



# Applied Precast Concrete Detailing

Tekla Structures 11.0

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# 7 Applied Precast Concrete Detailing

## In this lesson

This lesson explains how to modify and finalize concrete members in Tekla Structures. You will also learn how to use custom components to create concrete members and to connect them.

## Introduction

Concrete detailing can be done manually or by using system connections or custom components, which help you to automate the detailing. See more about concrete detailing in Tekla Structures [Help: Detailing > Reinforcement > Concrete detailing](#) and about connections in [Help: Detailing > Getting Started > Basics > Connection concepts](#).

For fully automatic connection creation, you can use the AutoConnection functionality to select and apply connections with predefined properties to selected parts. Use AutoConnection to have Tekla Structures automatically create similar connections for similar framing conditions. See more about AutoConnections in Tekla Structures [Help: Detailing > Getting Started > AutoConnection > Using AutoConnection](#).

## 7.1 Connecting Concrete Members Using Connections and Macros

In this exercise we will use system connections to connect the concrete beams and columns and to fit the hollow-core slabs to the steel beams. You can create connection macros either by using AutoConnections or manually. See more about connections in Tekla Structures [Help: Detailing > Getting Started > Basics > Connection concepts](#) and about AutoConnections in [Help: Detailing > Getting Started > AutoConnection > Using AutoConnection](#).

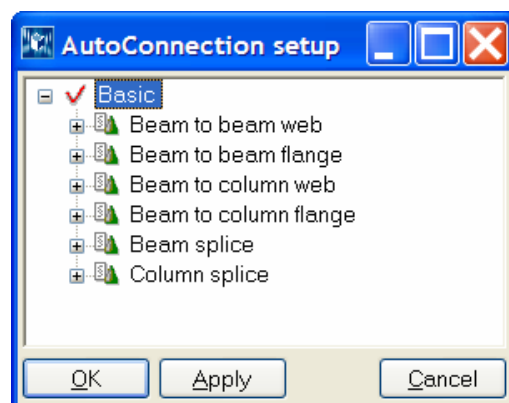
**AutoConnections** is the recommended way to create connections. Use AutoConnections to automatically select and apply connections with predefined properties to selected parts.

### Create corbels using AutoConnections and AutoDefaults

With AutoConnection you can define groups of rules which Tekla Structures automatically applies when you use AutoConnection to create connections in a model.

**Define conditions  
for  
AutoConnections**

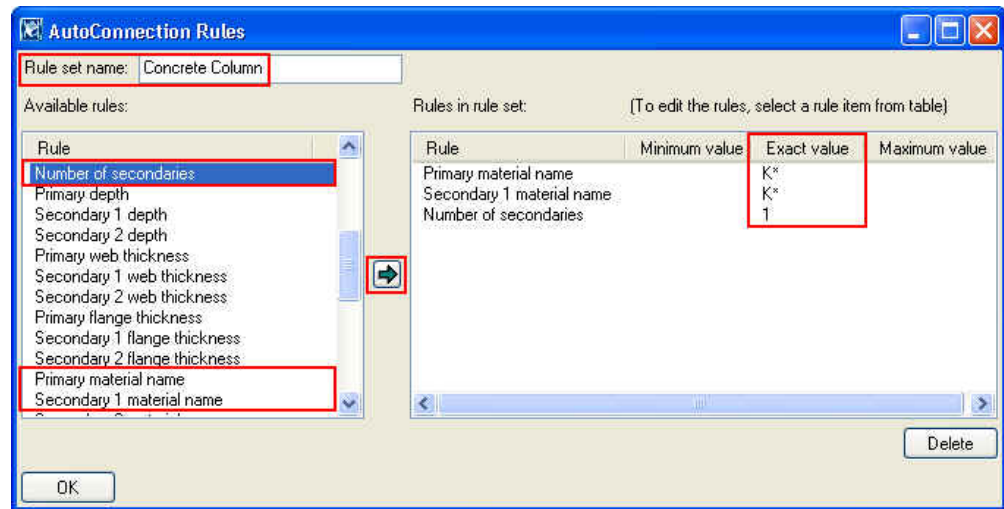
There are six basic cases for **AutoConnections**:



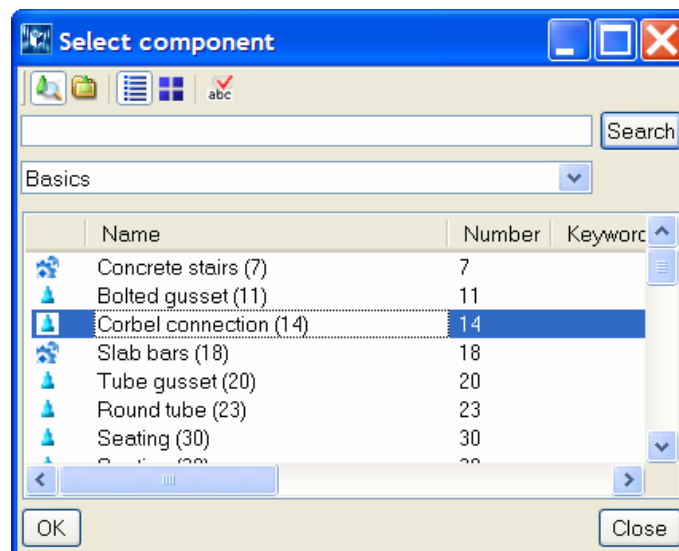
For each of these it is possible to define several framing conditions. We will now define two different conditions, which check the material and number of secondaries for corbel connections. The first condition will use the **Corbel connection (14)**, if only one beam is to be connected. For two beams we will use the **Two sided seating with dowel (76)** connection.

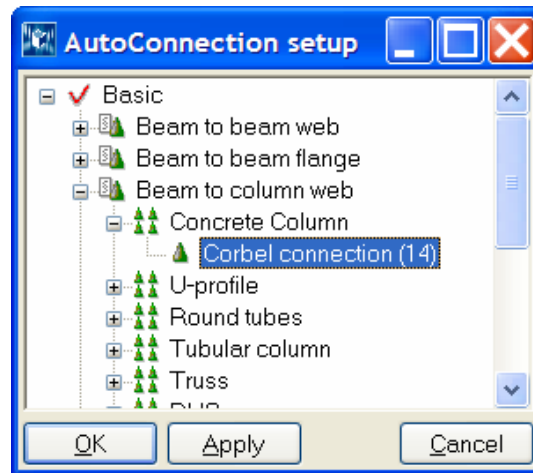
1. Open the **AutoConnection setup** dialog by selecting **AutoConnection...** from **Setup** pull down menu.
2. Right-click on the **Beam to column web** rule group and select **Create additional rule sets**. Tekla Structures creates a **New** rule set under the **Beam to column web** rule group.
3. Open the **Beam to column web** rule group and right-click on the **New** rule set and select **Edit rule set...** from the popup list.
4. Change the **Rule set name** to describe the use (Concrete Column).
5. Select **Primary material name** and **Secondary 1 material name** from the **Available rules** list and move them to the right by clicking the arrow in the middle of the dialog.

6. Write **K\*** in the **Exact value** field for both rules.
7. Add a new rule **Number of secondaries** by selecting it from the **Available rules** list and clicking the arrow.
8. Set the **Exact value** to 1.

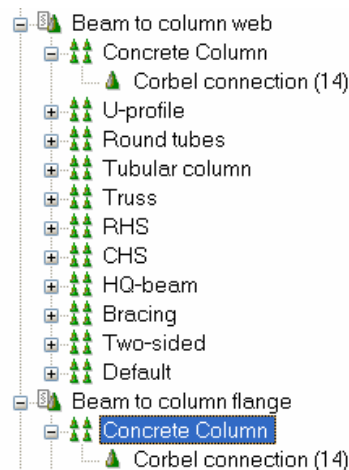


9. Click **OK** to close the dialog and save the rule settings.
10. We will next define which connection this rule will use. Open the **Concrete Column** rule set and right-click on the **No connection** icon to select the **Corbel connection (14)**. Now pick **Select connection type...**, which opens the **Select component** dialog.
11. In the **Select component** dialog select **Corbel connection (14)**. Close the dialog by clicking **OK**.





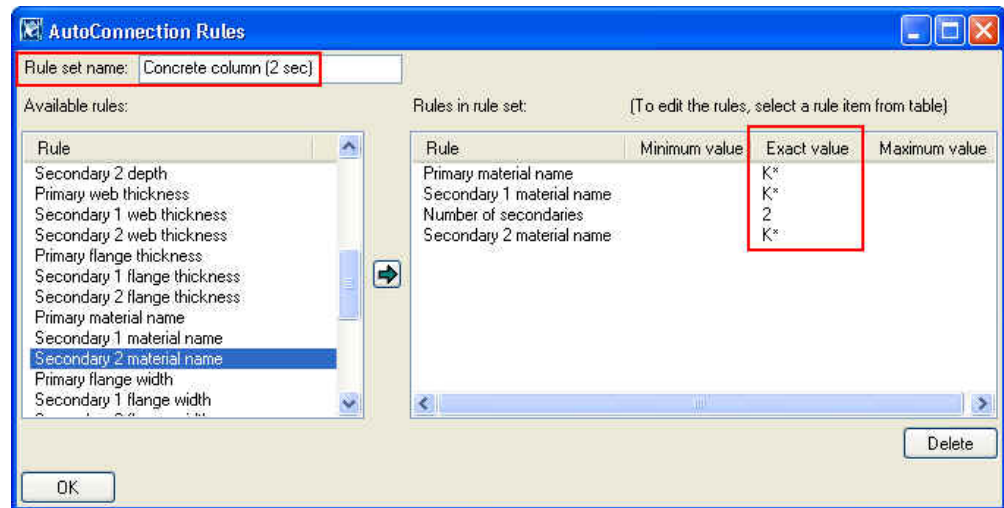
12. You have now completed one rule definition. Next, copy the rule set to apply also for the **Beam to column flange** condition by right-clicking on the **Concrete Column** rule set and selecting **Copy rule set** from the popup menu.
13. Open the **Beam to column flange** rule group and right-click on any rule set and select **Paste rule set** from the popup menu.



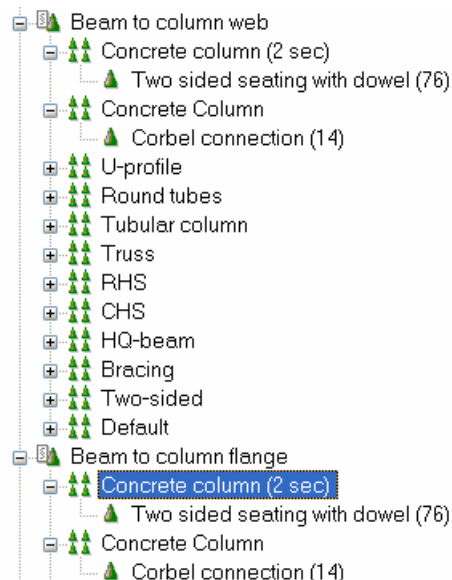
You have now defined the beam to column connection for concrete members always to be **Corbel connection (14)** if the number of secondaries is 1.

14. Next, create another rule set for the **Two sided seating with dowel (76)** connection in case there are two beams to be connected to a column. Repeat steps 2 – 8. **Rule name** is: Concrete column (2 sec)
15. Set the **Exact value** of "Number of secondaries" to 2.
16. Add a new rule **Secondary 2 material name** by selecting it from the **Available rules** list and clicking the arrow.
17. Write **K\*** to **Exact value** field.





18. Click **OK** to close the dialog and save the rule settings.
19. Move the rule set above the Concrete column rule set using right button command **Move up**. The rules are read from the list in appearance order and the first valid rule will be used.
20. Open the **Concrete column (2 sec)** rule set and right-click on the **No connection** icon to select the **Two sided seating with dowel (76)**. Now pick **Select connection type....**, which opens **Select component** dialog.
21. In **Select component** dialog select **Two sided seating with dowel (76)**. Close the dialog by clicking **OK**.
22. Next copy the rule set to apply also in **Beam to column flange** condition by right-clicking on **Concrete column (2 sec)** rule set and selecting **Copy rule set** from popup menu.
23. Open the **Beam to column flange** rule group and right-click on any rule set and select **Paste rule set** from popup menu.



24. Click **OK** to close the dialog and save the rule settings.

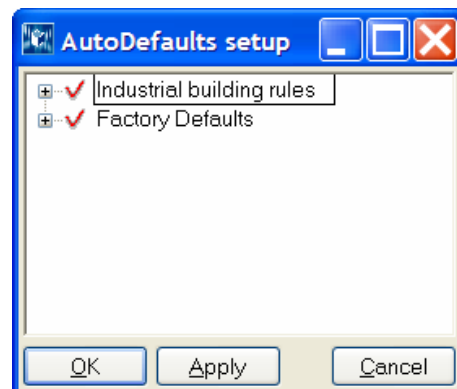
## Define AutoDefaults

With **AutoDefaults** you can create rules defining when to use different pre-defined connection properties. When the connections need to be modified (for example changing the beam size), Tekla Structures automatically redefines the connection properties using the AutoDefaults rules defined by you. See more in [Help: System > AutoConnection > AutoDefaults setup > AutoDefaults setup](#).

We will now create a new AutoDefaults rule group named **Industrial building rules**. This rule group could include all the rules needed to define when to use certain pre-defined connection properties for the entire project.

## Create new rule group: Industrial building rules

1. Click **Setup > AutoDefaults...** to open the **AutoDefaults setup** dialog box.
2. Right-click in the dialog and select **New rule group**, and a rule group named **New** appears.
3. Select the **New rule group**, press the **F2** key and type: **Industrial building rules**.



