Tekla Structures Basic Training

Tekla Structures 10.0

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6 Catalog

In this lesson

This lesson explains how to view and modify the catalogs. You will learn how to create a new profile cross section and how to define a rule group for it. You will also learn how to add a parametric profile to the profile catalog and how to add user-defined information in existing catalogs. After the profile catalog has been updated, the new profile will then be used for modeling.

In this lesson you will also learn how to add a new material type and a new grade to the material catalog.

Introduction

Catalogs are databases containing detailed information about profiles, materials and bolts, which are available for use in your project. For example, the bolt catalog contains a library of standard bolts and bolt assemblies used in structural steelwork. Catalogs can also contain project or company-specific information. Catalogs can also be imported and exported.

See more in Tekla Structures **Help: System > Catalogs > Things you should know about catalogs**.

See more for profile import and export in Tekla Structures **Help: System > Catalogs > The profile catalog > Merging profile catalogs**.

See more about material catalogs in Tekla Structures **Help: System > Catalogs > The material catalog**.

6.1 Modify Profile Catalog – Add a New Profile

In this exercise we will define a new cross section and profile using Tekla Structures Profile cross section from plate (S10) macro, which provides you with the ability to create user defined cross sections and user-defined profiles automatically from a contour plate. The macro adds the profile and the cross section to profile catalog. We will first create a contour plate to define the shape of the new cross section, and then we will use the new profile in our model.

Define the Cross Section Shape

Create a contour plate

You can create the contour plate in any **Plane** angle view. See more about views in Tekla Structures **Help: Modeling > Getting started > Views > View properties**.

First we will create a polygon by picking corner points according to the dimensions shown below. For now, we will just pick the points which describe the outline of the profile, later we will modify those corners which need to have a radius.

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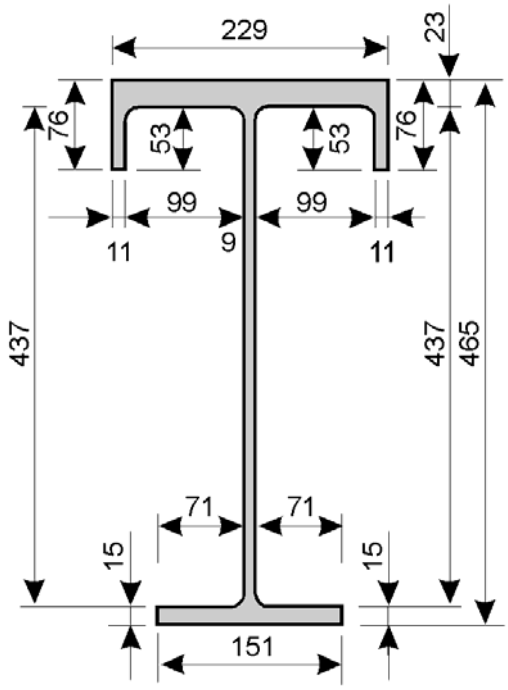
Before starting to create the polygon, check that you have **Snap to any position** on, in **Snap settings** toolbar. Also set ortho to on by pressing the letter **O**.

1. Pick the **Create contour plate** icon.

2. Pick any starting point for the polygon.

3. Move the cursor in the desired direction for a second point.
4. On the keyboard, enter a distance. Tekla Structures will automatically open the **Enter a numeric location** dialog.

5. Press **Enter**. Tekla Structures creates a new point at the given location.
6. Repeat for each corner point for the whole polygon outline.
7. Close the polygon by clicking the middle button.



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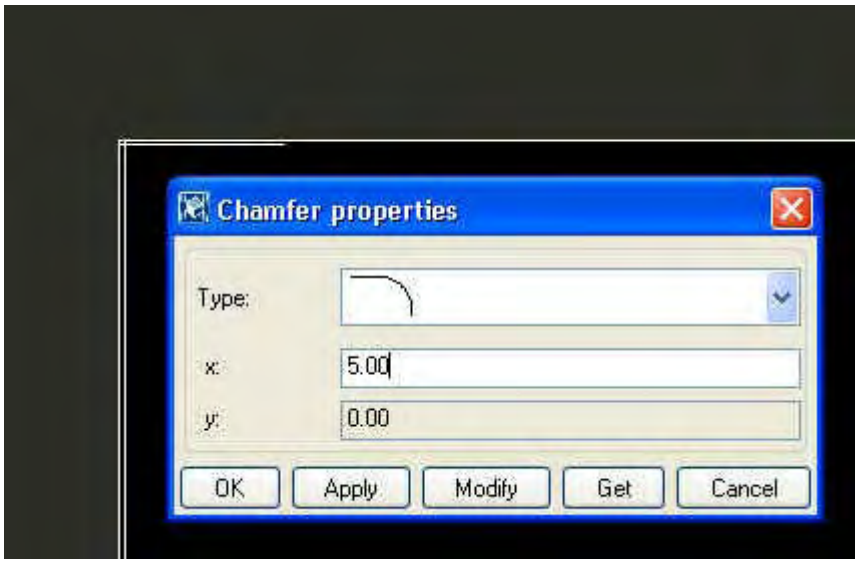
Add rounding to the contour plate corners

We will next complete the cross section shape by modifying the contour plate inner corners, which require a radius. First zoom in to one of the contour plate corners, which need a radius.

1. Pick the contour plate **chamfer**. See more about chamfers in Tekla Structures **Help: Modeling > Detailing > Detailing commands > Chamfer**.
2. Double-click the chamfer to open the dialog and then select the round chamfer type from pull-down list.



3. Enter a value for the radius and press **Modify**. Tekla Structures rounds the selected chamfer.
4. Leave the dialog open and select the other chamfers, which need to be rounded and press **Modify**.

The contour plate can have rounded chamfers, holes, part adds or cuts. They are transferred to the cross section and further to the profile using Tekla Structures **Profile cross section from plate (S10)** macro.

Create the Profile

Add a new profile to catalog

When the contour plate shape has been completed, you are ready to add your own cross section and profile to profile catalog using **Tekla Structures Profile cross section from plate (S10)** macro.

It is important that your work plane is parallel to the plate. E.g. if you create the plate in the x-y plane (i.e. on the ground) then ensure that your work plane is in the same plane (i.e. in the 3d view).

See more about work plane in Tekla Structures **Help: Modeling > Getting started > View reference >View > Workplane > Work plane...**

1. Open **Profile cross-section from plate (10)** dialog box by double-clicking the icon on connections toolbar.

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Define profile parameters

On the **Parameters** tab page we will enter a name for the profile cross section and the profile (blank spaces are NOT allowed in name). We must also decide where the new profile will be saved.

2. Enter **Section name** (be sure that the name is not already in use; Tekla Structures will overwrite the existing name).
3. Enter **Profile name** (note that section and profile can have same name).

4. Select the directory, where the profile catalog will be saved. See more about folders in Tekla Structures **System > Files and folders > Folders**.
5. Enter the profile's weight / m³.

Define profile attributes

Next we will define the profile's type and main dimensions. See more in Tekla Structures **System > Catalogs > The profile catalog**.

