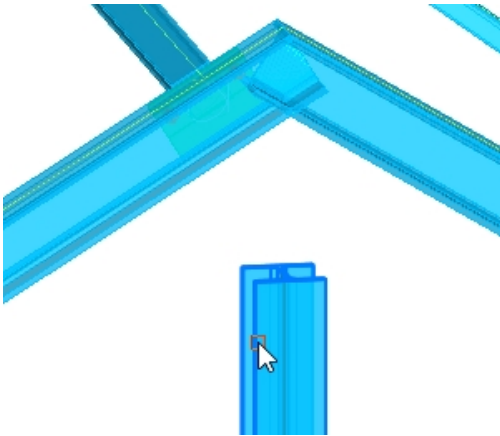


- Connections with 3 or more base profiles are also possible. We will now draw a connection with 3 base profiles.

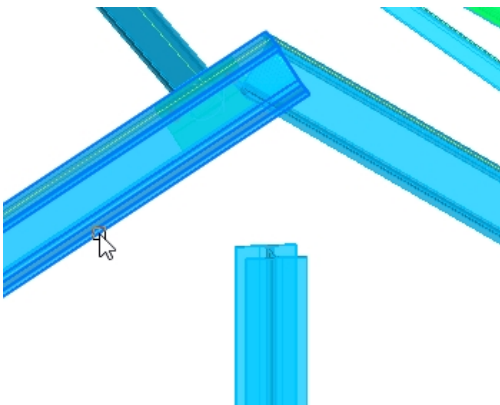
- Open the drawing *Apex with column support.dwg*



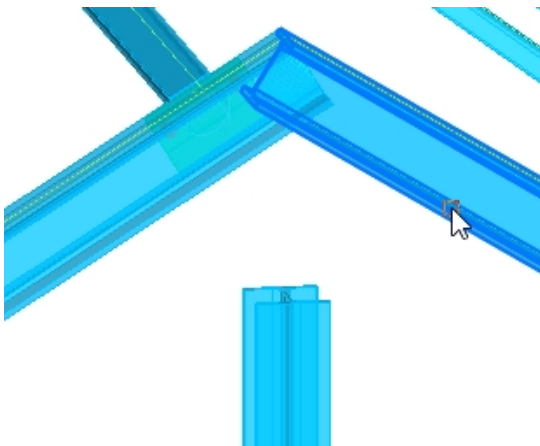
- Click on the icon **Apex & Column**



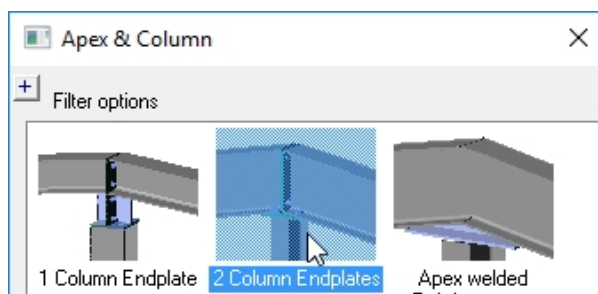
- Select the column beneath the first apex



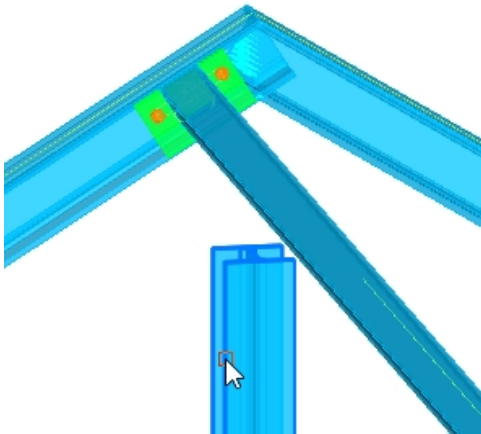
- Select the left rafter



- Select the other rafter

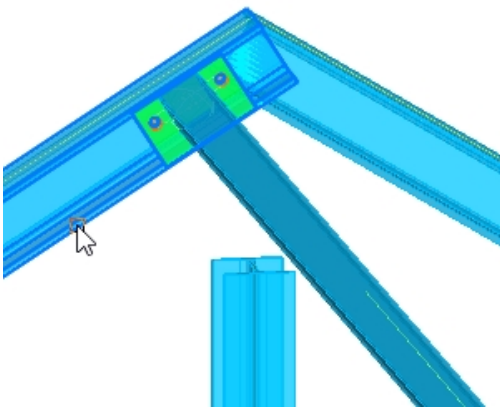


- Double-click the connection **2 Column Endplates**

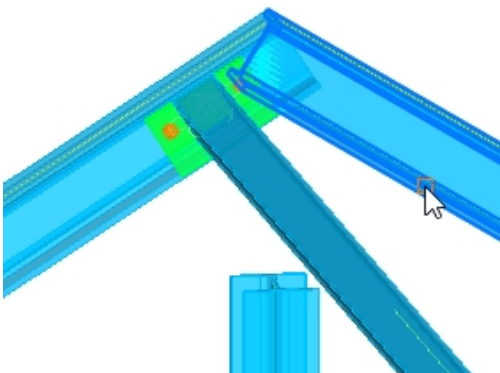


? We will now apply this connection in other places.

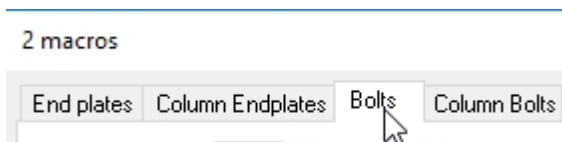
- Navigate to the apex in the back using met zoom/pan.
- Select the column underneath the apex in the back



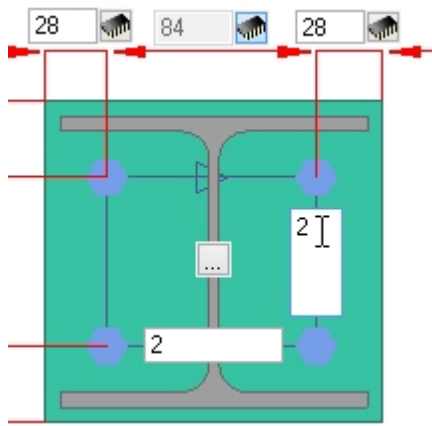
- Select the left rafter



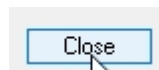
- Select the other rafter
- Then press **<Enter>** to end the command



- Activate the tab **Bolts**



- Modify the number of bolts to **2**



- Press **Close** in the *Review macro* window

Drawing simple bracings and copying them

◀ Step 1 ▶

❓ In this exercise the following topics will be handled :


- Drawing a simple bracing with gusset plates
- Copying a bracing with gusset plates

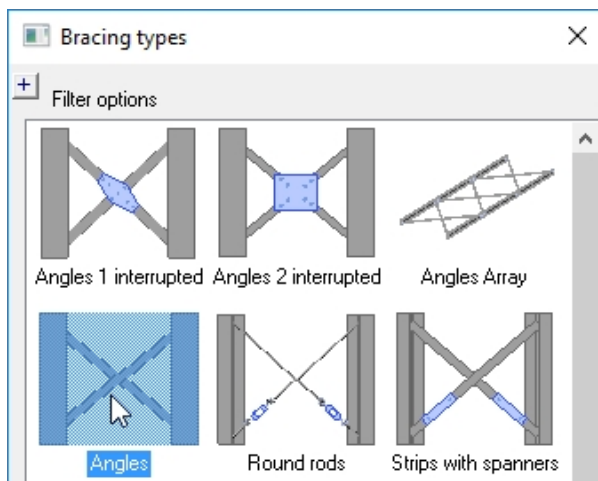


❓ In this step we will deliberately make a mistake, so that we can learn how to correct that mistake.

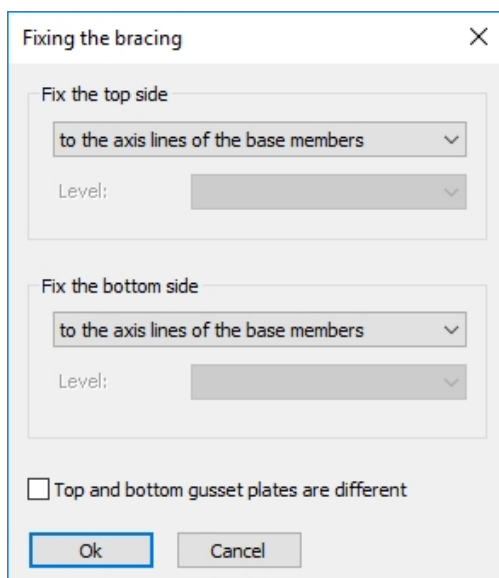
- Open the drawing  *Simple bracing.dwg*



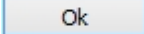
- Click on the icon  **Bracing**

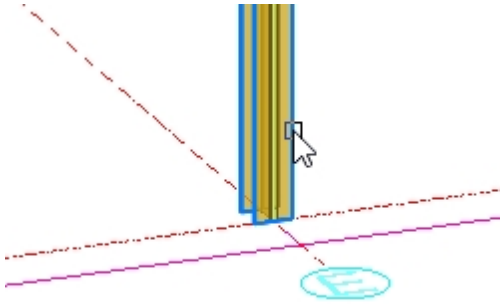


- Double-click the bracing **Angles**

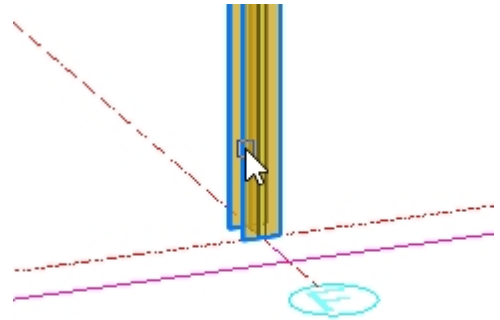


❓ To show the purpose of the setting **Fix the top side** we will first continue with the default values.

- Click on  in the window *Fixing the bracing*.



- Select the column on intersection **E1**



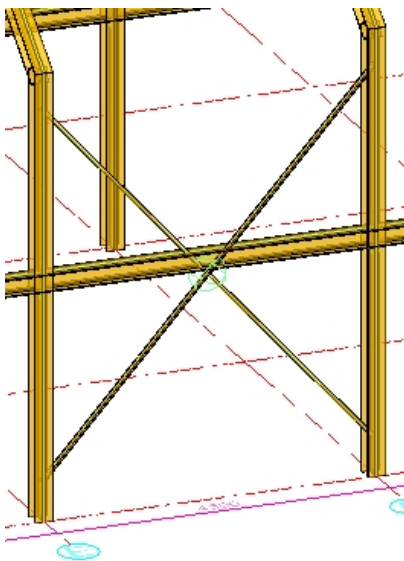
- Select the column on intersection **F1**



- Press in the window for selection of a gusset plate connection.

- Press the **<Esc>** key to cancel the command


- Then press in the *Bracing* window




- ❓ We've aborted this command early because the end height of the bracing is incorrect. The bracing should stop at the attic floor. In the next step we will undo the creation of the bracing in order to draw the correct bracing.

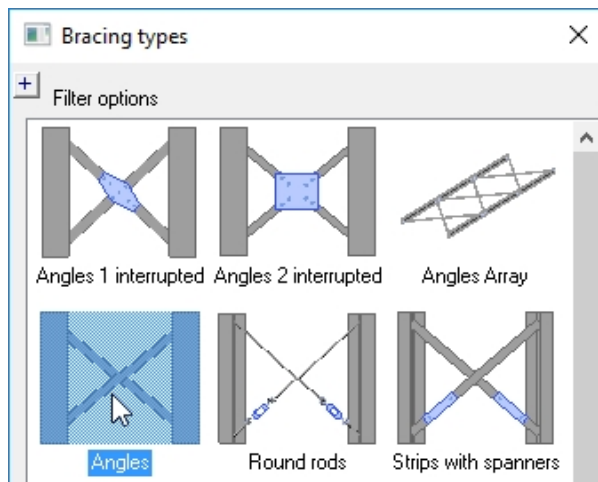
◀ Step 2 ▶



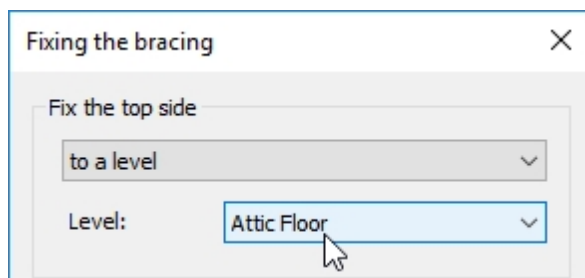
- Press the **Undo**  2 or 3 times until the incorrect bracing disappears.



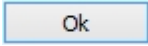
- Click on the icon  **Bracing**

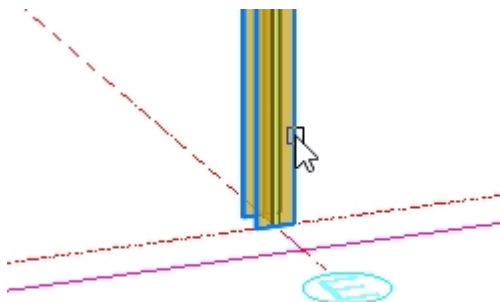


- Double-click the bracing **Angles**

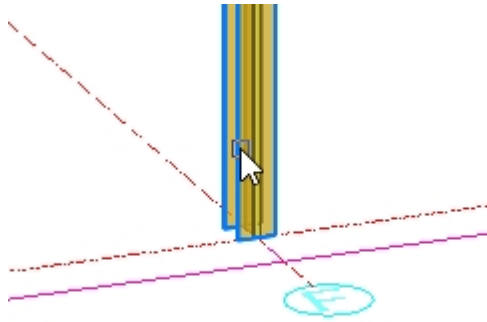


- Choose for **to a level** for *Fix the top side*, and select the level **Attic Floor**

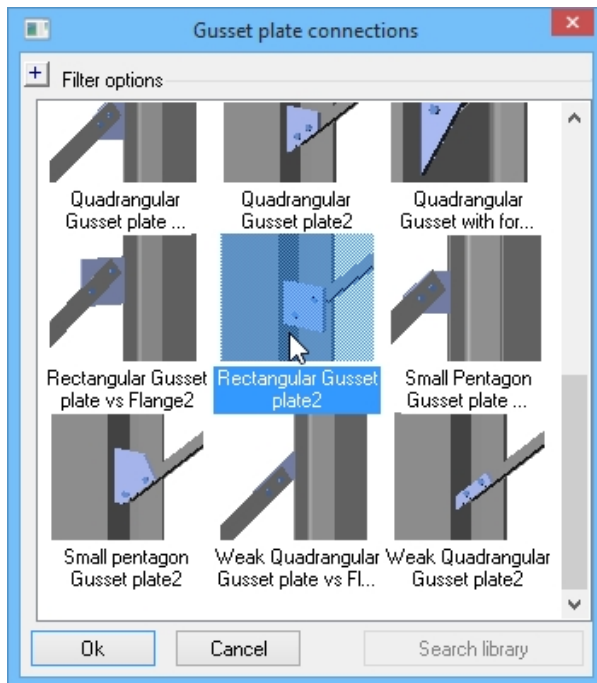
- Click on  in the window **Fixing the bracing**.



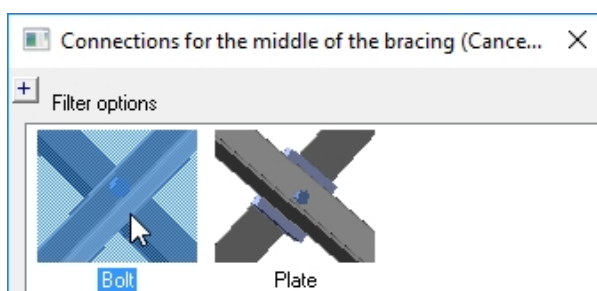
- Select the column on intersection **E1**



- Select the column on intersection **F1**



- Double-click the connection **Rectangular Gusset plate2**

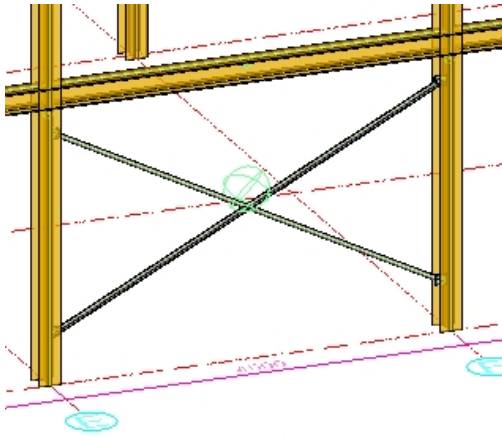


- Double-click the bolt for the connection in the middle.

❓ If you don't want a connection here, then you can just press the cancel button. This connection will then be skipped but not the entire bracing.



- Press **<Enter>** to end the command



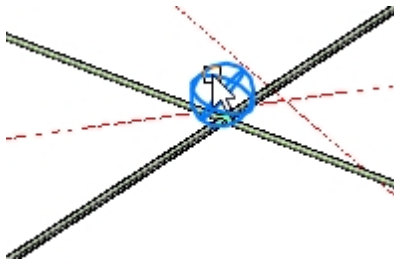
? This command has drawn several connections for us, and we now arrive at the options of all the new connections (the bracing, the bolt and 4 gusset plates).

Press 3 times to close the windows of these connections.

Step 3

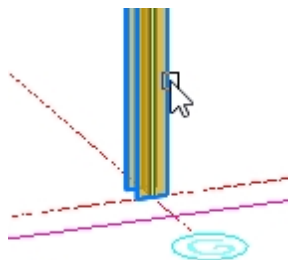


- Click on the icon  **SmartCopy**

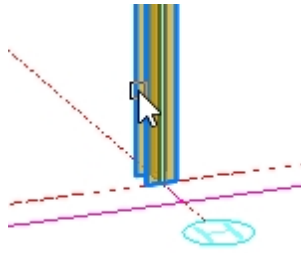


- Select the biggest green sphere of the new bracing.

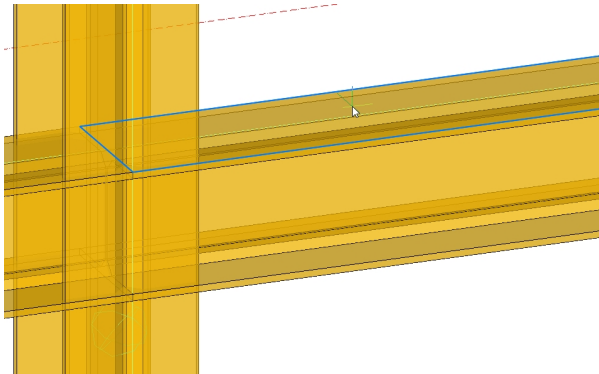
- Then press **<Enter>** to confirm the selection



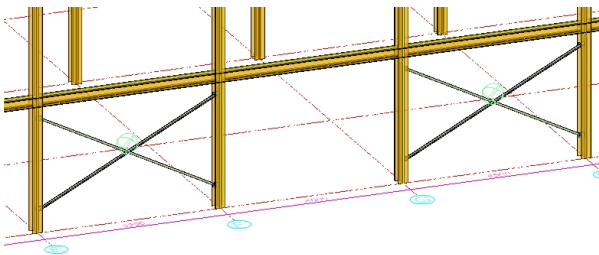
- Select the column on intersection **G1**



- Select the column on intersection **H1**



- Zoom in on the girder between grid lines G1 and H1.
Then select the top plane of the girder by moving the cursor to the middle of this plane and then pressing the left mouse button once.
- Then press **<Enter>** to confirm the plane selection.
- Press **<Enter>** again to end the command.



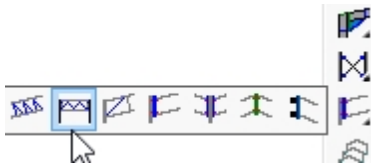
- ❓ The bracing together with all of it's connections were copied.
Parabuild asked for the height of the bracing again through the plane selection method, so the copy does not necessarily have to have the same height as the original.

Drawing trusses

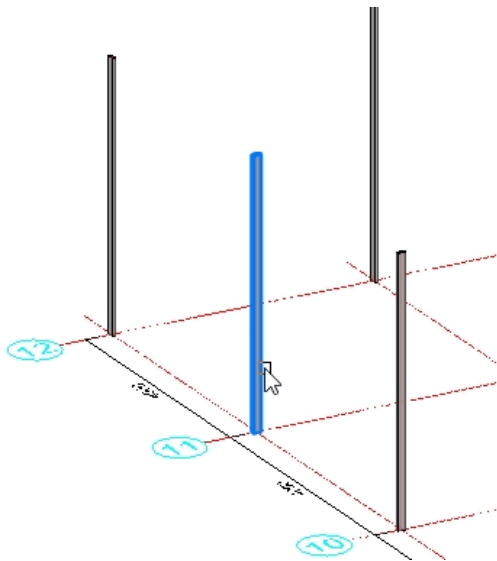
◀ **Step 1** ▶



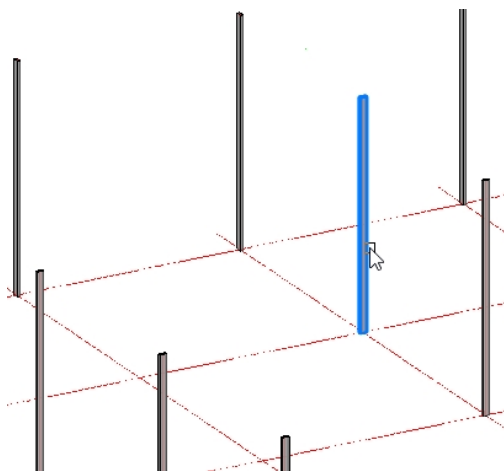
- Open the drawing  *Trusses.dwg*



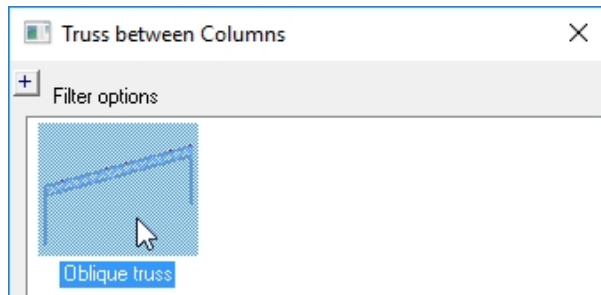
- Click on the icon  **Truss between columns**



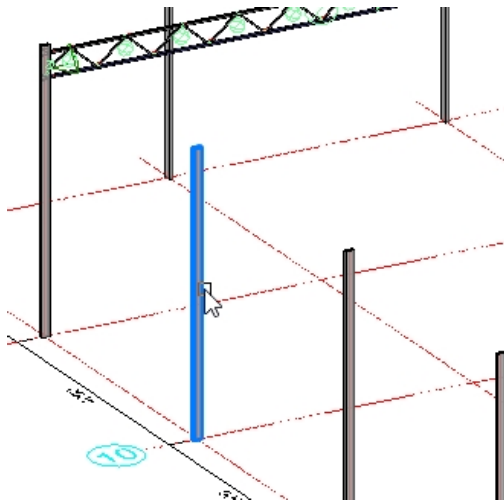
- Select the column on intersection **A11**



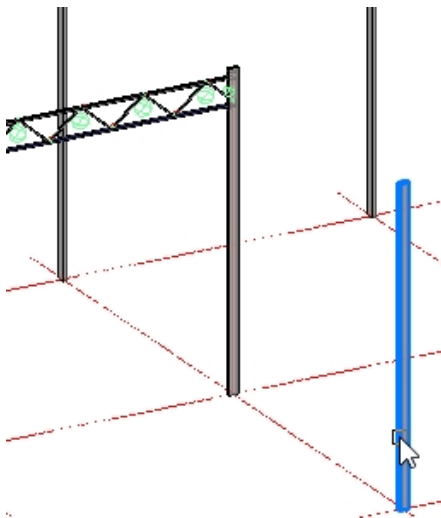
- Select the column on intersection **C11**



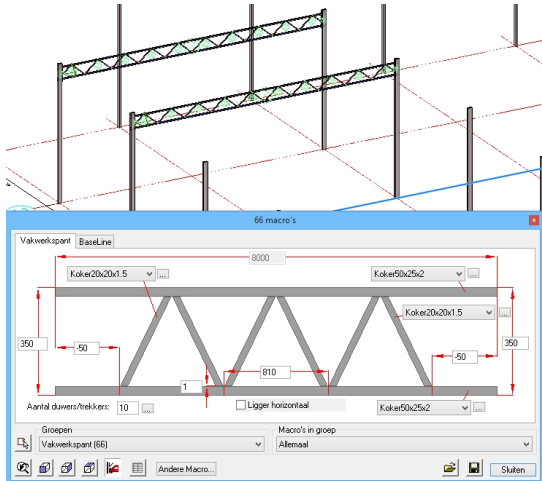
- Double-click the macro **Oblique truss**
- Then press **<Enter>** to accept *World* as the orientation of the truss



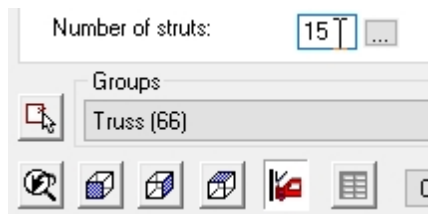
- Select the column on intersection **A10**



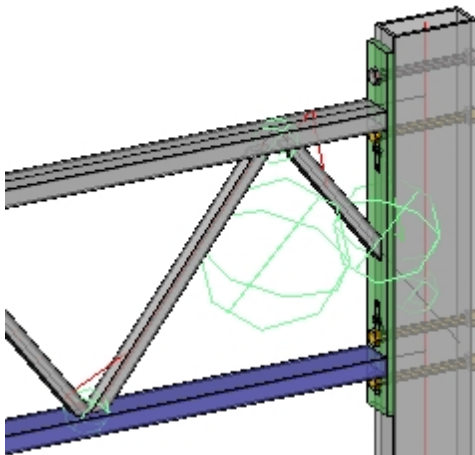
- Select the column on intersection **C10**
- Press **<Enter>** to accept *World* as the orientation of the truss
- Press **<Enter>** again to end the command.



- If necessary, move the *Review macro* window so that the new trusses are visible




- Modify the number of struts to **15**
- Then press **<Enter>** to apply the new number



- Zoom in to look more closely at the trusses

❓ All the smaller connections that are dependent on the struts, cuts in this case, are automatically recalculated.

❓ These trusses can also be copied using the *Smartcopy*  tool.

Generating output : Basics

These exercises are a quick introduction for generating output :

- Bill of materials
- CNC files
- BIM files for the communication with other software
- Workshop drawings
- General Arrangement drawings

Bills and CNC files

Step 1

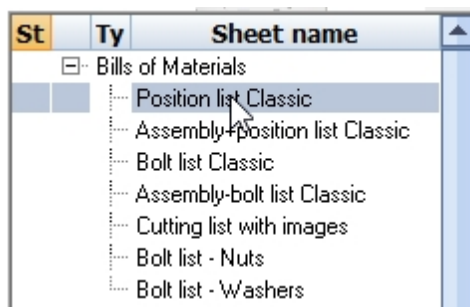


? In this exercise we look at the generation of Bills, Dstv files and DXF files for plates.

- Open the drawing Bills.dwg



- Click on **Sheets manager**



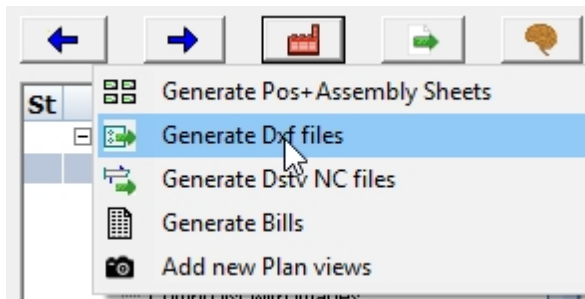
- Double-click the bill **Position list Classic** using the mouse

Postlijst Klassiek.xls - OpenOffice Calc

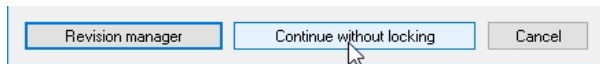
Pos	Aan/Naam	Lengte	Gewicht	Verfopp	Opmerking	Materiaal	Tot gewicht
1	PL1	30 P60X6-206	206	0.6	0.03		18
2	PL2	12 P260X10-580	580	12.1	0.32		145.2
3	PL3	8 P107X10-135	135	1.2	0.03		9.6
4	PL4	14 P190X10-140	140	2.1	0.06		29.4
5	PL5	1 P190X10-200	200	3	0.08		3
6	PL6	2 P190X10-200	200	3	0.08		6
7	PL7	12 P100X10-190	190	1.5	0.04		18
8	PL8	4 P127X10-142	142	1.4	0.04		5.6
9	PL9	12 P100X10-495	495	4	0.11		48
10	PL10	12 P299X10-500	500	12	0.31		144
11	PL11	4 P129X10-135	135	1.4	0.04		5.6
12	PL12	1 P190X10-200	200	3	0.08		3
13	PL13	3 P100X10-200	200	1.6	0.05		4.8
14	PL14	1 P140X10-275	275	3.1	0.09		3.1
15	PL15	1 P190X10-140	140	2.1	0.06		2.1
16	PL16	2 P100X10-200	200	1.6	0.05		3.2

? The bill will be generated and then opened in the current default program for spreadsheet files such as Microsoft Excel, Open Office, Parabuild spreadsheet or Notepad.

Step 2

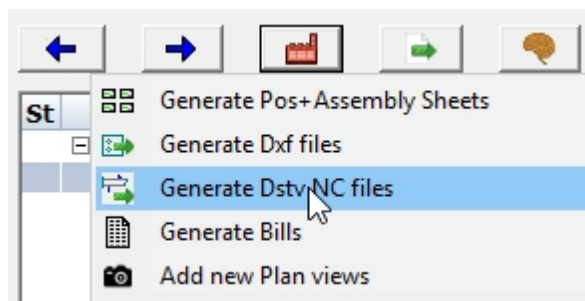


- Click on the button  and then on **Generate Dxf files**

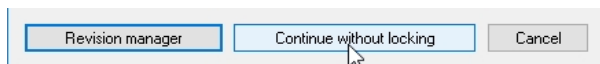


- Click on 

- Click on 




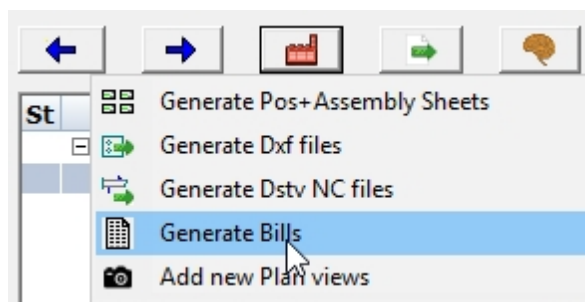
- Click on the button  and then on **Generate Dstv NC files**



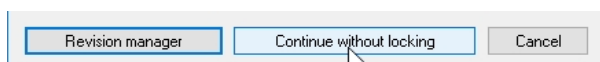
- Click on 

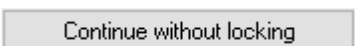
- Click on 

 Generation of Dstv files is disabled in some trial versions. If this the case then you can contact us to acquire an unlimited test version.



- Click on the button  and then on **Generate Bills**



- Click on 

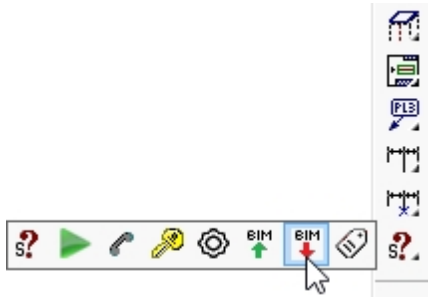
- Click on

Ok

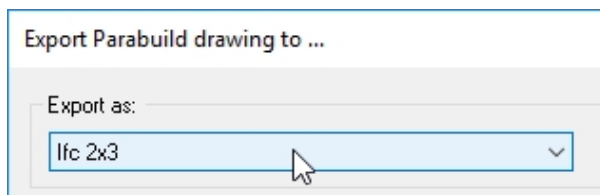
Step 3

❓ We will now export the 3D Model as an Ifc file.

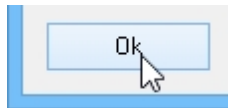
This file type can be used to exchange the 3D Model with other software such as Scia Engineer, Revit, ArchiCAD, ...