4. Press **OK** to save the settings.

## Create new rule sets for Two sided seating with dowel (76)

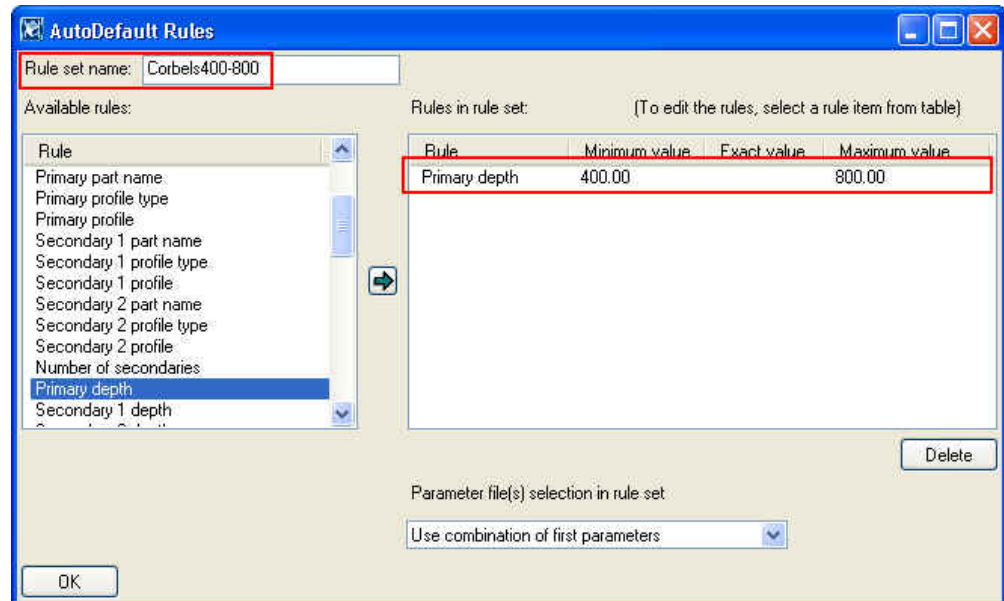
We will now create an AutoDefault rule for **Two sided seating with dowel (76)** and use it in the Industrial building rule group.

1. Open the **AutoDefaults setup** dialog from **Setup > AutoDefaults...** pull down menu.
2. Browse to **Two sided seating with dowel (76)** under **Industrial building rules** group.

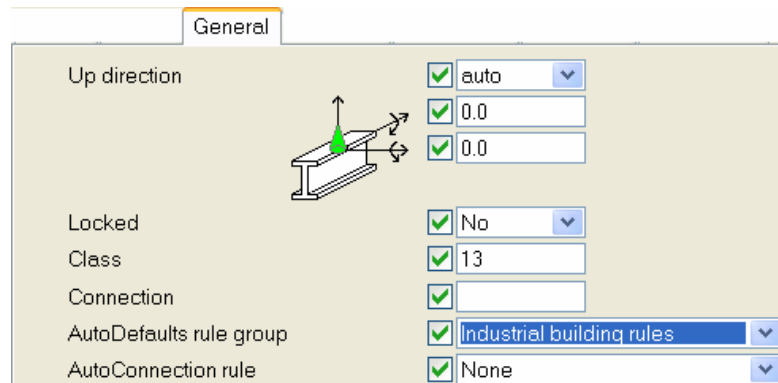


3. Right-click to create an additional rule set.
4. Select the **New** rule set under **Two sided seating with dowel (76)** and select **Edit rule set...** from the right-click popup menu.

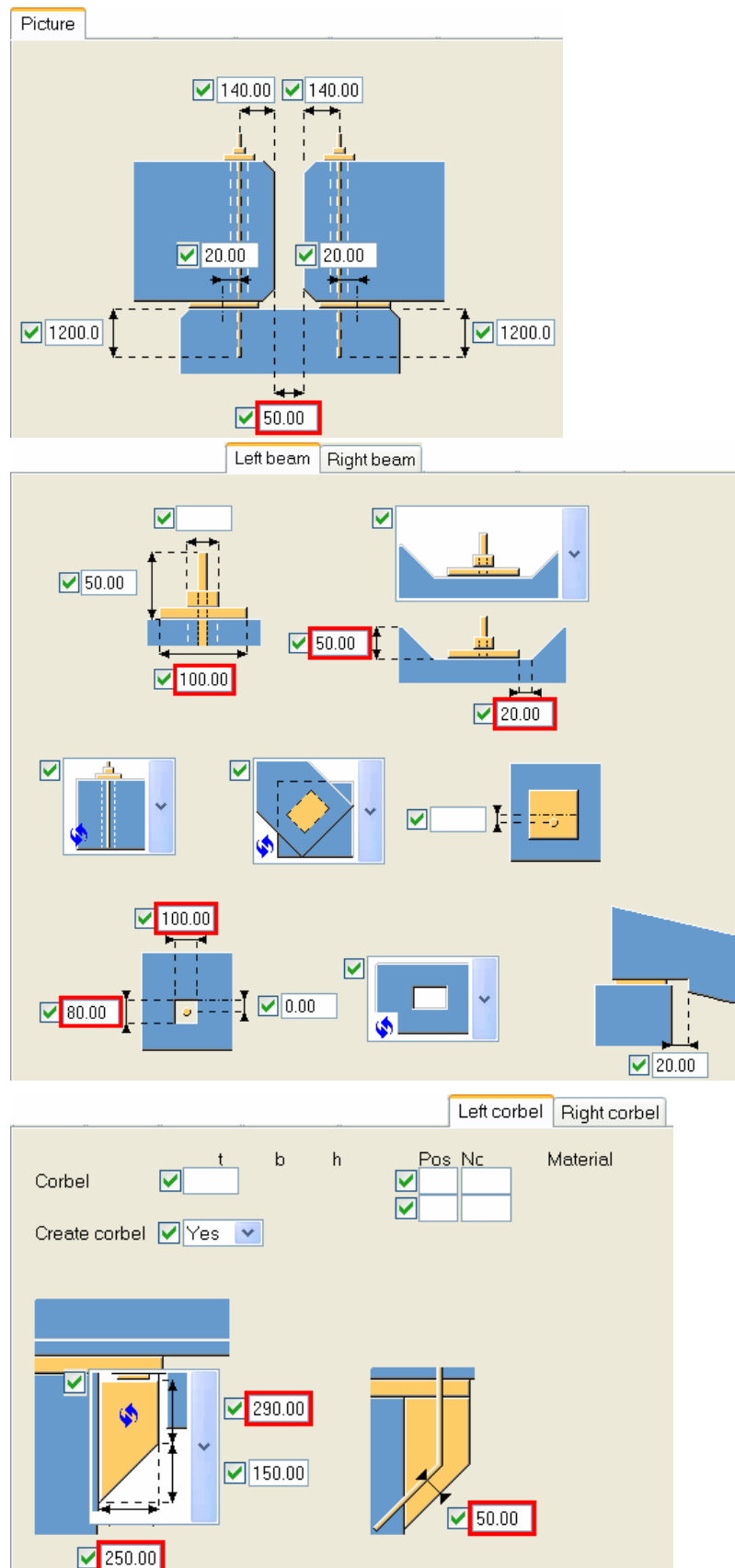
- Write a new name for the rule set: Corbels400-800.
- Select **Primary depth** from **Available rules** list and move it to the right using arrow button in the middle of the dialog.
- Set **Minimum value** to 400 and **Maximum value** to 800.



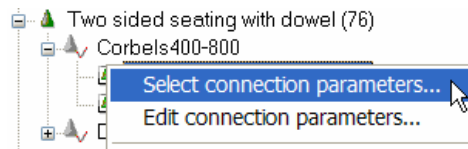
- Click **OK** to save the settings and close the dialog.
- Select connection parameters Standard.j30000076 under the Corbels400-800 rule set and right-click > **Additional connection parameters...**
- Select the new connection parameters and right-click > **Edit connection parameters**. The connection properties dialog opens.
- On the **General** tab, select the **Industrial building rules** for the AutoDefault rule group; it can also be **None**.



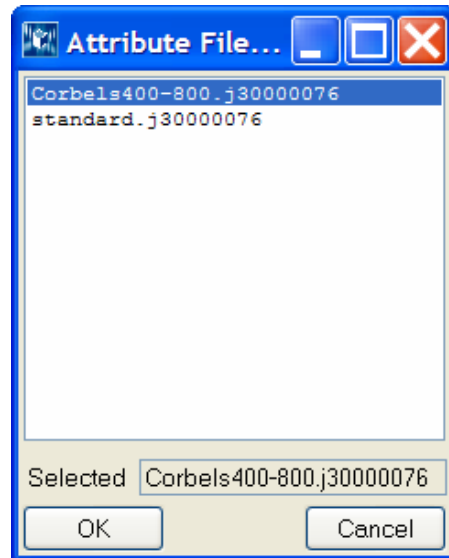
- On all the tabs, set the fields that you want AutoDefaults to override to Default by selecting the options marked with the arrow symbol. Set all needed options, values and dimensions on all tab pages as shown below:



13. Save the settings using **Save as** field, define the name Corbels400-800.
14. Close the dialog with **OK**.
15. Right-click on the connection parameters and pick **Select connection parameters...**



16. Select **Corbels400-800.j30000076** from Attribute File List.



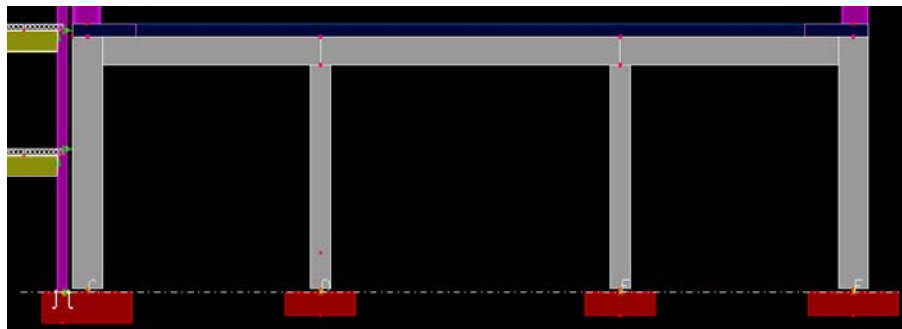
17. Close the Attribute File List with **OK**.

18. Close the AutoDefaults setup dialog with **OK**.

## Create connections

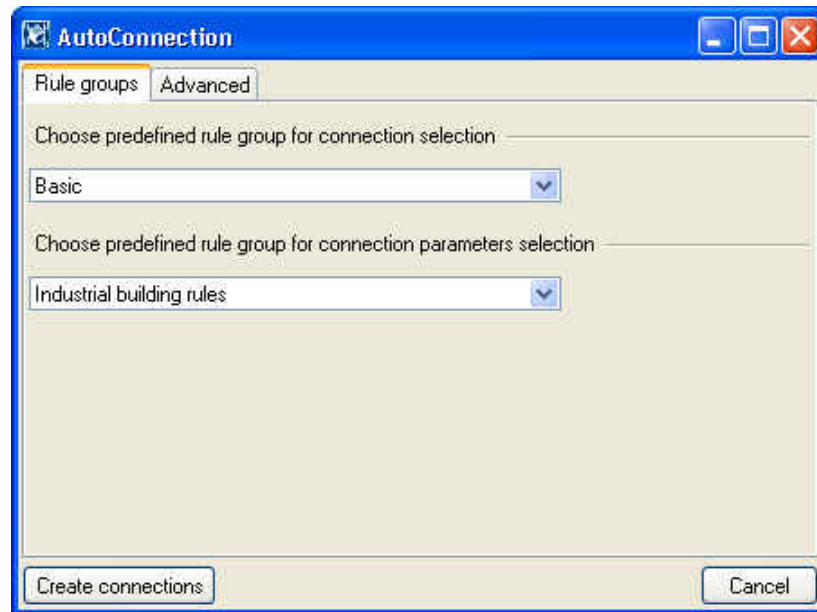
We will now use the AutoConnections and apply the AutoDefault rules which we just defined.

1. Select all concrete beams and columns between grid lines **C** and **F**.

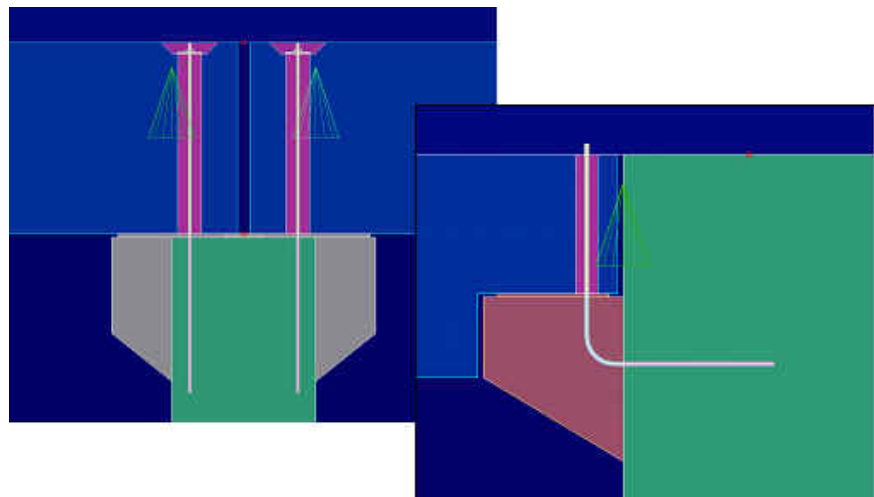


2. From the **Detailing** pull down menu select **AutoConnection...**

3. Select the Industrial building rules group for connection parameters.



4. Click the **Create connections** button. Tekla Structures creates connections between concrete beams and columns using **Corbel connection (14)**, which creates corbels and connects beams to columns if only one beam is to be connected. For two beams, Tekla Structures uses the **Two sided seating with dowel (76)** connection.



## 7.2 Create a Stairwell

In this exercise we will create a stairwell and footings for it using a system macro and a custom component.