6. Select the **Profile attributes** tab page.

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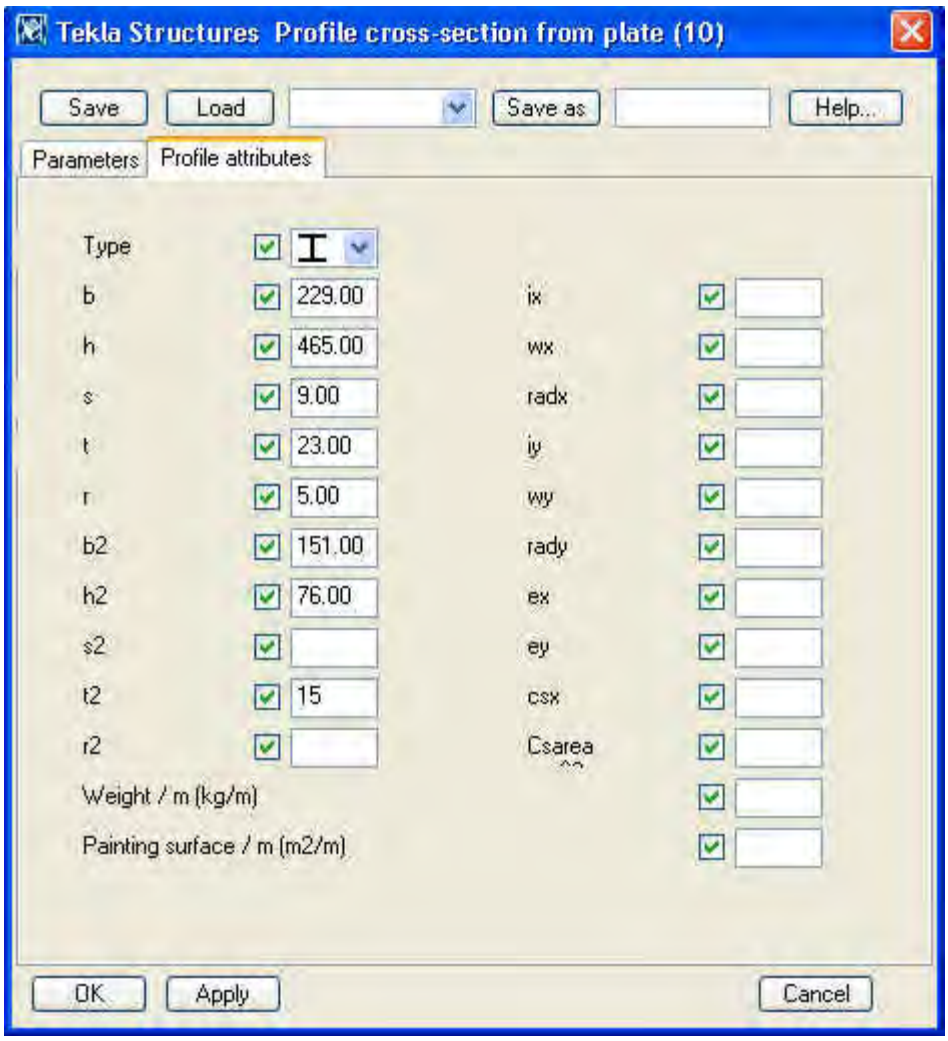

7. Select the profile type from the pull-down list.
8. Enter the profile's main dimensions.

Create profile

After you have entered all of the necessary information in the dialog, you can add the profile to the profile catalog.

9. Press **Apply**. Tekla Structures prompts you to pick the object, pick the contour plate.

After you have picked the plate, Tekla Structures generates a new profile cross section and adds the profile to the profile catalog. Tekla Structures also creates a sample profile on top of the contour plate.

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Check the Results

Once the profile has been created, the next step is to see that the result is correct. We will first open the profile properties dialog and check its content. Then we'll check the profile catalog.

Check profile properties

1. Double-click the new profile. Tekla Structures opens a **Beam properties** dialog.

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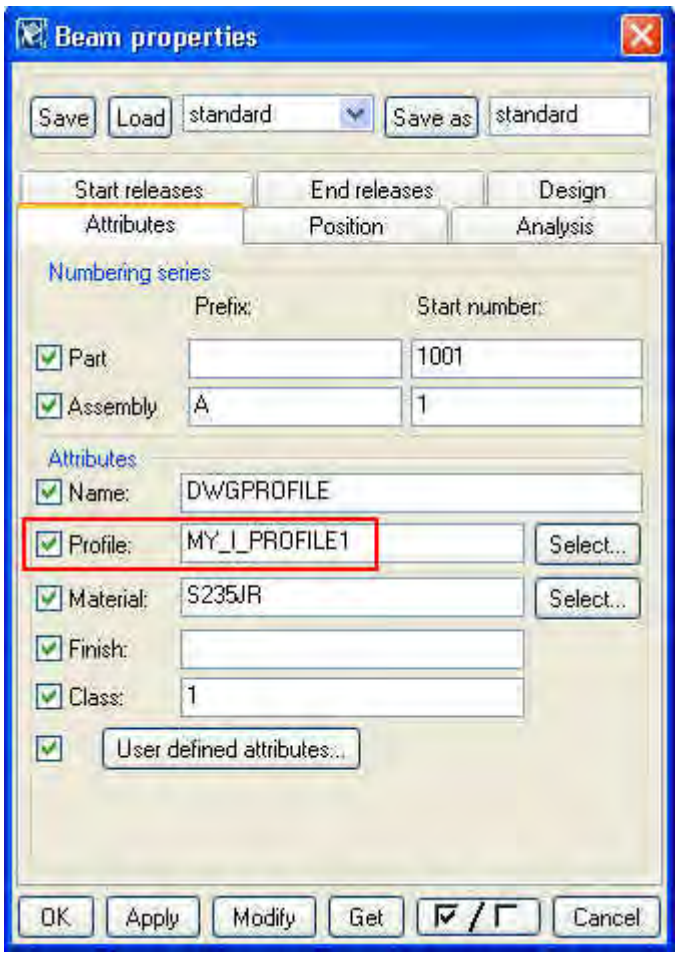
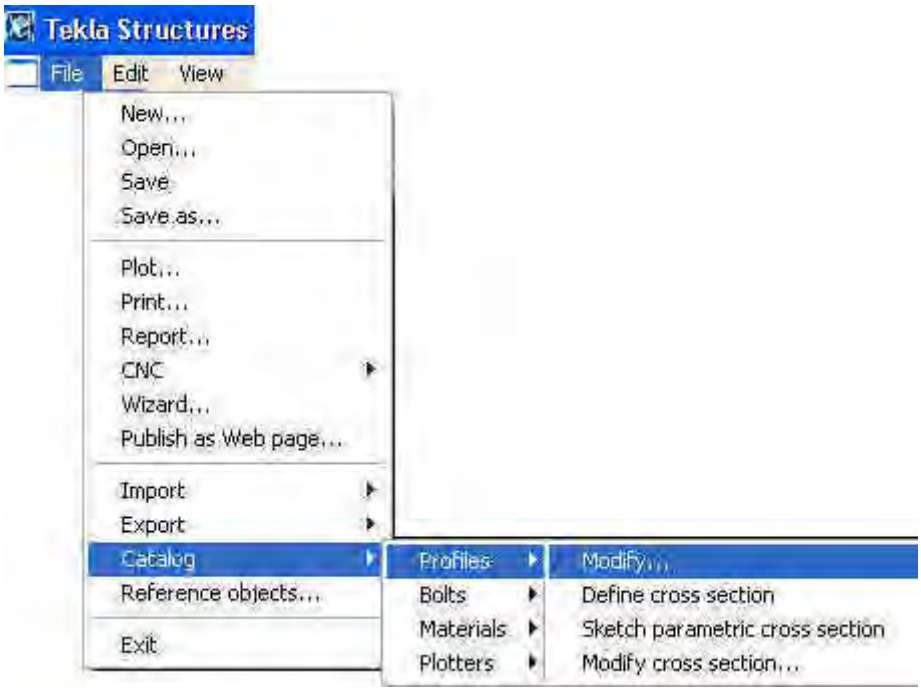


2. Check that **Profile** field has the correct profile name.
3. Close the **Beam properties** dialog.

Check profile catalog

1. Select **Catalog > Profiles > Modify…** from the **File** pull-down menu to access the Tekla Structures Profile catalog. See more information about profile catalog in Tekla Structures **Help: System > Catalogs > The profile catalog**.