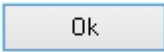


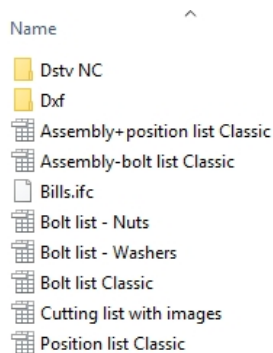
- Click on the button  **Export BIM to file**



- Make sure that the export type is **Ifc 2x3**



- Click on  to write the file



- Open **Windows Explorer** and go to the folder of this drawing, for example :

C:\Parabuild v3\Exercises\English\Bills

❓ All files that we generated are collected in this folder that has the same name as the DWG file of the 3D drawing.

Generating workshop drawings

Step 1

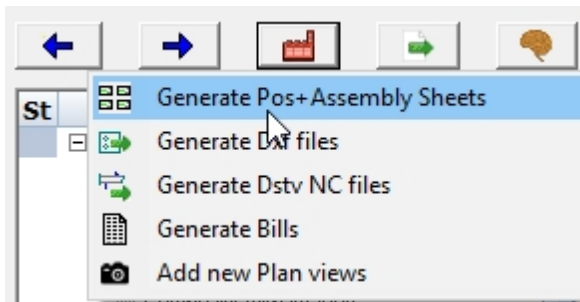


? We will now generate production drawings for plates, profiles and assemblies (marks).

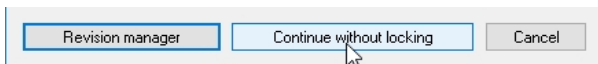
- Open the drawing *Workshop drawings.dwg*



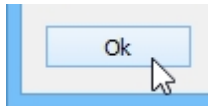
- Click on **Sheets manager** if the window is not yet open



- Click on the button and then click on **Generate Pos+Assembly sheets**



- Click on **Continue without locking**

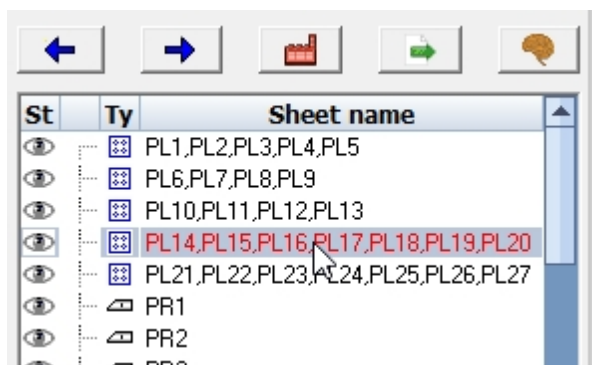


- Click on **Ok** in the selection window because we will generate all parts.

- Please wait for a moment while the drawings are being generated

Generating pos plate sheets PL11 (11/58)

? The progress of generation is shown on the sheets manager window. You can interrupt the generation process by pressing the <Escape> key.



- Double-click some items in the list in order to view the drawings.

? The drawing that you double-click is shown on screen. The 2D drawing that is currently visible is shown in red in this list.

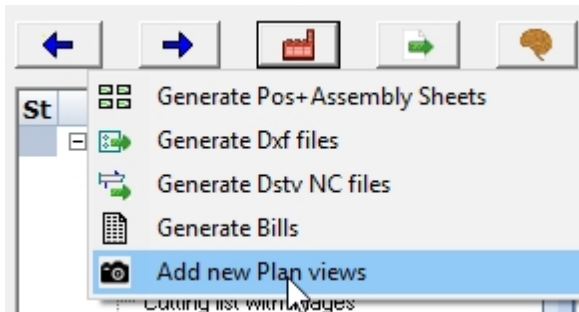
Creating General Arrangement drawings

Step 1

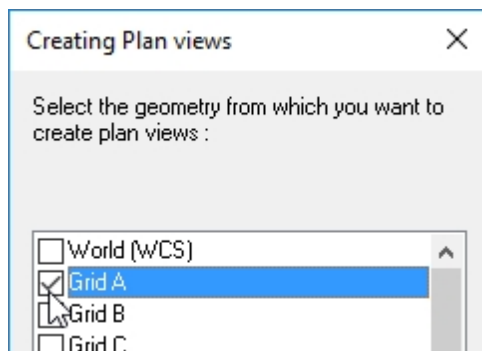


? We will now create and modify a general arrangement plan with multiple views.

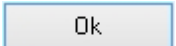
- Open the drawing  *GA Drawings.dwg*

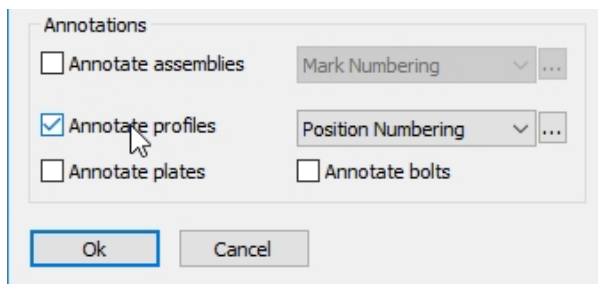


- Click on the button  and then click on **Add new Plan views**

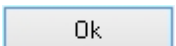


- Activate **Grid A**

- Then click on 



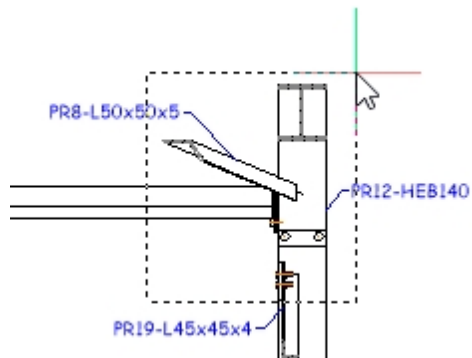
- Make sure that only the option **Annotate profiles** is checked

- Then click on 

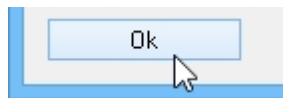
? Wait a few seconds until the new view becomes visible.

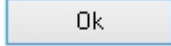


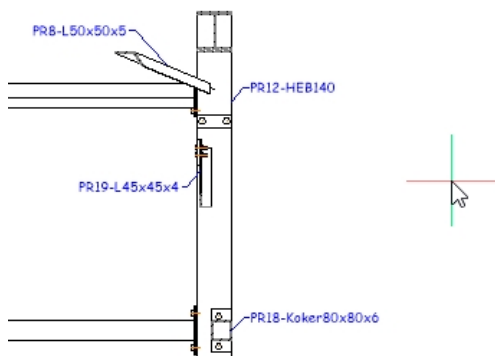
- Click on the icon  **Detail in GA drawing**



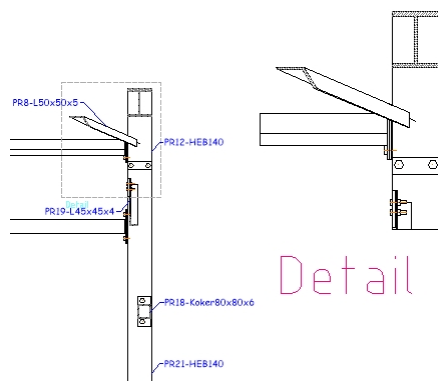
- Make a frame around the connection at the top right corner



- Press the  button twice to accept the default values

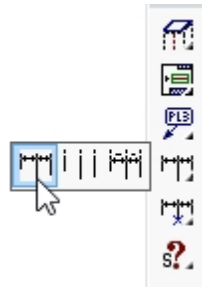


- Select a point somewhere in empty space next to the existing view for the location of the new detail



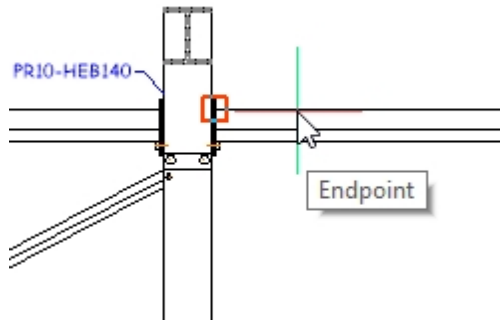
- 🔍 You can add as many views as you want on one page.

◀ Step 2 ▶

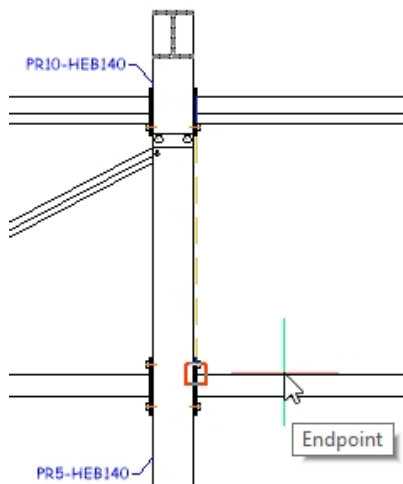


? We will now add a dimension to the view, modify the 3D model, and then refresh the 2D drawing.

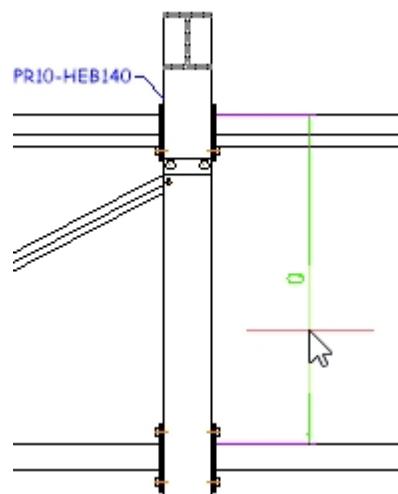
- Click on the icon  **Chain dimension**



- Zoom to the middle connection and move the cursor to the top line of the tube. Click the left mouse button to choose the endpoint of that line.

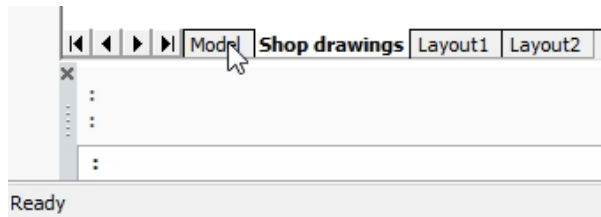


- Move the cursor to the top line of the tube underneath. Click the left mouse button to choose the endpoint of that line.

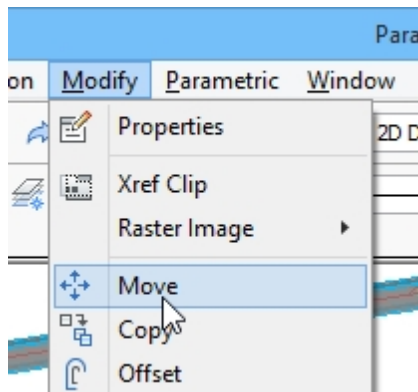


- Move the cursor to between the two tubes and click on the left mouse button.

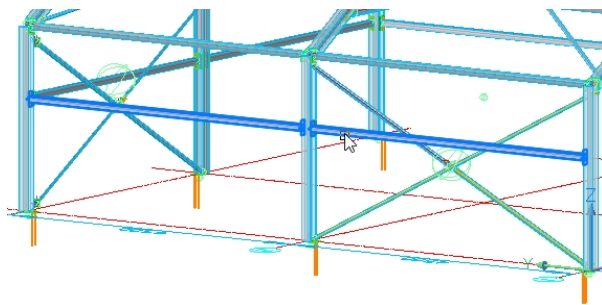
- Then press **<Enter>** to end the chain dimension tool.



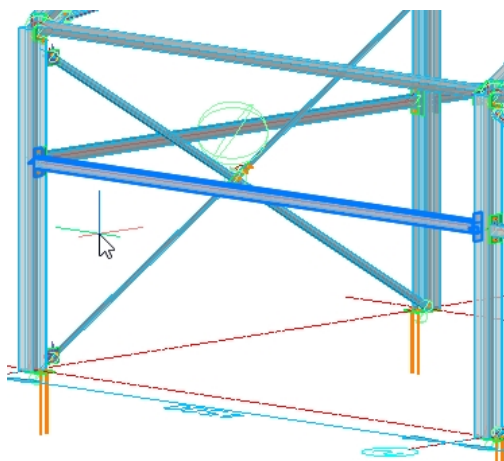
- Click on the tab **Model** just below the drawing, so that model space becomes active



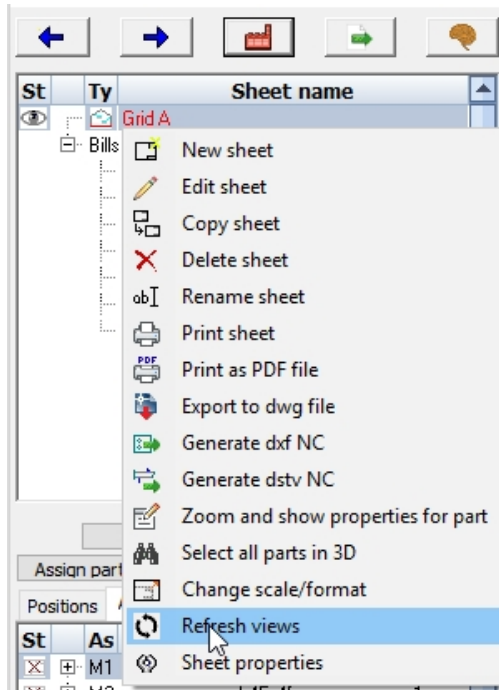
- Start the **Move** command using the top menu *Modify*



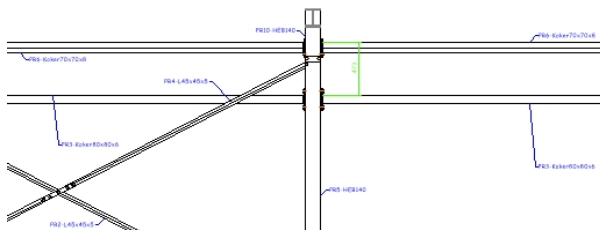
- Select the two tubes between columns **A1**, **A2** and **A3**
- Then press **<Enter>** to confirm the selection



- Click somewhere in empty space
- And then enter the following coordinates : **@0,0,500** followed by **<Enter>**



- In the *Sheets manager* window, click with the left mouse button on the sheet **Grid A** in order to select it
- Then click the right mouse button to open a sub menu
- Click on **Refresh views** in the menu



❓ The view was updated to reflect the modified 3D parts.
The dimension and the annotations of the modified tubes were also updated.

Connections : comprehensive

In these exercises we take a closer look at drawing, modifying and copying connections.

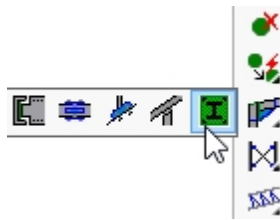
Endplates

◀ Step 1 ▶

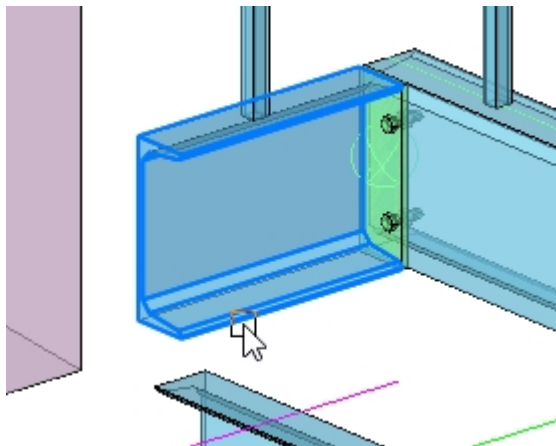


❓ In this exercise we will draw an endplate to a plane of a helper object, and an endplate to the endpoint of a helper line.

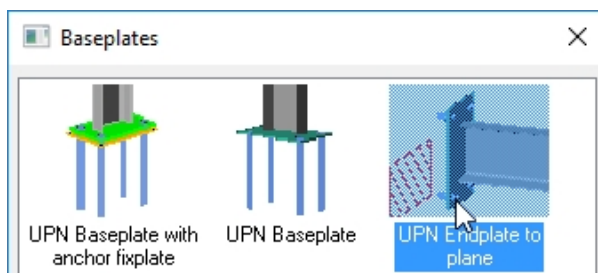
- Open the drawing *Endplates.dwg*



- Click on the icon **End / Baseplates**

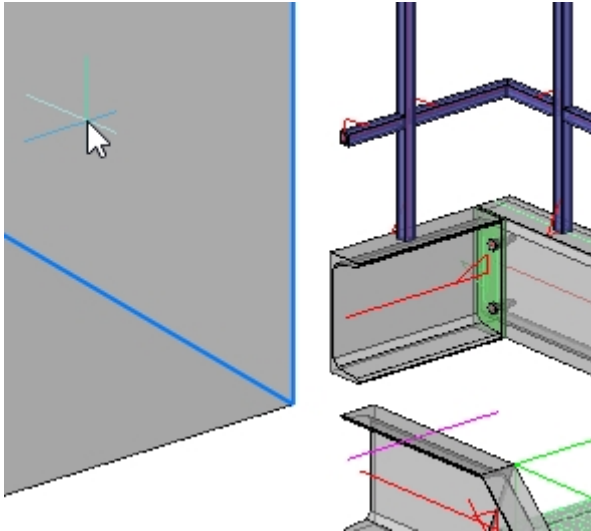


- Select the beam indicated on the illustration



- Double-click the connection **UPN Endplate to plane**

❓ By double-clicking you can select your connection more quickly.



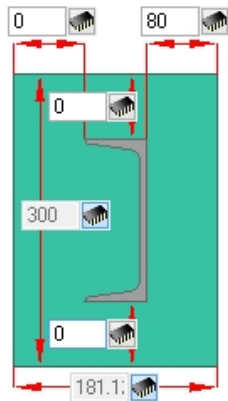
- Move the cursor to above the grey plane of the plate that represents a wall. Then click the left mouse button twice to select the plane underneath. The circumference of the plane underneath is drawn thicker.

- Press **<Enter>** to confirm the plane selection



? For the first mouse-click the top plane is selected, and for the next click on the same location the underlying plane is selected.

- Press **<Enter>** to end the command

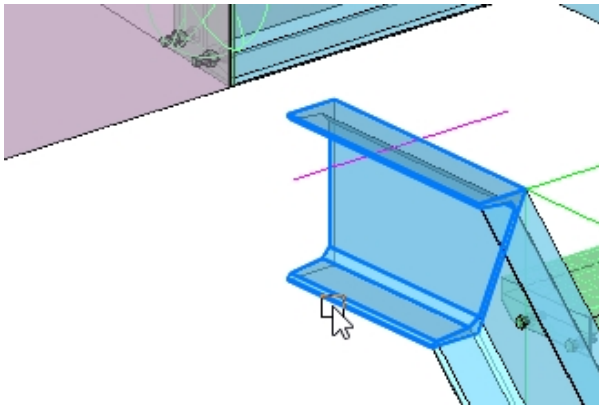


- Modify the edge distances for the endplate to **0, 0 and 80**

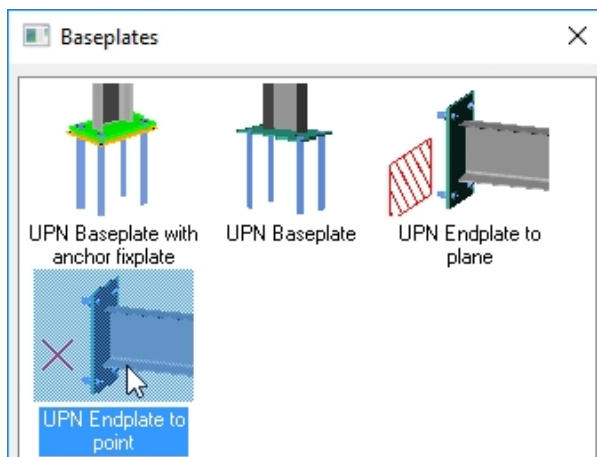
Step 2



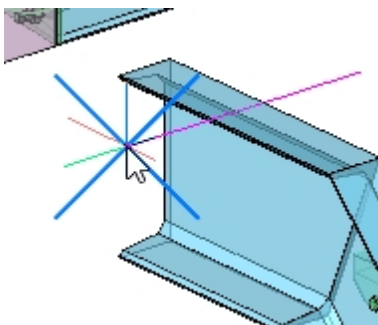
- Click on the icon  **End / Baseplates**



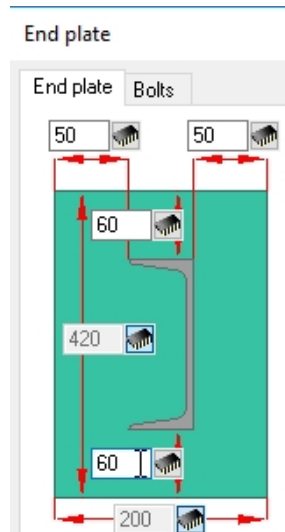
- Select the beam indicated on the illustration



- Double-click on the connection **UPN Endplate to point**

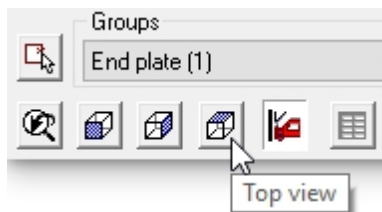



- Move the cursor to above the endpoint of the purple helper line.
Then click the left mouse button once to select the endpoint.
A cross is drawn to indicate that a point of an object was selected.
- Press **<Enter>** to confirm the point selection
- Press **<Enter>** to end the command

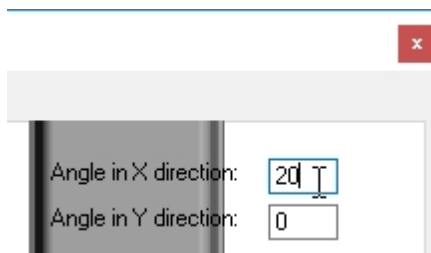


Modify the edge distances for the endplate :

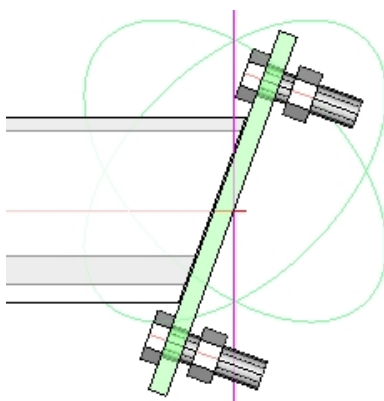
- Left : **50**
- Right : **50**
- Top : **60**
- Bottom : **60**




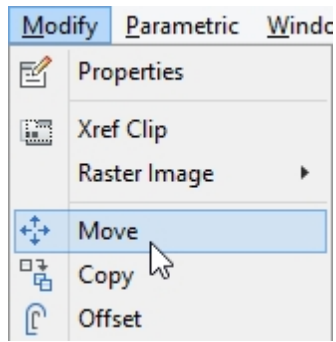
- Click on  **Top view** in the window **Review macro**




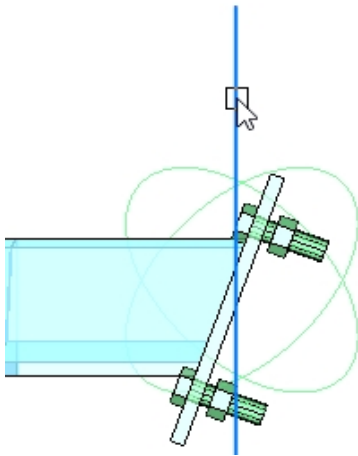
- Modify the **Angle in X direction** to **20**



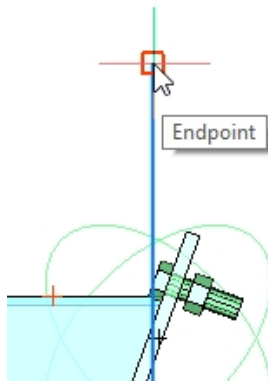
 As you can see the point is projected to the middle of the profile.
The endplate is rotated around this projected point.
It goes without saying that it is always preferable to use a plane as a basis for the location of an endplate.



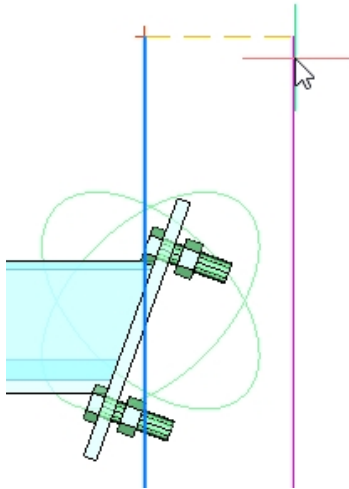
- Start the AutoCAD/BricsCAD command 
Move



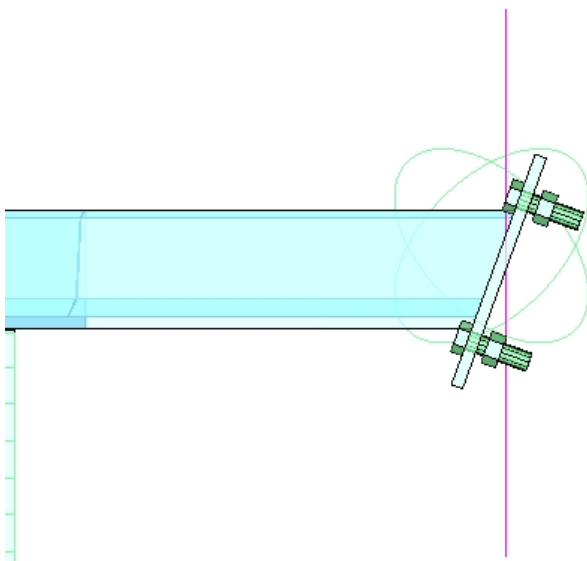
- Select the purple line
- Press **<Enter>** to confirm the point selection



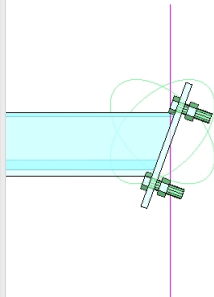
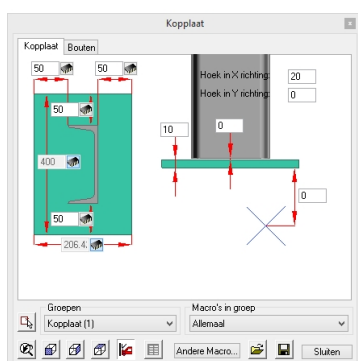
- Indicate the endpoint of the line as reference point



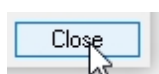
- Move the cursor to the right to indicate the direction we want to move the line to
- Enter **200** for the distance and then press **<Enter>**



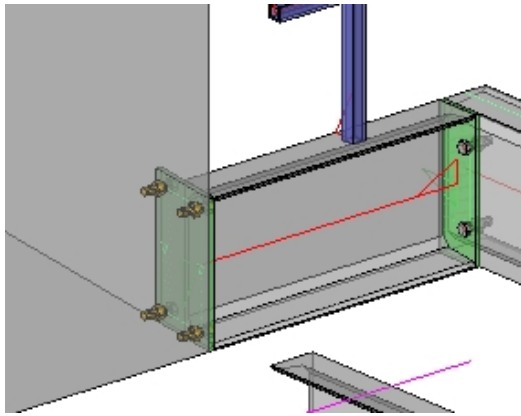
- ? The endplate remains connected to the line, it moved just after we moved the line. If you would not want the connection between the line and endplate in a given situation then you can delete the macro sphere.



- ? Have you noticed that the *Review Macro* window can always remain open? This allows you to take a measurement or to modify other elements without having to close and reopen this window.



- Click on **Close** in the *Review macro* window



Press and hold the SHIFT key and the middle mouse button to view the endplate from different angles.



❓ The endplate to plane function allows you to draw endplates to all planes of all Parabuild objects. The endplate is drawn flat against the selected plane, also follows the slope of the plane and the profile is always cut to the endplate.

Apex connections

◀ **Step 1** ▶


? In this exercise, we will perform the following actions:

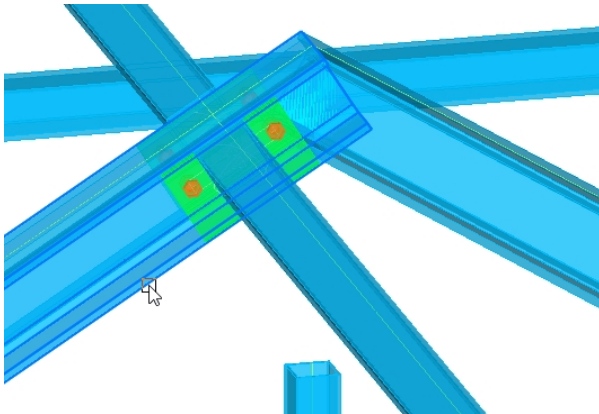
- Drawing a ridge joint
- Setting different center distances between bolts
- Drawing an end plate against a plate of a ridge joint



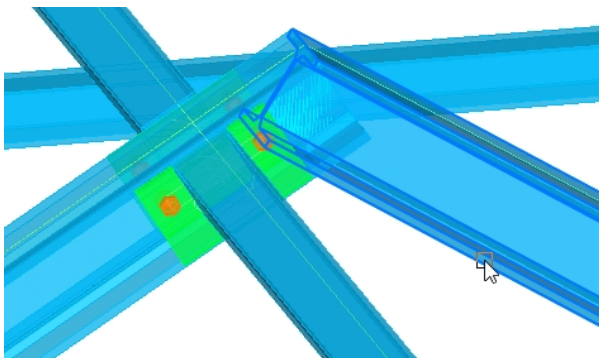
- Open the drawing  *Apex connections.dwg*



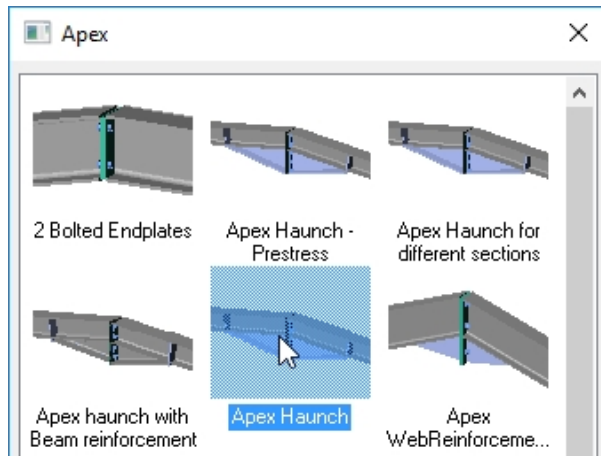
- Click on the icon  **Apex**



- Select a rafter



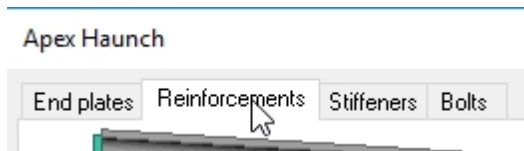
- Select the other rafter



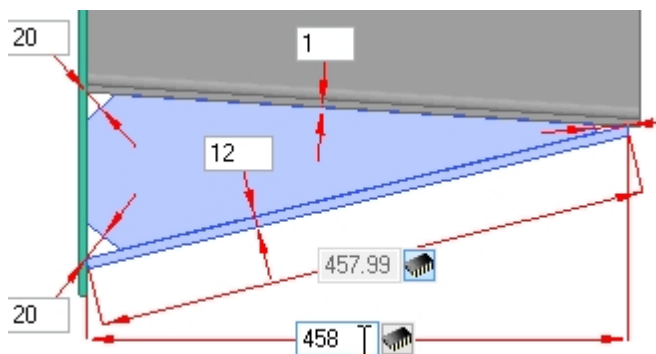
- Double-click the connection **Apex Haunch**

- Press **<Enter>** to end the command

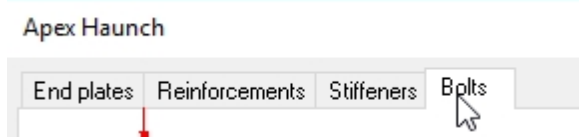
← **Step 2** →



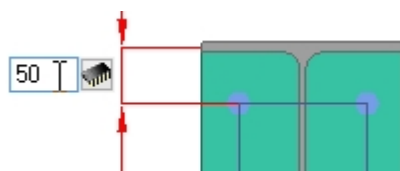
- Open the tab **Reinforcements**



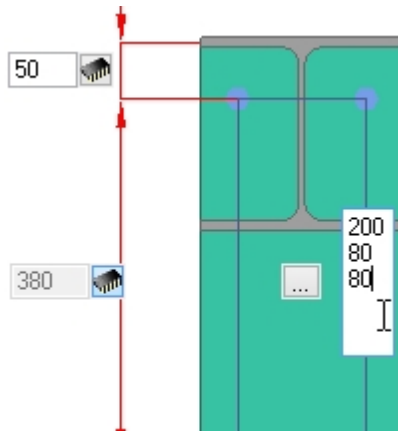
- Modify the horizontal length of the reinforcement to **458**



- Open the tab **Bolts**

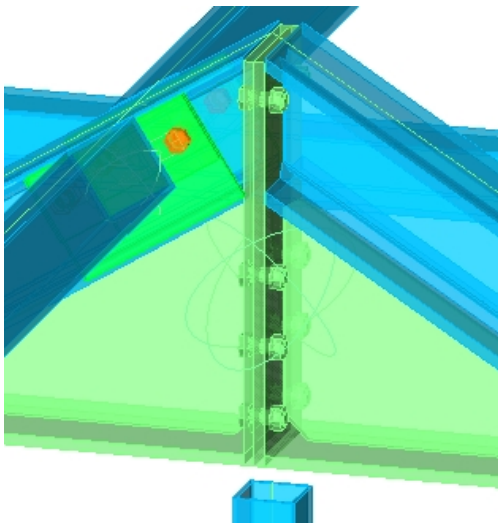


- Modify the top edge distance to **50**



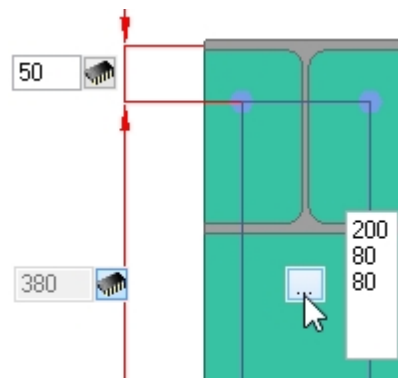
❓ Instead of entering a single number we will now enter 3 different center distances separated by a space.