### Create stairwell footings with the help of a custom component

#### Import the custom component

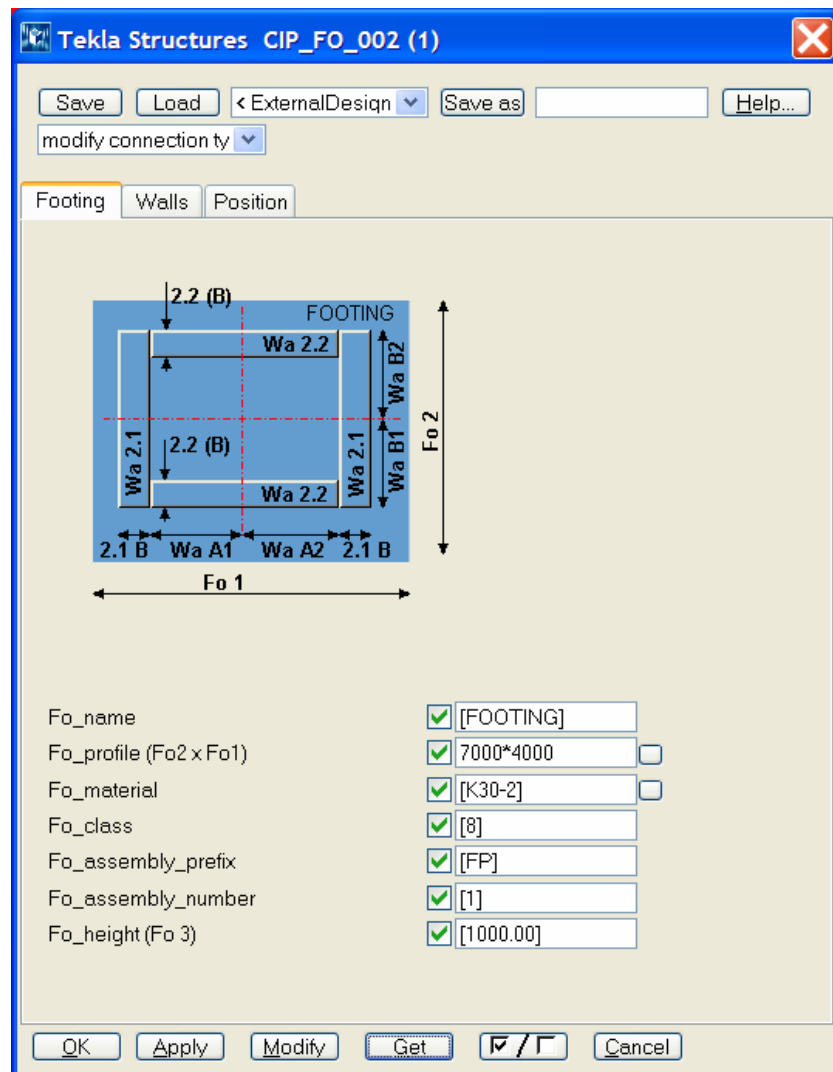
First, we need to import the needed custom component into the model.

1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. Right-click > Import...
3. Select **CastInPlaceCustomComponents300605.uel** file in the browser.
4. Click **OK**. The custom components are imported into the model and are ready for use.

#### Create the footings

The custom component will create a footing and supporting walls for the stairwell. Define first the values for the footing and the walls, then place them in the model.

1. In the Component catalog, double-click on the **CIP\_FO\_002** custom component to open the dialog.
2. On the **Footing** tab, insert the values as shown below.



- Set the values on the **Walls** tab. Note that the 2.2 walls will not be created and therefore the profile size is set to zero.



Tekla Structures CIP\_FO\_002 (1)

Save Load < ExternalDesign Save as Help...

modify connection ty

Footing Walls Position

Wa\_name ☒ [PANEL]

Wa\_profile\_2.1 (A x B) ☒ 1000\*300

Wa\_profile\_2.2 (A x B) ☒ 0\*300

Wa\_material ☒ [K30-2]

Wa\_class ☒ [13]

Wa\_assembly\_prefix ☒ [W]

Wa\_assembly\_number\_2.1 ☒ [1]

Wa\_dist (Wa A1) ☒ 1500.00

Wa\_dist (Wa A2) ☒ 1440.00

Wa\_dist (Wa B1) ☒ 3000.00

Wa\_dist (Wa B2) ☒ 3000.00

OK Apply Modify Get ☒ / ☒ Cancel

- On the **Position** tab, set the **Rotation** to Back and the **On plane** and **At depth** fields to Middle position.

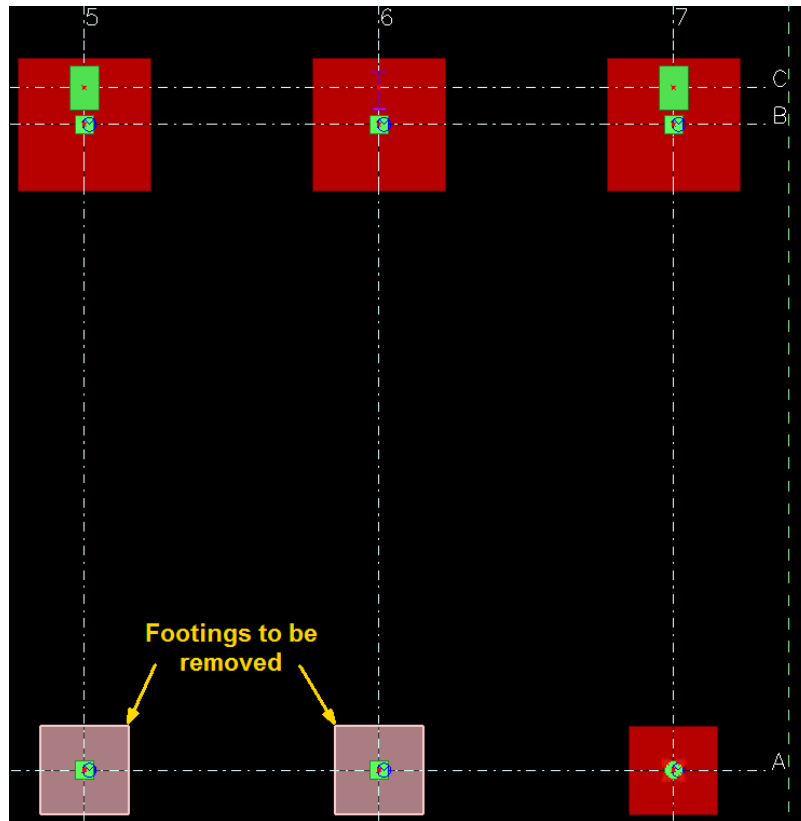
Footing Walls Position

On plane: ☒ Middle 0.00

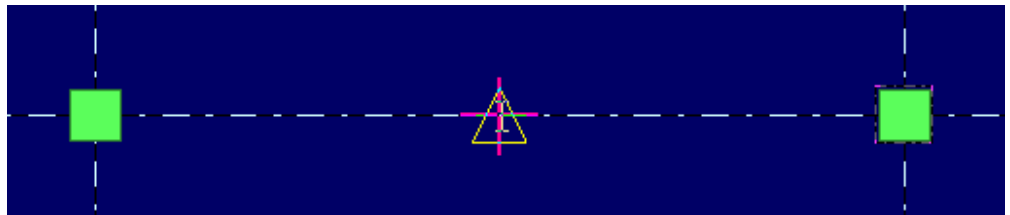
Rotation: ☒ Back 0.0

At depth: ☒ Middle 0.00

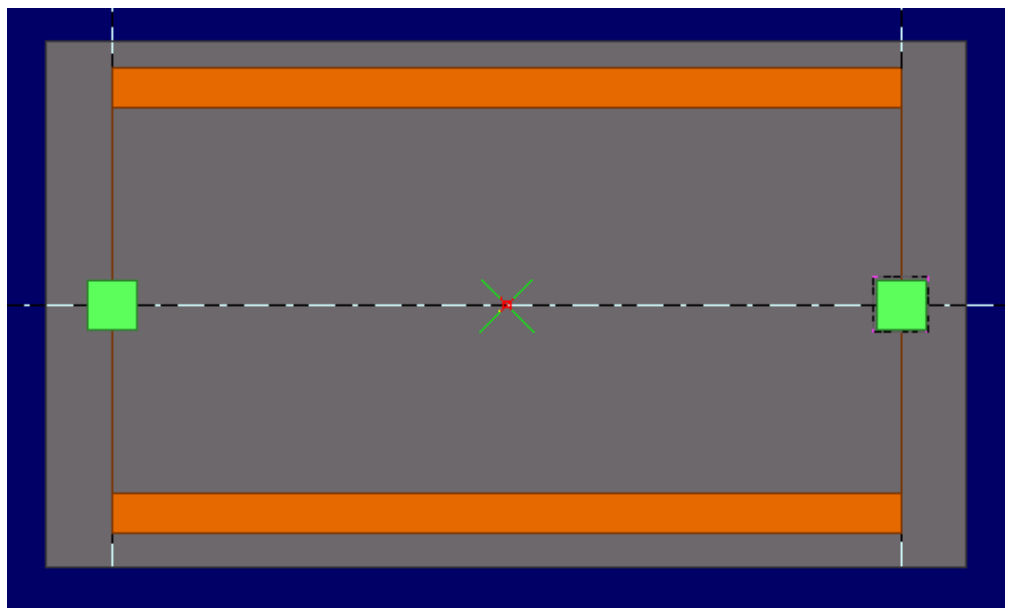
- Close the dialog with **OK**.
- In the PLAN +0 view, zoom in to gridline **A** between lines **5** and **6**.

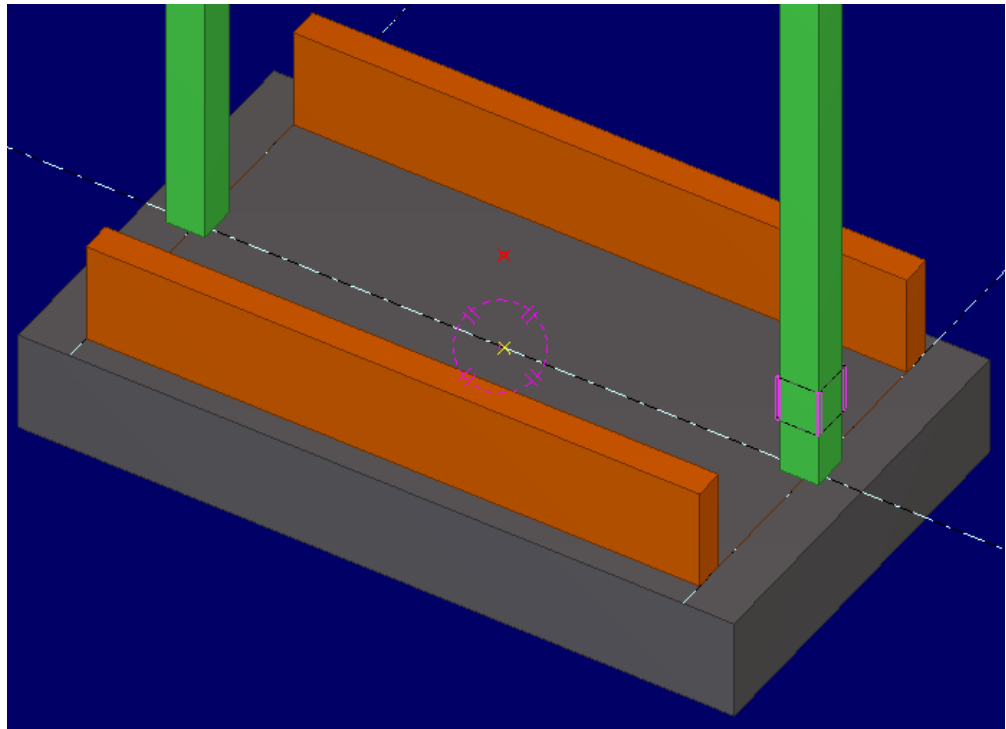


7. Delete the 1800\*1800 size footings below the columns on grid lines 5 and 6.
8. Select the **CIP\_FO\_002** custom component in the Component catalog.
9. Pick the middle point between grid lines 5 and 6 on the line A.



The footing and the walls are created.

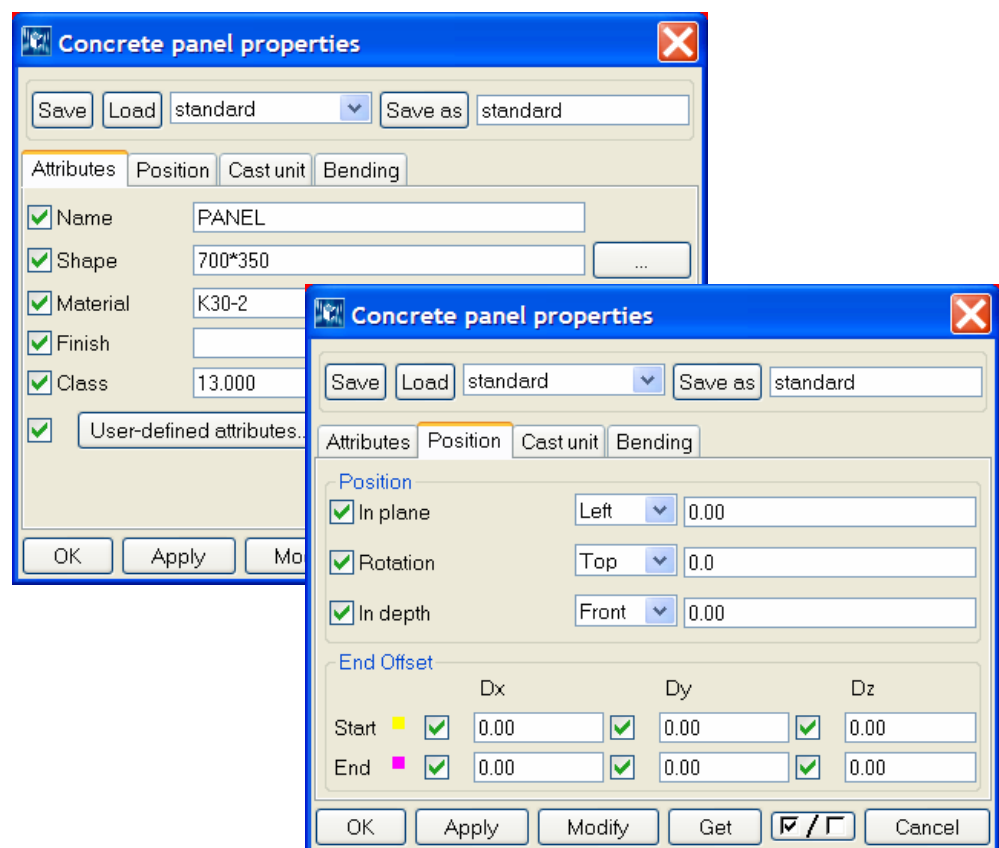




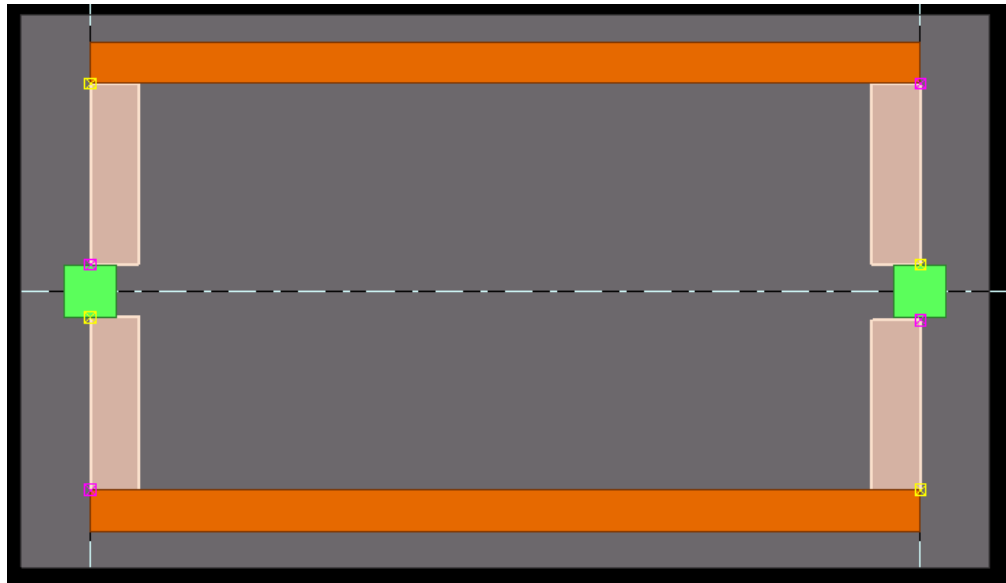
### Insert additional walls

We will next insert supporting wall panels on gridlines 5 and 6 between the columns and the side walls.