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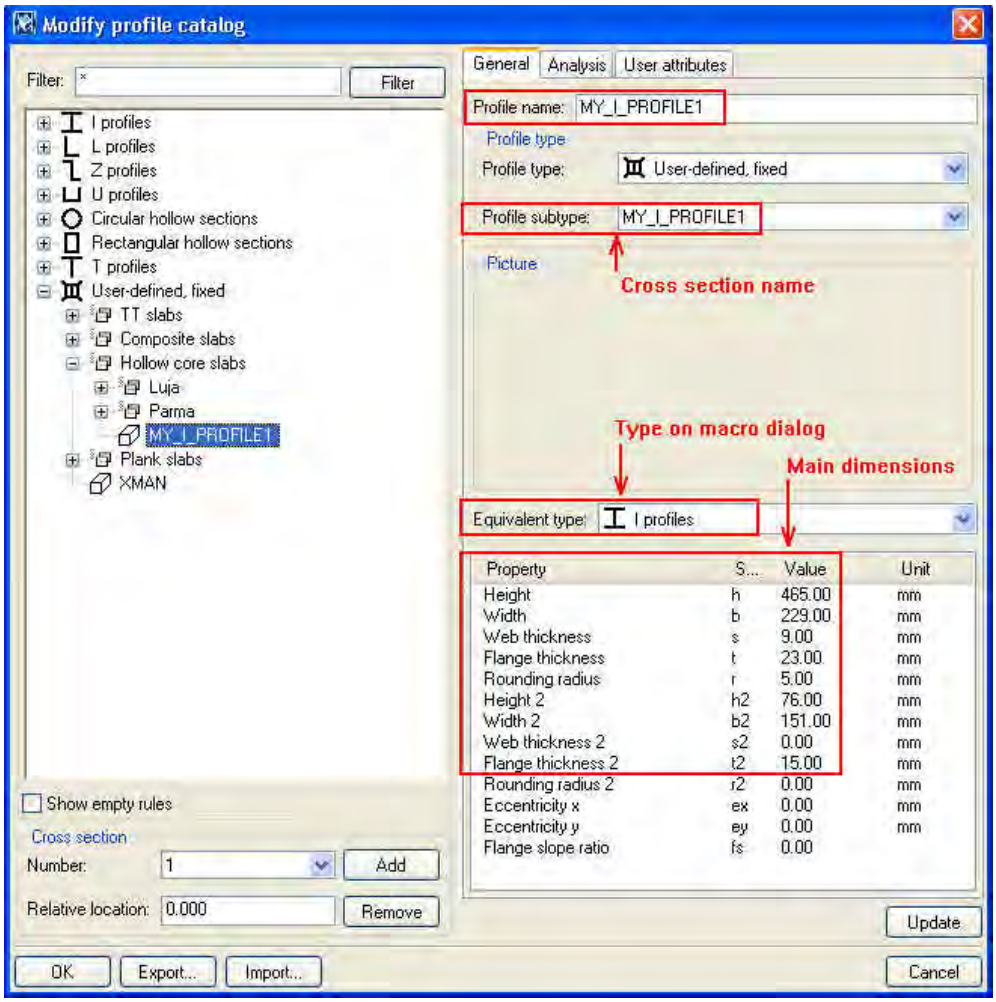
2. Find the new profile under **User defined, fixed** rule group. Tekla Structures places user defined profiles automatically under this rule.
3. Check the profile dimensions and general information on the **General** tab page. See that the cross section name in the **Profile** subtype field is the same as you defined in the macro dialog. Also check that the **Equivalent** type, which was defined in the **Type** field in the macro dialog, is correct.



4. Pick the **Analysis** tab page. Tekla Structures has automatically calculated the cross section area and unit weight for the new profile. Check that they are correct.

5. Press the **OK** button to save the profile and close the dialog.

Use the Profile in Model

Define beam settings

Once the profile has been created we can immediately use it in our model. Complete the settings in beam properties dialog and start creating the crane beams.

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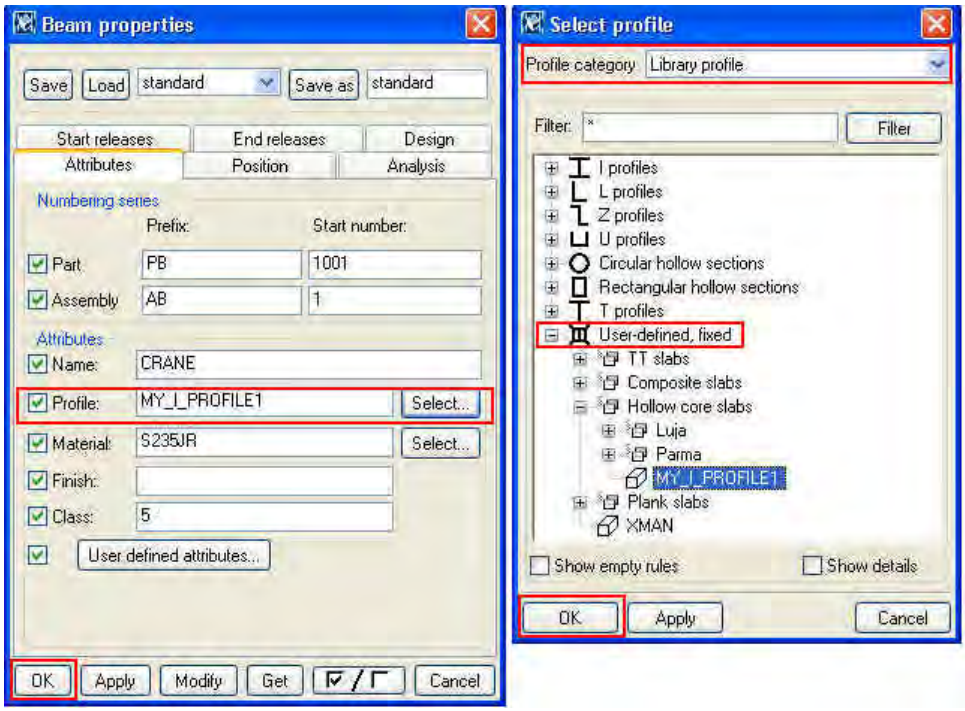
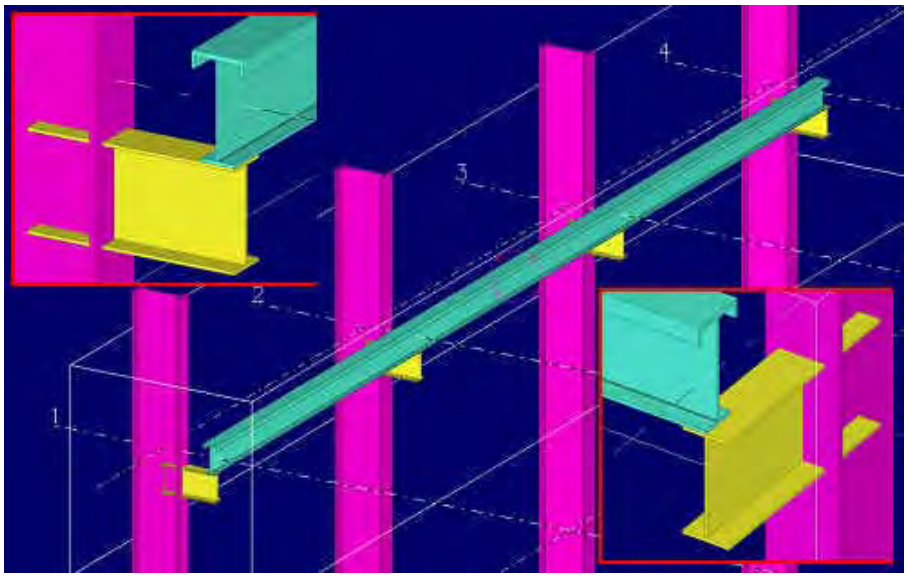
1. Double-click the **Create beam** icon and complete the beam properties as described below.
2. Select **MY_I_PROFILE** from **Select profile** list dialog under **Library profile category > User defined, fixed rule set**.



3. Press **OK** on both dialogs.

Create the cranes

When the beam settings are ready we can begin to create the crane beams. First we will create one beam and check that the shape and position are correct.



1. Zoom in to intersection of grid lines F and 1 on top of the IPE450 supporting beam.
2. Create one crane beam between lines 1 and 4. Start at the outer edge of the supporting beam on line 1, end at the middle of the supporting beam on line 4.
3. Select the crane beam and copy it between the grid lines 4 and 7.
4. Select both crane beams and copy them to the other side of the building on grid line C.