- Replace the number of vertical bolts to **"200 80 80"**

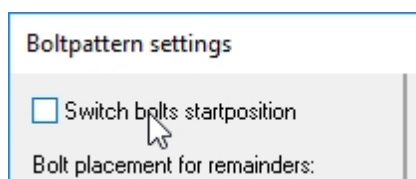


❓ The bolt patterns in all the connections can be used this way to draw the bolts at different center distances.

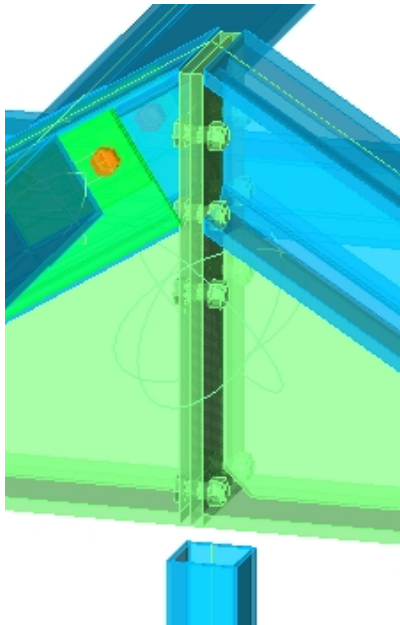
Most of the time the starting edge will be set correctly, but it is possible to switch the order of the bolts.



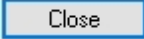
- Click on the button  in the middle of the bolt pattern



- Deactivate the top left setting **Switch bolts startposition**



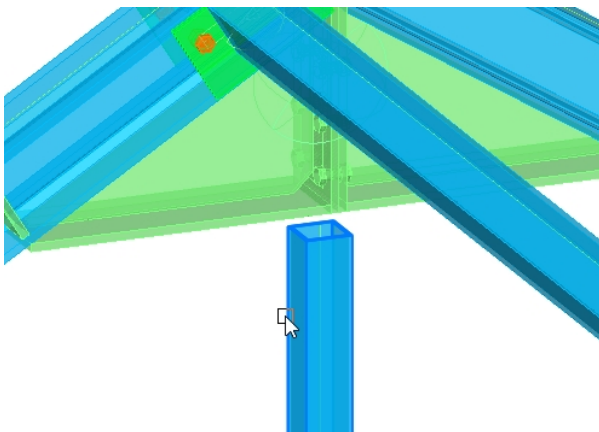
- Reactivate the setting **Switch bolts startposition** to correct the bolts

- And then click  to close this window

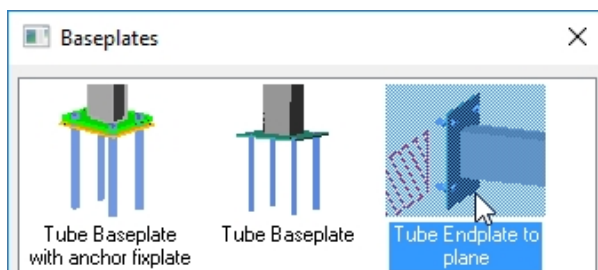
Step 3



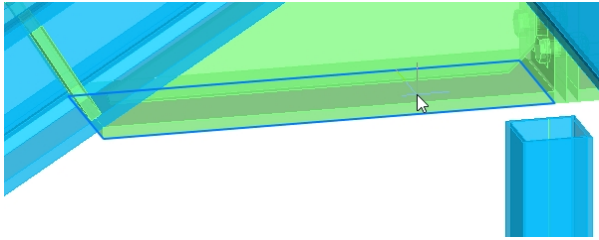
- Click on the icon  **End/Baseplates**



- Select the tube underneath the ridge joint



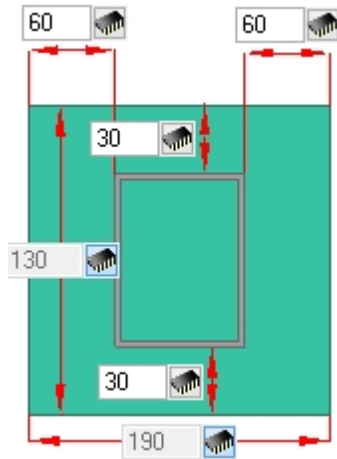
- Double-click the connection **Tube endplate to plane**



- Zoom in on of the reinforcing plates and move the to above the top plane. The click the left mouse button twice without moving the mouse to select the plane underneath.

- Then press **<Enter>** to confirm the plane selection

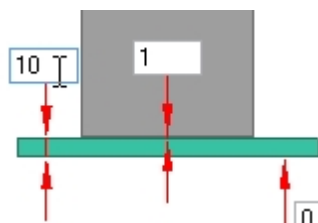
- Finally press **<Enter>** to end the command



- Modify the edge to tube distances to **30, 30, 60** and **60** as illustrated.



? It is possible that you have to switch the edge to tube distances vertically and horizontally. That is because the tube is symmetrical, and the rotation of the plate depends on the edge of the tube that was selected during the placement of the end plate.



- Modify the thickness of the plate to **10**

Beam to column (haunch)

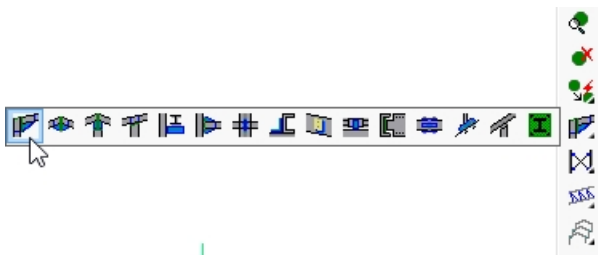
◀ Step 1 ▶


❓ In this exercise, we will perform the following actions:

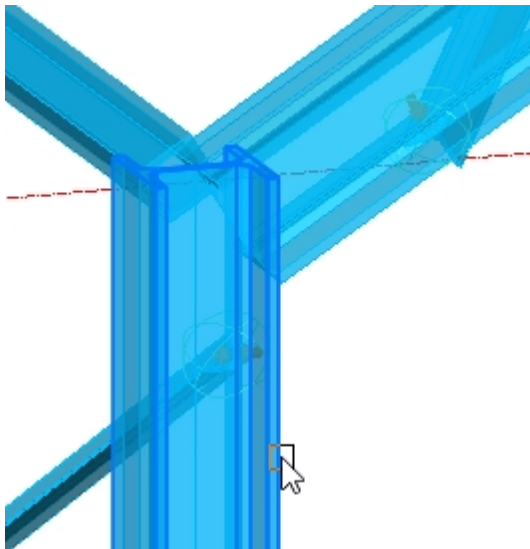
- Drawing a haunch connection
- Replacing a connection with another type
- Removing a part of a connection



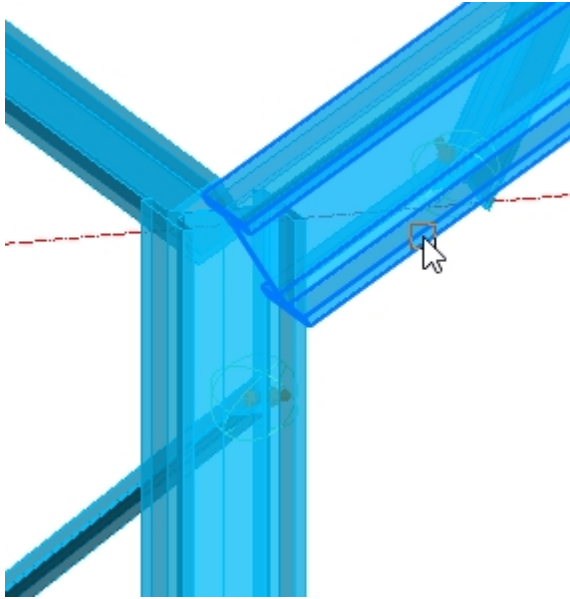
- Open the drawing  *Haunch connections.dwg*



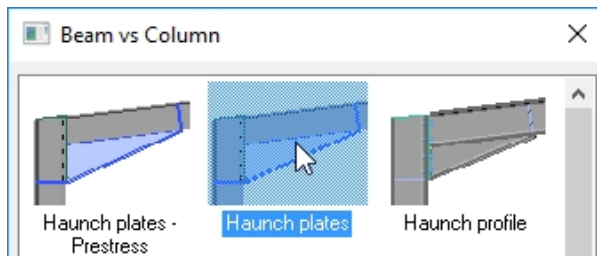
- Click on the icon  **Haunch**



- Select the column



- Select the rafter

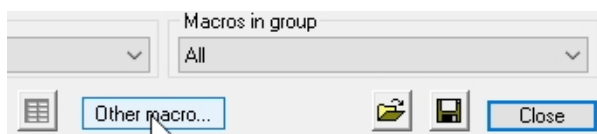


- Double-click the connection **Haunch plates**

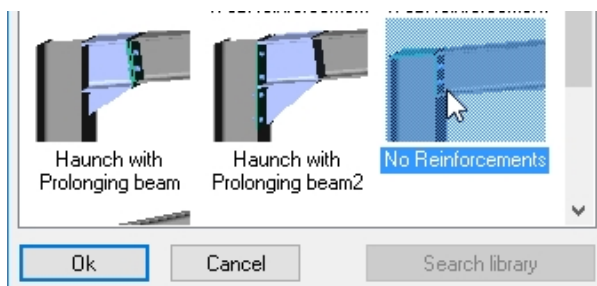
- Then press **<Enter>** to end the command

◀ **Step 2** ▶

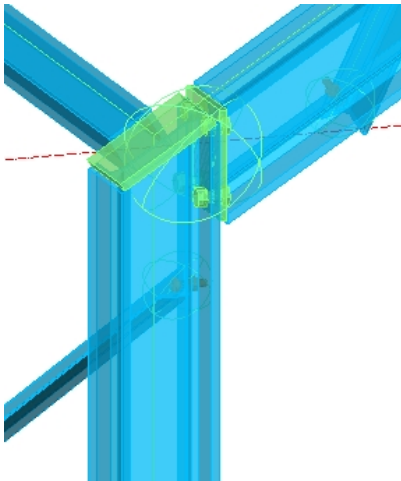
? For demonstration purpose we have chosen the wrong connection. There is a tool in the *Macro Review* dialog box allows us to quickly exchange the connection.



- Click on the button **Other Macro...**

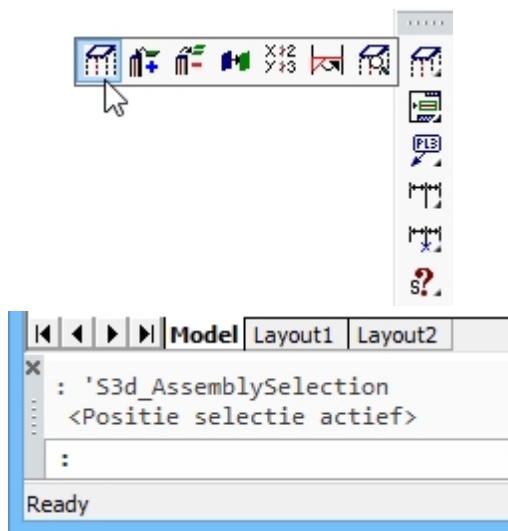




- Double-click the connection **No reinforcements**



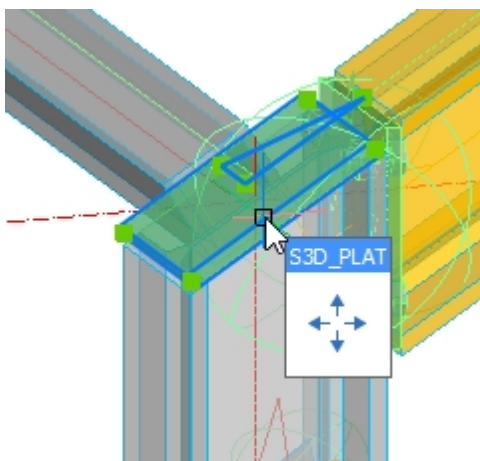
- ❓ Exchanging connections is only possible with connections of the same group.

Step 3



- Click on the icon **Assembly/Part selection** . If *<Assembly selection active>* appears on the command line, then press the button  again, because we need the *Single object* selection.

- ❓ In *Single object selection* we can select per part
- ❓ In *Assembly selection* Parabuild will automatically select the entire assembly when we select a part of that assembly



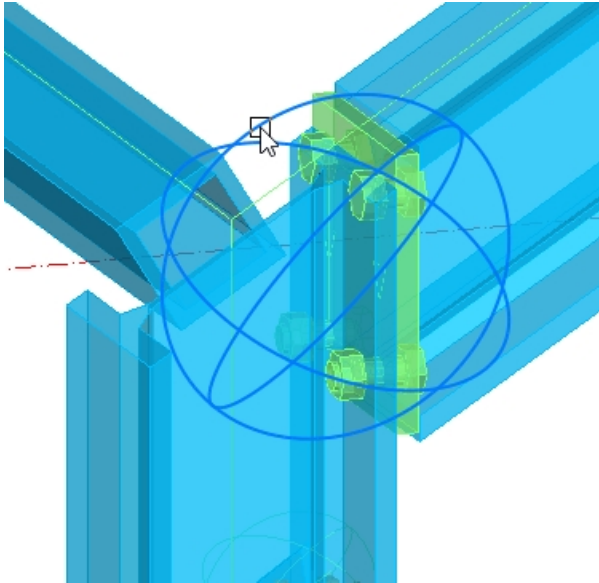
- Select the end plate of the column
- Press the **** key to delete the end plate

- ❓ For this situation, the end plate of the column was unnecessary. It is permitted to simply remove individual parts of connections.

Step 4

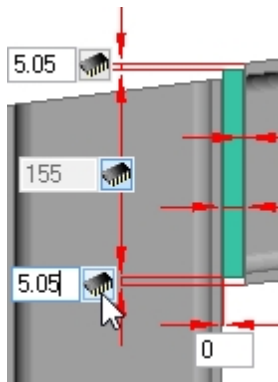



- Click on the icon  **Review macro**

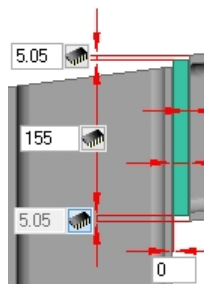




- Select the macro sphere of the new haunch connection

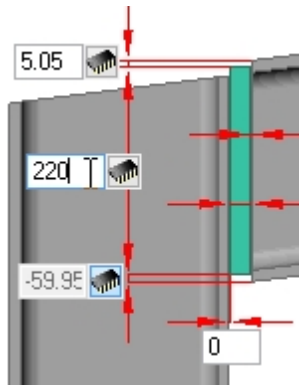
- And then press **<Enter>** to confirm the selection



- Press the  **Calculation** button next to the lower edge distance



 The bottom distance is not adjustable now but the top AND the middle are. Pressing the button  again would again obtain another combination.

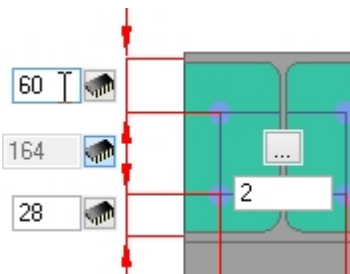


- Enter **220** for the length of the plate

Haunch

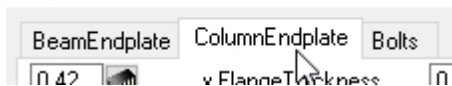


- Open the tab **Bolts**

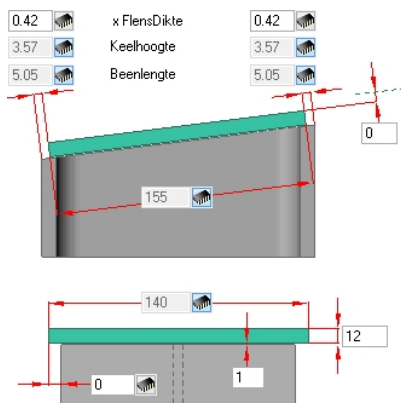


- Enter **60** for the top edge distance

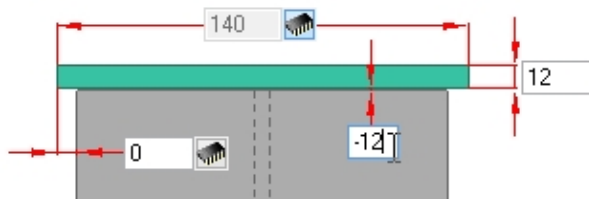
Haunch



- Open the tab **Column Endplate**

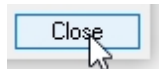


- ⓘ The end plate is not visible but all of the settings of the end plate are still visible because the cut is dependent on the end plate. This way we can still use the cut which is drawn against the invisible end plate.



- Change the clearance between the end plate and the cut to **-12**

? To compensate for the thickness of the plate, we can enter a negative gap. It is never permitted to set the thickness of a plate to 0.

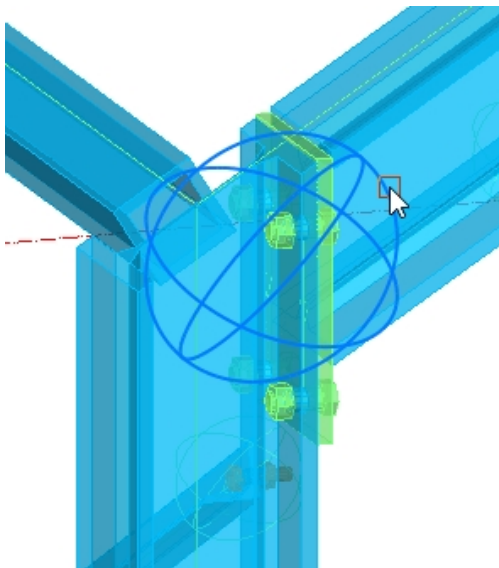


- Click on **Close** in the *Review macro* window

Step 5

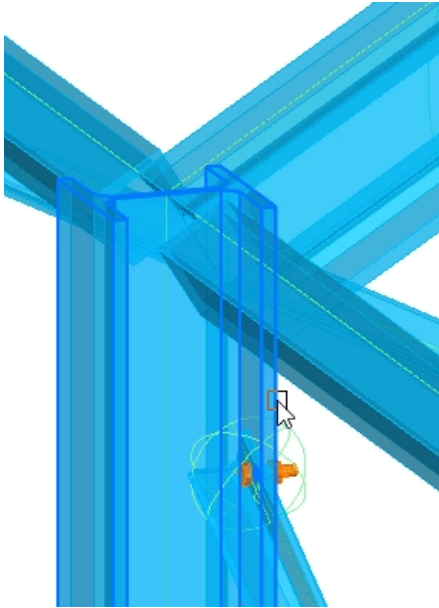


- Click on the icon **SmartCopy**

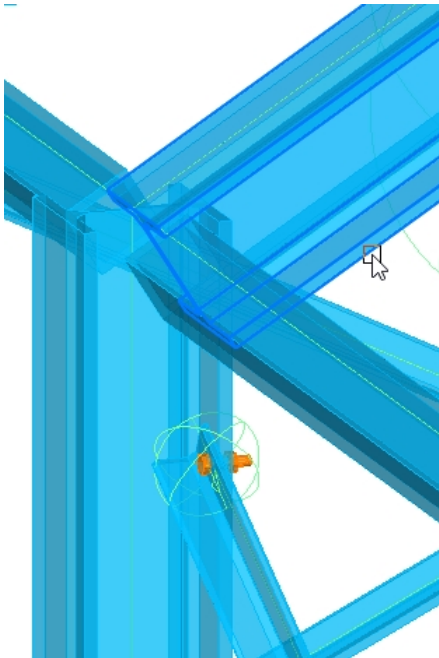


- Select the sphere of the connection that we just made

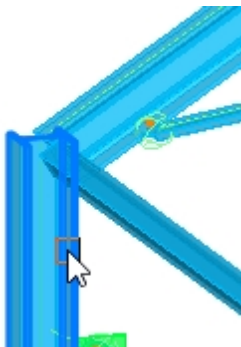
- And then press **<Enter>** to confirm the selection



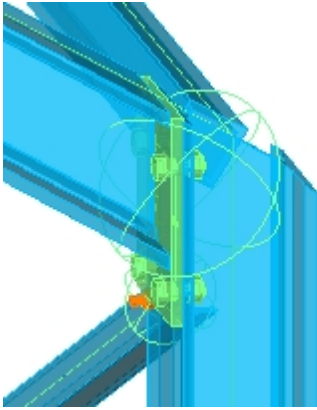
- Navigate to the next ridge joint with the zoom and pan functionality of the wheel button of the mouse.
- Then select the column



- Select the rafter of this column



- Repeat the last 2 steps to draw all haunch connections of this garage.



❓ The fact that the end plate has disappeared is without prejudice to the connection, so it can still be copied.

Other connections

◀ **Step 1** ▶


❓ In this exercise we will more closely at the following items :

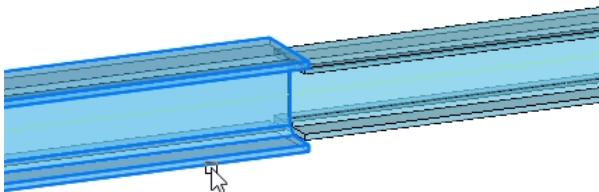
- drawing a splice connection
- the resemblance between connection groups "Beam vs Beam" en "Beam vs continuous column"
- storing the settings of a connection and later reusing them



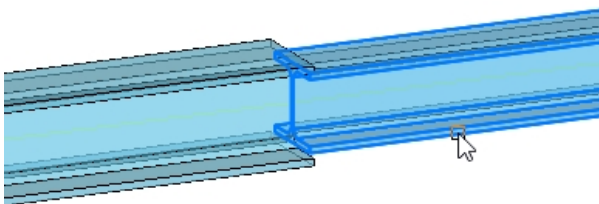
- Open the drawing  *Splice connection.dwg*



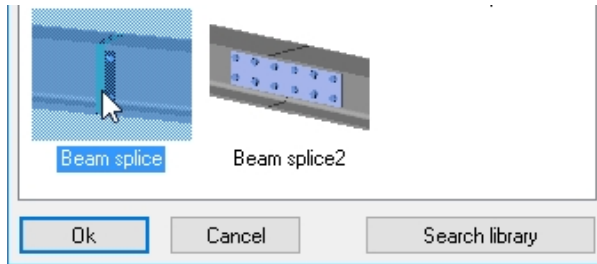
- Click on the icon  **Splice**



- Select the beam on the left



- Select the beam on the right

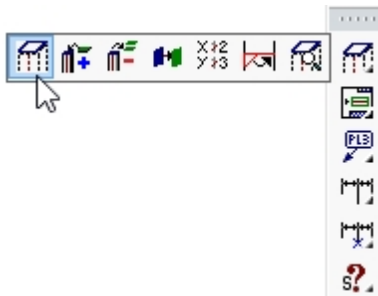




- Double-click the connection **Beam splice**

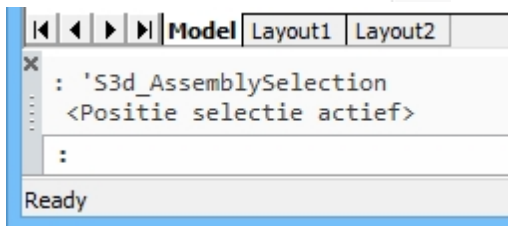


- Press **<Enter>** to end the command

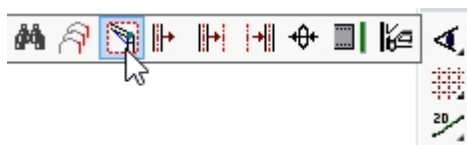
Step 2



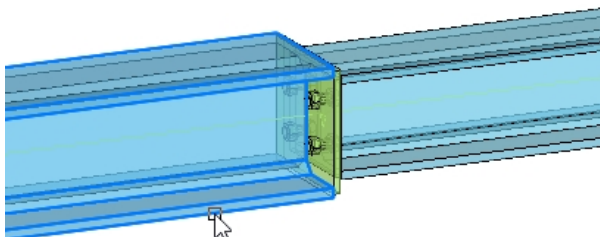
- Click on the icon **Assembly/Part selection** 
If *<Assembly selection active>* appears on the command line, then press the same button  again, because we need the *Single object* selection.



- ❓ In *Single object selection* we can select per part
- ❓ In *Assembly selection* Parabuild will automatically select the entire assembly when we select a part of that assembly



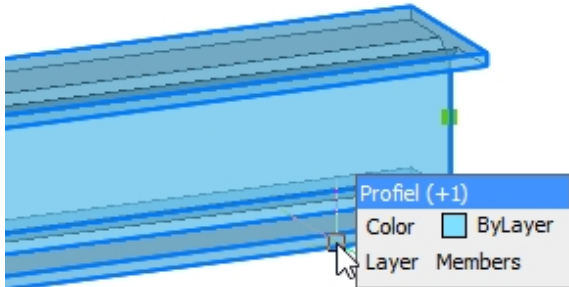
- Click on the icon  **Isolate selection**



- Select the beam to the left

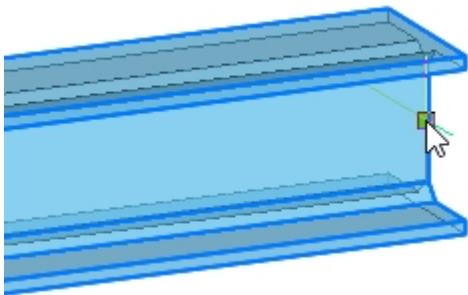


- Press **<Enter>** to end the command

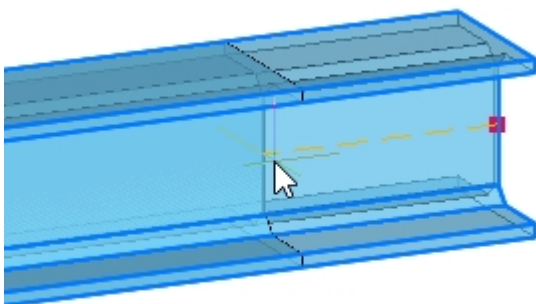


- Select the one beam that is now visible

② A *Grip* is shown at the end of the profile.




- Move the cursor to above the grip and click on the left mouse button

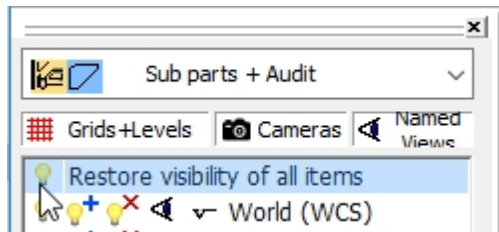



- Move the cursor to the left. If the beam doesn't shorten in a straight line, then press the function key **<F8>** to activate Ortho mode

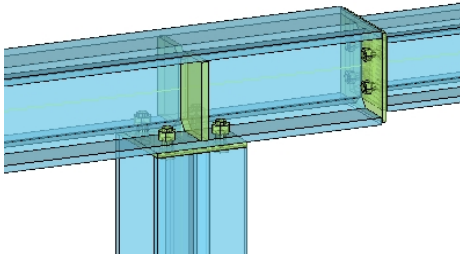
- Now enter **1200** and press **<Enter>** to confirm the stretch distance




- If the view manager is not opened yet, then click on the icon  **View manager**



- Click on the lamp  next to the first line **Restore visibility of all items**



-  The splice connection is special compared to other connections because location of the connection is not the intersection between the two base profiles.
 (the intersection point doesn't exist when the profiles are parallel)
 That is why the end of the profile that you selected first is used for the placement point of the plates of the connection. The second base profile is shortened or lengthened.

Step 3



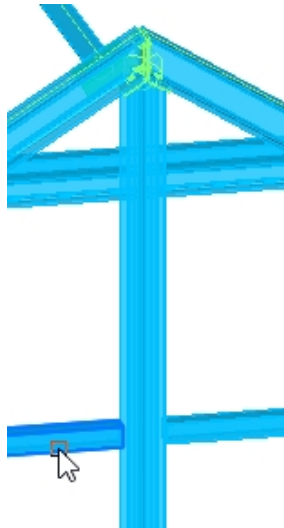
- Open the drawing  *Other connections.dwg*



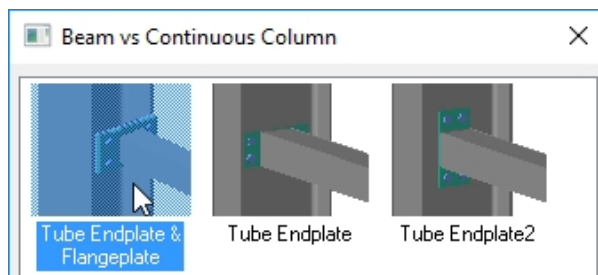
- Click on the icon  **Beam vs Continuing column**



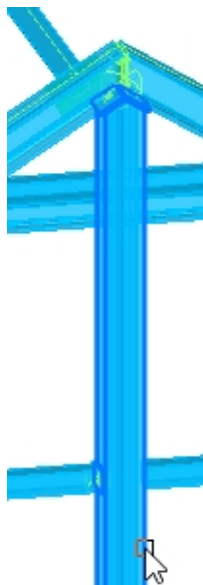
- Select the front/middle column



- Selecteer the tube to the left

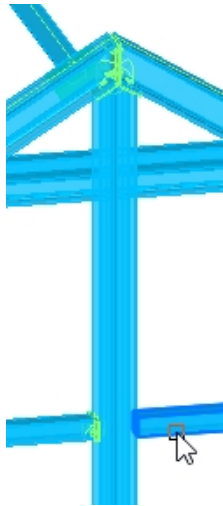


- Double-click the connection **Tube Endplate & Flangeplate**



- 🔍 We will now draw the same connection on different locations.