1. Double-click on the **Create concrete panel** icon to open the dialog.
2. Fill in the values as shown below:



3. Close the dialog by clicking the **OK** button.
4. Pick the start and end points for each wall and close them with the middle mouse button.



### Insert a slab

Before creating the stairwell, we will insert a slab above the walls we just created.

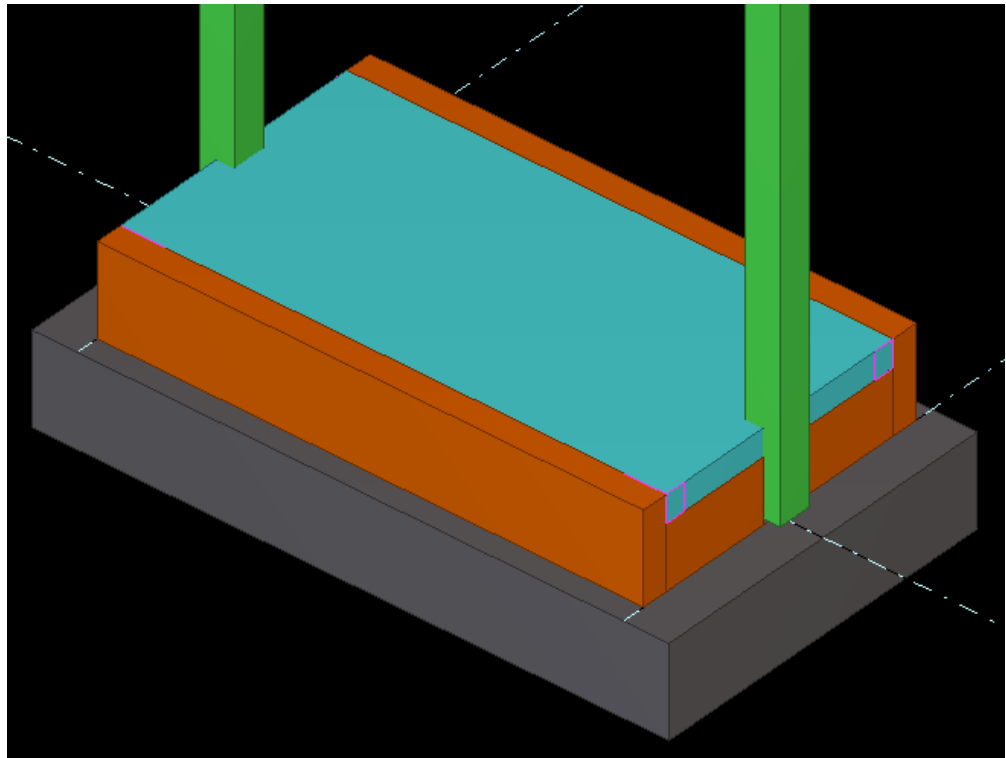
1. Double-click on the **Create concrete slab** icon to open the dialog.
2. Set the slab height to be 300 mm, select K30-2 as the material and position it to be Front in depth with value 700.

Position

☒ In depth      Front    700.00

3. Close the dialog with the **OK** button.
4. In the PLAN +0 view, pick the polygon position by clicking at the corner points.
5. Close the polygon with the middle mouse button.



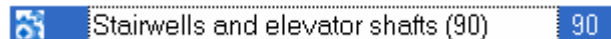


## Create the stairwell using a macro

### Define the stairwell settings

We will create the stairwell using the **Stairwells and elevator shafts (90)** component. First we need to find the needed component.

2. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
3. Type "stair" in the search field.
4. Click the Search button. All components having a word "stair" are listed.
5. Double click the **Stairwells and elevator shafts (90)** component.



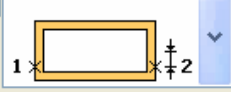
6. Fill in the tab pages as shown below:

**Tekla Structures Stairwells and elevator shafts (90)**

Save Load standard Save as standard

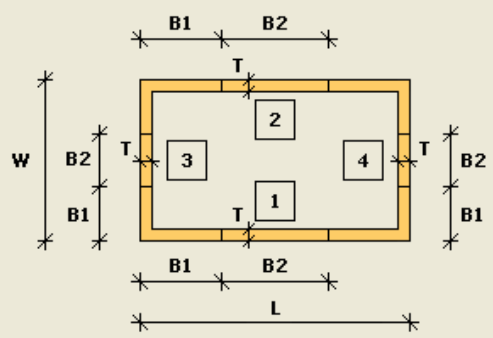
Plan View Openings Stairs and landings Attributes

Levels ☒ 1000.00 4025.00 7525.00 13400.00

Position ☒  ☒ 30.00

Total length, L ☒ 5960.00 Total width, W ☒ 3280.00

Wall panels	1st Floor	Typical Floors	Top Floor
<b>1</b> Thickness, T <input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00
Widths, B1, B2 ... <input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.
<b>2</b> Thickness, T <input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00
Widths, B1, B2 ... <input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.
<b>3</b> Thickness, T <input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00
Widths, B1, B2 ... <input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.
<b>4</b> Thickness, T <input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00	<input checked="" type="checkbox"/> 160.00
Widths, B1, B2 ... <input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.	<input checked="" type="checkbox"/> 1500.00 1500.



On the **Plan View** tab, define the levels and wall dimensions for 1<sup>st</sup>, typical and top floors.

**Tekla Structures Stairwells and elevator shafts (90)**

Save
Load
standard
▼
Save as
standard

Plan View
Openings
Stairs and landings
Attributes

		1st Floor	Typical Floors	Top Floor
<b>1</b>	Position, A	✓ 4200.00	✓ 0.00	✓ 0.00
	Width, B	✓ 1200.00	✓ 0.00	✓ 0.00
	Location, C	✓ 0.00	✓ 0.00	✓ 0.00
	Height, D	✓ 2100.00	✓ 0.00	✓ 0.00
<b>2</b>	Position, A	✓ 4200.00	✓ 4200.00	✓ 4200.00
	Width, B	✓ 1200.00	✓ 1200.00	✓ 1200.00
	Location, C	✓ 0.00	✓ 0.00	✓ 0.00
	Height, D	✓ 2100.00	✓ 2100.00	✓ 2100.00
<b>3</b>	Position, A	✓ 0.00	✓ 0.00	✓ 0.00
	Width, B	✓ 0.00	✓ 0.00	✓ 0.00
	Location, C	✓ 0.00	✓ 0.00	✓ 0.00
	Height, D	✓ 0.00	✓ 0.00	✓ 0.00
<b>4</b>	Position, A	✓ 1700.00	✓ 1700.00	✓ 1700.00
	Width, B	✓ 1200.00	✓ 1200.00	✓ 1200.00
	Location, C	✓ 0.00	✓ 0.00	✓ 0.00
	Height, D	✓ 2100.00	✓ 2100.00	✓ 2100.00

On the **Openings** tab, set the dimensions for doors.

**Tekla Structures Stairwells and elevator shafts (90)**

Save Load standard Save as standard

Plan View Openings **Stairs and landings** Attributes

1st Floor

Typical Floors

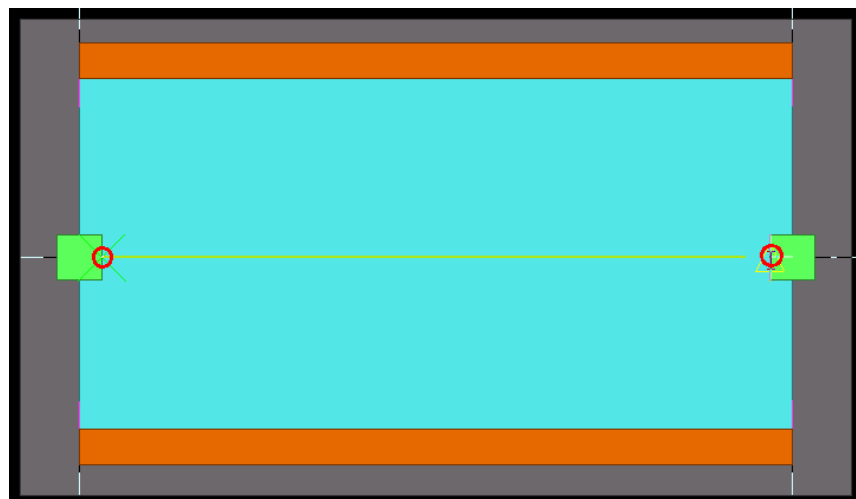
Top Floor

**Elevator Shafts**

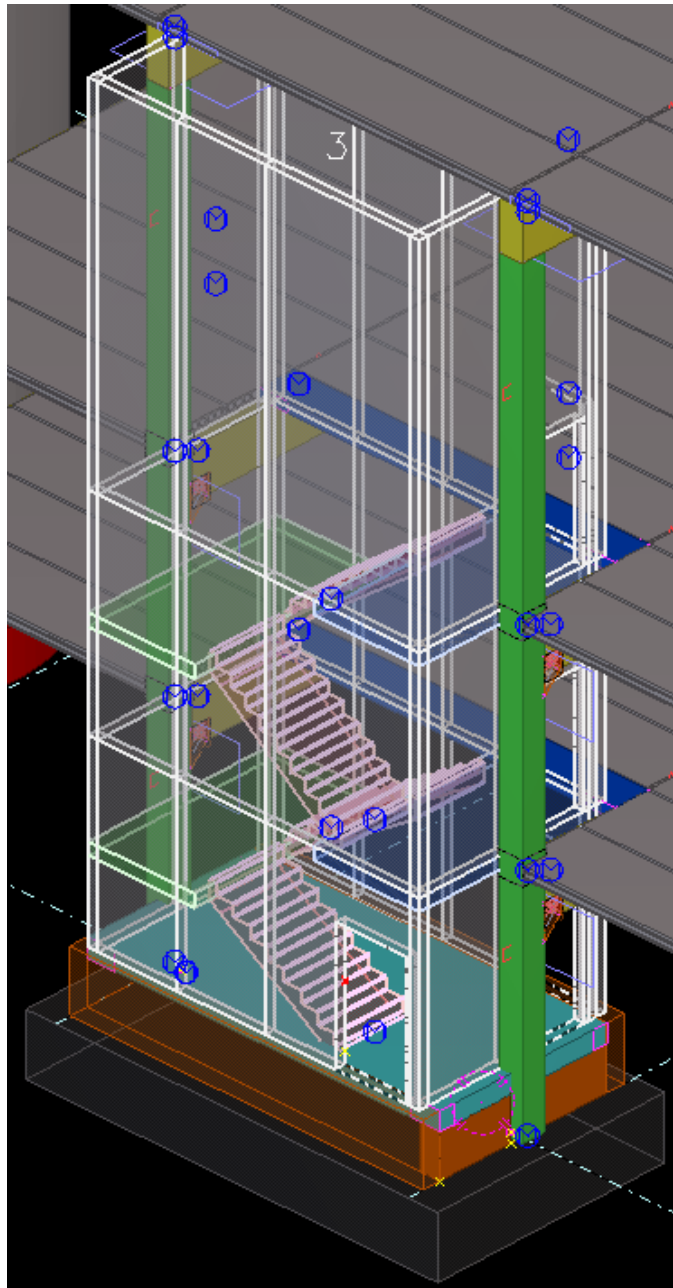
B1	<input checked="" type="checkbox"/> 1800.00	<input checked="" type="checkbox"/> 1800.00	<input checked="" type="checkbox"/> 1800.00
B2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B3	<input checked="" type="checkbox"/> 1800.00	<input checked="" type="checkbox"/> 1800.00	<input checked="" type="checkbox"/> 1800.00
H1	<input checked="" type="checkbox"/> 1200.00	<input checked="" type="checkbox"/> 1200.00	<input checked="" type="checkbox"/> 1200.00
H2	<input checked="" type="checkbox"/> 1200.00	<input checked="" type="checkbox"/> 1200.00	<input checked="" type="checkbox"/> 1200.00
S1	<input checked="" type="checkbox"/> 220.00	<input checked="" type="checkbox"/> 220.00	<input checked="" type="checkbox"/> 220.00
S2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
S3	<input checked="" type="checkbox"/> 220.00	<input checked="" type="checkbox"/> 220.00	<input checked="" type="checkbox"/> 220.00
Step	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E / F	<input checked="" type="checkbox"/> 190.00	<input checked="" type="checkbox"/> 190.00	<input checked="" type="checkbox"/> 190.00
TH	<input checked="" type="checkbox"/> 150.00	<input checked="" type="checkbox"/> 150.00	<input checked="" type="checkbox"/> 150.00
G1	<input checked="" type="checkbox"/> 200.00	<input checked="" type="checkbox"/> 200.00	<input checked="" type="checkbox"/> 200.00
G2	<input checked="" type="checkbox"/> 200.00	<input checked="" type="checkbox"/> 200.00	<input checked="" type="checkbox"/> 200.00

On the **Stairs and landings** tab, define the placement and dimensions for stairs.