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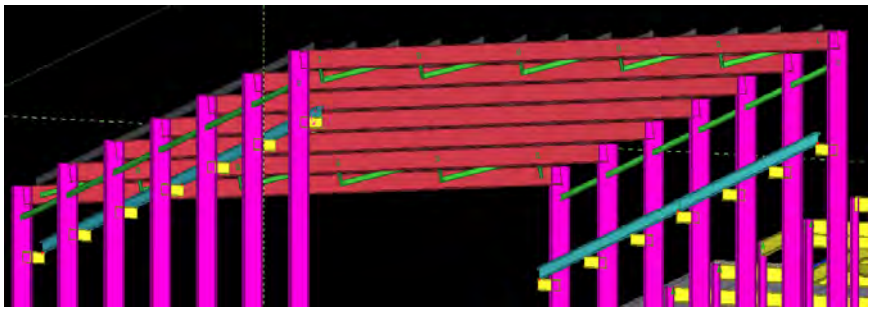
We now have crane beams on both sides of the building.

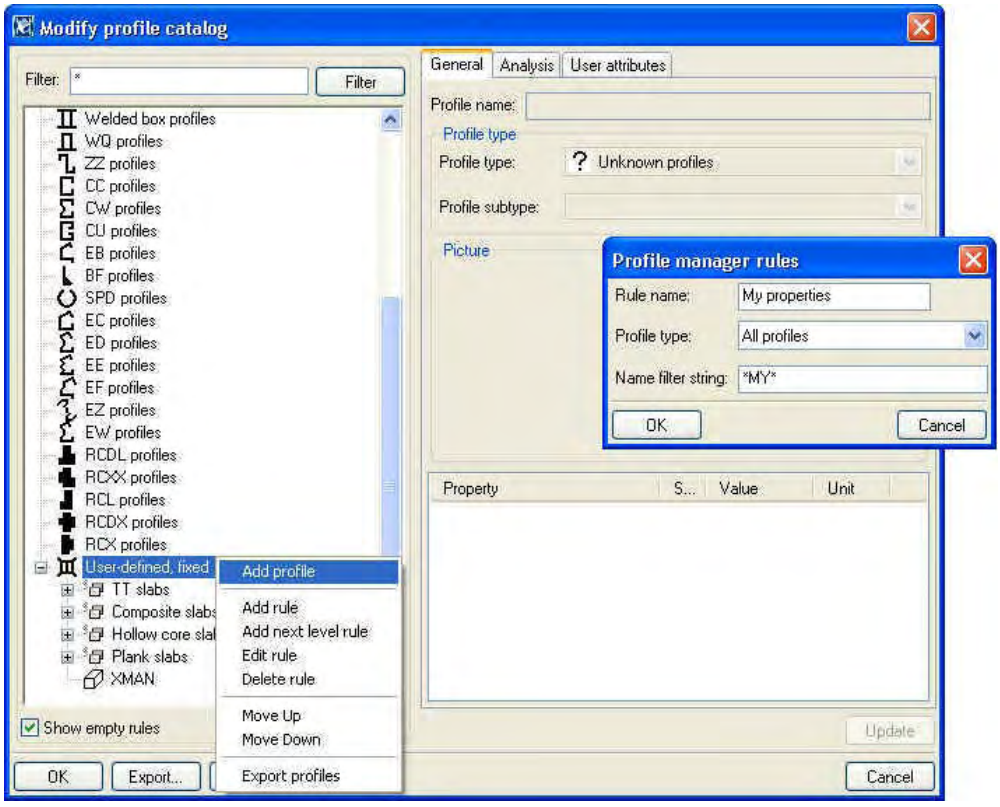
Add a Rule to Profile Catalog



Next we will add a rule for the new profile in the profile catalog. Profiles are grouped according to rules such as profile type (e.g. I profiles) and profile sub-type (e.g. HEA). See more about rules in Tekla Structures **Help: System > Catalogs > The profile catalog > Working with rules**.

Add a rule

1. Right-click on the profile tree dialog (**File -> Catalog -> Profiles -> Modify…**), click **Add rule** to display the **Profile manager rules** dialog box.



2. Type in the **Rule name** My properties.
3. Choose the **Profile type** to which the rule will be applied.
4. Enter the **Name filter** string that will define the new rule. Tekla Structures groups the catalog entries that satisfy your criteria under a new rule. In this case, to group all **MY_PROFILES** enter ***MY*** in the name filter field. See more about filters in Tekla Structures **System > Catalogs > Things you should know > The filter**.

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As a default the wildcard symbol (*) is entered, meaning "all entries". To group all catalog entries with names beginning with A, enter A* as the Name filter string. To group all catalog entries with names containing 100, enter *100*. The characters ***** and **?** can also be used in object names. If the object name you want to filter contains ***** or **?**, enclose * or ? in square brackets. E.g., to find the profile P100*10, enter P100[*]10 in the filter field.

5. Press **OK** to save the rule and close the dialog.

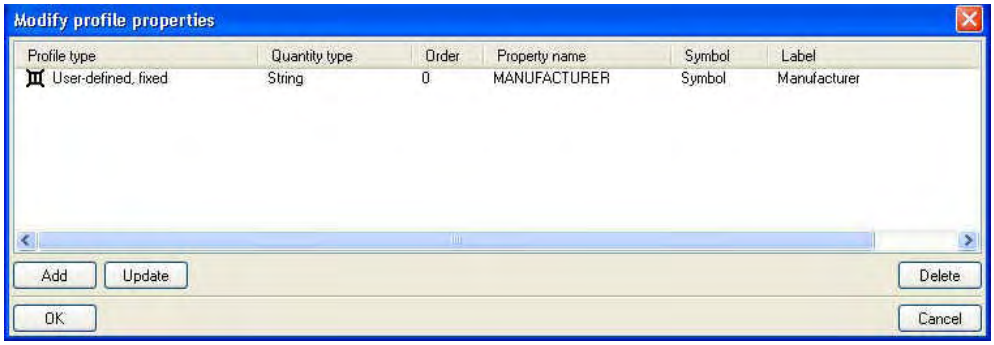
Add User-Defined Information to Profile

We will next add the profile manufacturer information into the profile catalog by way of user-defined attributes. For that you need to re-open the profile catalog. See more in Tekla Structures **System > Catalogs > The profile catalog > Adding user defined attributes to a profile**.

Create a new user attribute

Select the **User attributes** tab page in the **Modify profile catalog** dialog.

1. Press the **Definitions…** button. Tekla Structures opens a **Modify profile properties** dialog box.
2. Press **Add**. Tekla Structures creates a new user defined attribute.
3. Select **User defined, fixed** profile type from pull-down list.
4. Check that **Quantity type** is set to String.
5. Under **Property name** enter a unique name (e.g. MANUFACTURER) for the new attribute. Blank spaces are NOT allowed in the name.
6. Enter a name (e.g. Manufacturer) for the attribute under **Label**. This text will be displayed in the dialog.



7. Press **Update**. Tekla Structures updates the attribute values.
8. Press **OK** to save the information. When re-opening the **Modify profile properties** dialog, the new attribute appears under **User defined, fixed** -type profiles.

Enter value for the attribute

1. Select **MY_I_PROFILE** from profile catalog.
2. Insert a manufacturer name (e.g. My workshop) into **Value** field on the **User attributes** tab.