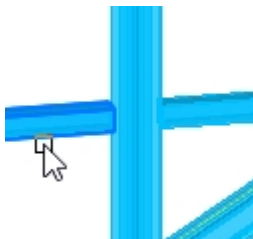
- Select the front column again



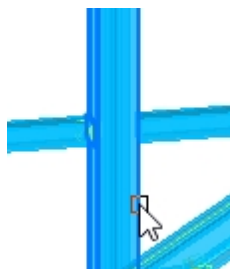
- Select the tube to the right



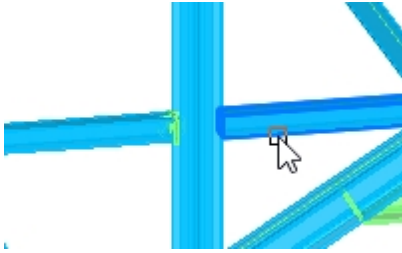
- Select the middle / back column



- Select the back / left tube



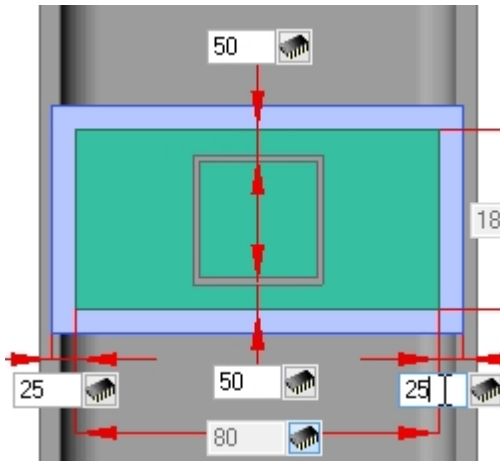
- Select the middle / back column again



- Select the back / right tube

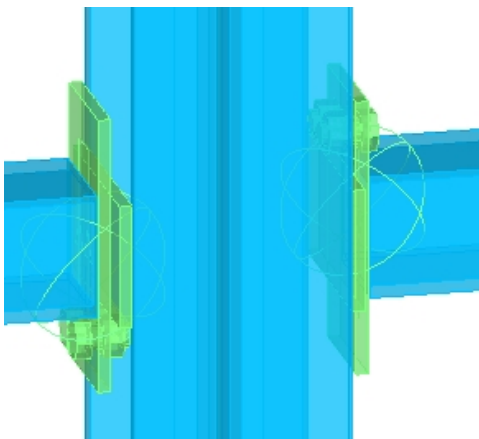


- Press **<Enter>** to end the command

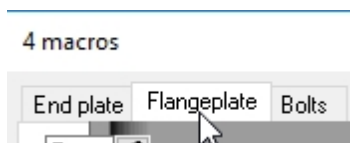


Modify the dimensions of the endplate as follows :

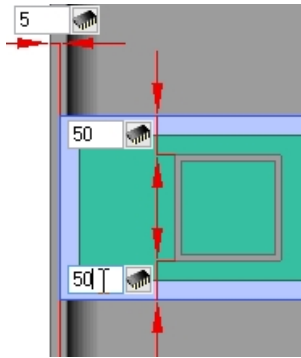
- Top **50**
- Bottom **50**
- Left **25**
- Right **25**



? It is possible that the connections are rotated 180° compared to each other, if you didn't consistently selected the tubes or columns on the same edges. This causes the top/bottom distances to be switched. In this case it is not an issue because we can simply correct the distances. If you need non-symmetrical connections then you would have more work with correcting the distances per connection. Then it would pay off to select the base profiles consistently : for example consistently at the bottom and on the inside of the building.

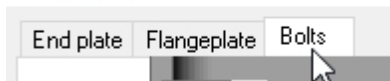


- Activate the tab **Flangeplate**

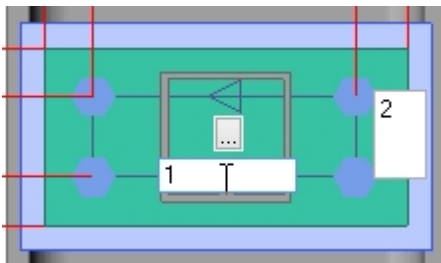


- Modify the top distance to **50** and also the bottom to **50**

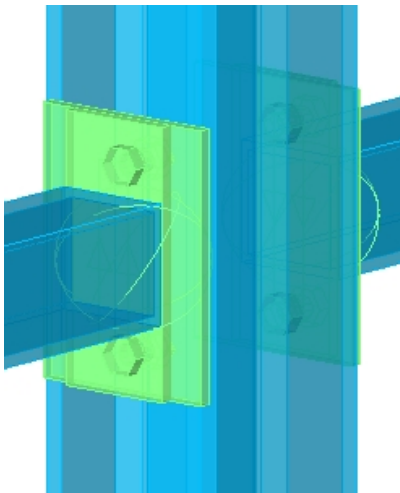
4 macros



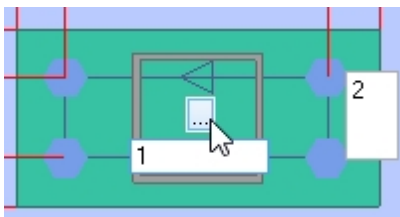
- Activate the tab **Bolts**



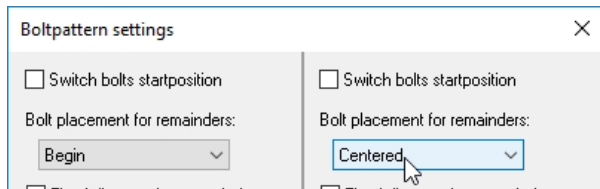
- Modify the number of vertical bolts to **2** and the number of horizontal bolts to **1**



- ⓘ If you rotate the view and zoom in on the connection then you can see that the bolts are not centered. By default Parabuild will always draw the bolts on the start position of the bolt pattern.



- Click on the button  of the bolt pattern



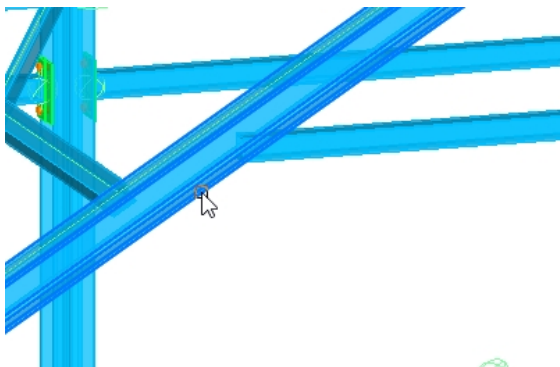
- Modify the **Bolt placement for remainders** to **Centered** on the right hand side

- Click on 

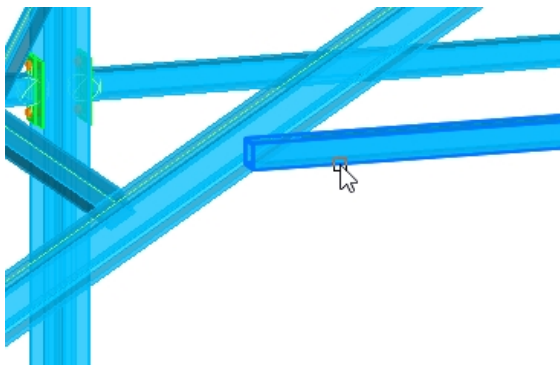
Step 4



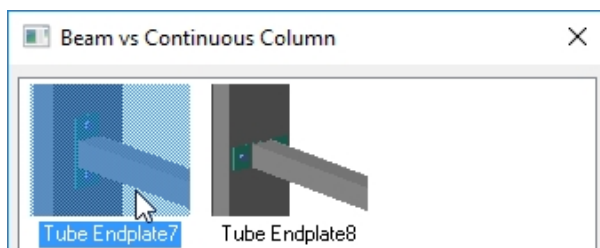
- Click on the icon  **Beam vs continuing column**



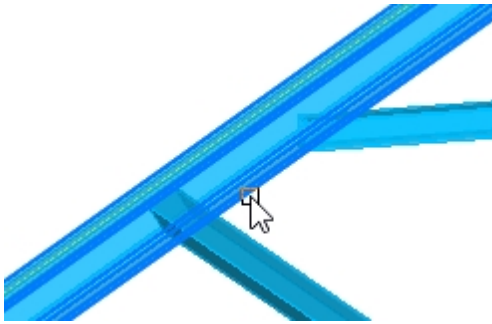
- Select the front / left rafter



- Select the tube (collar tie) that is located between the rafter and the column at the front

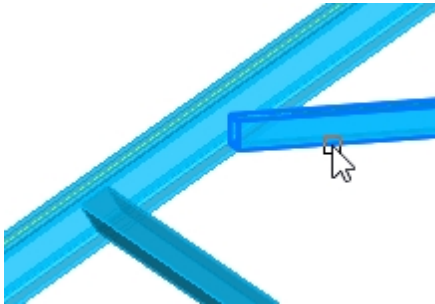


- Double-click the connection **Tube Endplate7**



? We will apply the same connection somewhere else.

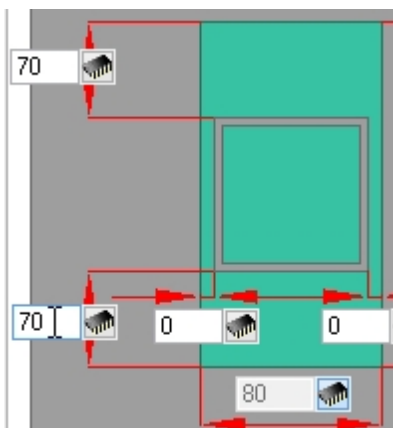
- Select the rafter in the back / left



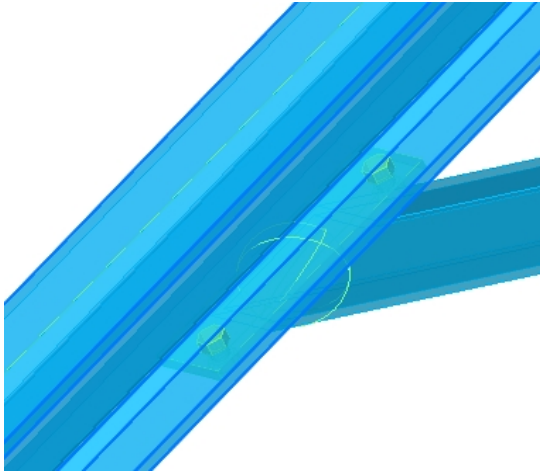
- Select the tube (collar tie) that is located between the rafter and the column in the back



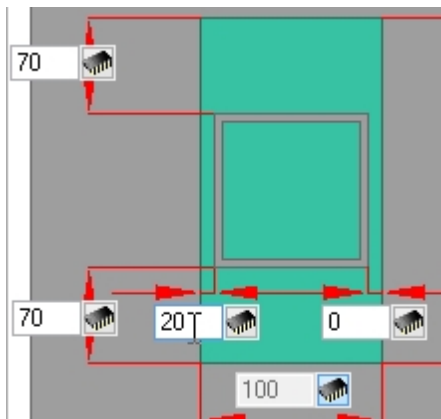
- Press **<Enter>** to end the command



- Modify the top distance to **70** and the bottom distance to **70**

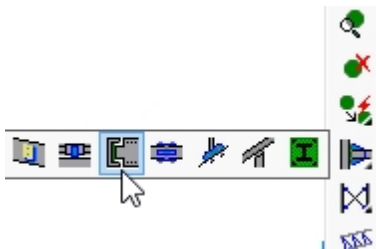


Zoom in on the new connection and select the rafter.
 You can see that the bolts didn't drill any holes in the rafter.
 The reason for this is because the bolts are located too closely to the web of the rafter and they penetrate the web/flange rounding.
 We must move the bolts to solve this.

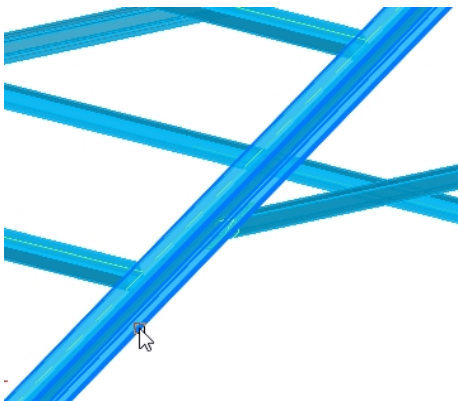


- Modify the left distance to **20**

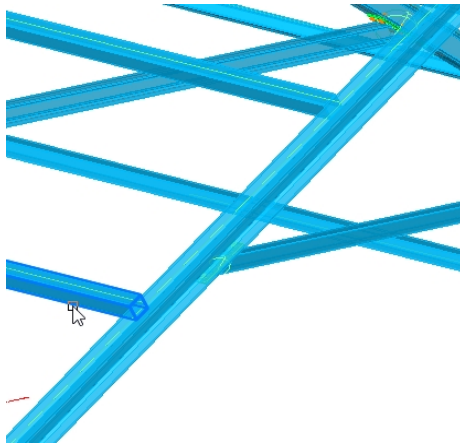
Step 5



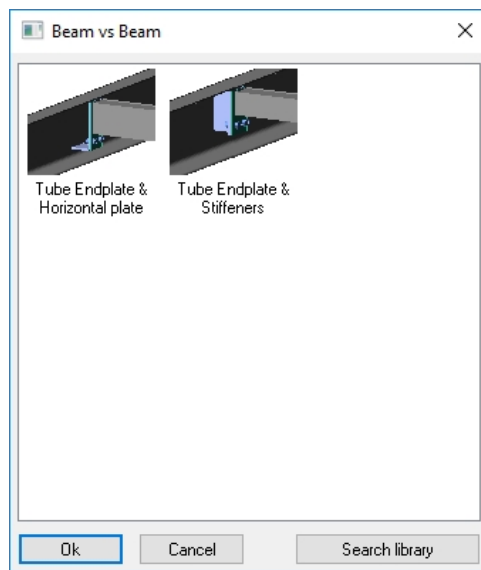
- Click on the icon  **Beam vs beam**



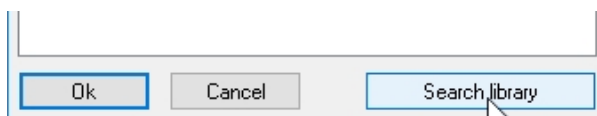
- Select the front / left rafter



- Select the second tube between the front rafters

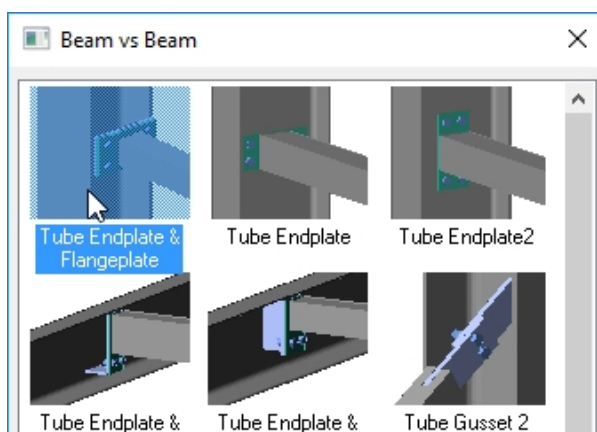


- ❓ The connection that we want to use (end plate and flange plate) is not shown because we've started the wrong icon. But we can still continue...



- Click on the button

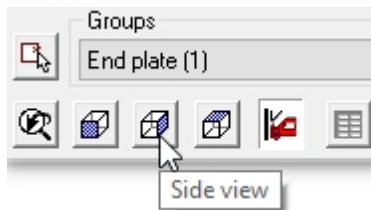
Search library




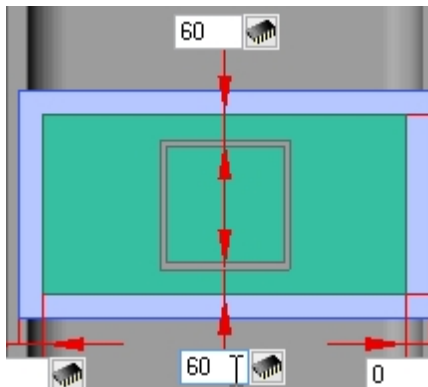
- Double-click the connection **Tube Endplate & Flangeplate**



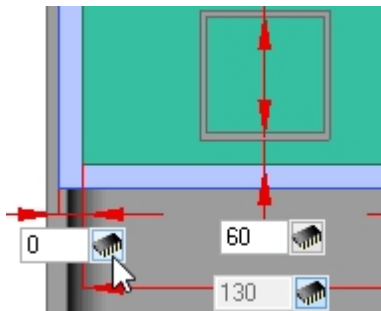
- Press **<Enter>** to end the command




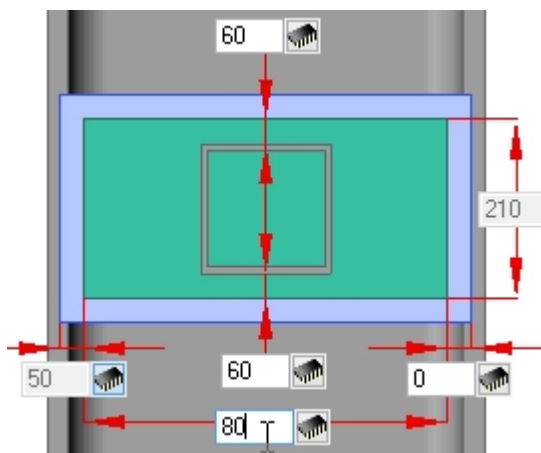
- Click on the *Side view* button  at the bottom to change to a view of the front of the plates



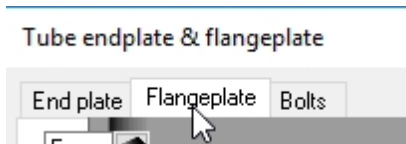
- Modify the top distance to **60** and the bottom distance to **60**



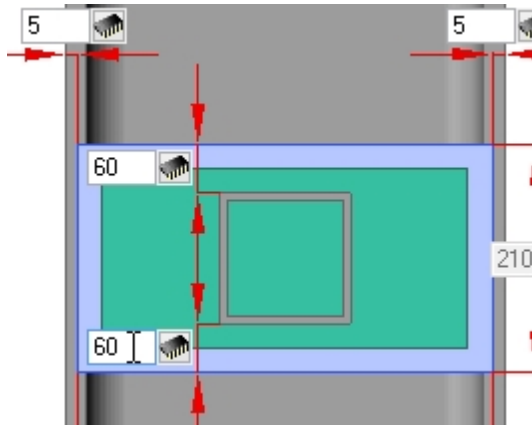
- Press the button  next to the 'left' distance so that Parabuild calculates this distance



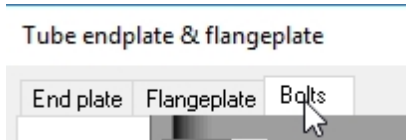
- Modify the width of the endplate to **80**



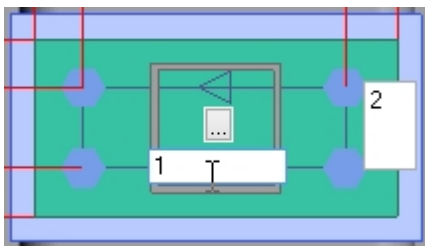
- Activate the tab **Flensplaat**



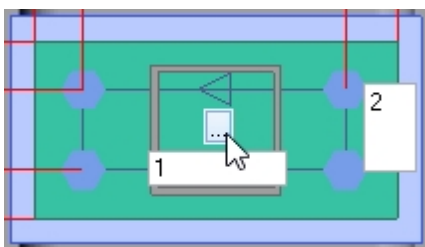
- Modify the top distance to **60** and the bottom distance to **60**



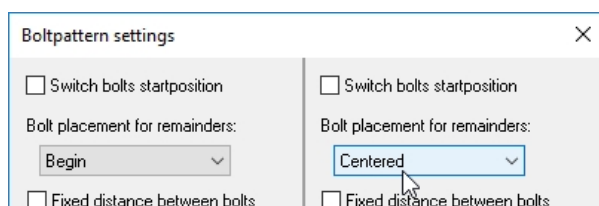
- Activate the tab **Bolts**



- Modify the number of vertical bolts to **2** and the number of horizontal bolts to **1**

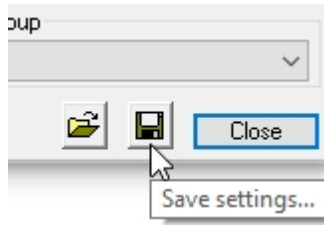



- Click on the button  of the bolt pattern

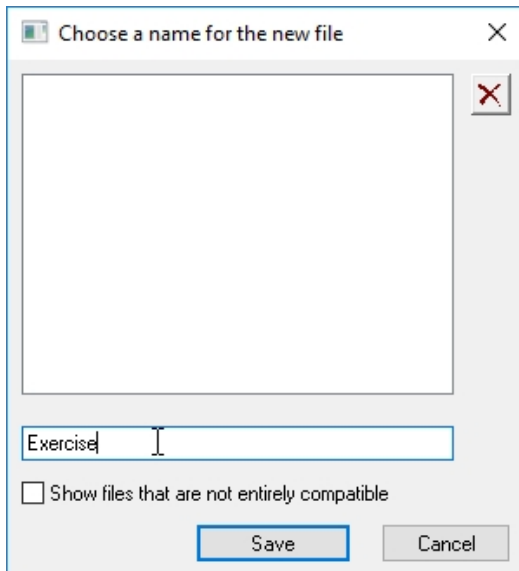



- Modify the **Bolt placement for remainders** to **Center** on the right hand side

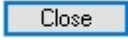
- Click 



- Click on  at the bottom of the dialog box



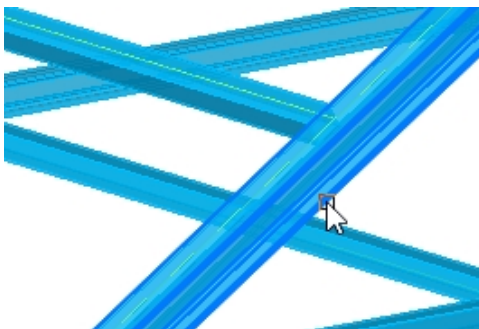
- Enter **Exercise** for the name and then click on 

- Click  so that the original 3D view is restored

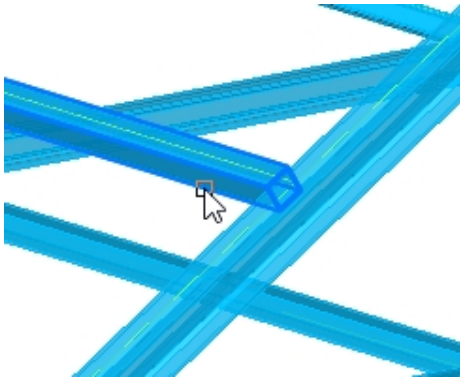
Step 6



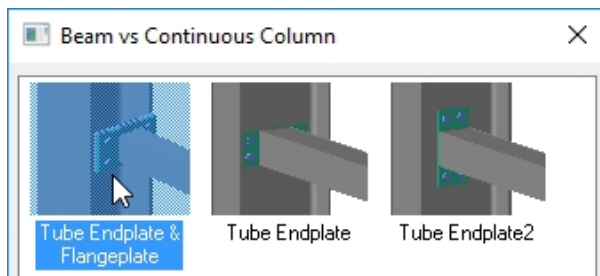
- Click on the icon  **Beam vs Continuing column**



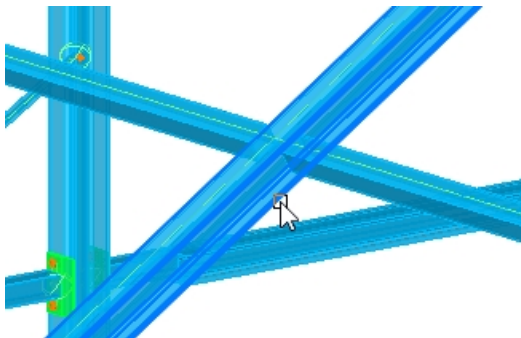
- Select the middle / left rafter



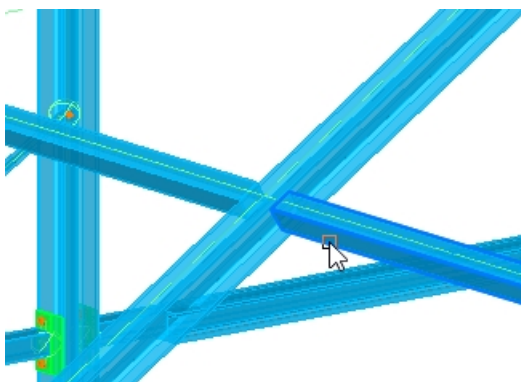
- Select the other tube that is not yet connected to the front rafter



- Double-click the connection **Tube Endplate & Flangeplate**



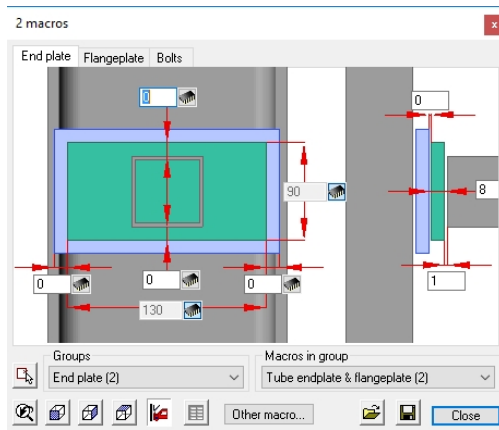
- Navigate to the next connection on the same height in the middle of the building
- Select the middle rafter




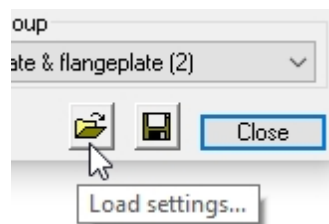
- Select the tube on the right side of the middle rafter




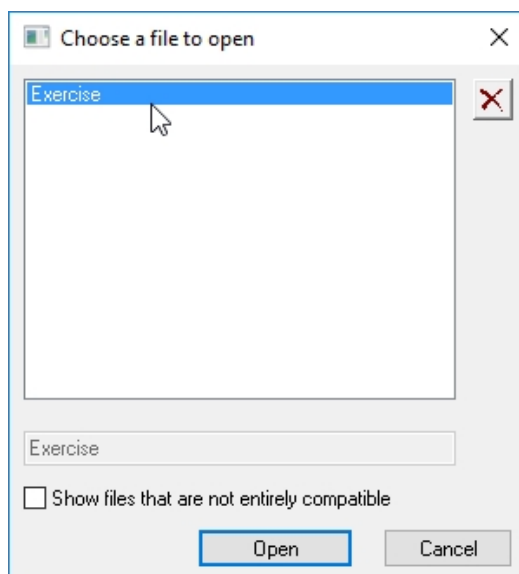
- Press **<Enter>** to end the command

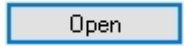


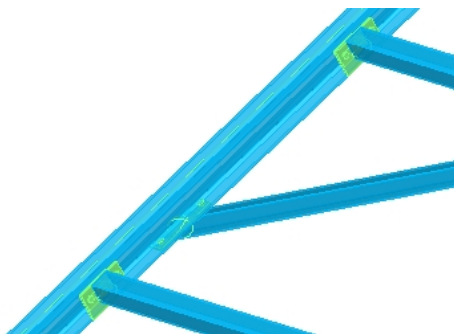
❓ If everything went well then you can now see the **Review macro** dialog box with **2 Macros** in its title bar. If that is not the case because you didn't perform the actions in one command, then you can use the icon  **Review Macro** to modify the new macros.



- Click on  at the bottom of the dialog box



- Select the file **Exercise** that we saved before and then click on 




❓ The parameters of all the tabs were now applied on all the macros that are currently being reviewed. The parameter file that you saved is stored in the library of Parabuild. If you use a shared library on a network, then your colleagues will have access to the same parameter files.

Separate connection parts


◀ **Step 1** ▶

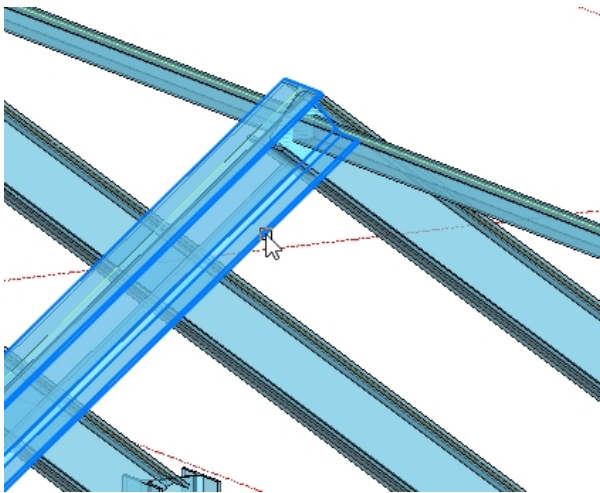
- ❓ In this exercise the following items will be handled :
- a knee joint can be used for an apex situation, and vice versa
 - drawing additional stiffeners for a profile
 - merging 2 connections
 - copying a merged connection using Smartcopy



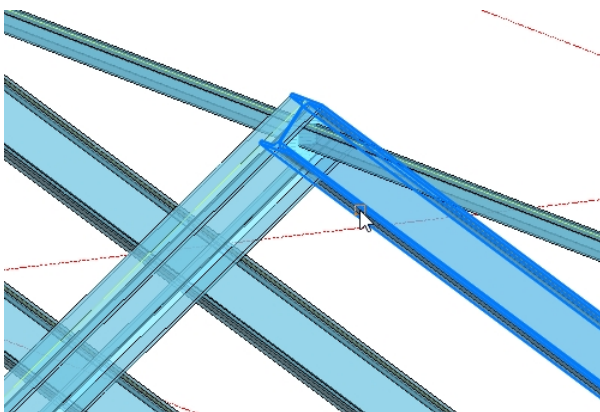
- Open the drawing  *Separate connection parts.dwg*



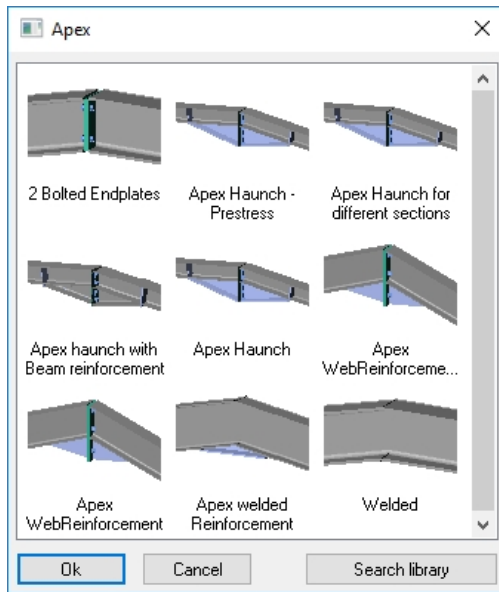
- Click on the icon  **Apex**



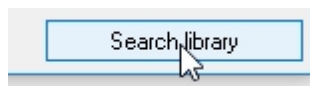
- Select the left rafter of the apex on intersection B3



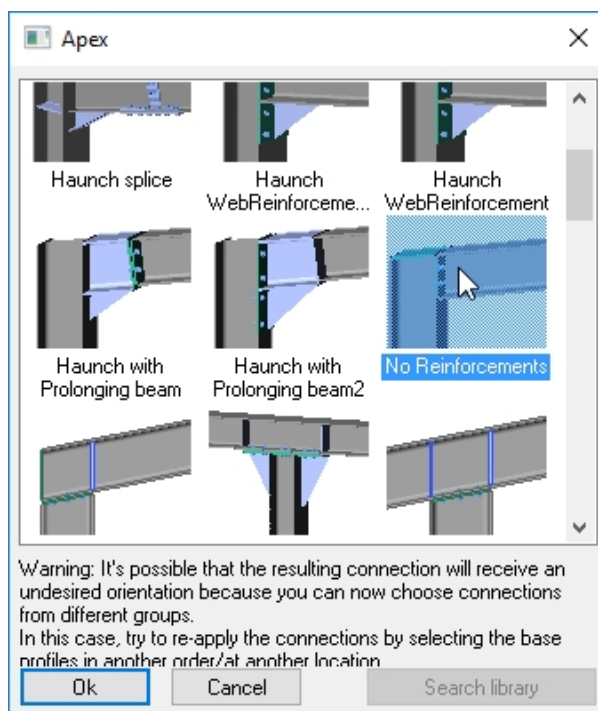
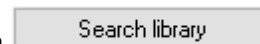
- Select the right rafter of the apex on intersection B3



? For this exercise we don't need a reinforcement, and we can't use the typical miter endplates for a knee joint because then the tubes can't be connected to the apex anymore. That's why we're searching for an alternative connection.



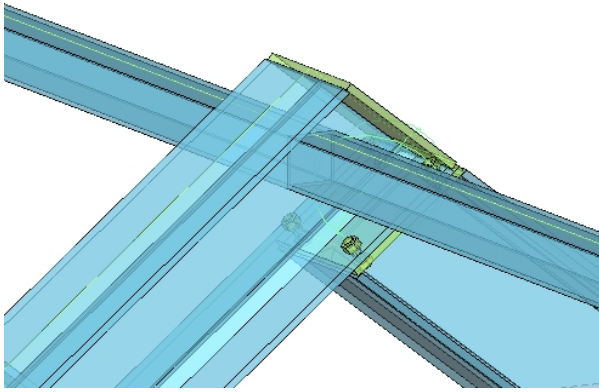
- Click the button



- Double-click on the connection **No reinforcements**



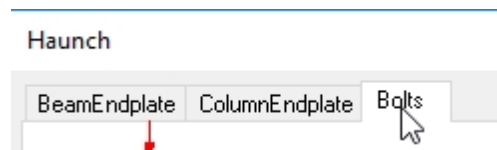
- Press **<Enter>** to end the command



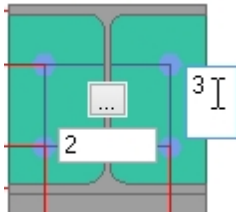
? The group *Apex connections* did not contain the desired connection. A better fitting connection did exist in the group *Haunch connections*.