7. Close the dialog with the **OK** button.
8. In the **PLAN +0** view, pick, first, the intersection of gridline A and the column inner side on line 5, then the intersection of line A and the column inner side on line 6. The stairwell is created.







## 7.3 Using Pre-cast Concrete Custom Components

In this exercise we will use pre-cast custom components for creating and connecting concrete members.

### Insert a column shoe connection

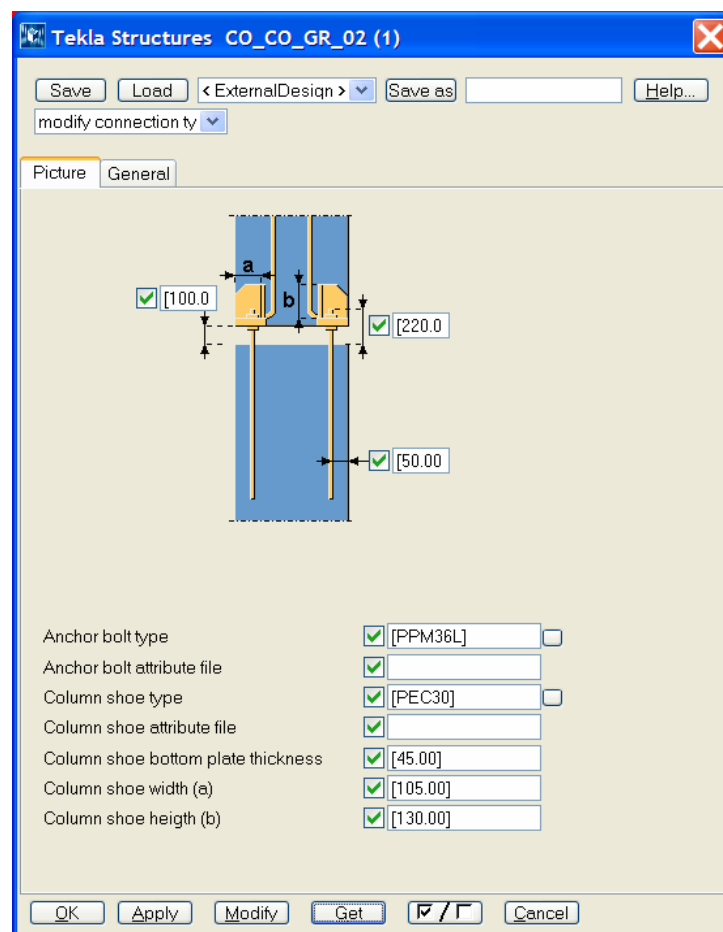
#### Import the custom component

First, we need to import the needed custom component into the model.

1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. Right-click > Import...
3. Select the file **PrecastCustomComponents310505.uel** in the browser.
4. Click **OK**. The custom components are imported into the model and are ready for use.
5. Double-click on the **CO\_CO\_GR\_02** custom component to open the dialog.

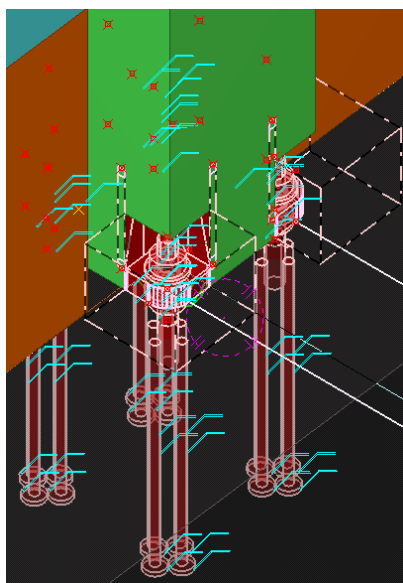


6. Use the default the values as shown below.



7. Close the dialog with the **OK** button.
8. Pick the footing of the stairwell.

9. Pick the column on gridline 5. The column shoes and anchor bolts are created.
10. Repeat for the column on line 6.



## Create plinth walls and wall panels

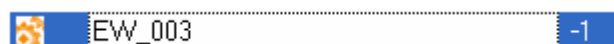
### Non-bearing plinth walls

For the plinth wall insulation we need first create a new material named "Stonewool"

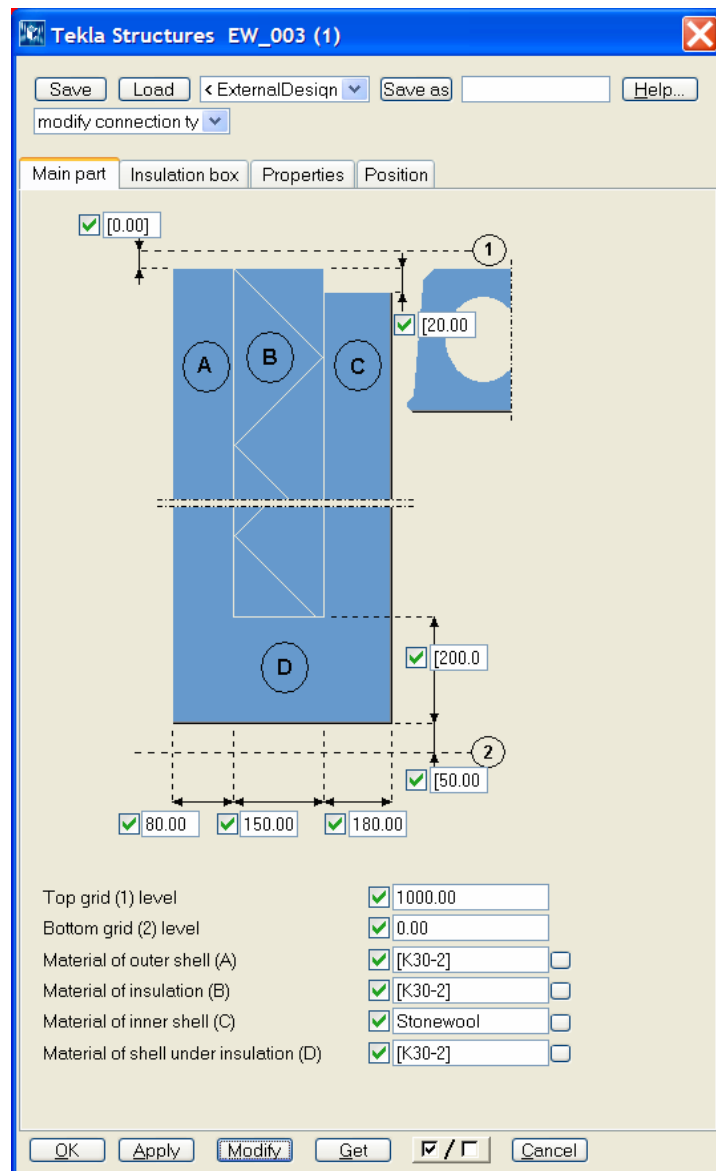
1. Open the Modify material catalog from **File > Catalog > Materials > Modify...**
2. Right-click over the Miscellaneous branch and select **Add grade**.
3. Select the new material and press **F2**, then type Stonewool
4. Set the profile and plate density values to be 250 kg/m<sup>3</sup>
5. Close the dialog with **OK**.
6. Close also the Save confirmation dialog with **OK**.

We will now create non-bearing plinth walls on gridline A. First, we need to find the needed custom component in the component catalog. The component was imported together with the column – footing connection (CO\_CO\_GR\_02).

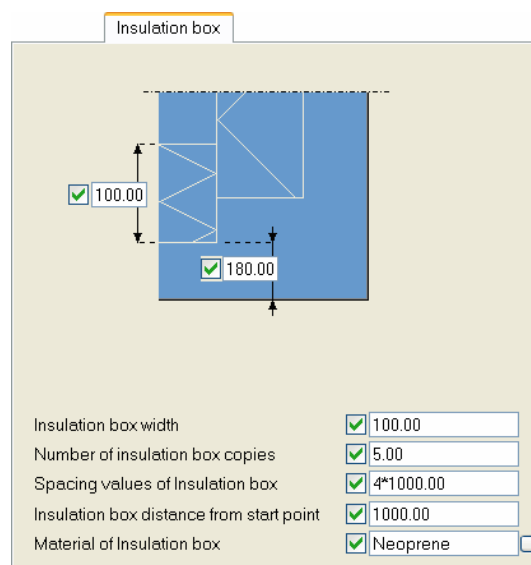
1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. Open the "Custom" folder
3. Double-click on the **EW\_003** custom component to open the dialog.



4. Fill in the fields on each tab page as shown below.



On the **Main part** tab set the dimensions and materials.

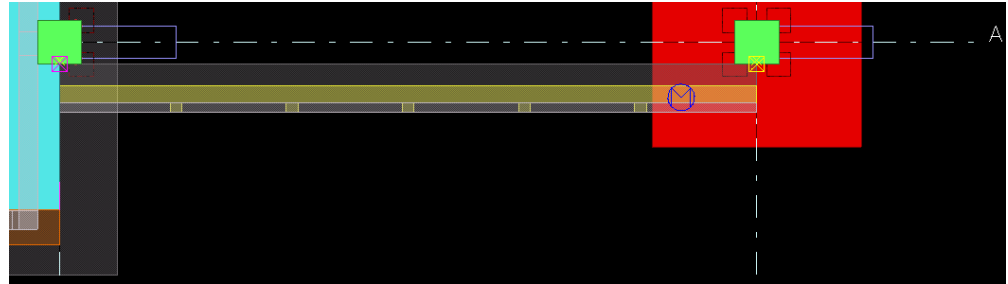


Define the dimensions and spacing of the insulation boxes.

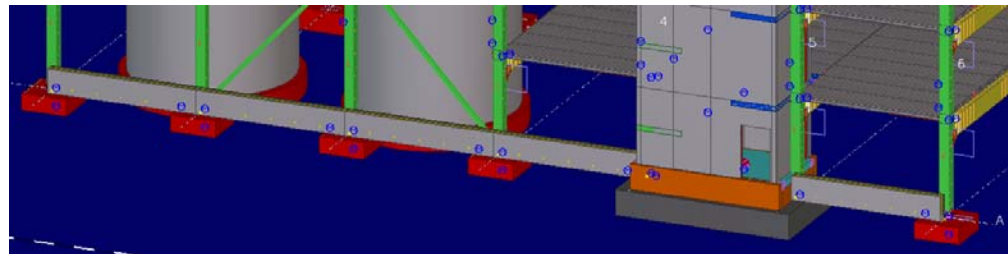
On plane:	<input checked="" type="checkbox"/> Left	0.00
Rotation:	<input checked="" type="checkbox"/> Top	0.0
At depth:	<input checked="" type="checkbox"/> Middle	0.00

Set the position to be Left on plane, Rotation to Top and Middle at depth.

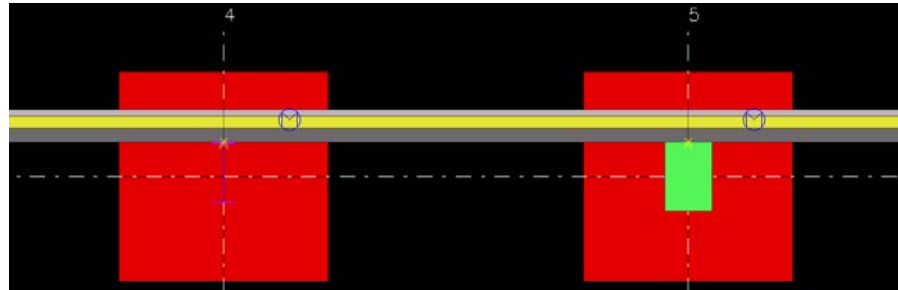
5. Click **OK** to close the dialog and apply the settings.
6. Pick the start point at the columns outer side mid point at line 7.
7. Pick the end point at the columns outer side mid point at line 6. A plinth wall is created.



8. Create similar plinth walls between gridlines 5 and 1 on gridline A, one wall between each column.



9. Create similar plinth walls on gridline F, one wall between each column.



### Bearing plinth walls

Next, we will create bearing plinth walls on gridlines 1 and 7.

1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. In the Custom folder, double-click on the **EW\_004** custom component to open the dialog.
3. Fill in the fields on each tab page as shown below.

**Tekla Structures EW\_004 (1)**

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Main part Insulation box Properties Position

Top grid (1) level 1000.00  
 Bottom grid (2) level 0.00  
 Material of outer shell (A) [K30-2]  
 Material of insulation (B) Stonewool  
 Material of inner shell (C) [K30-2]  
 Material of shell under insulation (D) [K30-2]

OK Apply Modify Get / Cancel

On the **Main part** tab set the dimensions and materials.

Insulation box

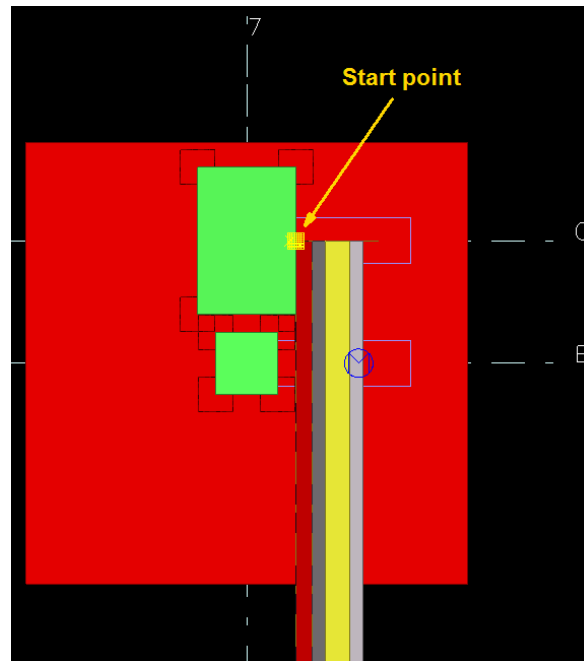
Insulation box width 100.00  
 Number of insulation box copies 12.00  
 Spacing values of Insulation box 11\*1000.00  
 Insulation box distance from start point 1000.00  
 Material of insulation box Stonewool

Define the dimensions and spacing of the insulation boxes.