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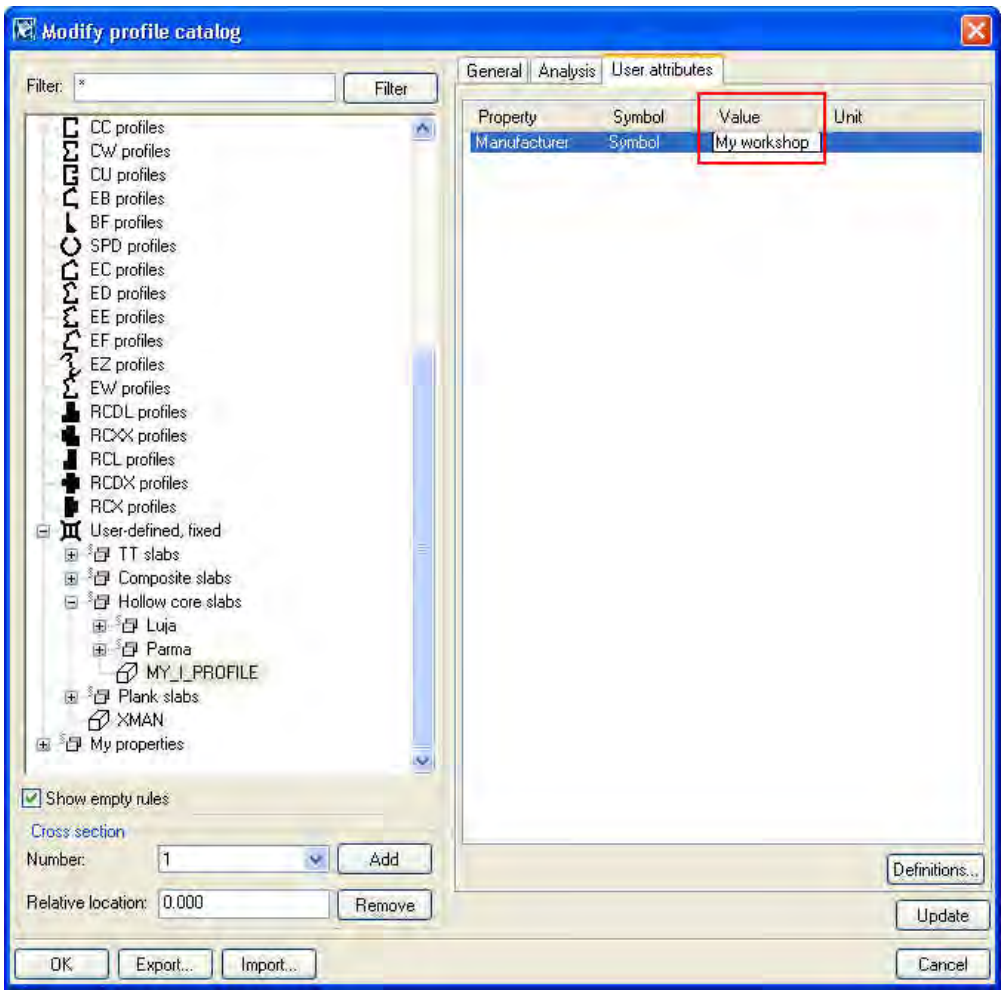

3. Press **Update** to enter the information to selected profile.
4. Press **OK** to save the information and close the dialog.

Add a Library Profile – Parametric Profiles

We will next add a standard (fixed) profile to the profile catalog using a pre-defined parametric profile. This makes it faster and easier to select the necessary profile when adding it to the model; otherwise we would have to define the dimensions for the parametric profile in the beam properties dialog.

See more information about profile catalog in Tekla Structures **System > Catalogs > The profile catalog**.

Add profile

1. Select **Catalog > Profiles > Modify…** from the **File** pull-down menu.
2. Right- in the tree structure and click **Add profile**. A new profile will be created with the name **PROFILE** (number).

Set profile properties

3. Change the profile name to **MY_FOOTING_BEAM1**. The profile name must be uppercase, with no spaces. Tekla Structures will automatically convert lowercase text to uppercase in this field.

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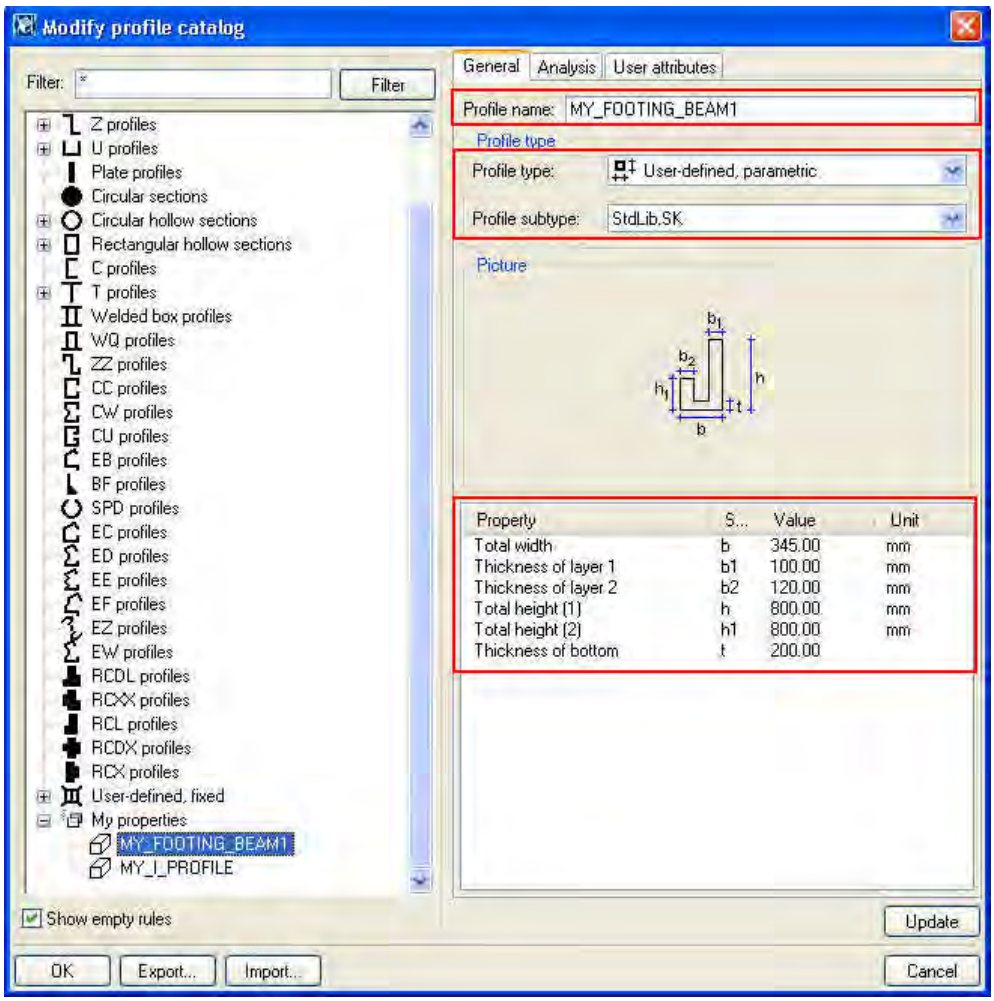

4. Choose the **Profile type, User defined, parametric** from pull-down list and the **Profile subtype StdLib.SK**.
5. Enter dimensions for the profile. These dimensions will be fixed on the part properties dialogs, and can be changed only in the **Modify profile catalog** dialog.
6. Press **Update** to insert the values to the profile.
7. Press **OK** to save the values.

6.2 Use the New Library Profile – Add Footing Beams to Model

We will next use the new library profile to model footing beams.

Define Beam Properties

We will first set the beam properties, find the correct profile and set the correct position.