The button  will search the entire library.

It is therefore not that important that you know the correct icon for your connection, just as long as you first select the continuing profile first and then as second selection the profile that should be shortened.

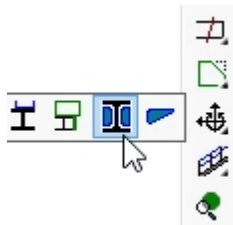


- Activate the tab **Bolts**



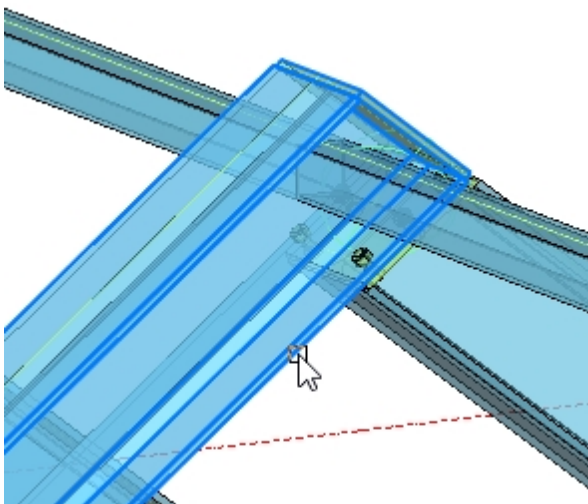
- Choose **3** for the number of vertical bolts

Step 2

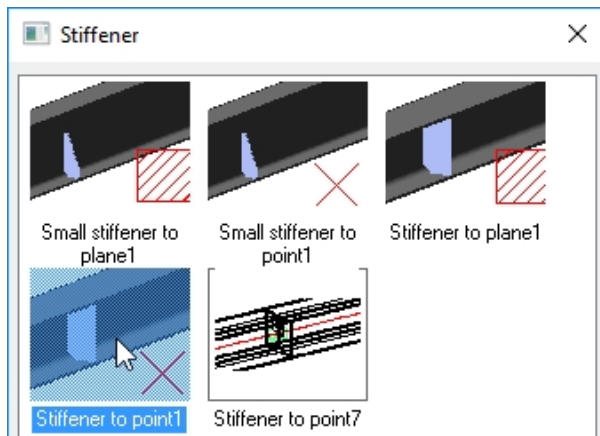


? We will add stiffeners in the rafter on the left.

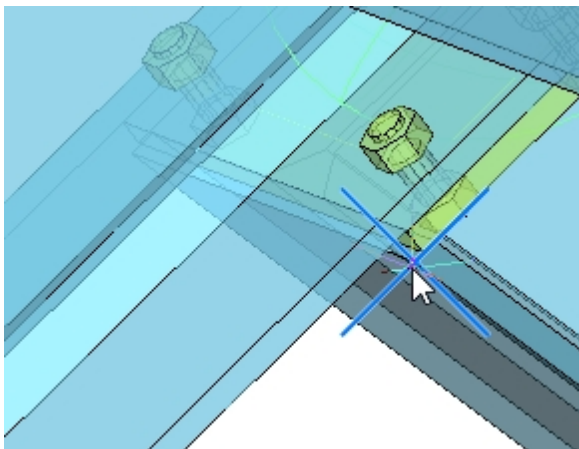
- Click on the icon  **Stiffeners**



- Select the rafter on the left



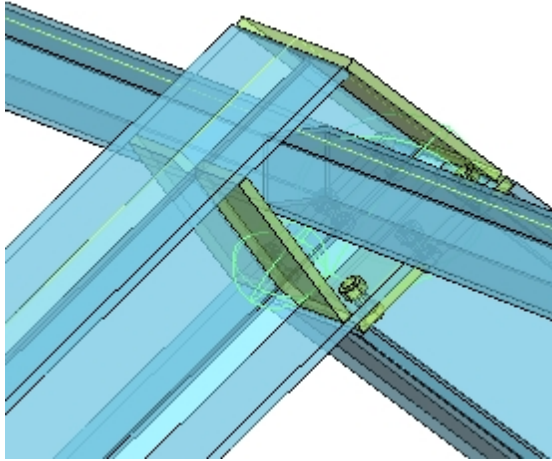
- Double-click the connection **Stiffener to point1**



- Zoom in closely on the end of the rafter on the right side, and select the bottom end point of this rafter.
- Then press **<Enter>** to confirm the point as a selection

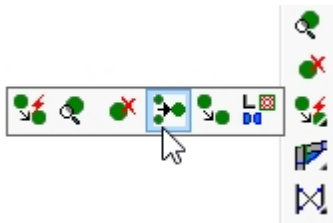


- Press **<Enter>** to end the command

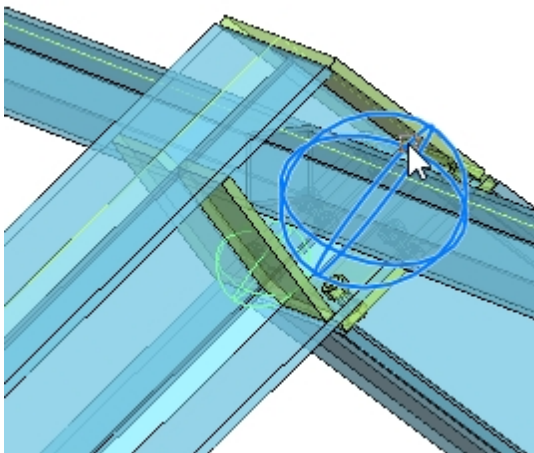


? The point that we choose on the rafter on the right is projected to the rafter on the left. This way an exact location for the stiffeners can be determined. This stiffener's location will remain dependent on the end point of the other rafter.

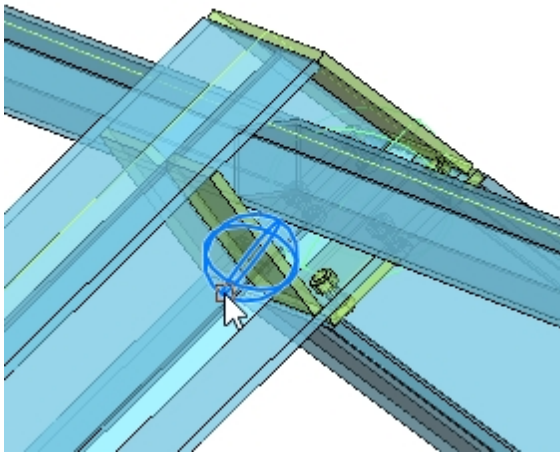
Step 3



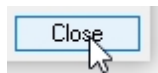
- Click on the icon  **Merge macros**



- Select the big sphere of the apex connection

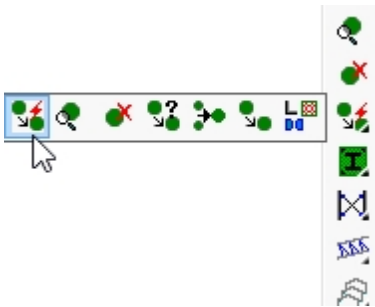


- Select the small sphere of the stiffener
- Then press **<Enter>** to end the selection

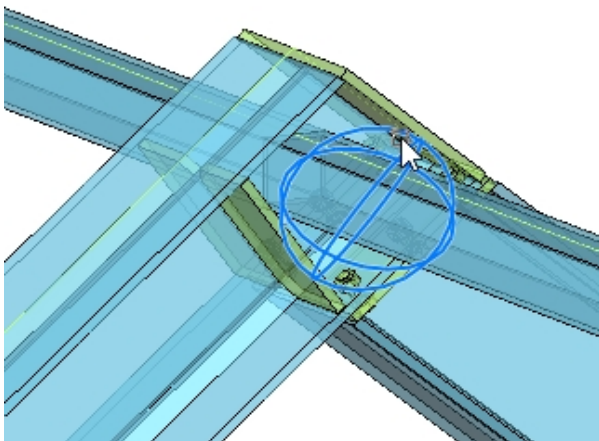


- Click **Close** twice to close the *Review macro* windows .

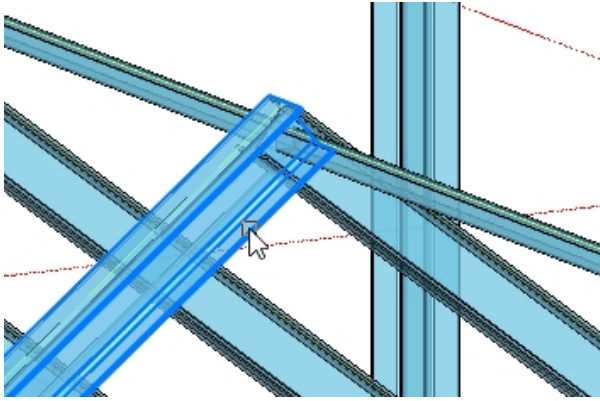
Step 4



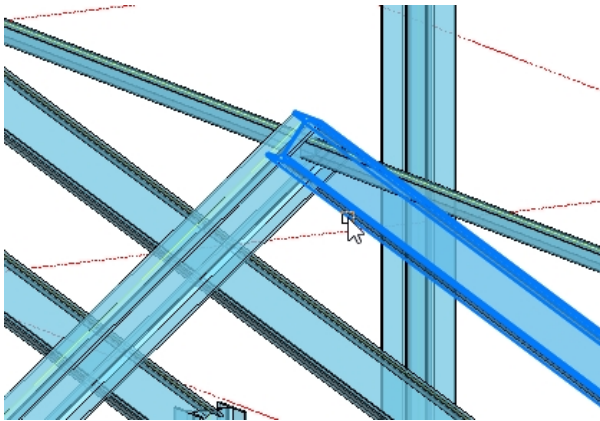
- Click on the icon  **SmartCopy**



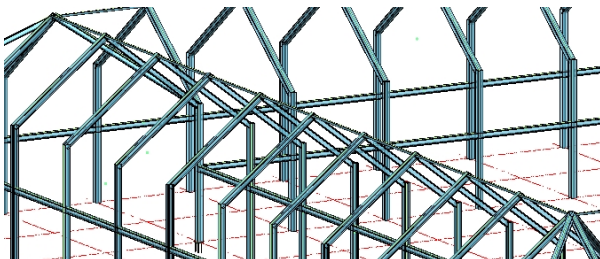
- Select the macro that we just merged
- Then press **<Enter>** to confirm the selection.



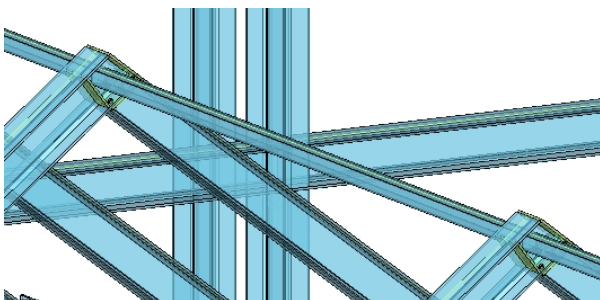
- Select the rafter on the left on intersection B4



- Select the rafter on the right on intersection B4



- Repeat this for some other apex connections
- Then press **<Enter>** to end the command



- ❓ After merging the stiffeners with the apex connection we can still easily copy the connection using the Smartcopy tool. However do note that this tool won't work anymore if you use a line, polyline or plate as base in one of the merged connections. The smartcopy tool only works on profiles and planes for the base elements of the connections.

Macros : comprehensive

In these exercises we take a closer look at drawing, modifying and copying of bigger macros such as bracings and trusses.

Bracing in more difficult circumstances

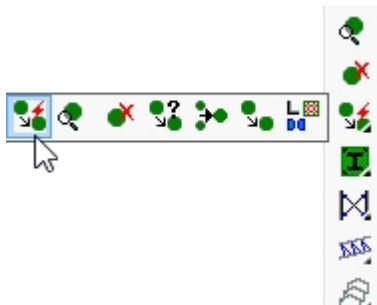
Step 1

- ❓ In this exercise the following items are handled :
- an example case where the bracing can't be copied
 - drawing a bracing at an angle if the base profiles are not aligned

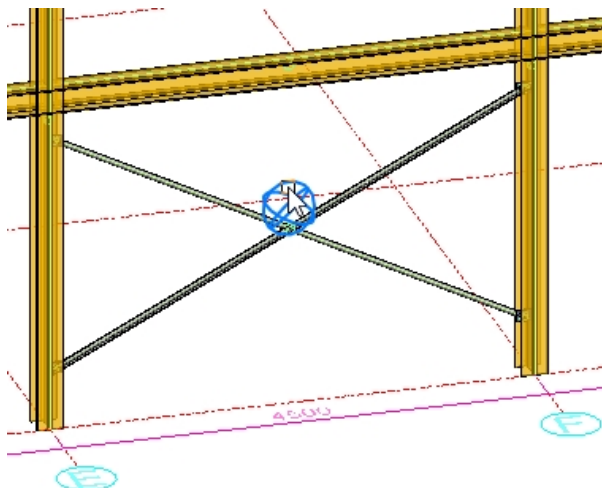


- ❓ For demonstration purpose we will first copy a bracing to 2 base profiles that are not suited for the bracing.

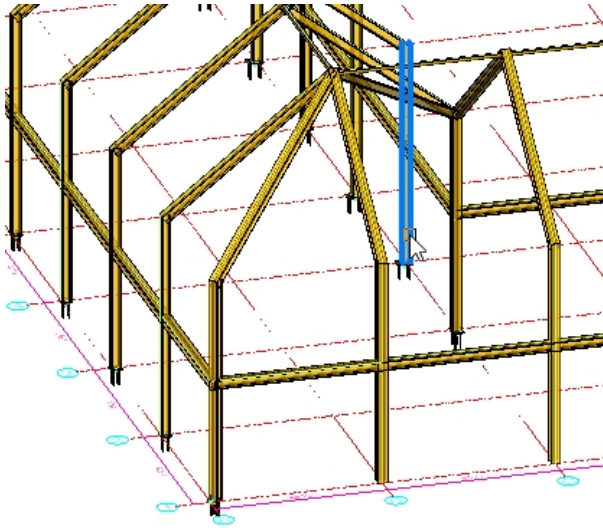
- Open the drawing  *Bracing more difficult.dwg*



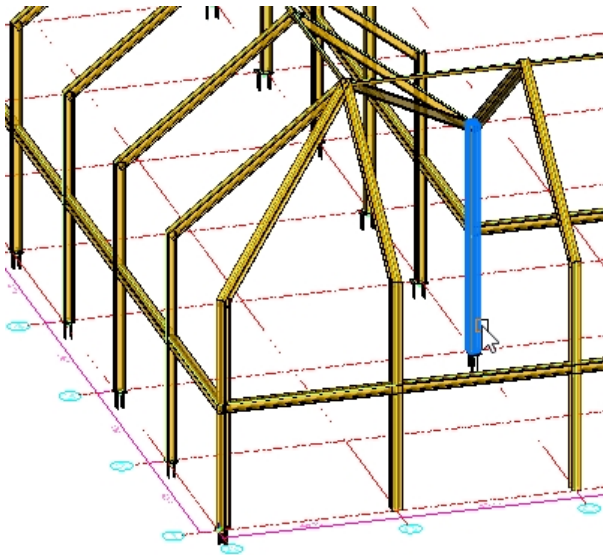
- Click on the icon  **SmartCopy**



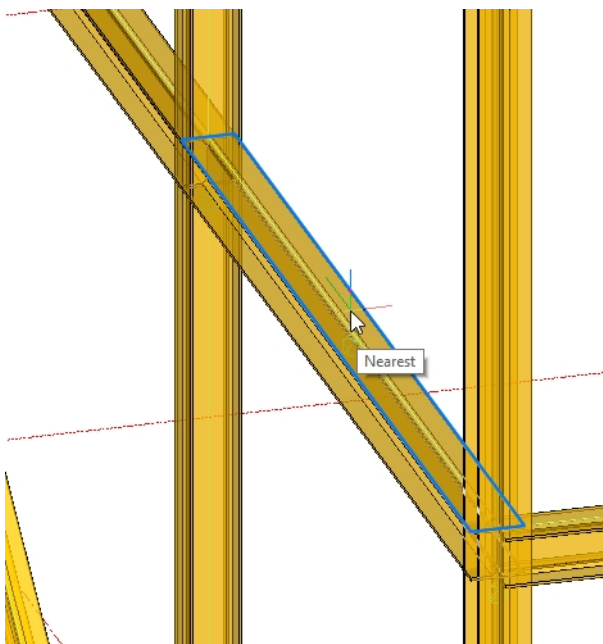
- Select the macro of the bracing between the columns **E1** and **F1**
- Then press **<Enter>** to confirm the selection



- Select the column on intersection **C4**




- Select the column on intersection **C3**



- Select the top plane of the beam between the columns **C3** and **C4** by moving the cursor to an open space of this plane and then clicking on the left mouse button
- Then press **<Enter>** to accept the plane selection




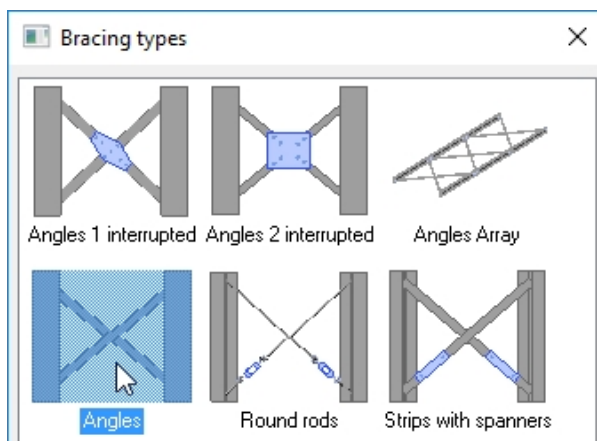
❓ The bracing couldn't be copied because the orientation of the 2 columns on C3 en C4 are rotated 90° compared to each other. To draw a bracing between these 2 columns we need to use the **Bracing**  command again.

- Press **<Esc>** to cancel the command

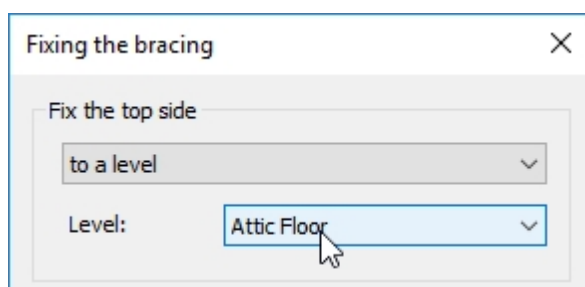
Step 2



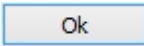
- Click on the icon  **Bracing**

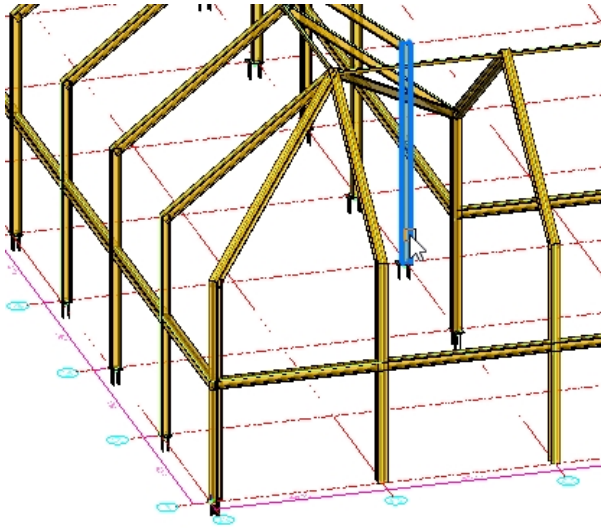


- Double-click the bracing **Angles**

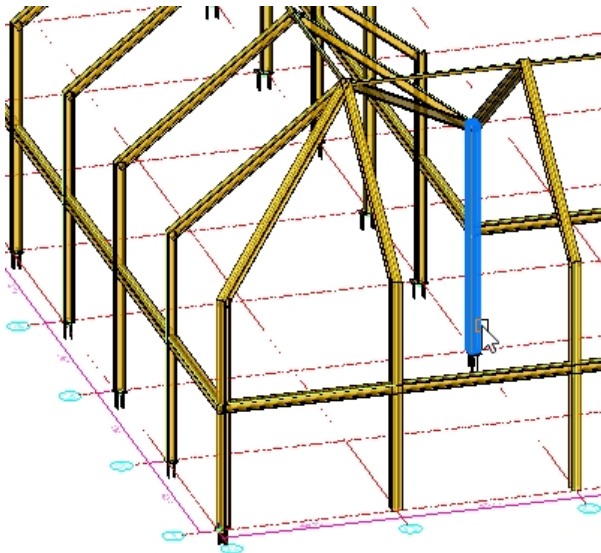


- Choose **to a level** for fixing the top, and for the level choose **Attic Floor**

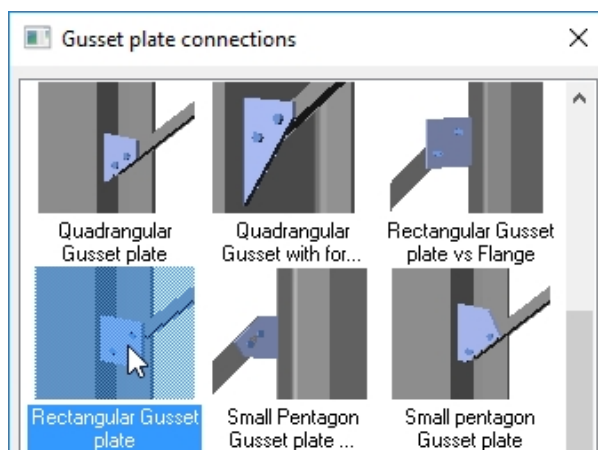
- Click on  in the window **Fixing the bracing**



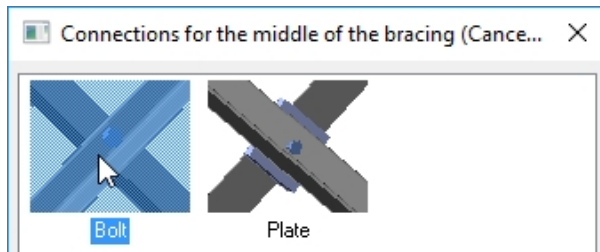
- Select the column on intersection **C4**



- Select the column on intersection **C3**

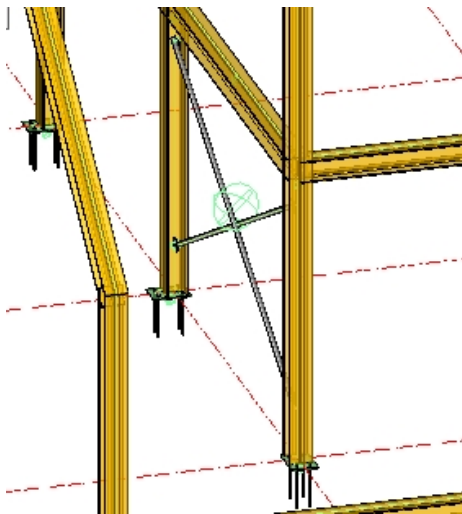


- Double-click the connection **Rectangular Gusset plate**



- Double-click the bolt for the connection in the middle of the bracing
- Then press **<Enter>** to end the command

- Press **Close** 3 times to close all the connection windows

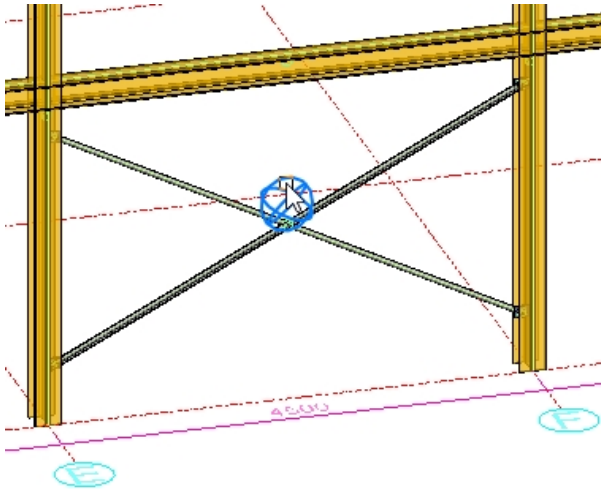


- ? Parabuild has now used different gusset plate connections for the column on C3 (some welded to the web and others welded to the flange). That is also the reason why the smartcopy command of the other bracing didn't work.

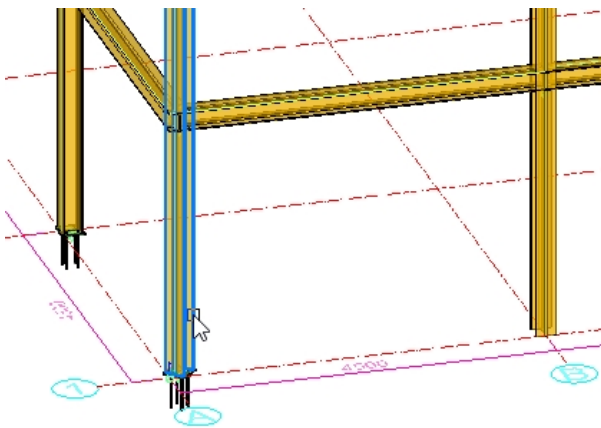
Step 3



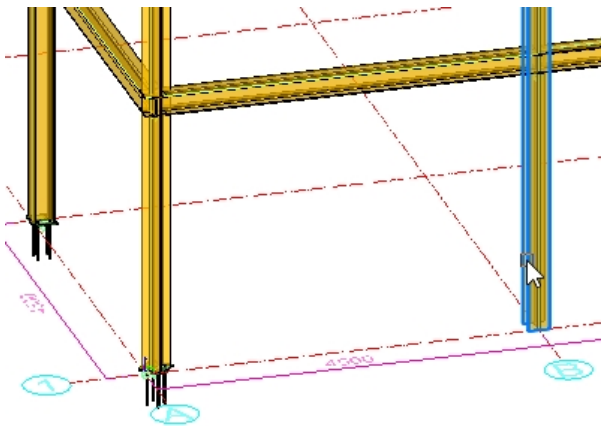
- Click on the icon  **SmartCopy**



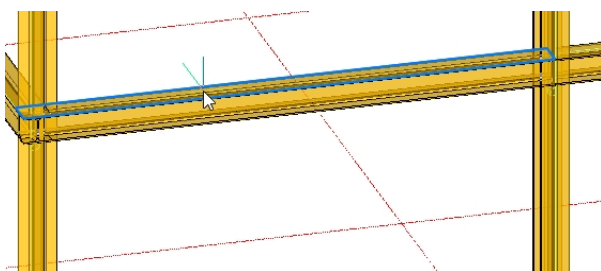
- Select the macro of the bracing between the columns **E1** and **F1**
- Then press **<Enter>** to confirm the selection



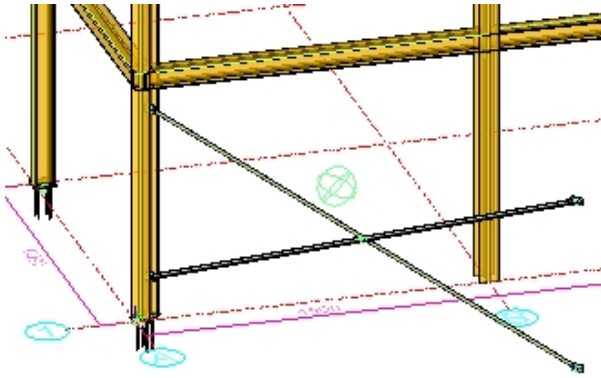
- Select the column on intersection **A1**



- Select the column on intersection **B1**



- Select the top plane of the beam between columns **A1** and **B1** by moving the cursor to an open space of this plane and then clicking the left mouse button
- Then press **<Enter>** to confirm the plane selection

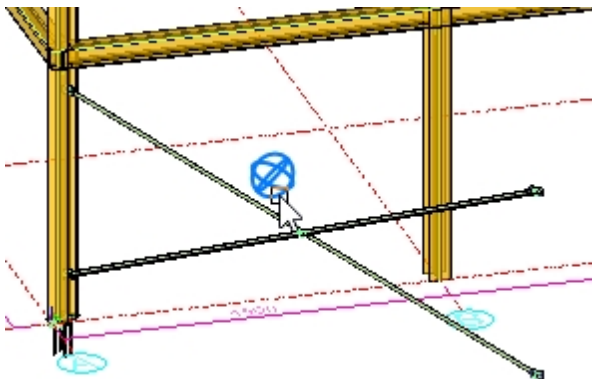


? The bracing is drawn wrong because Parabuild always prefers to draw the bracing parallel to the first column that was selected. This is to avoid plates welded at an angle. In the current situation we have to draw the plates at an angle, but this is easily adjustable...

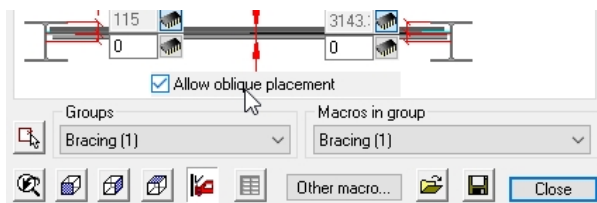
Step 4



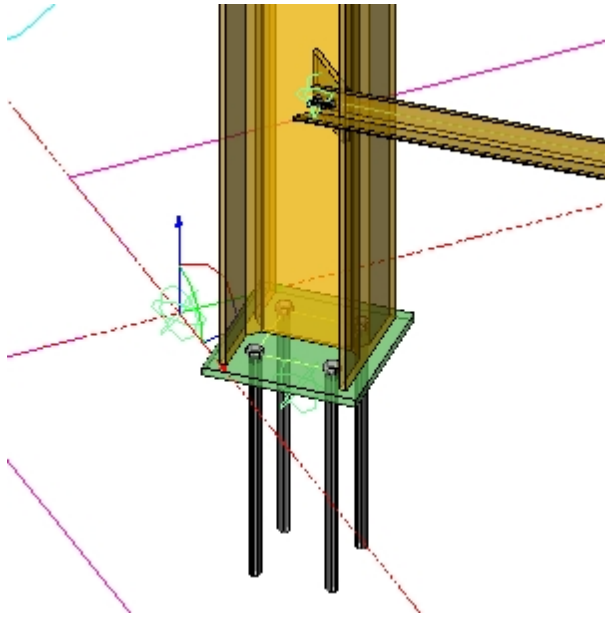
- Click on the icon  **Review macro**



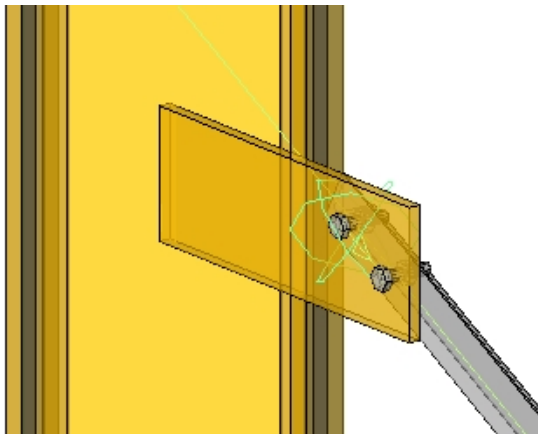
- Select the macro of the bad bracing
- Then press **<Enter>** to confirm the selection



- Activate the check box **Allow oblique placement**

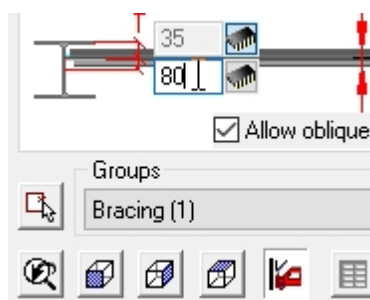


? The angle profile that goes from bottom left to top right is shown in yellow because it collides with column **A1**.

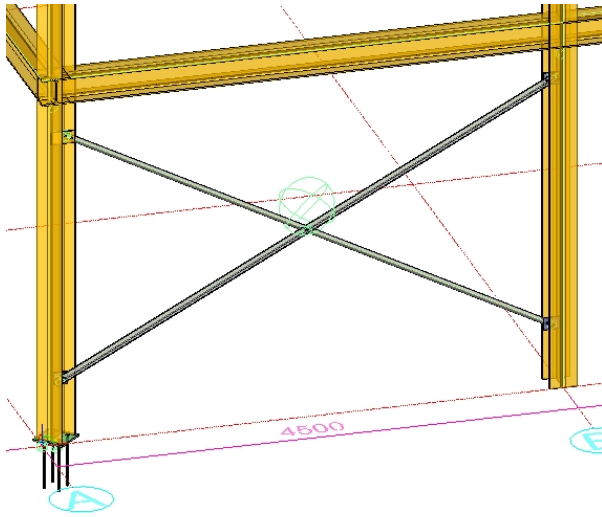


? The other angle profile has received a too big gusset plate against the column **A1**. The reason for this is that the angle profile is coming close to the outer edge of the column. The cutting routine in Parabuild in this case automatically draws the cut to the outer flange of the column instead of the web.