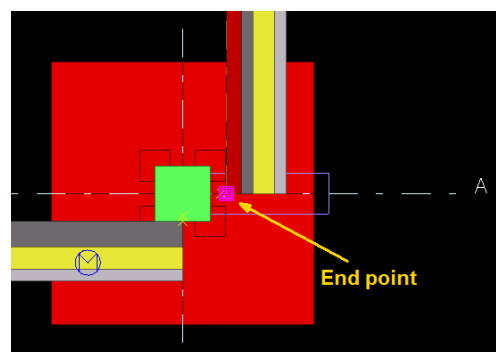
On plane:	<input checked="" type="checkbox"/> Left	0.00
Rotation:	<input checked="" type="checkbox"/> Top	0.0
At depth:	<input checked="" type="checkbox"/> Middle	0.00

Set the position to be Left on plane, Rotation to Top and Middle at depth.

4. Close the dialog with the **OK** button.
5. Pick the start point on gridline C at the 900\*600 column's long side mid point.



6. Pick the end point on gridline A, perpendicular to the start point.

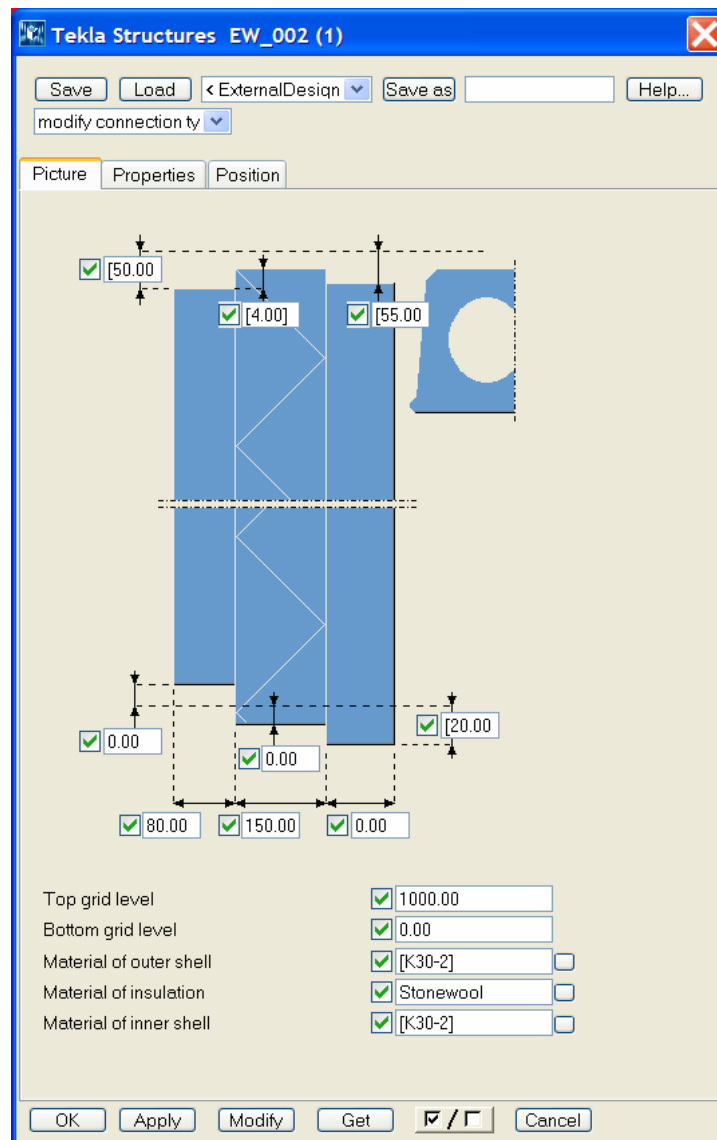


7. Create similar plinth walls between gridlines C and F.
8. Repeat with reverse picking order at gridline 1. Note that you need to use reference pick with **Ctrl** button on grid line C at the 900\*600 column's long side mid point, then pick the actual start point on gridline A, perpendicular to it.

### Panels around the stairwell

Next, we will create outer panel with insulation around the outer part of the stairwell.

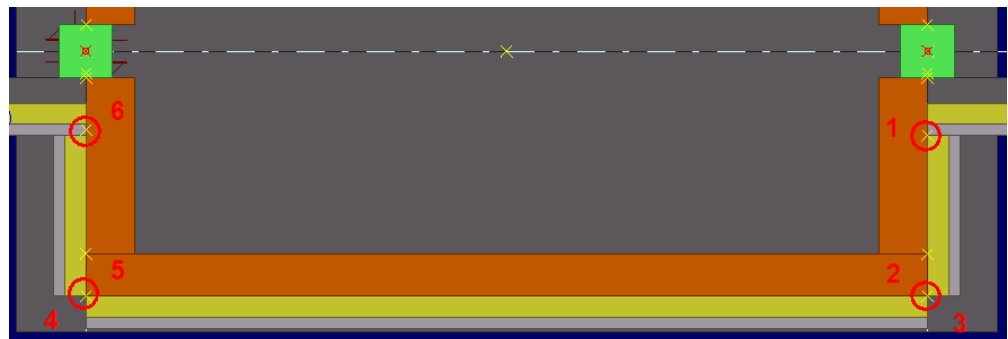
1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. In the Custom folder, double-click on the **EW\_002** custom component.
3. Fill in the fields on each tab page as shown below.



On the **Picture** tab, define the dimensions and materials. Note that the thickness of the inner panel is zero.

Set the position to be Left on plane, Rotation to Top and Middle at depth.

4. Close the dialog with the **OK** button.
5. Pick the start and end points at the corners around the stairwell's bearing walls.



We should now have plinth walls and wall panels around the whole building. Next, we will connect the walls to each other.



# Connect the walls using custom components

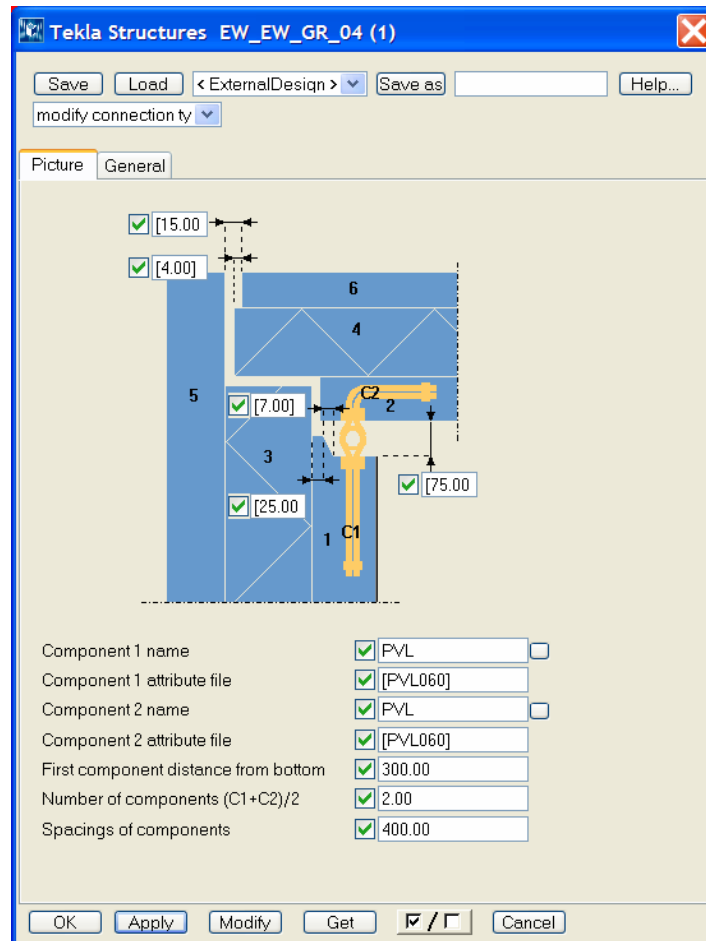
## Outer corners

We will now create corner connections between the walls on the outer corners.

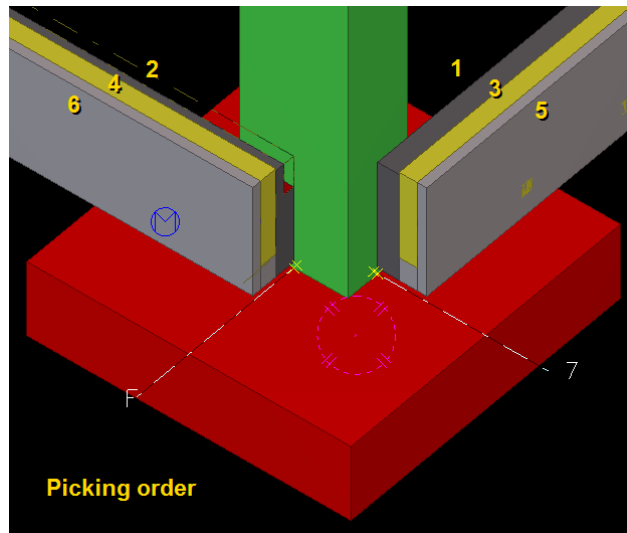
1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. Open the "Custom" folder
3. Double-click on the **EW\_EW\_GR\_04** custom component to open the dialog.



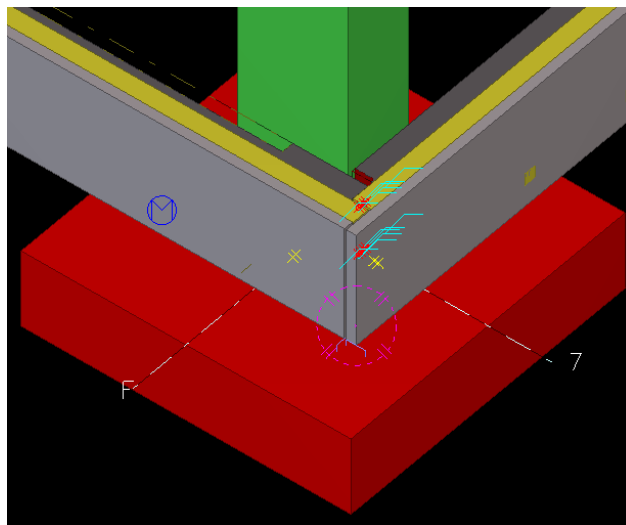
4. Fill in the fields as shown below.



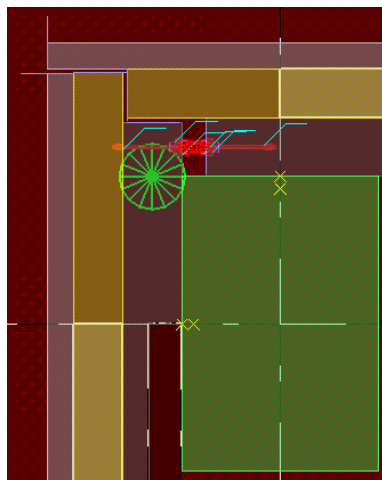
5. Close the dialog by clicking the **OK** button.
6. Zoom into the intersection of gridlines F and 7.
7. Pick the parts of the walls as shown on the dialog's **Picture** tab. End with the middle mouse button.



The connection is created.



8. Use the component **EW\_EW\_GR\_06** for the corner at the intersection of gridlines 1 and F.
9. Set the values on the Picture tab as in previous connection and put the up direction to  $-z$ .



10. Repeat for gridline A outer corners. Use **EW\_EW\_GR\_04** at grid line 1 and **EW\_EW\_GR\_06** at grid line 7.

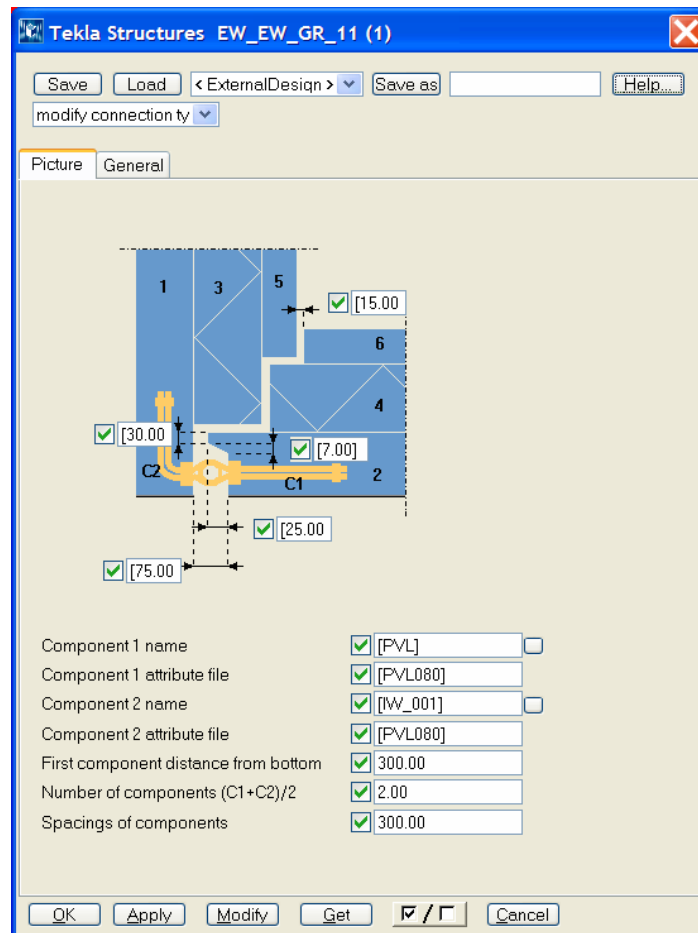
**Corners around  
the stairwell**

Next we will connect the walls around the stairwell.