Select the profile

1. Double-click **Create concrete beam** icon to open the properties dialog.

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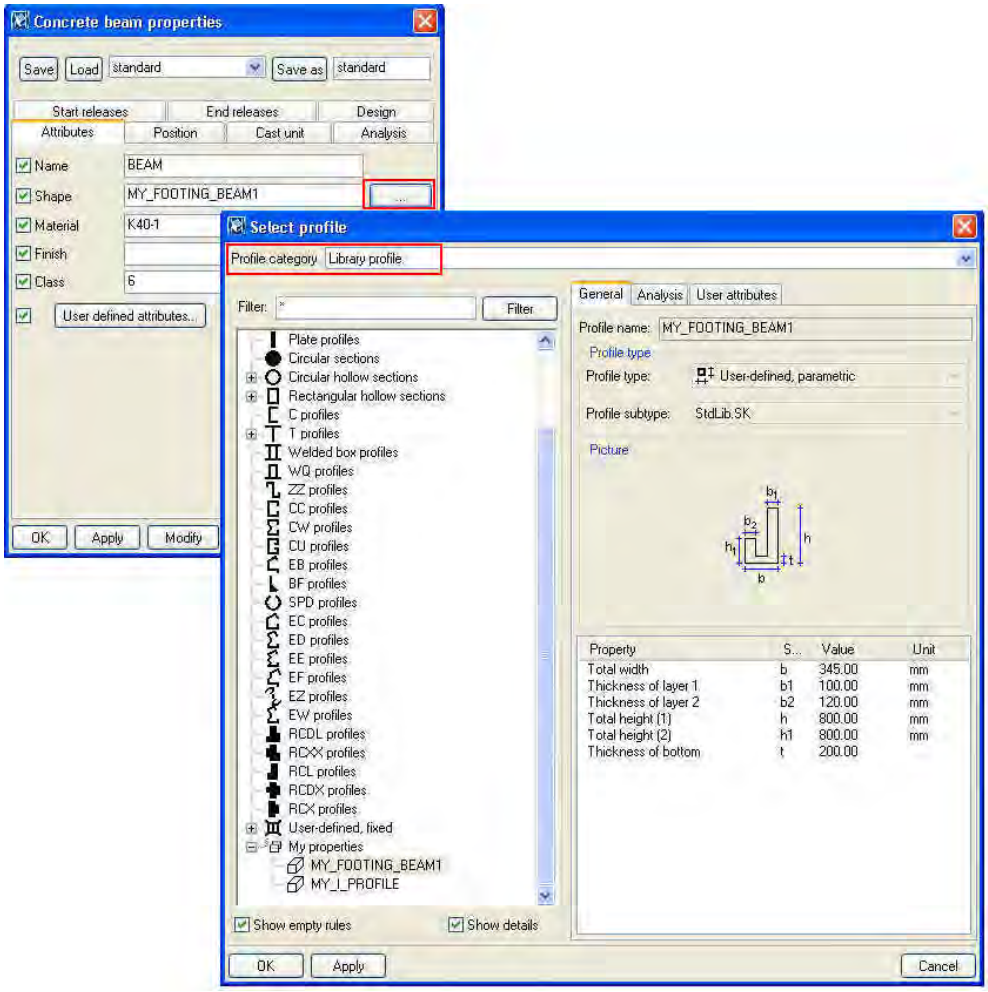
2. Select the new profile by pushing **...** (Browse) button. Tekla Structures opens the **Select profile** dialog.
3. Select **Library profile** for profile category.
4. Select MY_FOOTING_BEAM1. The dimensions are fixed and can only be changed in the **Modify profile catalog** dialog.



5. Press **OK** to accept the profile and to close the dialog. **MY_FOOTING_BEAM1** appears in **Shape** field in the **Concrete beam properties** dialog.

Set the position

6. Select the **Position** tab page and set the position as shown below.

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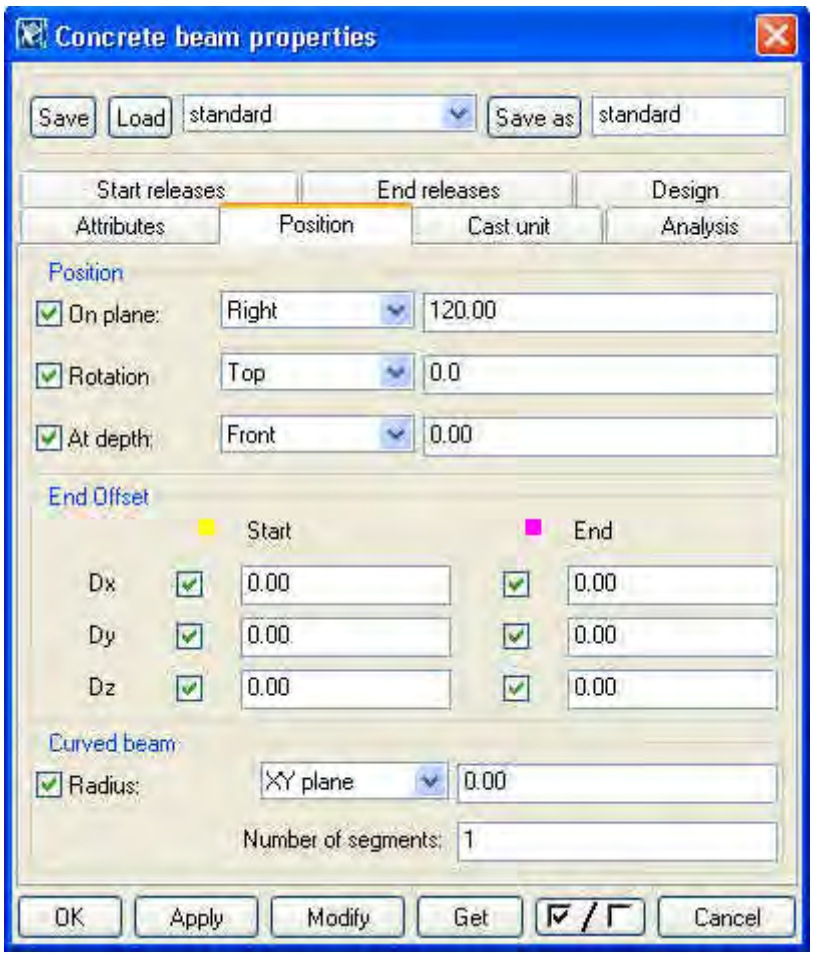

7. Press **OK** in **Concrete beam properties** dialog to accept the beam settings and to close the dialog.

Create Footing Beams

When the beam settings have been completed you can start creating the footing beams. Create first one beam and check that the shape and position are correct.

Create footing beams

1. Pick the starting point for footing beam on plane view +0.00 at the outer corner of column.
2. Pick the end point for the footing beam on plane view +0.00 at the intersection of the grid line and the column outer plane.

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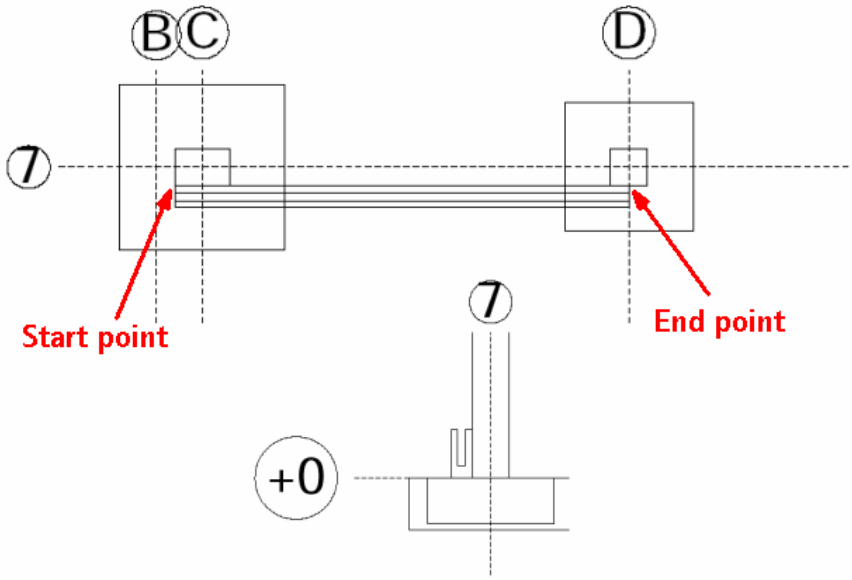
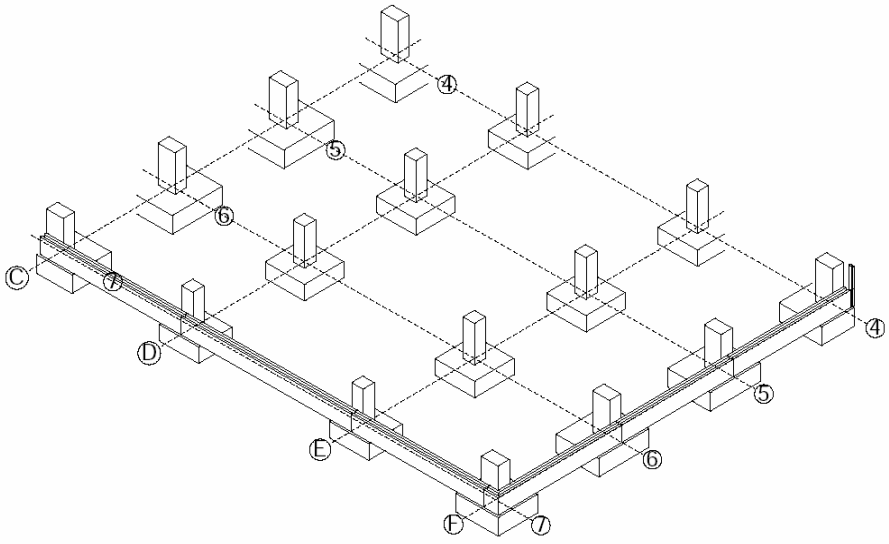