This is easily corrected by moving the bracing...



- Modify the displacement of the bracing on the left hand side to **80**



❓ Thanks to the continuous collision checks during the design phase you can see the issues that would cause erection problems.


Bracing without gusset plates

◀ Step 1 ▶


❓ In this exercise the following items are handled :

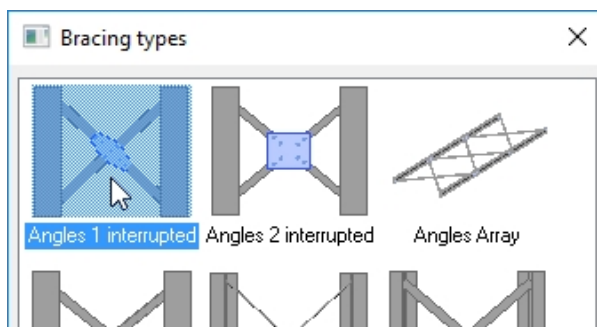
- drawing a bracing aligned to the flanges of a profile
- drawing bolts instead of gusset plates
- creating a simple connection that contains a cut and a bolt pattern, and then reusing that connection



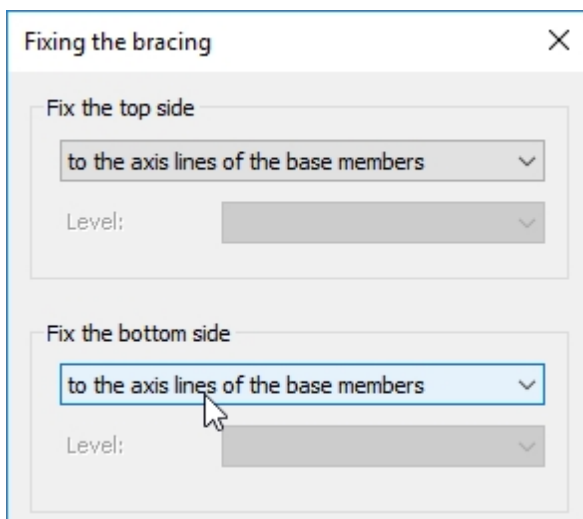
- Open the drawing  *Bracing without gusset plates.dwg*



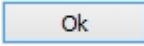
- Click on the icon  **Bracing**

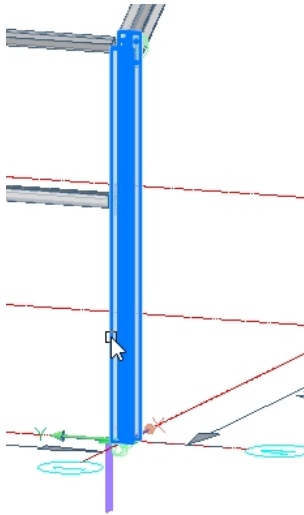


- Double-click the bracing **Angles 1 interrupted**

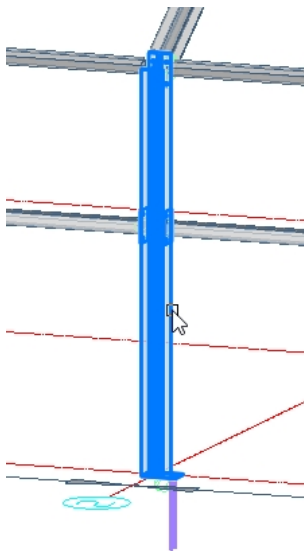


- Make sure that both the *top side* and *bottom side* are set to **to the axis lines of the base members**

- Click on  in the **Fixing the bracing** window



- Select the column on intersection **A1**

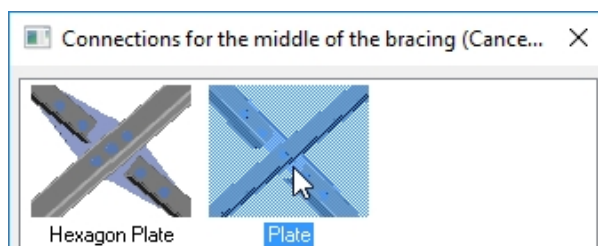


- Select the column on intersection **A2**

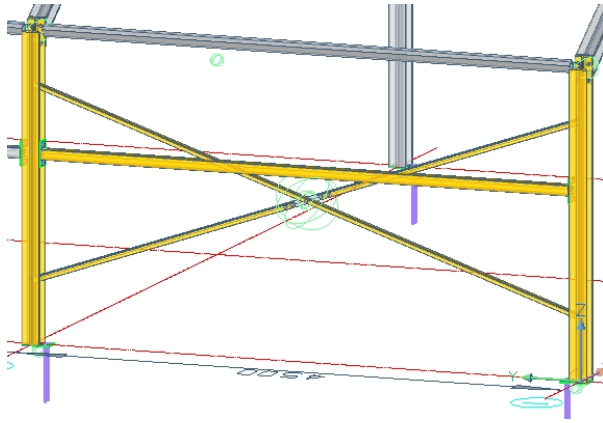
ⓘ Although Parabuild first asks for the left profile and then the right profile we now do the exact reverse. That is because we now want the bracing to have a different orientation. We will come back to this a bit later when we copy this bracing.



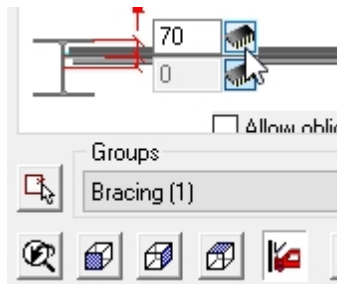
- Press **Cancel** so that no gusset plate connections are drawn




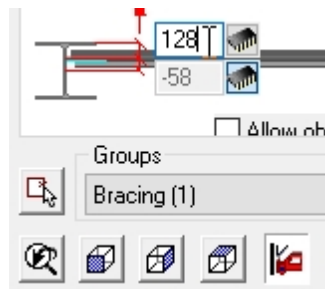
- Double-click the connection **Plate** for the connection in the middle of the bracing
- Then press **<Enter>** to end the command



? The bracing is colliding with the tube. To solve this we will move the bracing to the flanges, on the inside of the building.

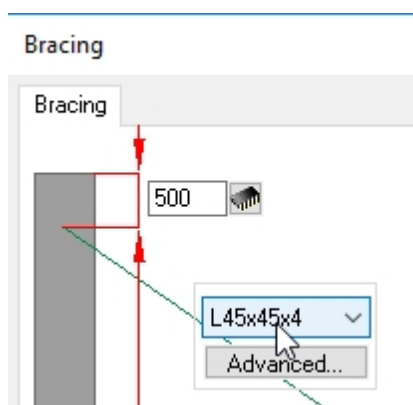


- At the bottom left of the dialog box of the bracing, click on the button  so that the distance 70 becomes adjustable.

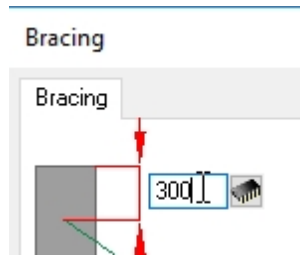


- Modify the distance from flange to bracing to **128**

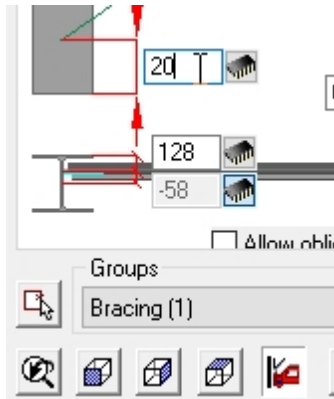
? 128 is the total height of the column minus the flange thickness.



- Modify the size of the angle profile to **L45x45x4**



- Modify the top offset to **300**



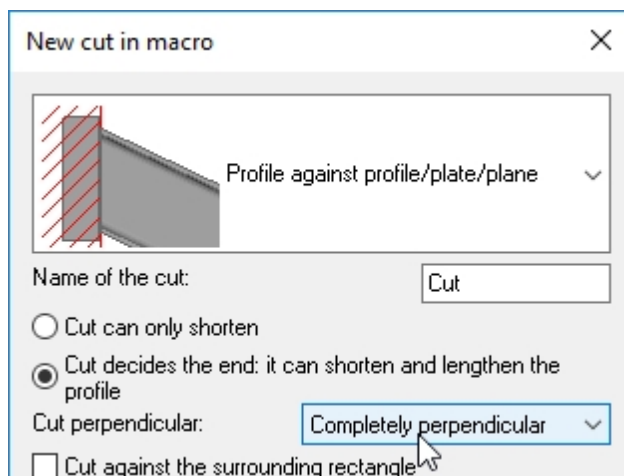
- Modify the bottom offset to **20**

Step 2

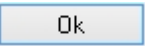
? The angle profiles are too long because Parabuild has drawn it to the axes of the columns. We will now create a new connection that shortens the angle profile and also bolts it to the flange. We will assemble this connection ourselves because it doesn't exist in the library. We will then reuse this connection for all other ends of the angle profiles.

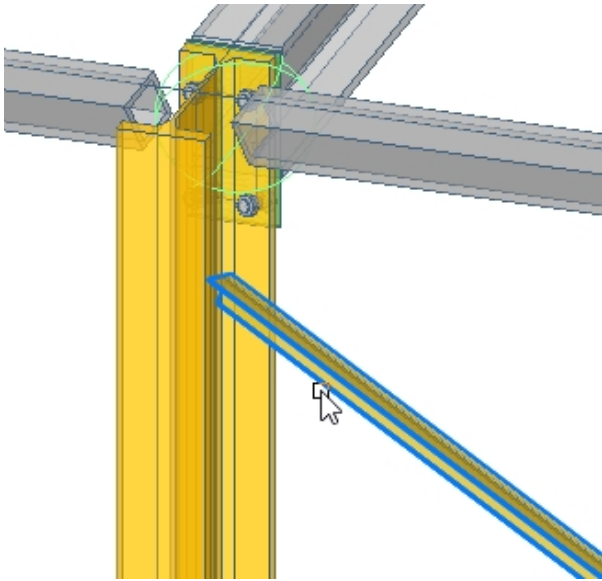


- Click on the icon  **Add cut to macro**

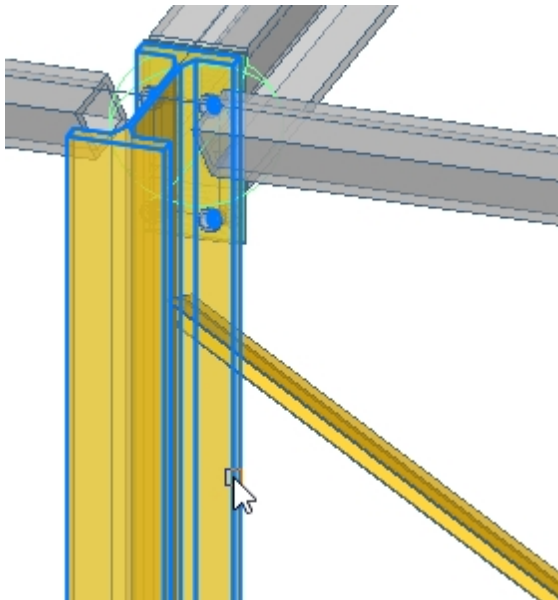


- For the setting *Cut perpendicular*, choose **Completely perpendicular**

- Then click on  to close the window



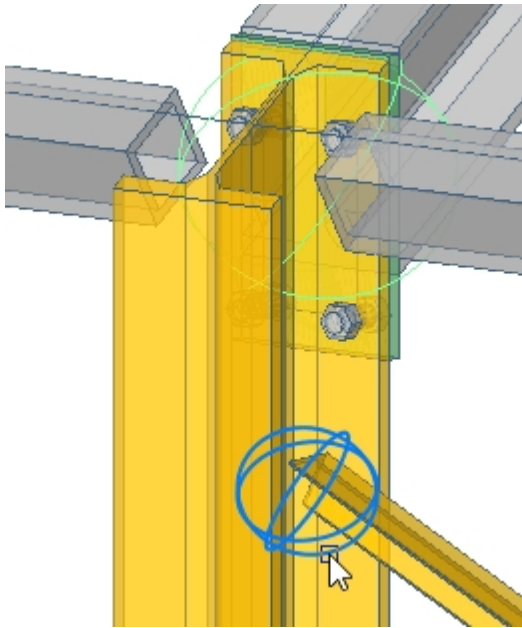
- Select the new top / left angle profile



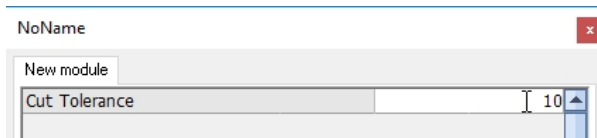
- Select the column on intersection **A2**



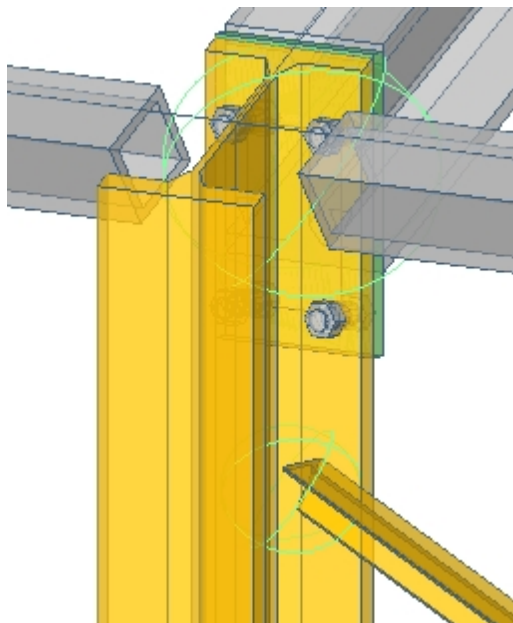
- Click on the icon  **Macro nazien**



- Select the new macro
- Then press **<Enter>** to confirm the selection

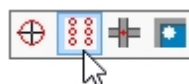



- Modify the Cut offset to **10**

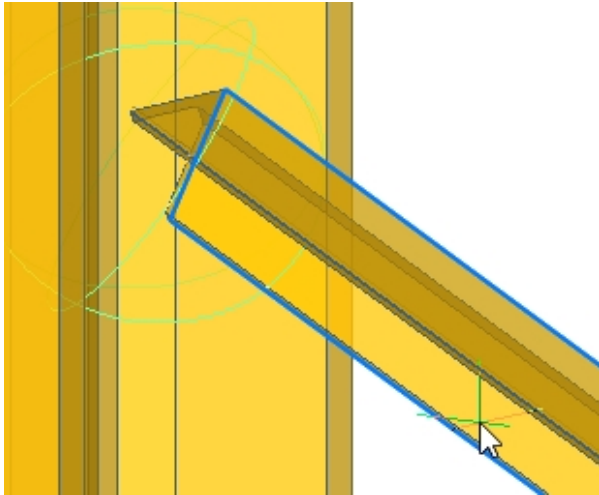


- ❓ The angle profile doesn't collide any more with the rounding of the column. It is however still yellow because it still collides with the other column at the other end.

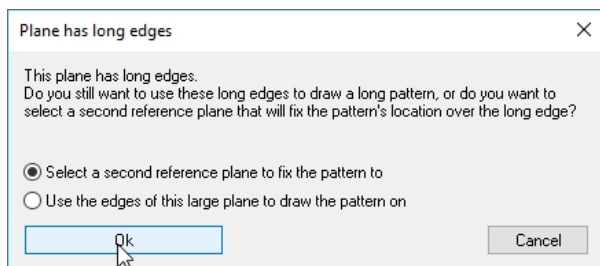
← Step 3 →



- Click on the icon  **Bolts on a plane**

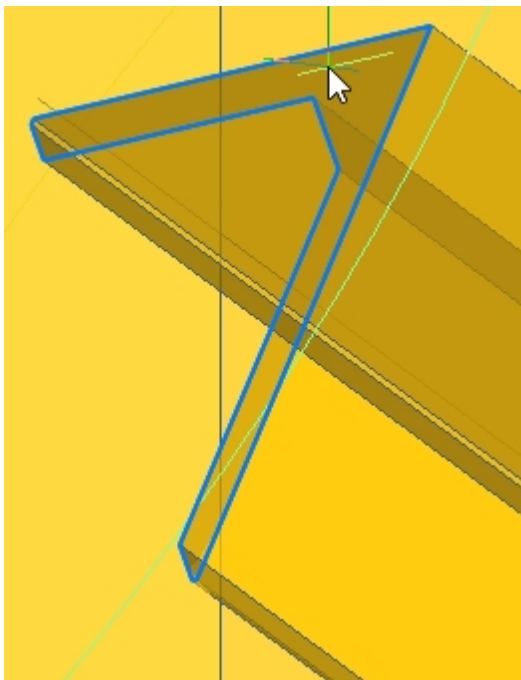


- Move the cursor to above the inner flange of the angle profile, and then press the left mouse button to select this plane
- Now press the left mouse button again without moving the cursor, so that the plane behind it is selected
- Then press **<Enter>** to confirm the selection of the back plane

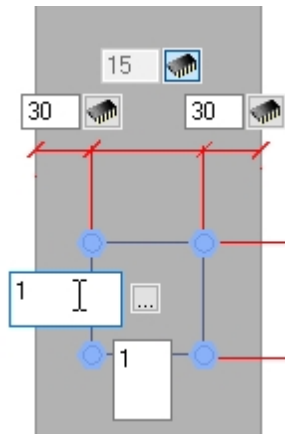


- Click on **Ok** to continue with the selection of a second reference

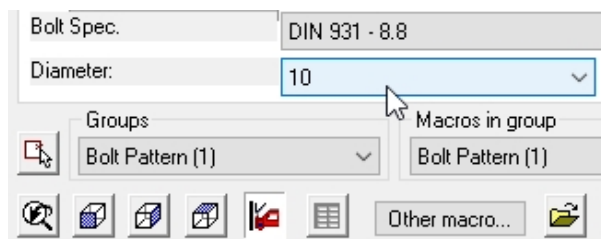
? The option without the second reference plane would draw a very long bolt pattern over the entire length of the angle profile.



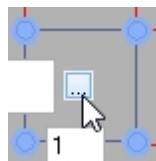
- Zoom in on the end of the angle profile and press the left mouse button on the end plane. The top plane of the angle profile is selected because it is in front
- Click the left mouse button again without moving the cursor in order to select the end plane
- Then press **<Enter>** to confirm the selection of the end plane



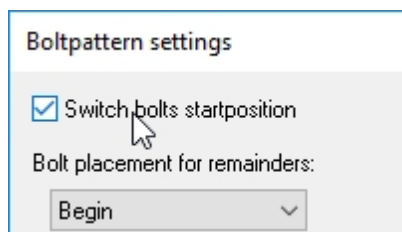
- Modify the number of bolts to **1**



- Modify the diameter of the bolt to **10**

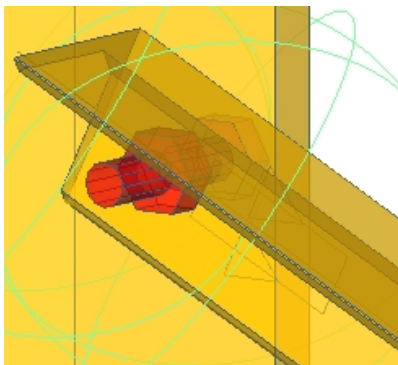


- Click on  in the middle of the bolt pattern

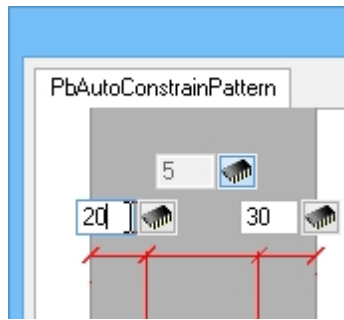


- Activate the setting **Switch bolt startposition** in the top left corner

- Then click  to close this window

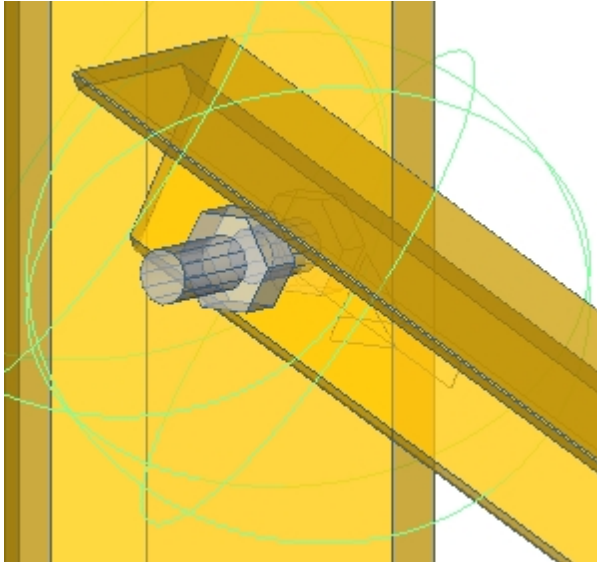


- ❓ The bolt is now drawn closest to the end plane, which makes more sense.

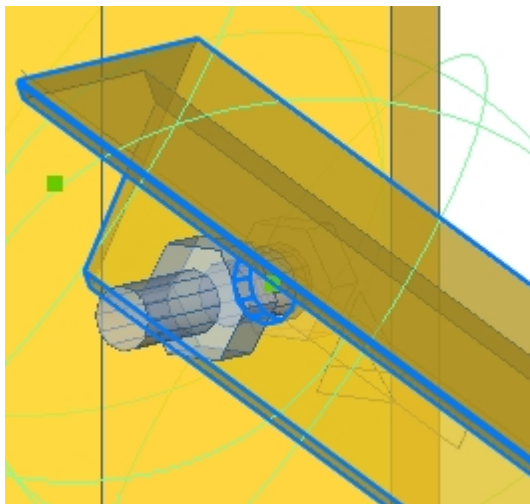


- Modify the top / left distance to **20**

❓ The parameters in this dialog box do not have an exact visual representation of the bolt pattern that is actually drawn. The reason for this is that there is just one dialog box for a command that can draw many varied bolt patterns.

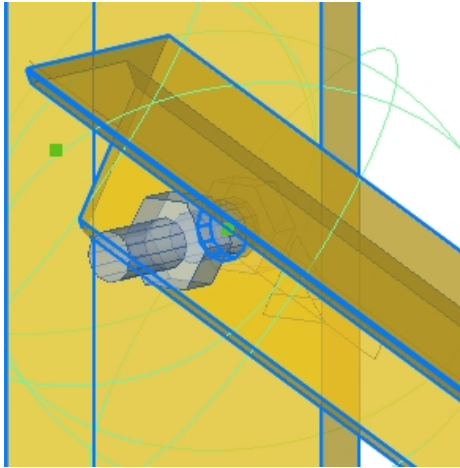


❓ The bolt is now drawn in a grey color, which indicates that it has at least one hole.



- Select the angle profile.

⚠ If you look carefully then you can see both a hole and a grip for the hole




- Select the column



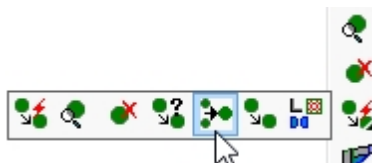
There was no hole drawn in the column yet. The cause of this is that the macro of the bolt does not know of the existence of the column. We can solve this by merging the macro of the cut with the macro of the bolt. We will do this in the next step.




If in another situation it wouldn't be possible to merge 2 macros, then you should use the command  **Check for new holes**.

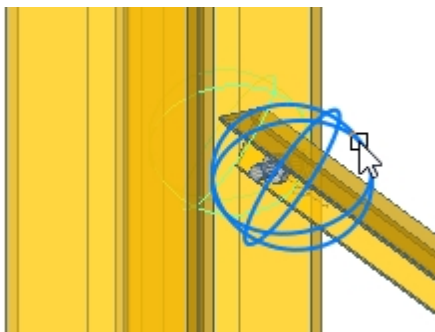


Step 4

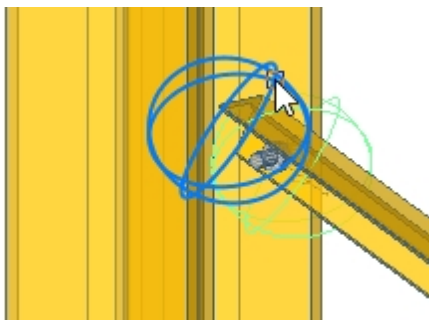


We will now merge the bolt and the cut into one macro that can be copied using SmartCopy.

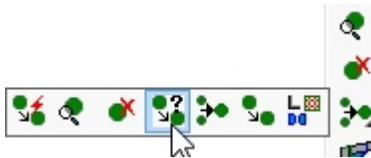
- Click on the icon  **Merge macros**




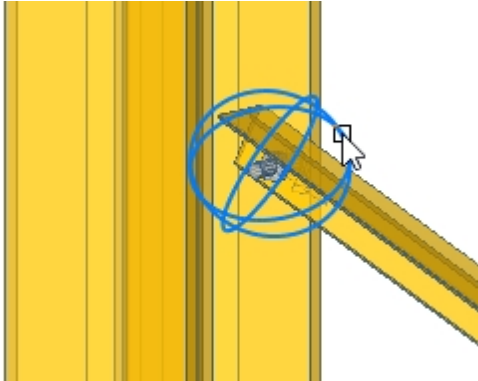
- Select one of the 2 new macros.



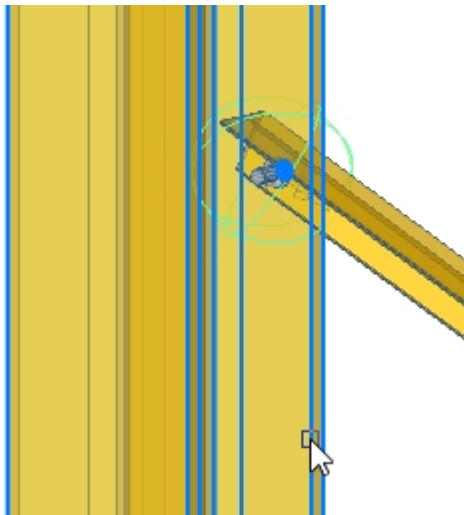
- Select the other macro, and then press **<Enter>** to end the selection



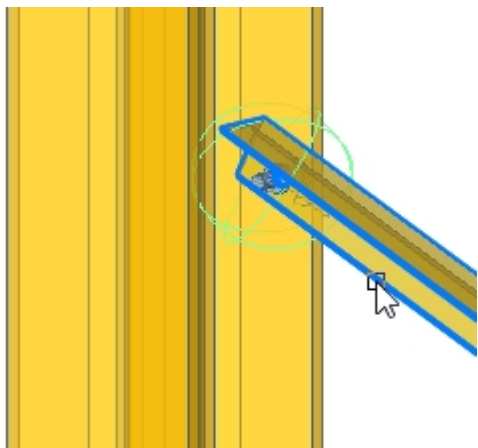
- Click on the icon  **SmartCopy Settings**



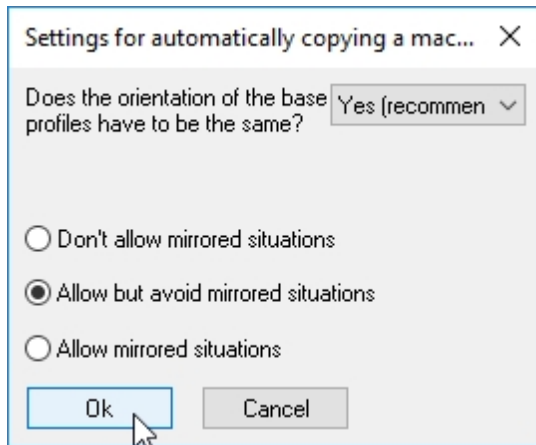
- Select the (merged) macro



- Select the column as first base element



- Select the angle profile as second base element



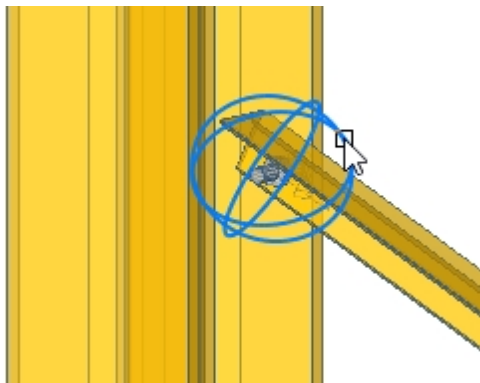
- Click on **Ok** in the **SmartCopy Settings** window

Step 5

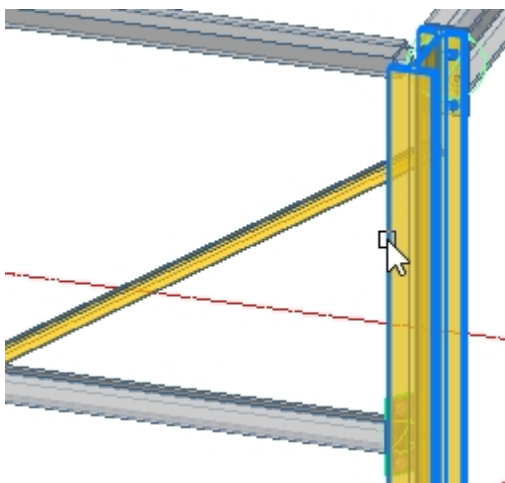


- ? We will now copy the new macro to the other 3 sides of the bracing.