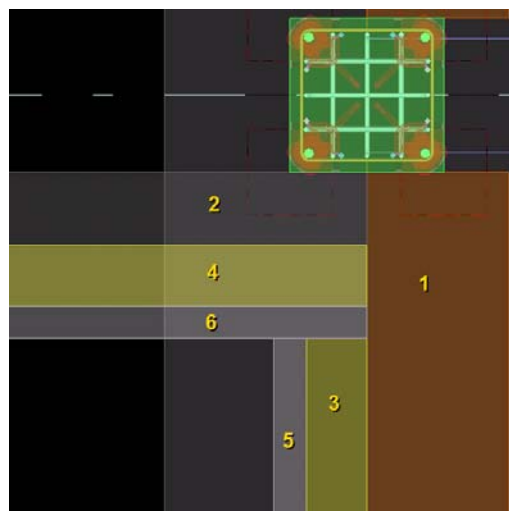
1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. Open the "Custom" folder
3. Double click the **EW\_EW\_GR\_11** custom component to open the dialog.

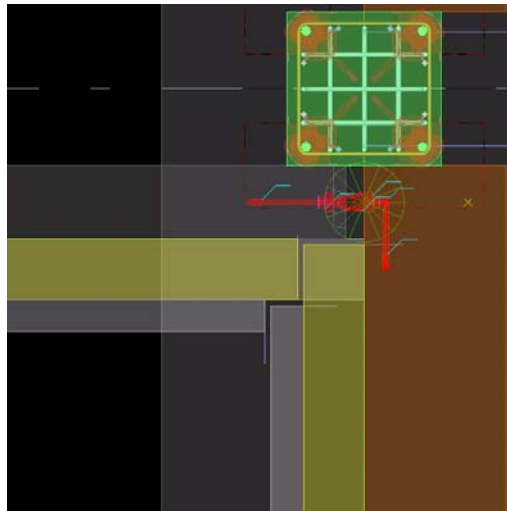


4. Fill in the fields as shown below.



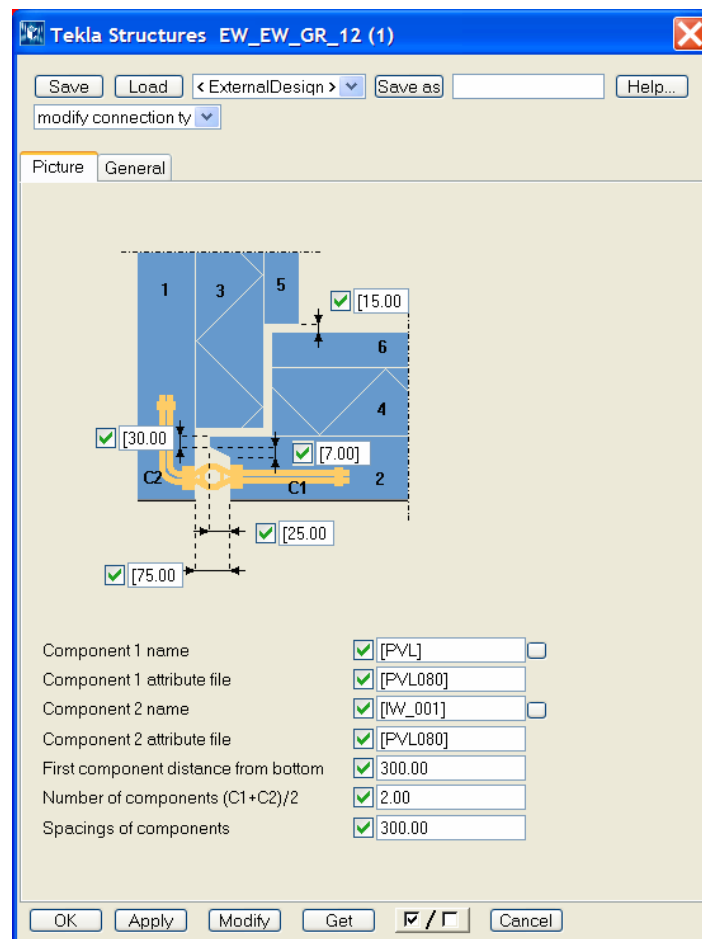
5. Close the dialog with the **OK** button.
6. Zoom in to stairwell's inner corner on gridline 5 and pick the parts in order shown on the dialog, end with the middle mouse button.





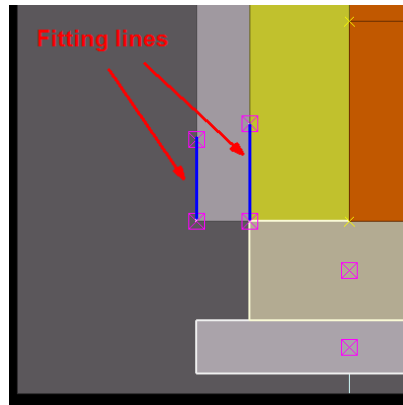
A connection is created.

7. Then go to the stairwell's inner corner on grid line 6 and make the connection using **EW\_EW\_GR\_12** custom component with Picture tab page values shown below. Use  $-z$  up direction on General tab. Picking order is the same as in previous connection.

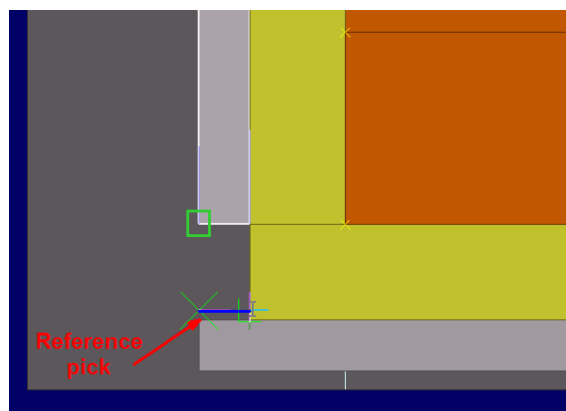


8. Use the manual fitting tool to adjust the stairwell's outer corners on gridlines 5 and 6. Before fitting, switch the **"Select objects in components"** on.
  - a. Select the **"Create fitting"** icon.
  - b. Pick the panel to be fitted between grid lines 5 and 6.
  - c. Point the fitting line with two points along joining parts' sides as shown in the first picture below.

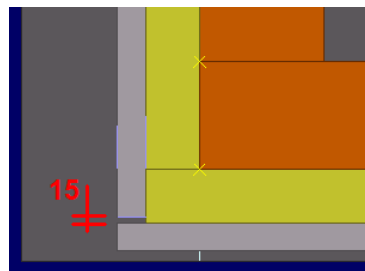
- d. Repeat for the insulation.



- e. Continue with the panel on grid line 5 by picking it, then make a reference pick with **Ctrl** button down at the corner of the panel we just fitted. Point direction at the selected panel's corner and give a **numerical value** 15, then press **Enter** to get the start point for fitting line 15 mms from the panel's side.



- f. Pick the fitting line end point at the side of the insulation, perpendicular to the start point.



- g. Repeat for the opposite corner at grid line 6.

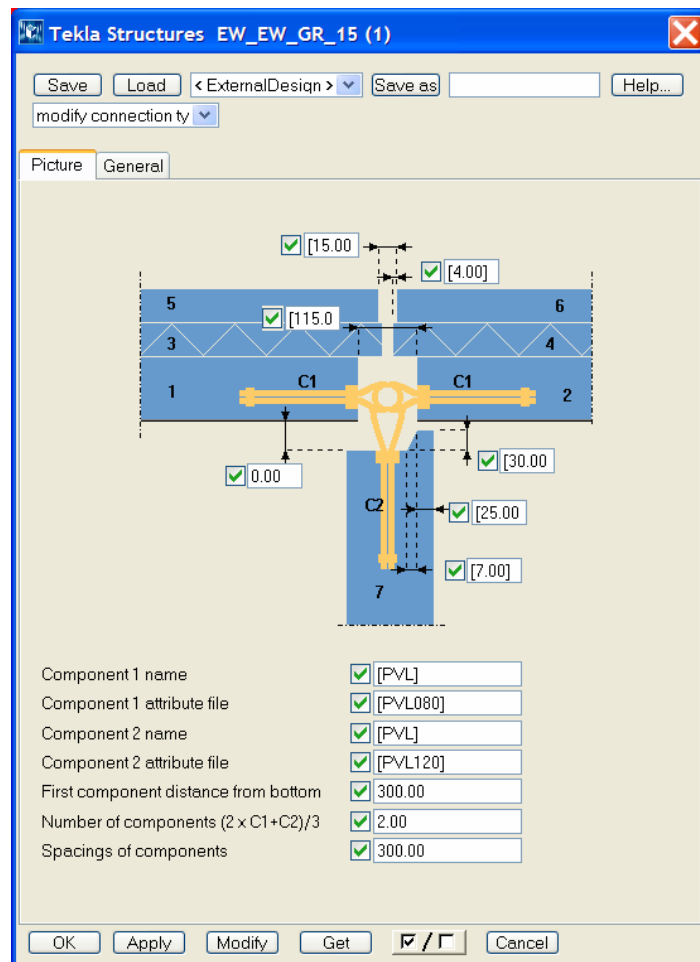
## Connections on straight sides

Now we will connect the parallel walls to each other.

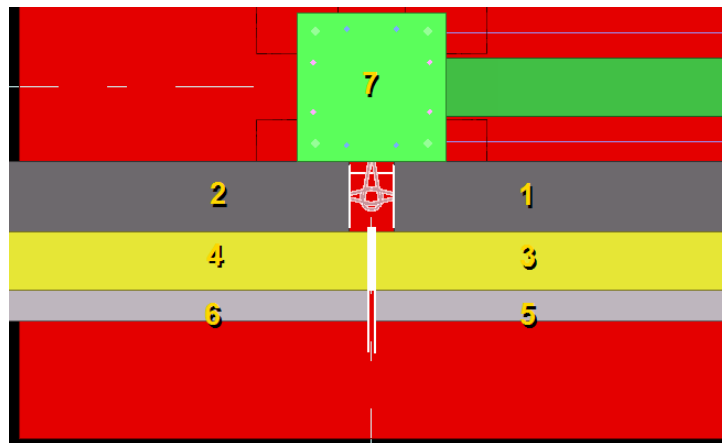
1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. Open the "Custom" folder
3. Double click the **EW\_EW\_GR\_15** custom component to open the dialog.



4. Fill in the fields as shown below.

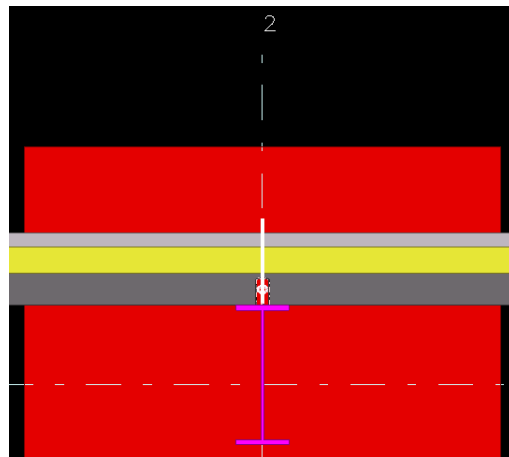
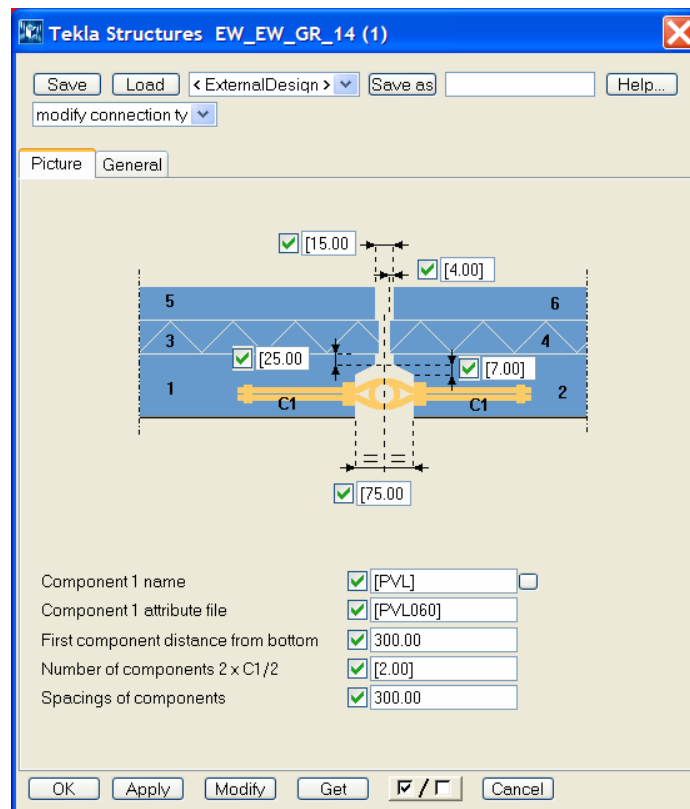


5. Close the dialog with the **OK** button.
6. Zoom in to column in the intersection of gridlines A and 2.
7. Pick, first, the panels in the order shown on the dialog, then the column, and end with the middle mouse button.



The connection is created between the walls and the column.

8. Repeat to all similar cases around the building at concrete columns.
9. On gridline F, use the component **EW\_EW\_GR\_14** for connecting the walls beside the steel columns with settings shown below.



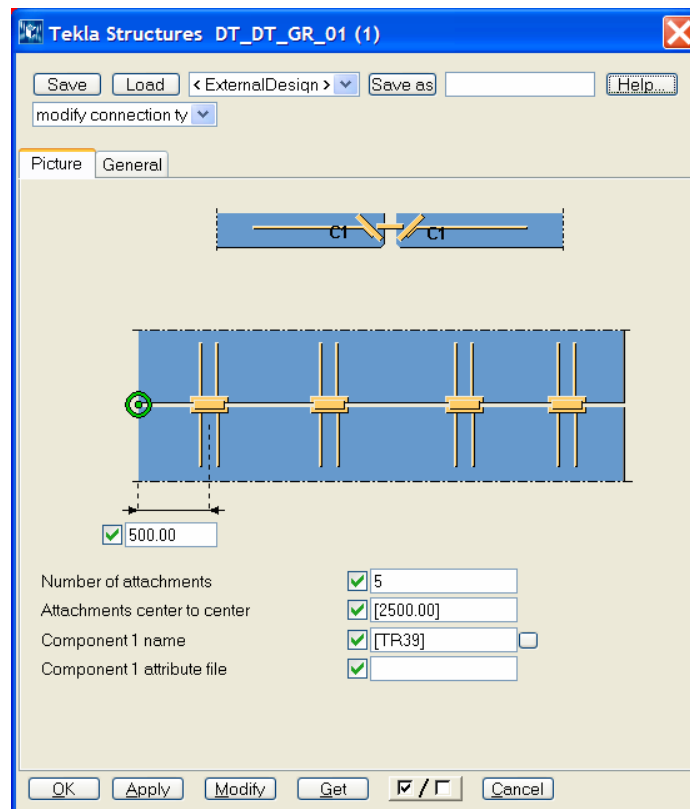
## Connect double-T slabs using custom components

We will now connect the double-T slabs to each other using a seam-type custom component.