3. Complete by clicking the middle button.
4. Check the position by creating part views. Pick the footing beam, right-click and select, **Create view > Part basic views...**
5. Select the **Create concrete beam** icon again and create the next footing beam. Make the start point at the end point of previous beam and the end point at the next grid line. Repeat for the next beam. You should now have 3 footing beams at grid line 7.
6. Skip the corner and continue creating footing beams between grid lines 6 and 4.

Create Polybeam

We will now create a footing beam to wrap around the corner using the polybeam function.

See more about polybeams in Tekla Structures **Help: Modeling> Parts > Steel part commands > Polybeam**.



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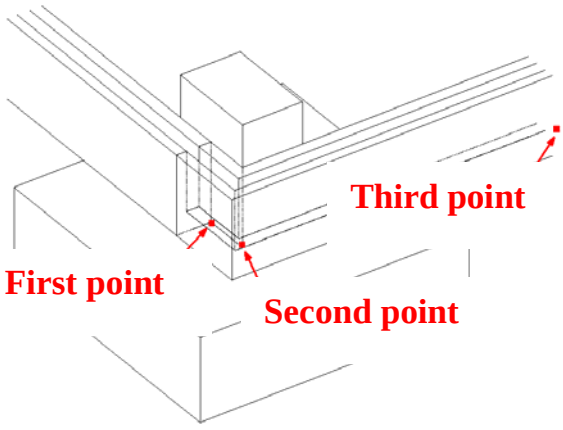


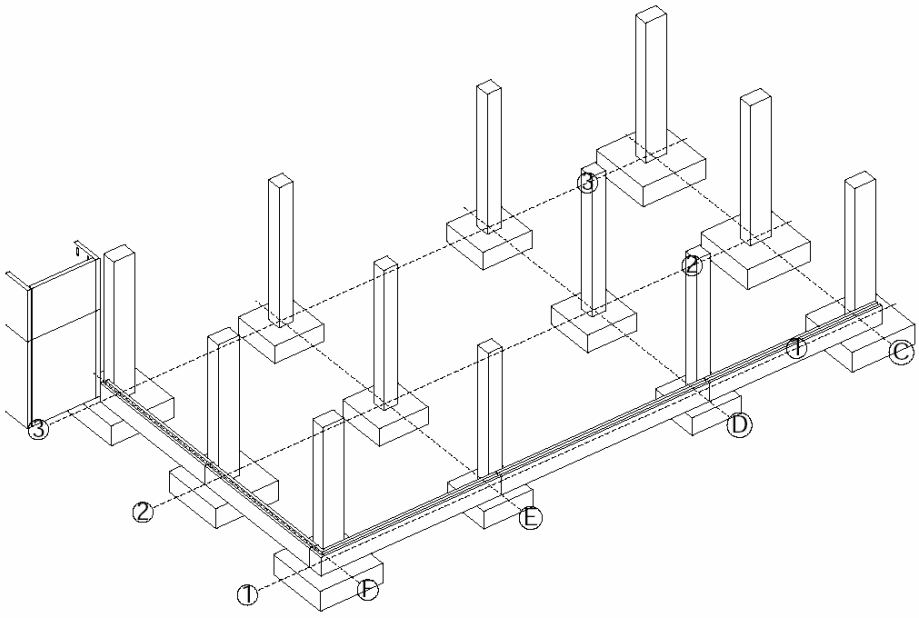
Create footing polybeam

1. Select **Create concrete beam** icon again and pick the starting point at the end point of beam between grid lines E and F.
2. Then pick to the column outer corner.
3. Make the third pick at grid line 6.
4. Complete the polybeam by clicking the middle button.

Complete Footing Beams

Create the remaining footing beams

1. Continue by creating the footing beams on grid line 3.
2. Create another footing polybeam at the corner.



3. Create the last two footing beams between grid lines E and C.

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6.3 Modify Material Catalog – Add a New Material

We will next add a new material called **Neoprene** to the catalog. Neoprene will be used later on concrete consoles.

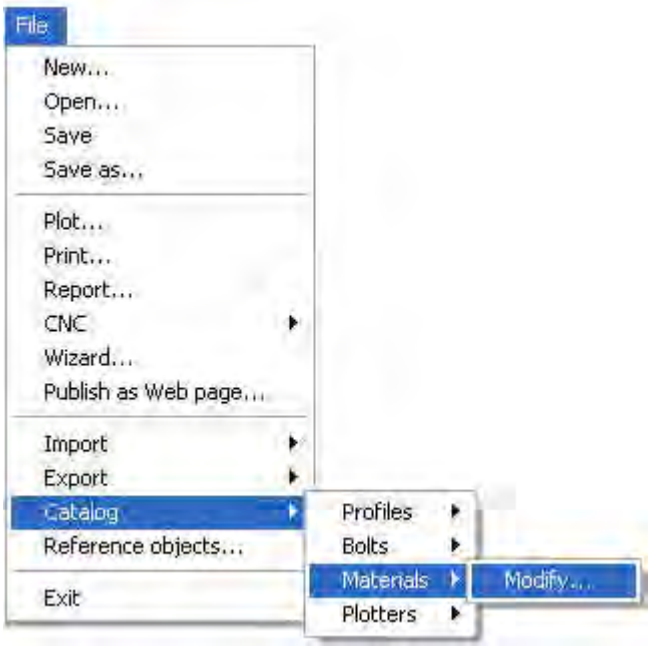
See more about material catalog in Tekla Structures **System > Catalogs > The material catalog**.

Add a New Material Type

We will first create a new material type under which the new material will be created.

Open the material catalog

Select **File > Catalog > Materials > Modify…** from **File** pull-down menu to open the Modify material catalog dialog.



Create a new material type

If the material type you need is missing from the tree, you can create a new one.