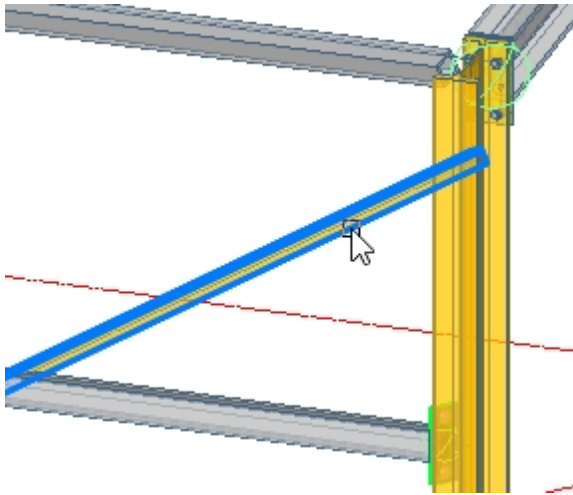
- Click on the icon  **SmartCopy**



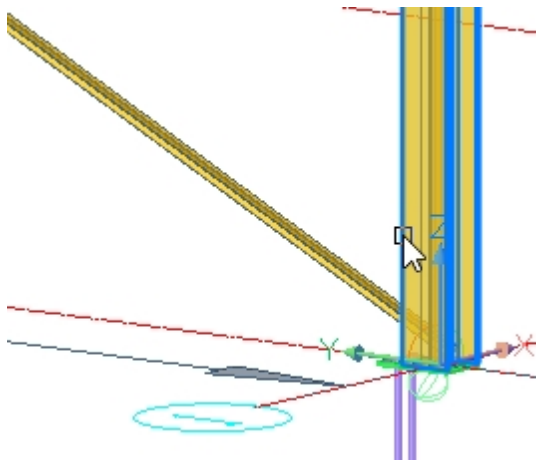
- Select the (merged) macro
- Then press **<Enter>** to confirm the selection



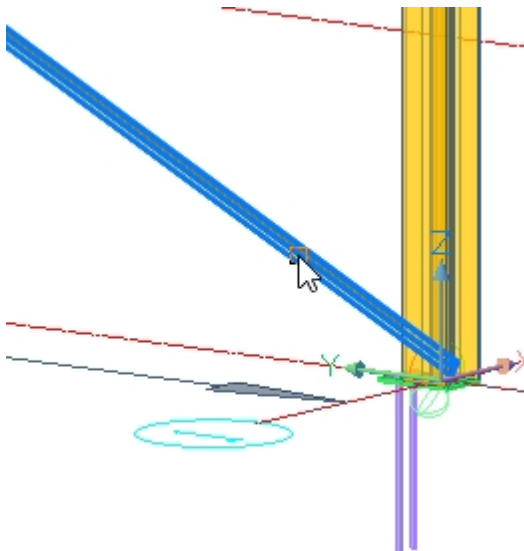
- Select the column on intersection **A1**



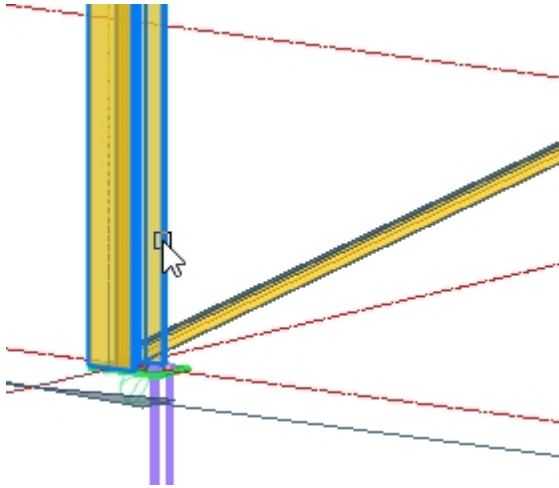
- Select the top / right angle profile



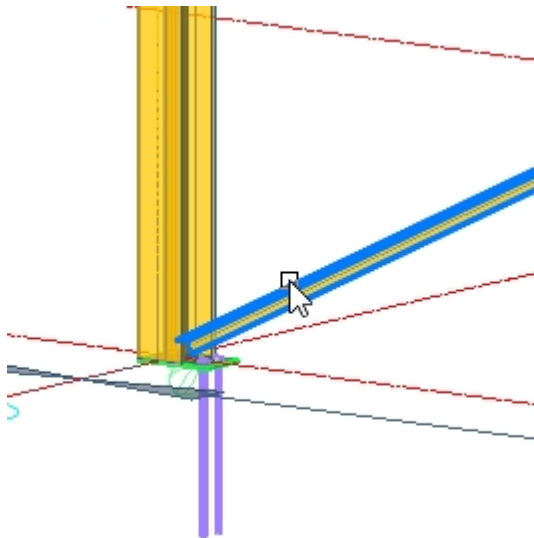
- Select the column on intersection **A1**



- Select the bottom / right angle profile




- Select the column on intersection **A2**



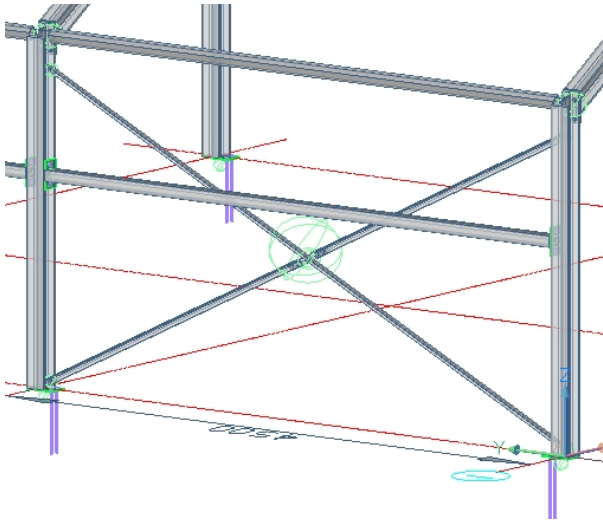
- Select the bottom / left angle profile
- Then press **<Enter>** to end the command



- Click on the icon  **Clash Check**

 If the **Review macro** window is not opened then there is no continuous collision check being performed.

Using this command we can check the entire project for collisions.



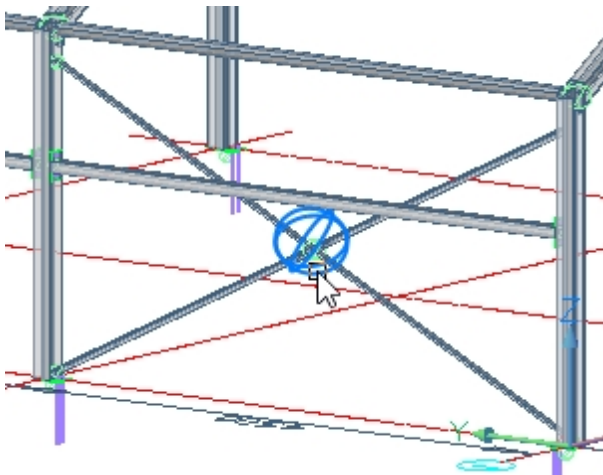
? The bracing does not collide any more thanks to the shortened angle profiles.

Step 6

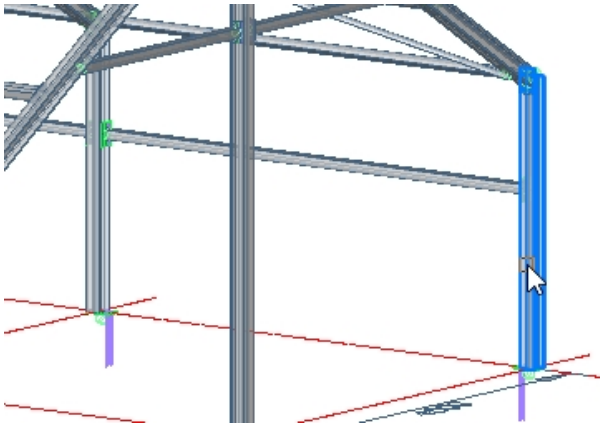


? We will now copy the finished bracing to the other side.

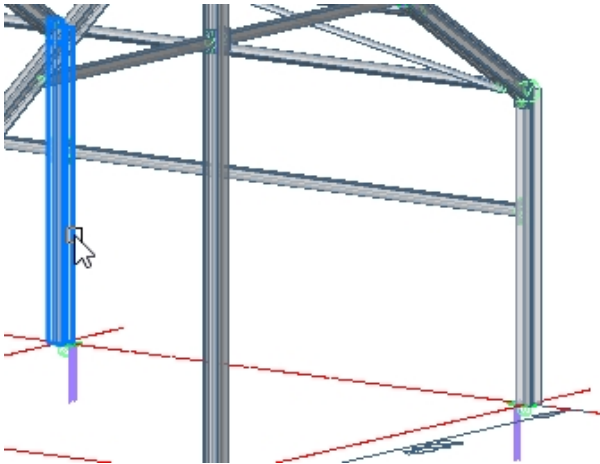
- Click on the icon  **SmartCopy**



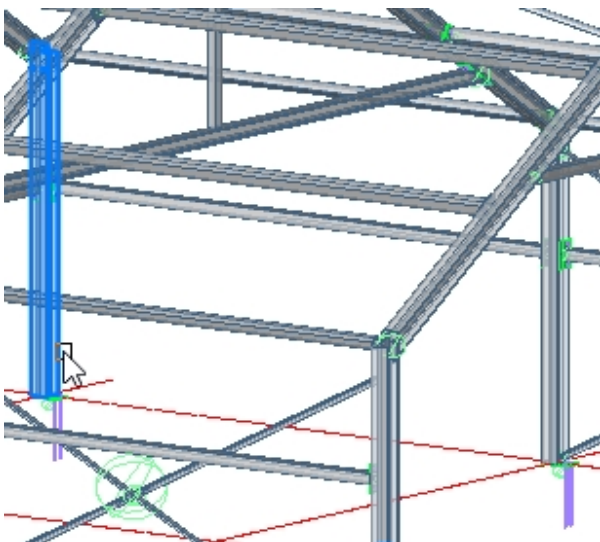
- Select the big macro of the bracing
- Then press **<Enter>** to confirm the selection



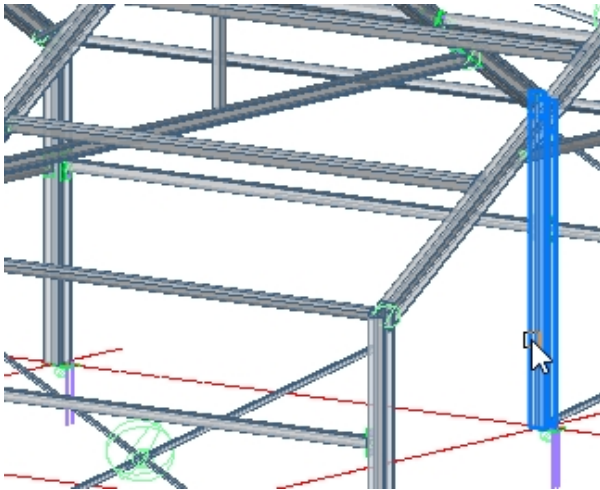
- Select the outer column on intersection **C1**



- Select the middle column on intersection **C2**



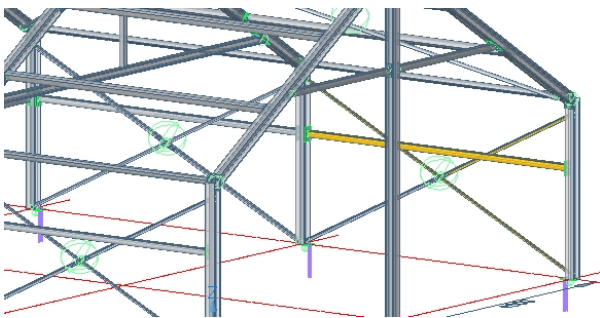
- Select the outer column on intersection **C3**




- Select the middle column on intersection **C2**
- And press **<Enter>** to end the command



- Click on the icon  **Clash Check**



-  The bracing on the right side is colliding with the tube.
That is because we've placed it on the outside of the building.
We did correctly rotate the bracing on the left side by selecting the columns in a different order : first the left column and then the right column.


Assembling a truss yourself

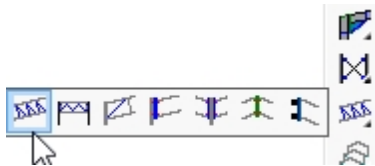
◀ Step 1 ▶


❓ In this exercise the following items are handled :

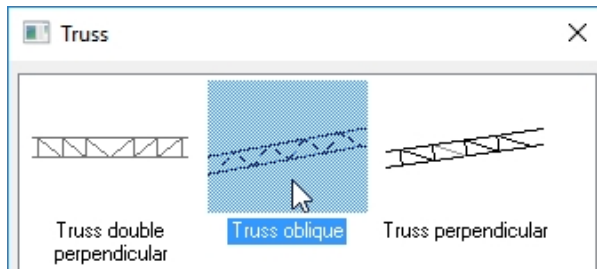
- drawing a truss based on a model line
- connecting a truss to columns
- copying a truss together with all it's component connections



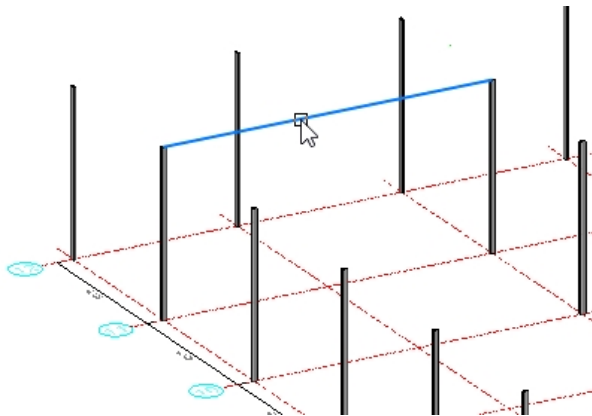
- Open the drawing  *Assembling a truss yourself.dwg*



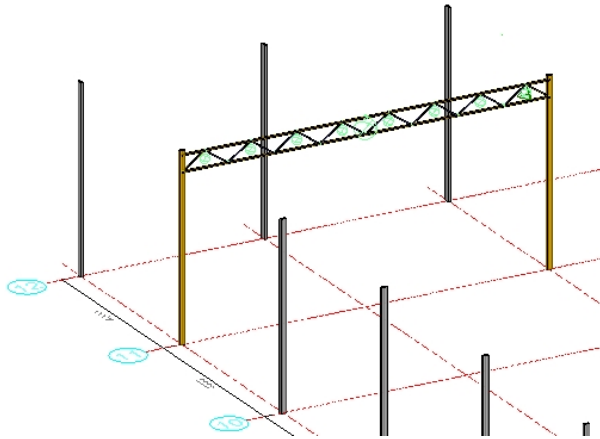
- Click on the icon  **Truss**



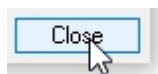
- Double-click on **Truss oblique**



- Select the model line that is located between the intersections **A11** and **C11**
- Then press **<Enter>** to end the command



? This is the simplest method for drawing a truss. However the truss has no knowledge of the columns and therefore it is not connected to them.



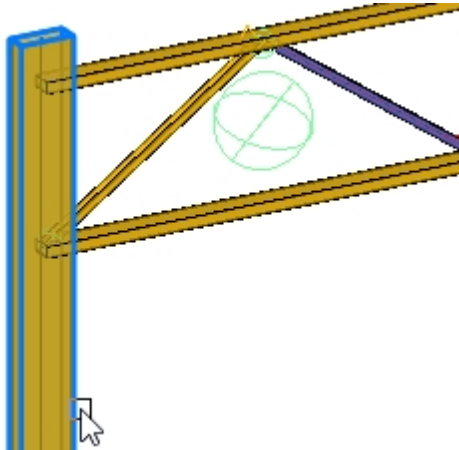
- Press the **Close** button to close the truss parameters window

Step 2

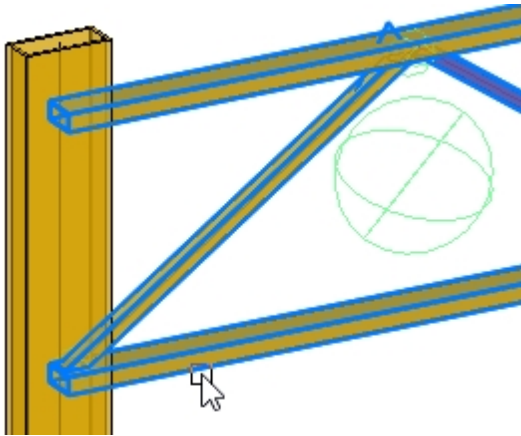


? We will now connect the truss to the columns.

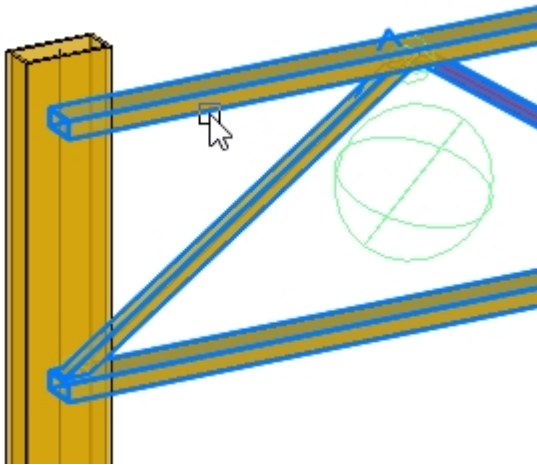
- Click on the icon **Truss haunch connection**



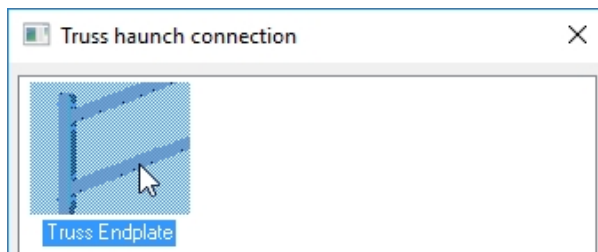
- Select the column on intersection **A11**



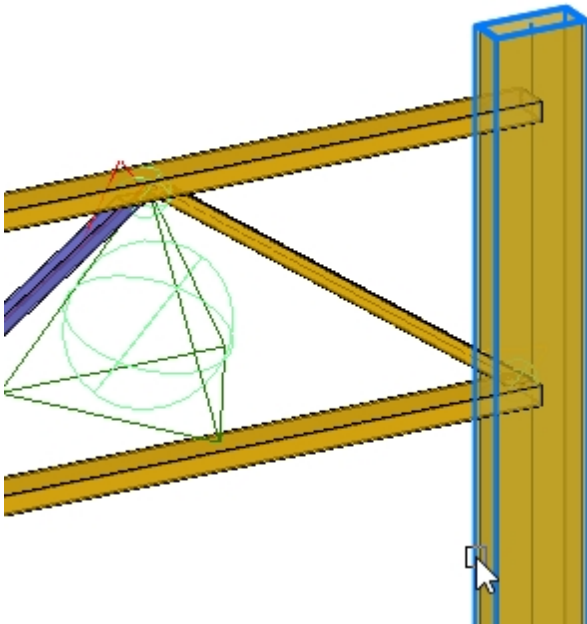
- Select the bottom chord



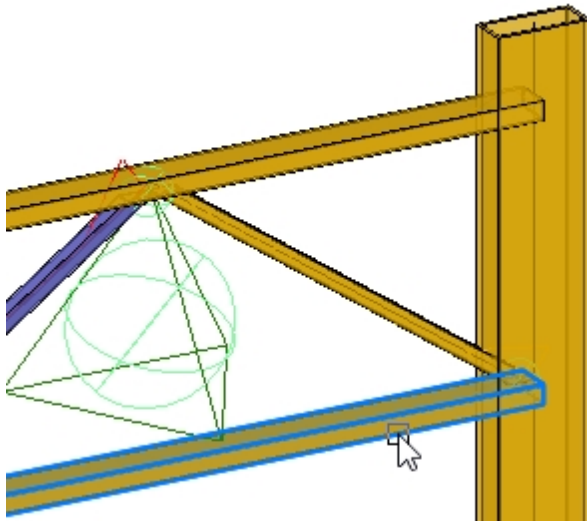
- Select the top chord



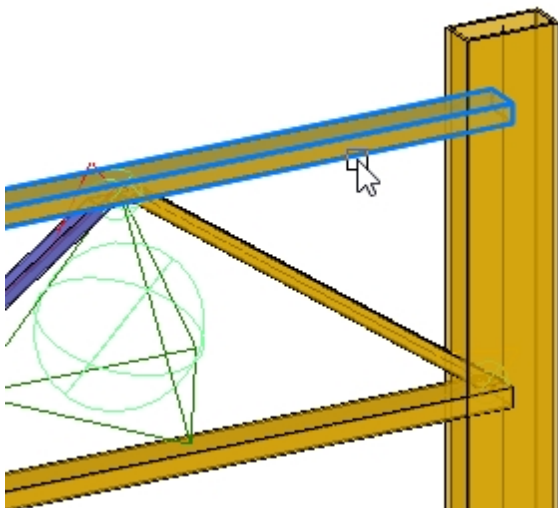
- Double-click the connection **Truss Endplate**



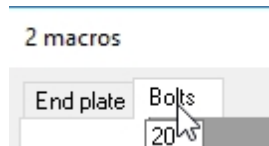
- Select the column on intersection **B11**



- Select the bottom chord



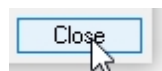
- Select the top chord
- Then press **<Enter>** to end the command



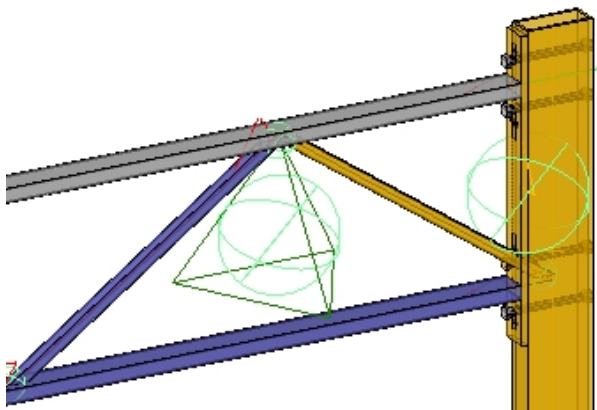
- Activate the **Bolts** tab in the parameters window of the endplate



- Modify the horizontal number of bolts **4 times to 1**



- Press the **Close** button to close the endplate connection window



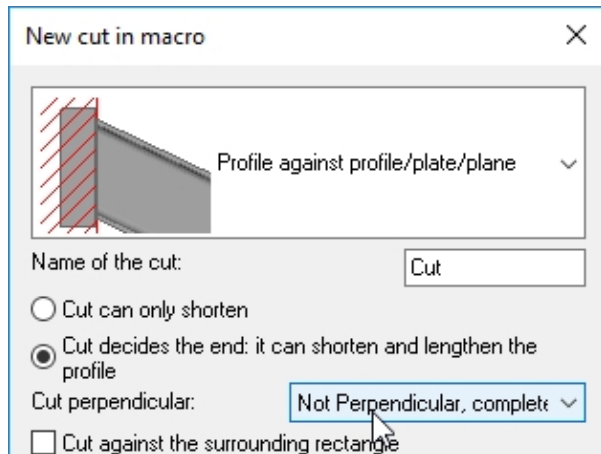
? The first and last struts of the truss are colliding with the endplate. This can be solved by shortening the length of the array of struts, or by cutting the first and last struts.

Step 3

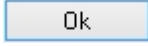
? The first and last struts are colliding with the column. We will fix this by drawing two cuts.

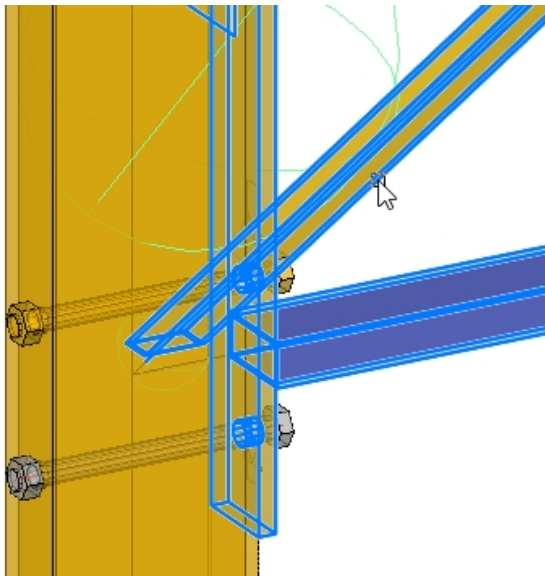


- Click on the icon  **Add cut to macro**

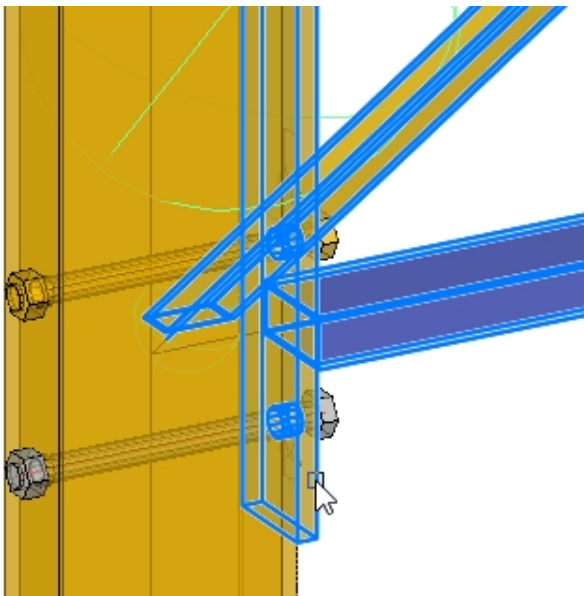


- Make sure that the *Cut perpendicular* setting is set to **Not Perpendicular**

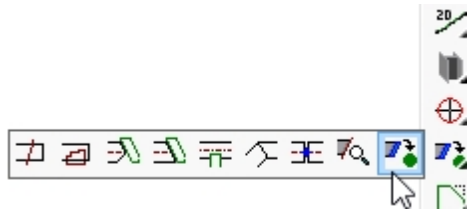
- Then press  to close the *New cut* window.



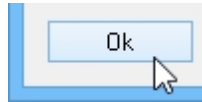
- Select the colliding strut on intersection **A11**

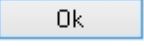


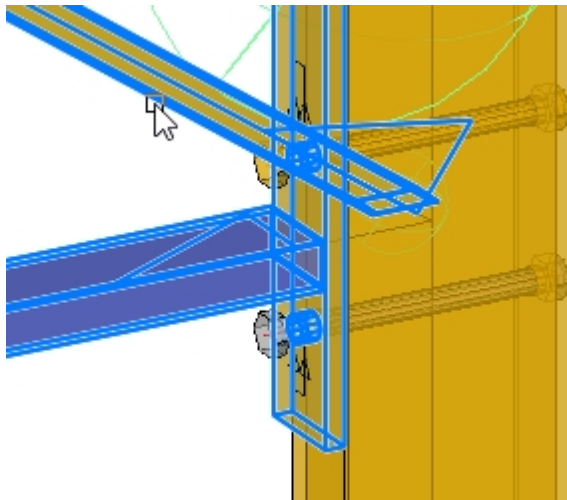
- Select the endplate of the column on intersection **A11**



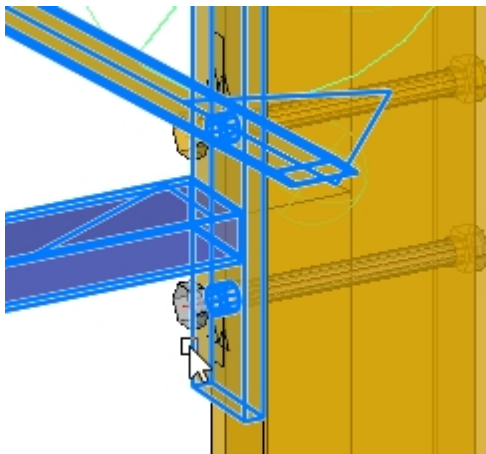
- Click again on the icon  **Snede als macro tekenen**



- Press  in het *New cut* window.




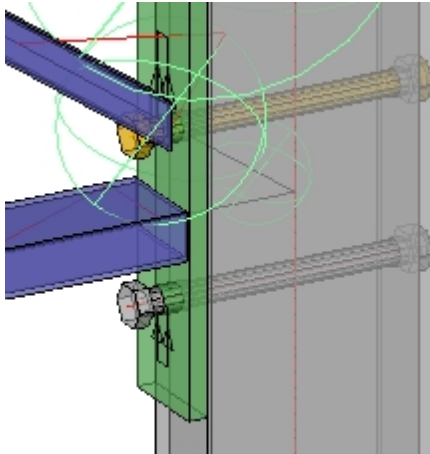
- Select the colliding strut on intersection **C11**



- Select the endplate of the column on intersection **C11**



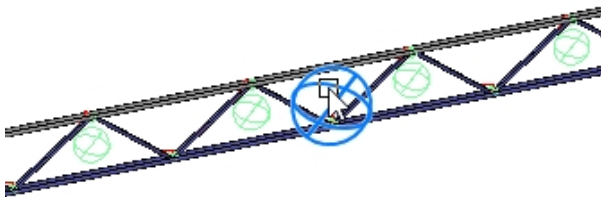
- Click on  **Clash Check** to check the entire drawing for collisions.



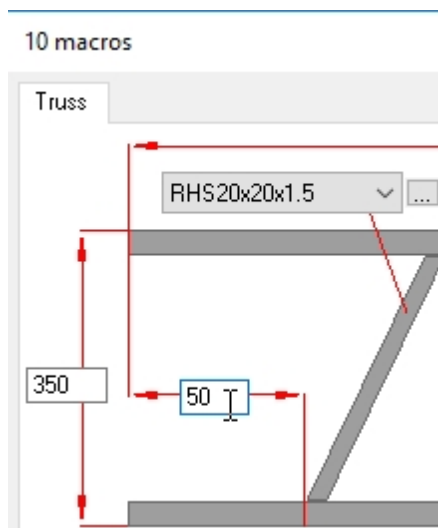
? One bolt is yellow because it collides with the strut. We can solve this by changing the start and end offset of the first and last struts.



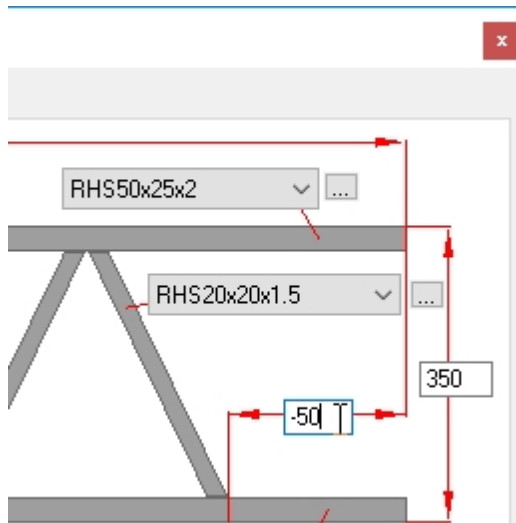
- Click on the icon  **Review macro**



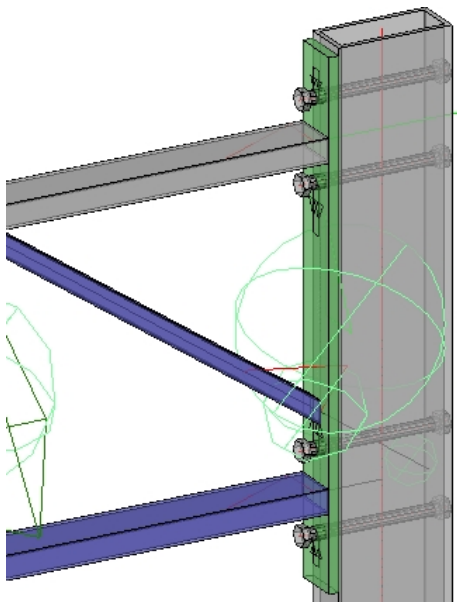
- Select the biggest macro sphere of the truss
- Then press **<Enter>** to end the selection



- Modify the start offset of the array to **-50**



- Modify the end offset of the array to **-50**
- Then press **Close** to close this window



- ❓ The bolt is not yellow any more because it can be bolted now.

Generating output : comprehensive

In these exercises we take a closer look at the creation and modification of :

- Bill of materials
- Workshop drawings
- General Arrangement drawings

Modifying bills

Step 1

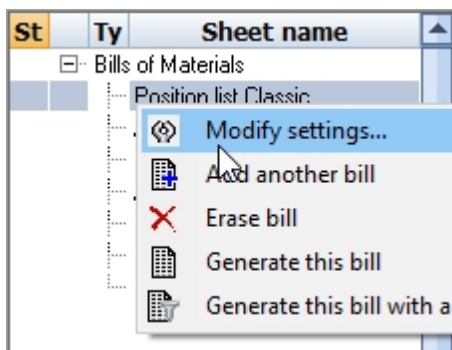


In this exercise we will look at how to open and modify Bill of Materials.