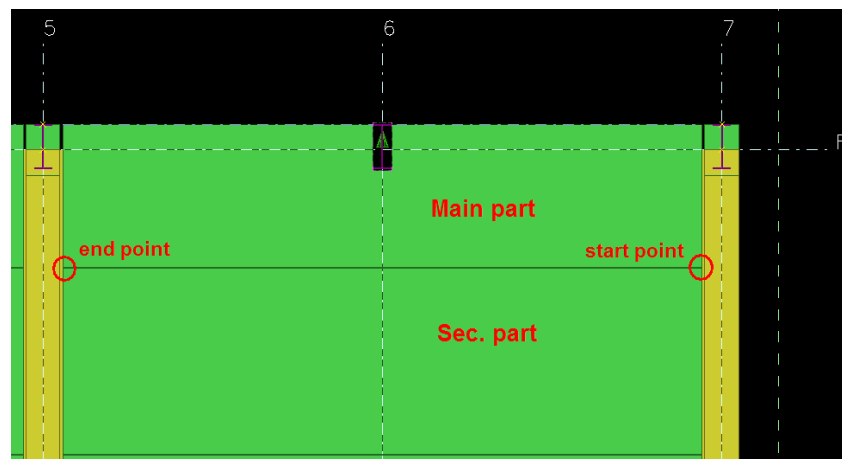
1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. Open the "Custom" folder
3. Double-click on the **DT\_DT\_GR\_01** custom component to open the dialog.



4. Fill in the fields as shown below.

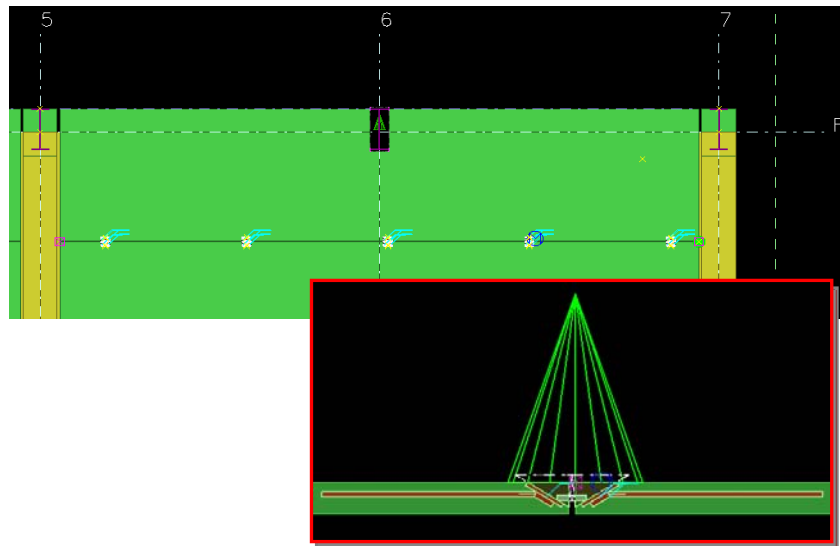


5. Click **OK** to close the dialog and apply the settings.
6. In the PLAN +7175 view, zoom in to the top right corner at gridline F between lines 5 and 7.
7. Select the 50 mm thick slabs and hide them using **right-click > Shift + hide**.
8. Pick the top most DT-slab (main part) then the next slab aside it (sec. part).
9. Pick start and end points as shown below.

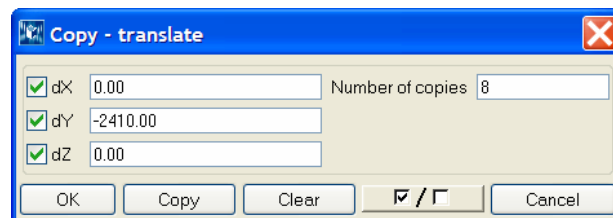


The connection is created.

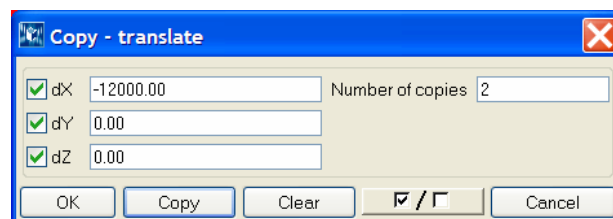




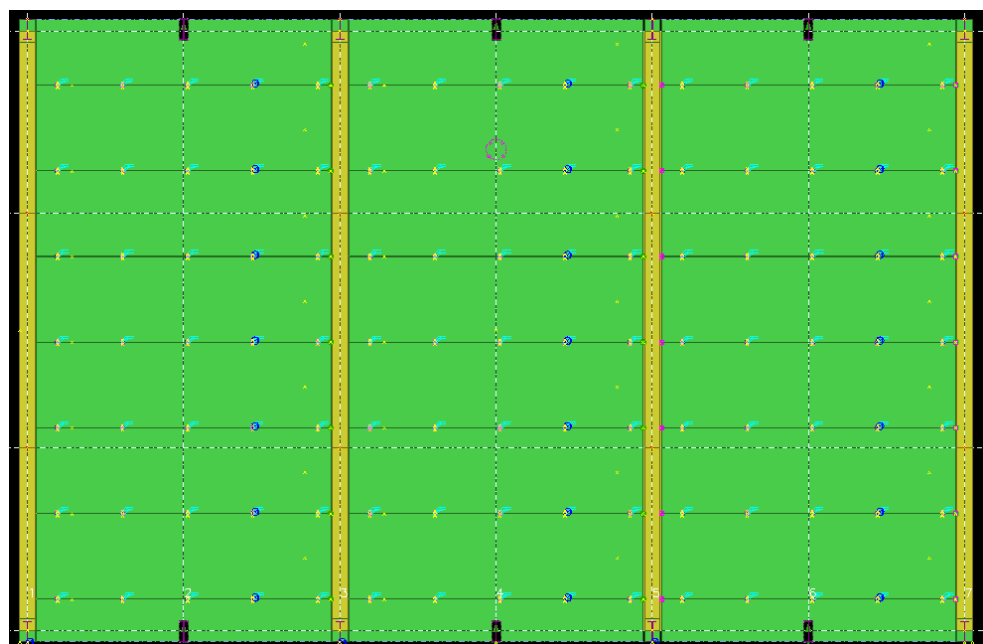
10. Select the connection in the model and copy it 8 times to y direction -2400 mm.



11. Then select all the double-T slab seam connections and copy them 2 times to x direction -12000 mms.



Now all the double-T slabs should be connected to each other.



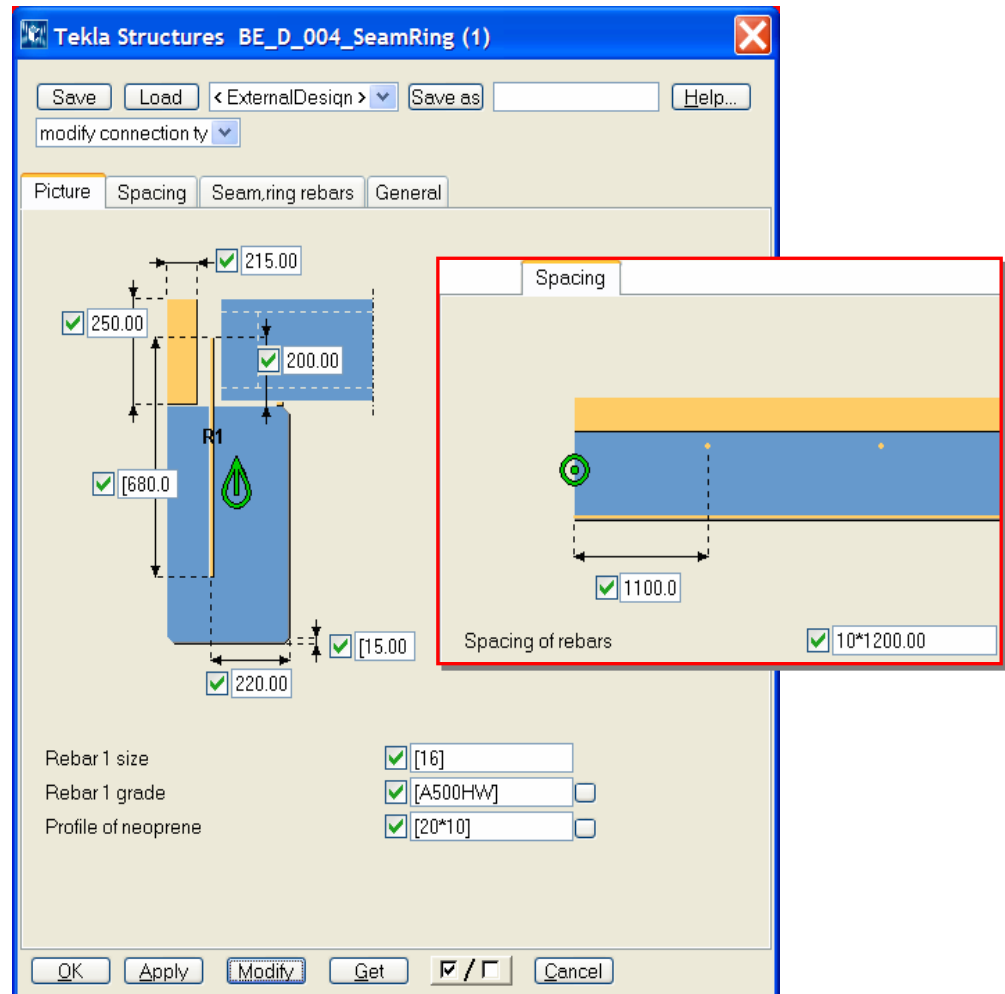
## Create seam ring reinforcements using custom components

Next we will create seam ring reinforcements around the hollow core-slabs using custom components.

1. Open the Component catalog by pressing **Ctrl + F** or from the **Tools > Find a component...** drop down menu.
2. Open the "Custom" folder.
3. Double-click on the **BE\_D\_004\_SeamRing** custom component to open the dialog.

 **BE\_D\_004\_SeamRing** -1

4. Fill in the fields as shown below.



Set the dimensions of the in-situ concrete and the placing of the rebars.

**Tekla Structures BE\_D\_004\_SeamRing (1)**

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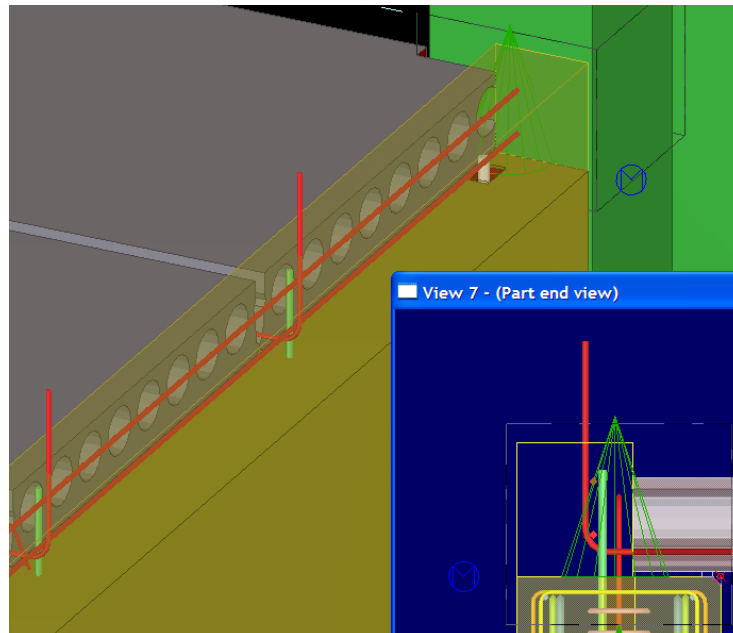
Picture Spacing **Seam,ring rebars** General

Onplane for seam rebars	<input checked="" type="checkbox"/> -50.00 40.00
Start leglength for seam rebar	<input checked="" type="checkbox"/> [400.00]
End leglength for seam rebars	<input checked="" type="checkbox"/> [1500.00]
Size for seam rebars	<input checked="" type="checkbox"/> [12]
Material for seam rebars	<input checked="" type="checkbox"/> [A500HW] <input type="checkbox"/>
Exact spacing values for seam	<input checked="" type="checkbox"/> 9*1200.00
Bending radius for seam rebars	<input checked="" type="checkbox"/> [40.00]
Onplane for ring rebars	<input checked="" type="checkbox"/> -230.00
Fromplane for ring rebars	<input checked="" type="checkbox"/> 70.00
Start cover thickness for ring	<input checked="" type="checkbox"/> 50.00
End cover thickness for ring r	<input checked="" type="checkbox"/> [20.00]
Size for ring rebars	<input checked="" type="checkbox"/> [16]
Material for ring rebars	<input checked="" type="checkbox"/> [A500HW] <input type="checkbox"/>
Exact spacing values for ring	<input checked="" type="checkbox"/> [100.00]
Class attribute for seam rebar	<input checked="" type="checkbox"/> [2]
Class attribute for ring rebar	<input checked="" type="checkbox"/> [2]
Name attribute for seam rebars	<input checked="" type="checkbox"/> SEAM_REBAR
Name attribute for ring rebars	<input checked="" type="checkbox"/> SEAM_REBAR
Seam rebars from beam start	<input checked="" type="checkbox"/> 1120.00

OK Apply Modify Get ☒ / ☐ Cancel

Define the seam ring reinforcement properties and placing.

5. Close the dialog with the **OK** button.
6. Pick the beam on gridline 7 at level +3850.
7. Pick the intersection point of gridlines B and 7 at the end of the beam.



The reinforcements and the in-situ beam are created.

8. Select the component and copy it to the upper levels (3500 and 95500 mms up).
9. Create similar reinforcement to grid line 4 at two lowest levels putting the first seam rebar at 800 mms from the start.