1. Right-click on a material branch in the tree and select **Add miscellaneous branch**.

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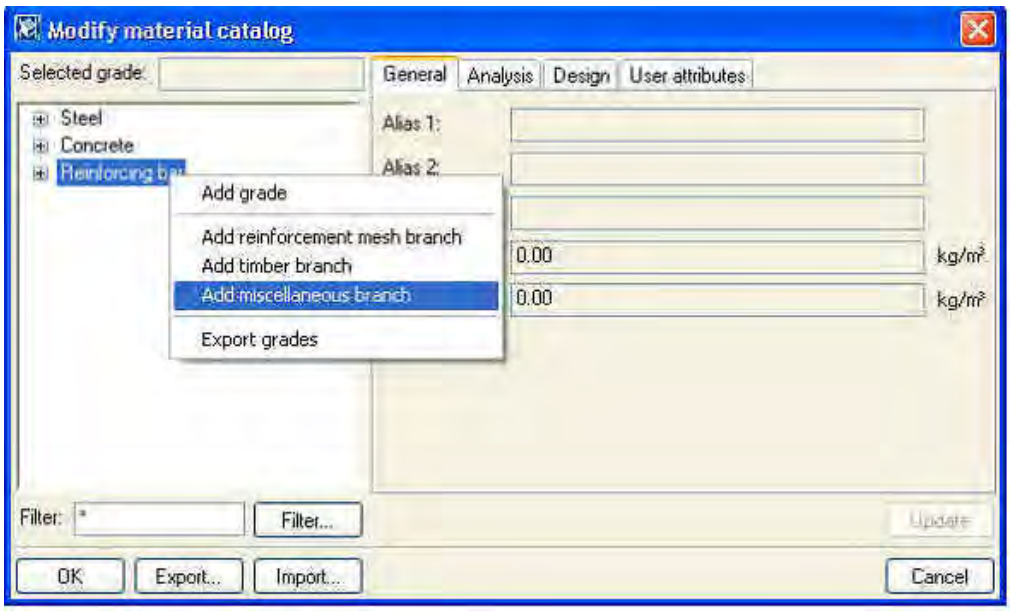
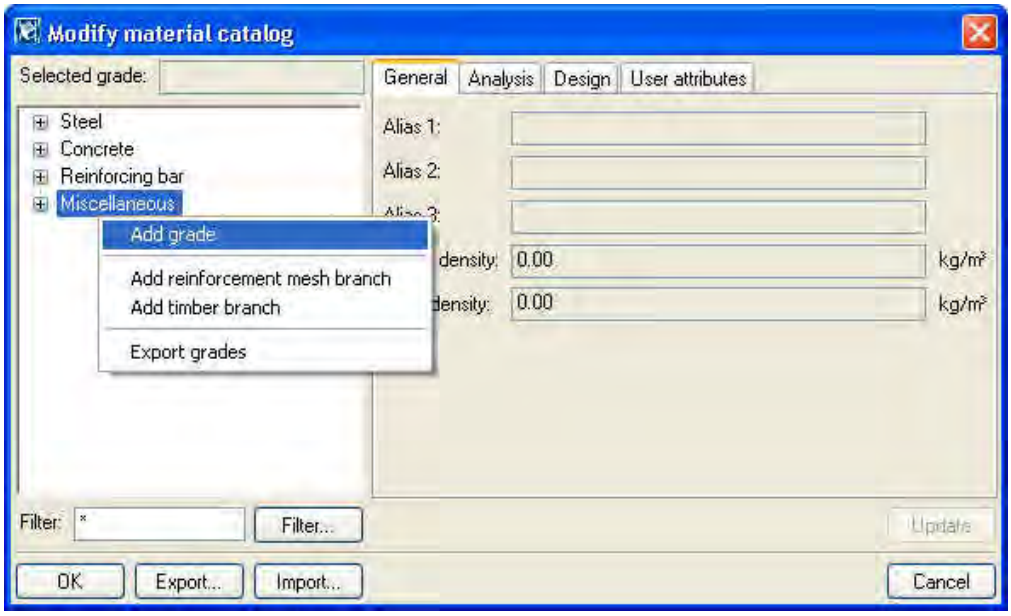


Add a New Material

We will next add a zero-weight material under the miscellaneous branch and use it for silos in the model.

Create a new material grade

2. Right-click on **Miscellaneous branch** in the tree and select **Add grade**.



3. Type **Zero_weight** for the material name in the tree.

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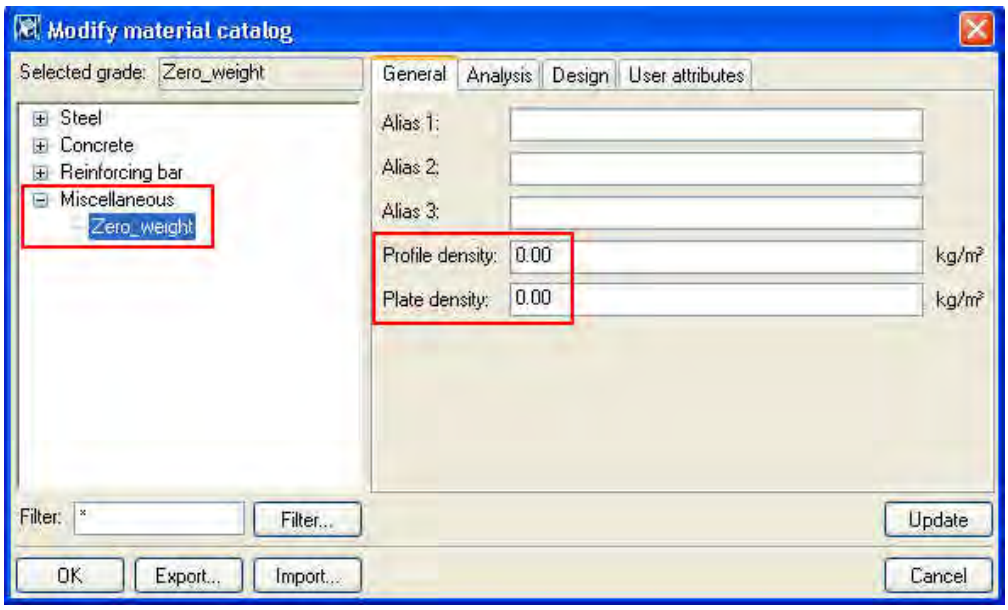


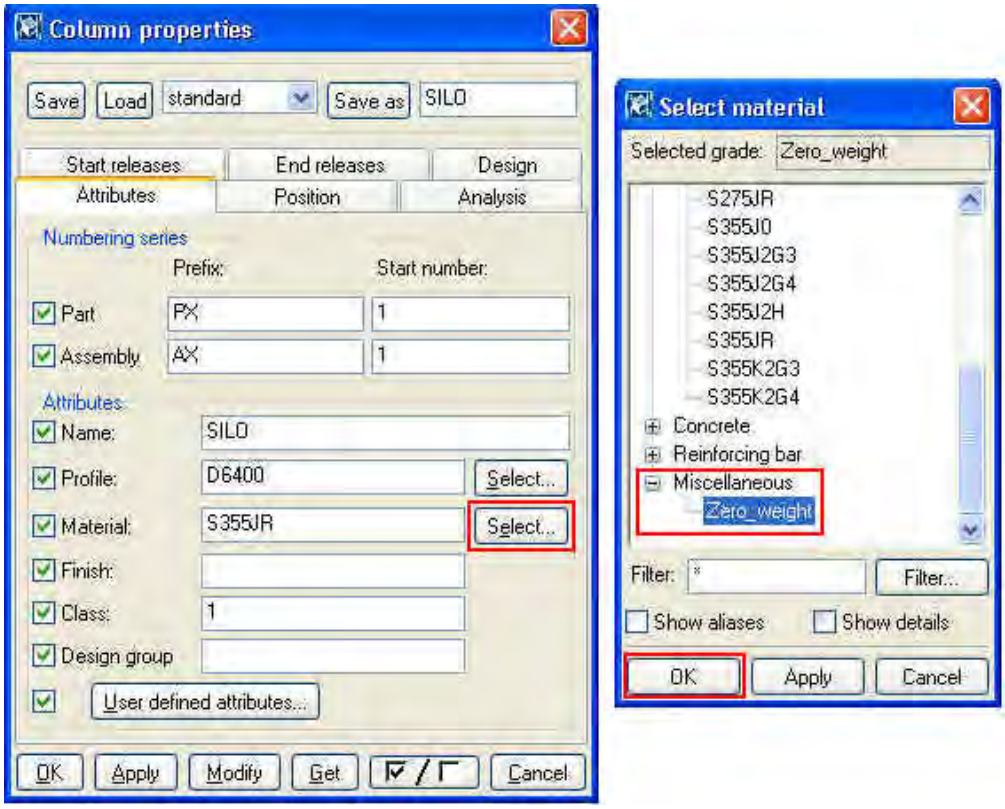
4. Add the material's **density** 0.00 for profiles and plates.
5. Save the new material type and grade by pressing **OK**.

We will next use the new zero-weight material for the silos in order to exclude the silos out from the total weight of the model.

Change material of the silos

Select the two silos in the model and double-click on one of them while holding the **Shift** button down to open the properties dialog.

1. Select **Zero_weight** material from **Select material** list.
2. Close **Select material** dialog by clicking **OK**.
3. Push **Modify** button in the **Column properties** dialog to change the material of the silos.



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