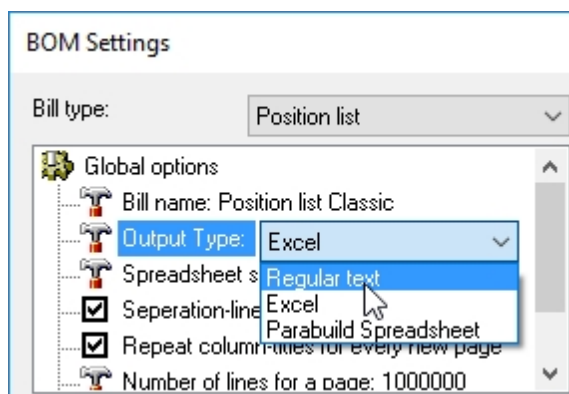
- Open the drawing *Modifying bills.dwg*



- Click on **Sheets manager**

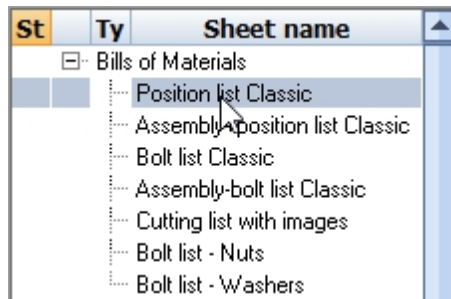


- Right-click on the bill **Position list Classic**, and then choose **Modify settings...** from the list



- Modify the setting **Output type** to **Regular text**

- Then click to close this window



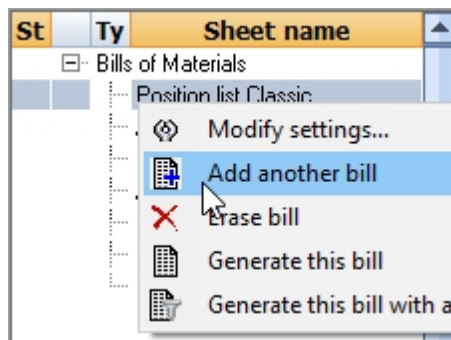
- Double-click with the mouse on the bill **Position list Classic**

Positie lijst Klassiek - Notepad

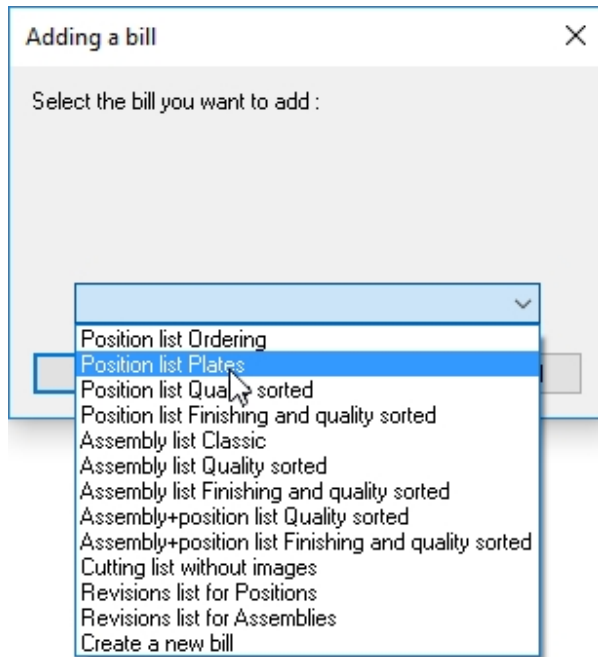
Pos	Aantal	Naam	Lengte	Gewicht	Verfopp.	Opmerking	Materiaal	Tot gewicht
PL1	30	P60X6-206	206	0.6	0.03			18.00
PL2	12	P260X10-500	500	12.1	0.32			145.20
PL3	8	P107X10-135	135	1.2	0.03			9.60
PL4	14	P190X10-140	140	2.1	0.06			29.40
PL5	1	P190X10-200	200	3.0	0.08			3.00
PL6	2	P190X10-200	200	3.0	0.08			6.00
PL7	12	P100X10-190	190	1.5	0.04			18.00
PL8	4	P127X10-142	142	1.4	0.04			5.60
PL9	12	P180X10-495	495	4.0	0.11			48.00
PL10	12	P299X10-500	500	12.0	0.31			144.00
PL11	4	P129X10-135	135	1.4	0.04			5.60
PL12	1	P190X10-200	200	3.0	0.08			3.00
PL13	3	P100X10-200	200	1.6	0.05			4.80
PL14	1	P140X10-275	275	3.1	0.09			3.10
PL15	1	P190X10-140	140	2.1	0.06			2.10
PL16	2	P180X10-200	200	1.6	0.05			3.20
PL17	1	P190X10-200	200	3.0	0.08			3.00
PL18	4	P107X10-136	136	1.2	0.03			4.80
PL19	1	P190X10-200	200	3.0	0.08			3.00
PR1	16	PR30	498	2.8	0.05			44.80

? Some ERP software can read this text file.

← Step 2 →



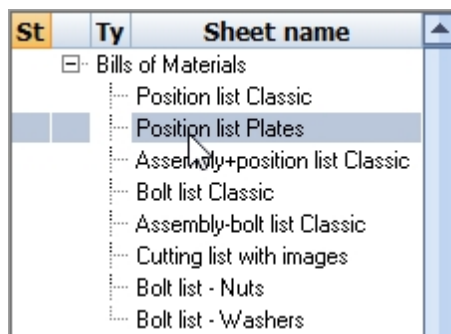
- Right-click on the bill **Position list Classic**, and then choose **Add another bill** from the list



- Choose **Position list Plates** from the list

- Then click on

Ok



- Double-click on the list **Position list Plates**

Position list Plates.xls - OpenOffice Calc

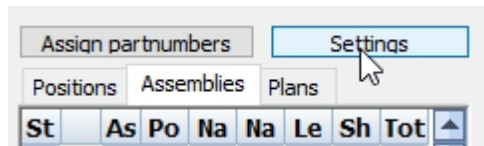
File Edit View Insert Format Tools Data Window Help

Arial 10 B I U

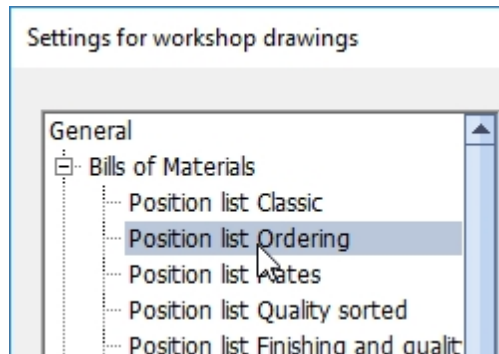
	A	B	C	D	E	F
	Thickness	Width	Length	Numb	Tot length	Name
1						
2	6	60	206	30	6180	P60X6-206
3	10	40	1700	5	8500	P40x10
4	10	75	2903	3	8709	P75x10
5	10	100	190	12	2280	P100X10-190
6	10	100	200	5	1000	P100X10-200
7	10	100	495	12	5940	P100X10-495
8	10	107	135	8	1080	P107X10-135
9	10	107	136	4	544	P107X10-136
10	10	127	142	4	568	P127X10-142
11	10	129	135	4	540	P129X10-135
12	10	140	275	1	275	P140X10-275
13	10	190	140	15	2100	P190X10-140
14	10	190	200	6	1200	P190X10-200
15	10	260	580	12	6960	P260X10-580
16	10	299	500	12	6000	P299X10-500
17				133		

With this method we've made a hidden list visible.

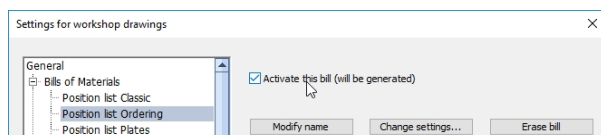
← Step 3 →



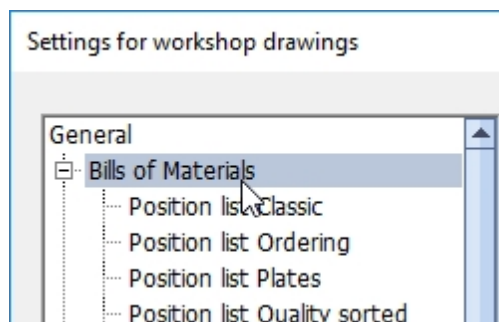
- Click on the button **Settings** in **Sheets manager**



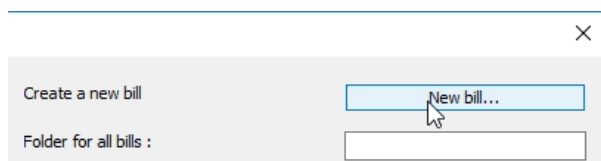
- Open **Bills of Materials** in the tree structure and click on **Position list Ordering**



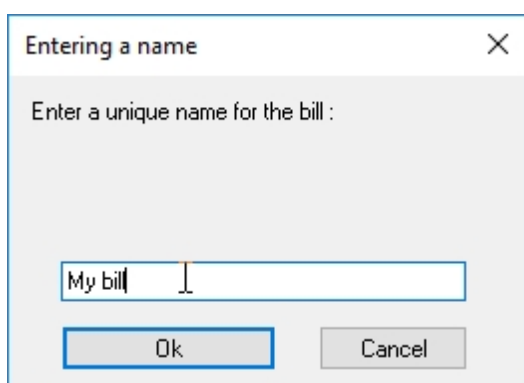
- Activate the setting **Activate this bill**



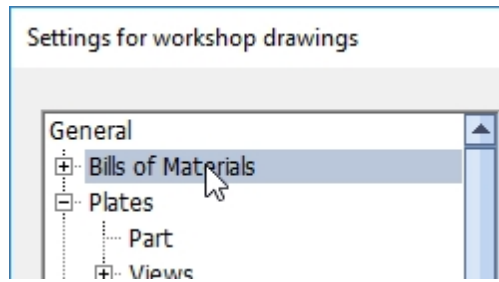
- Click on **Bills of materials**



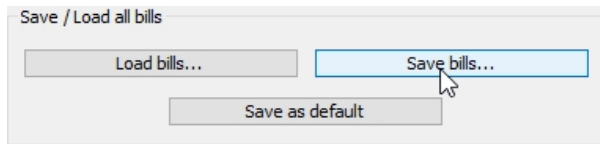
- Click on **New bill...**



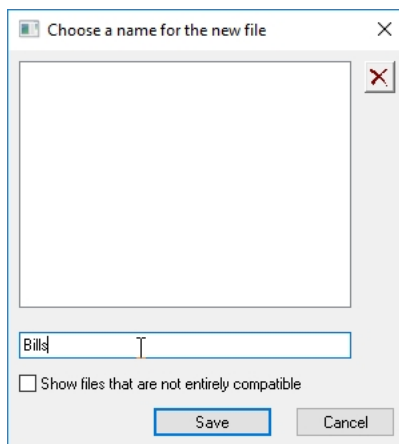
- Enter **My bill** for the name of the bill
- Then press **Ok**



- Click on **Bills of materials**



- Click on **Save bills...**



- Enter **Bills** for the name of the parameters file

- Click **Save** to save you bills configuration

- Then click **Ok** to close the settings window

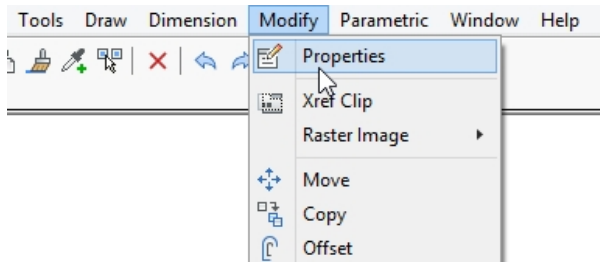
Workshop drawings : comprehensive

Step 1

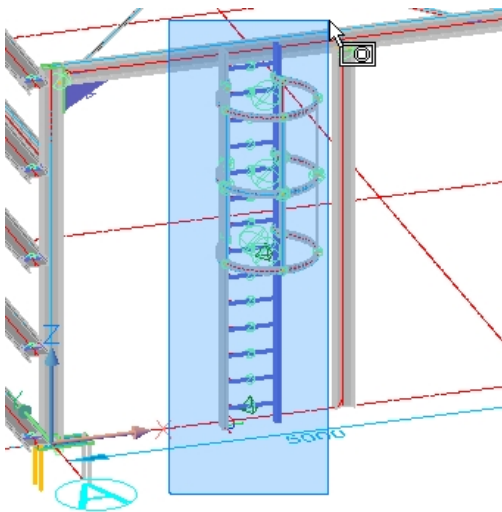
? In this exercise we will assign phases to the parts, and then we will generate only the shop drawings of a particular phase.



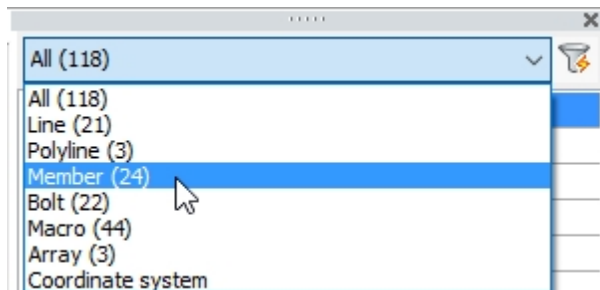
- Open the drawing  *Work shop drawings - comprehensive.dwg*



- Open the properties window : **Modify > Properties**

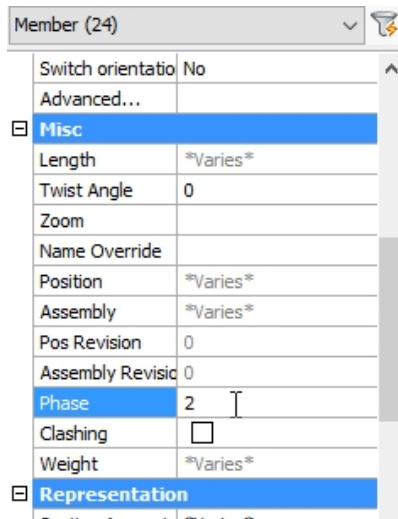


- Create a blue frame around the cage ladder, from bottom left to top right

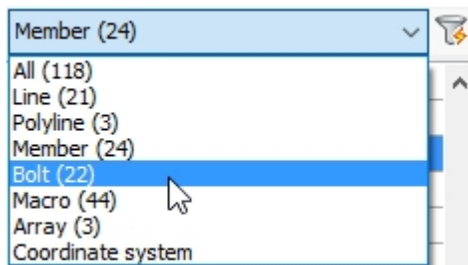


- Click in the top of the properties window on **All (XXX)** to open a list of all selected objects

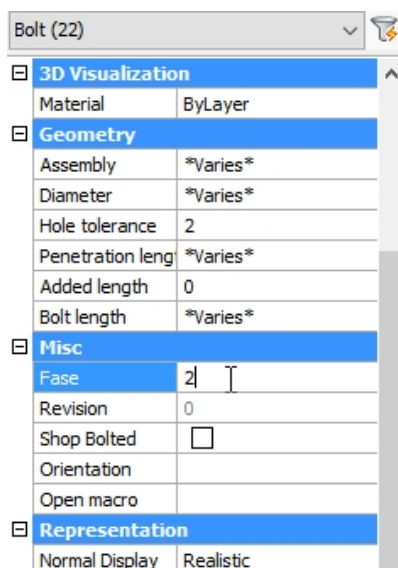
- And then select **Member (24)** in the list of objects



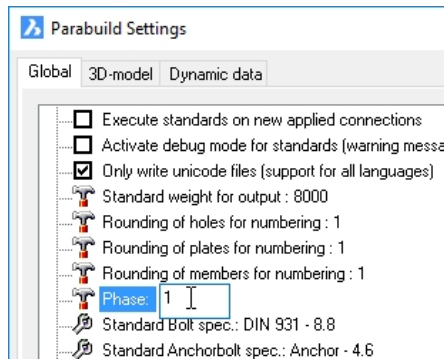
- Search for the property **Phase** and modify it's value to **2**.



- Select **Bolt (22)** in the top of the window

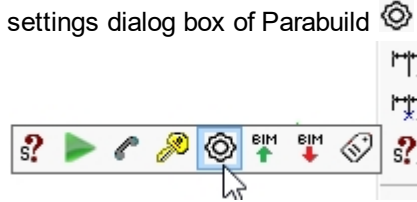


- Search the property **Phase** and modify it's value to **2**.



? We can change the properties of each individual part very quickly this way.

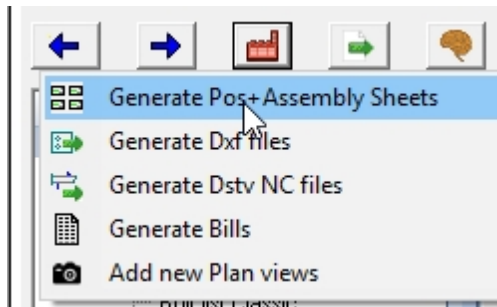
All new parts have received phase 1 by default because this is a setting stored in the drawing. You can change this default value in the general settings dialog box of Parabuild :



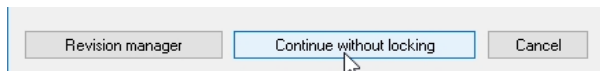
Step 2



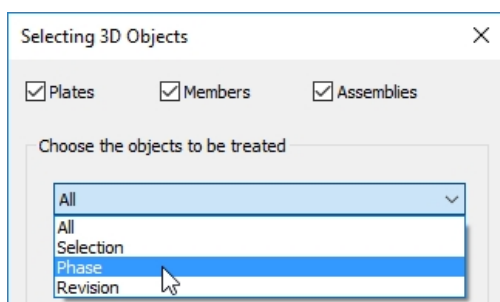
- Click on  **Sheets manager**



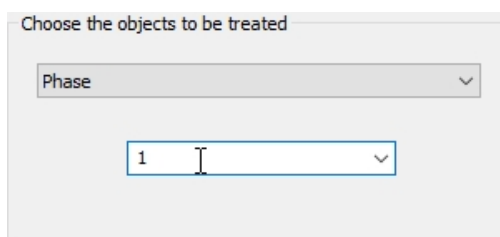
- Click on the button  and then click on **Generate Pos + assembly sheets**



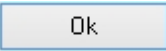
- Click on 



- For the parts to be treated, choose **Phase**



- Enter **1** for the phase

- And then click on 

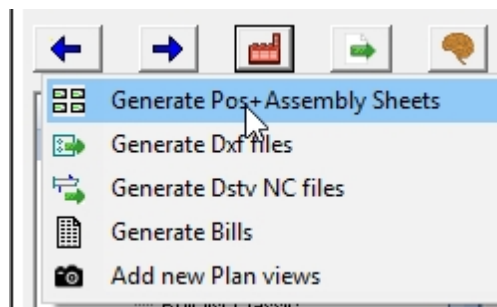
? The progress of sheet generation is shown. You can cancel this process at any time by pressing the Escape key a few times.

Generating pos plate sheets PL4
(4/40)

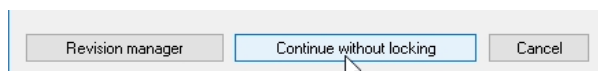
St	Ty	Sheet name
		PL1 Phase 1
		PL2,PL3,PL4,PL5 Phase 1
		PL6,PL7,PL8 Phase 1
		PL9,PL10,PL11,PL12 Phase 1
		PL13,PL14,PL15,PL16,PL17,PL18 Phase 1
		PR4 Phase 1
		PR5 Phase 1
		PR6 Phase 1
		PR7 Phase 1
		PR8 Phase 1
		PR9 Phase 1
		PR10 Phase 1
		PR11 Phase 1
		PR12 Phase 1
		PR13 Phase 1

The resulting sheets.

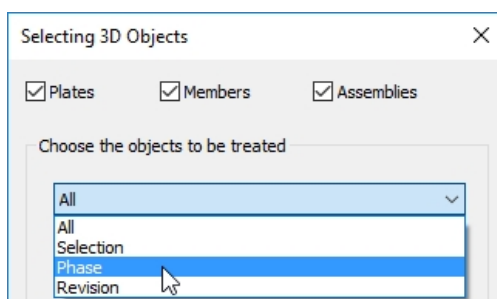
Step 3



- Click on the button and then click on **Generate Pos + assembly sheets**



- Click on **Continue without locking**



- For the parts to be treated, choose **Phase**

Choose the objects to be treated

Phase

2

Ok

- Enter **2** for the phase

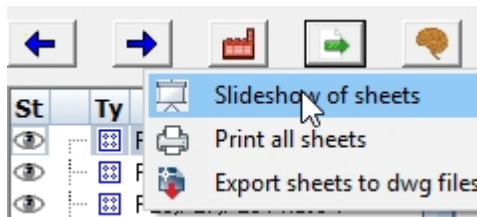
- And then click on


Ok

St	So	Pagina naam
		PL1,PL2,PL3,PL4 Fase 1
		PL5,PL6,PL8 Fase 1
		PL9,PL10,PL11,PL12,PL13,PL14 Fase 1
		PL15,PL16,PL17,PL18 Fase 1
		PR2 Fase 2
		PR3 Fase 2
		PR4 Fase 1
		PR5 Fase 1
		PR11 Fase 1
		PR15 Fase 1
		PR16 Fase 1
		PR17 Fase 1
		PR18 Fase 2
		PR20 Fase 1

Parabuild adds the phase number to the name of each sheet. This allows you to print the sheets in parts when the production has to be done in phases. It is possible that for example Position number PR1 exists in both phase 1 and in phase 2. In this case 2 sheets will be created for the same part PR1.

Step 4



- Click on the button  and then click on **Slideshow of sheets**

Slideshow

Enter the nr of seconds to wait between each sheet :

1

Ok Cancel

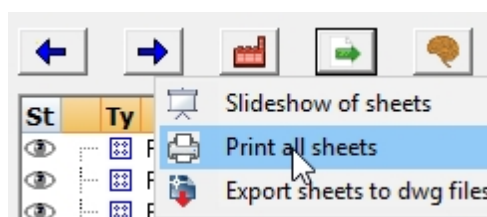
- Enter **1** for the number of seconds


- And then click on


Ok

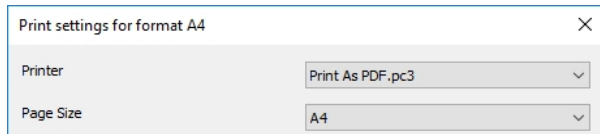
Can you find the position number of the part that is bad this way?
We will correct this part in the following exercise.

Step 5



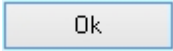
- Click on the button  and then click on **Print all sheets**

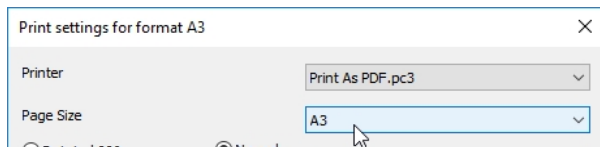
 In this example we choose the printer *DWG To PDF.pc3*, but you can choose a different printer if you don't have this one.



Print settings for format A4

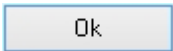
- Choose the printer **Print as PDF.pc3** or **DWG To PDF.pc3**
- Choose for the format **A4** or **ISO Full Bleed A4 (297.00 x 210.00 MM)**

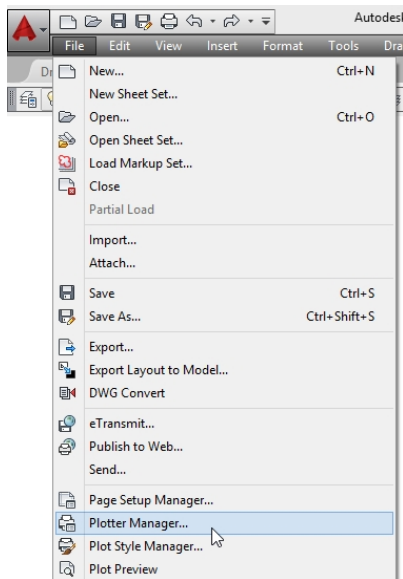
- And then click on 




Print settings for format A3

- Choose the printer **Print as PDF.pc3** or **DWG To PDF.pc3**
- Choose for the format **A3** of **ISO Full Bleed A3 (420.00 x 297.00 MM)**

- And then click on 



 Parabuild remembers the printer settings for each format, and asks the settings just once per format.

Depending on your settings the Pdf files are opened automatically or not. This is adjustable in the Plotter manager.

Expired drawings

Step 1

? This exercise shows what happens when a shop drawing becomes expired after the 3D model has changed.



- Open the drawing  *Expired drawings.dwg*



- Click on  **Sheets manager**

St	Ty	Sheet name
		PL1 Fase 1
		PL2 Fase 1
		PL3 Fase 1
		PL4 Fase 1
		PL5 Fase 1
		PL6 Fase 1
		PL7 Fase 1
		PL8 Fase 1
		PL9 Fase 1
		PL10 Fase 1
		PL11 Fase 1
		PL12 Fase 1
		PL13 Fase 1

- Double-click the drawing **PL12 Fase 1**

Step 2

Assign partnumbers		Settings	
Positions Assemblies Plans			
St	Posi	Nam	Leng Shee Tota
	PL1	P100x 206	PL1 F. 30

? We will search for this plate and correct it.

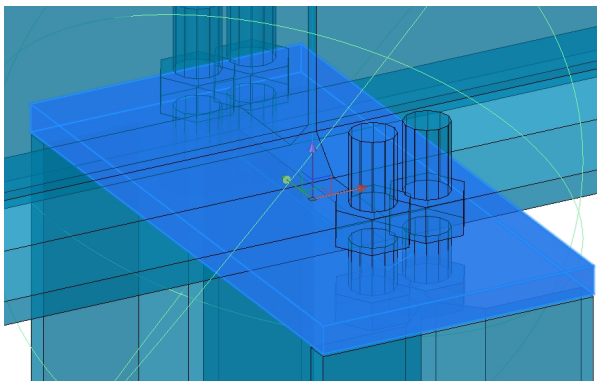
- Activate the tab **Positions** in the  Sheets manager

Positions		Assemblies		Plans	
St	Posi	Nam	Leng	Shee	Tota
	PL6	P190x 200		PL6 F. 4	
	PL7	P100x 190		PL7 F. 12	
	PL8	P127x 142		PL8 F. 4	
	PL9	P100x 495		PL9 F. 12	
	PL10	P293x 500		PL10 I 12	
	PL11	P129x 135		PL11 I 4	
	PL12	P100x 200		PL12 I 1	
	PL13	P190x 200		PL13 I 1	
	PL14	P140x 275		PL14 I 1	

- Select **PL12** using the left mouse button

St	Posi	Nam	Leng	Shee	Tota
PL6	P190	200	PL6 F.4		
PL7	P100	190	PL7 F.12		
PL8	P127	142	PL8 F.4		
PL9	P100	495	PL9 F.12		
PL10	P299	500	PL10 I.12		
PL11	P129	135	PL11 I.4		
PL12	P100	200	PL12 I.1		
PL			Add to new sheet		
PL			Add to new sheet, with pr		
PL			Add to current sheet		
PL			Zoom and show properties		
PL			Select all parts in 3D		

- Right-click on **PL12** and then choose **Zoom and show properties for part** from the list

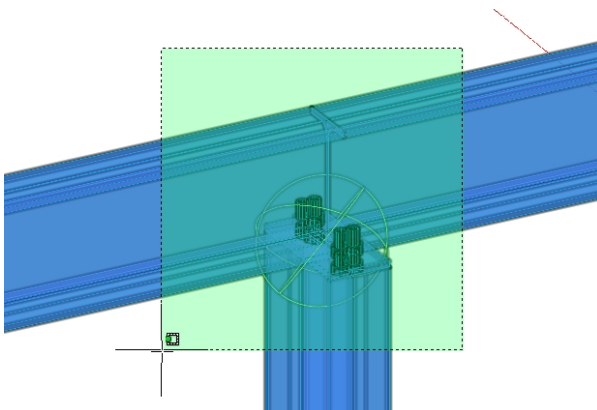


- ② The properties of one part with position number PL12 is shown.

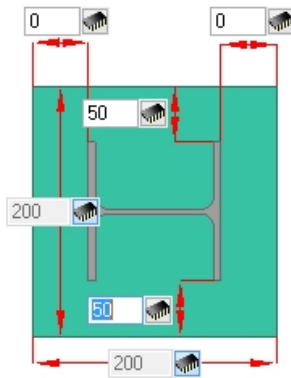
Step 3



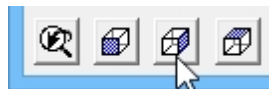
- Click on the icon  **Review macro**



- Select the macro that we're going to correct



- Enlarge the plate by **50** on 2 sides



- Press the button

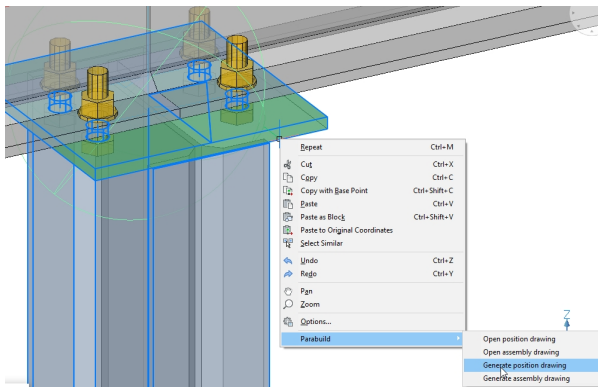
End plate



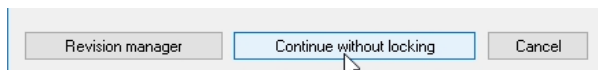
- Activate the tab **Bolts** and enter **70** for the edge distances.

- And then click **Close** to close this window

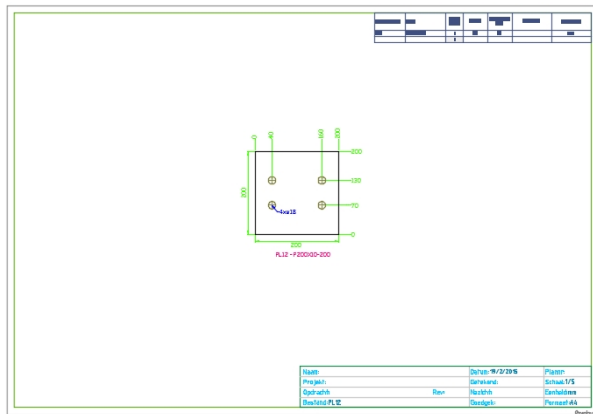
Step 4



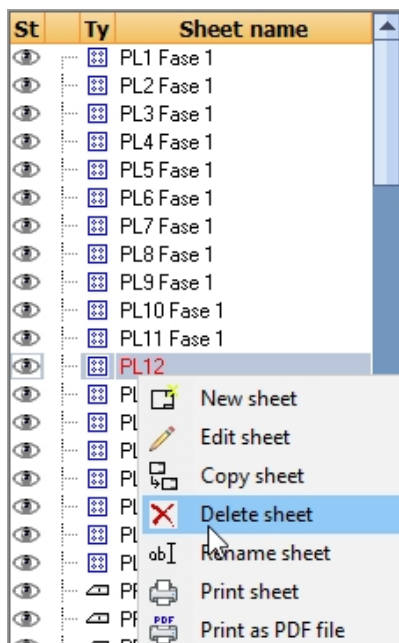
- Move the cursor to above the modified plate, then right-click and choose **Parabuild > Generate position drawing** from the list.



- Click on **Continue without locking**

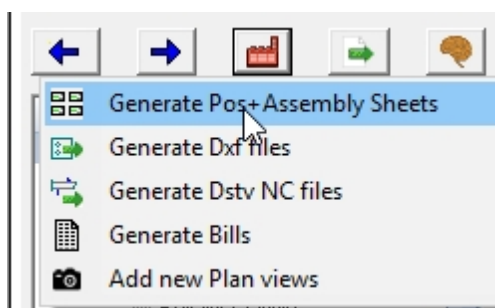


? This is a useful tool to quickly generate the sheet to review it. However it doesn't allow us to use a phase selection.

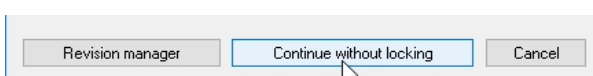


- Click on the new **PL12** drawing, right-click and then choose **Delete sheet** from the list.

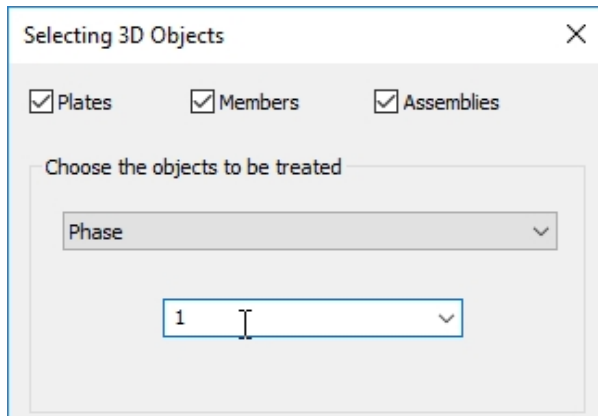
Step 5



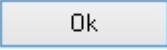
- Click on the button  and then click on **Generate Pos + assembly sheets**



- Click on **Continue without locking**



- For the parts to be handled, choose **Phase 1**

- And then click on 

St	Ty	Sheet name
	PL12	Fase 1
	PL12	Phase 1
	PL13	Fase 1
	PL14	Fase 1
	PL15	Fase 1
	PL16	Fase 1
	PL17	Fase 1
	PL18	Fase 1
	PR1	Fase 2
	PR2	Fase 2
	PR3	Fase 2
	PR4	Fase 1
	PR5	Fase 1
	PR6	Fase 1
	PR7	Fase 1
	PR8	Fase 1
	PR9	Fase 1
	PR10	Fase 1
	PR11	Fase 1
	PR12	Fase 1
	PR13	Fase 1
	PR14	Fase 1

Parabuild has reviewed all existing drawings and has tagged all the expired drawings with a yellow warning sign : PL12, PR14, PR25, M16, M17, M35.

There were also new shop drawings generated for the parts that didn't have a drawing yet, in this case a new shop drawing for all the modified parts and assemblies.

St	Ty	Sheet name
	PL4	Fase 1
	PL5	Fase 1
	PL6	Fase 1
	PL7	Fase 1
	PL8	Fase 1
	PL9	Fase 1
	PL10	Fase 1
	PL11	Fase 1
	PL12	Fase 1
	PI	New sheet
	PI	Edit sheet
	PI	Copy sheet
	PI	Delete sheet
	PI	Rename sheet
	PI	Print sheet
	PI	Print as PDF file

Normally we should delete all these expired drawings so that we won't mistakenly print them.