Tekla Structures 2019i

Upgrade to this version

September 2019

Contents

1 Tekla Structures 2019i release notes

Welcome to Tekla Structures 2019i!

Check the links below for information on the many new features and improvements in this version:

Compatibility

We suggest that you complete any unfinished models using your current version of Tekla Structures.

This version is not backwards compatible. When you create or save a model in Tekla Structures 2019i, you cannot open it in older versions due to database differences.

Tekla Structures 2019i can only be installed on 64-bit Windows operating systems.

See the Tekla Structures 2019i Hardware Recommendations for more information.

Tekla Structures 2019i requires **Tekla License Server 2017** or later. To check which license server version to use with your current Tekla Structures version, see Which license server version to use.

Administrator's release notes

Advanced users should read the Tekla Structures administrator's release notes (page 74) for information on how to apply the additional customizations available in this release.

Localization release notes

Environment-specific changes are explained in the Localization release notes (page 106).

Tekla Open API release notes

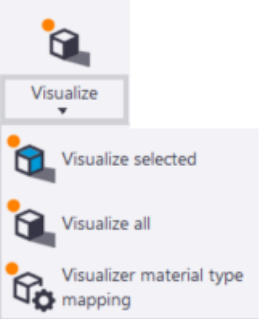
The Tekla Open API release notes can be found in the Tekla Developer Center .

1.1 Trimble Connect Visualizer - Create 3D renderings of your models

Starting from Tekla Structures 2019i, you can now access Trimble Connect Visualizer directly from Tekla Structures. In Trimble Connect Visualizer, you can take snapshots or create animations that demonstrate the design of your models and the build options, and use the snapshots and animations to create more appealing sales and project presentations.

Create 3D renderings and set material type mappings

The **Visualize** commands are located on the **View** tab.

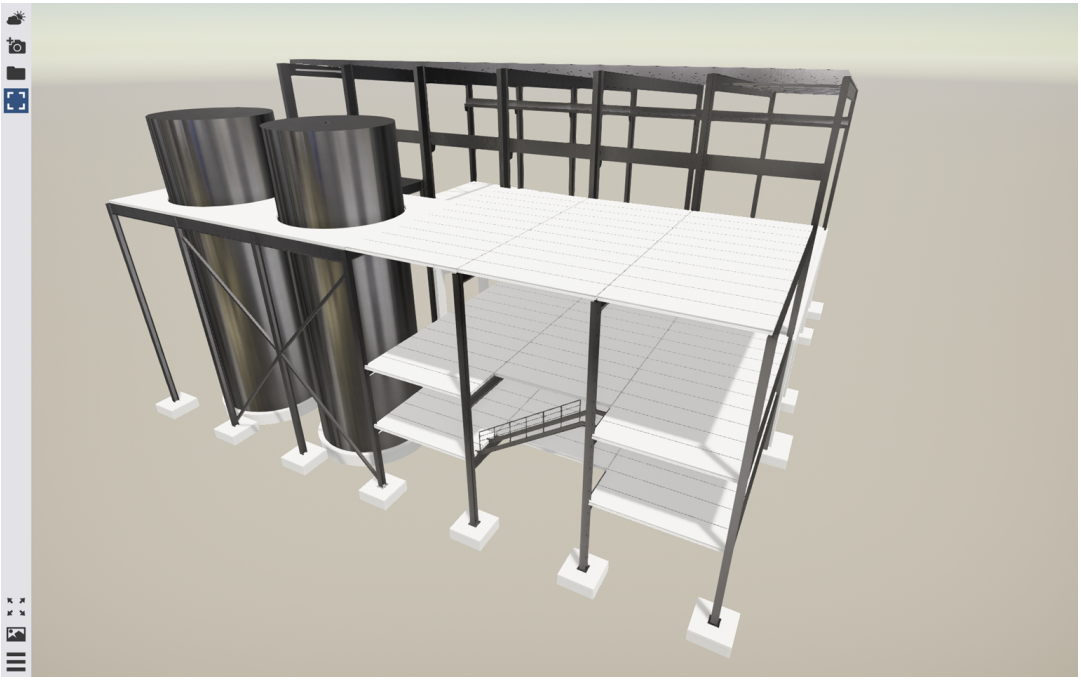


- Click **Visualize selected** to open a rendering of the selected model objects in Trimble Connect Visualizer.
- Click **Visualize all** to open a rendering of the entire model in Trimble Connect Visualizer.
- Click **Visualizer material type settings** to open the **Visualizer settings** dialog box, where you can adjust how the materials in your model are shown in Trimble Connect Visualizer.

  The material type mappings can be saved either:

  - to the `\attributes` folder under the model folder, so that all users of the model can use the material type mappings.
  - to the app data, so that the same material type mappings can be applied to all of your models.

Adjust the model view in Trimble Connect Visualizer



You can zoom, pan, and rotate the model to view different angles of the model.

To	Do this
Zoom in or out	Do either of the following: • Scroll forward or backward with the mouse wheel. • Press the W and S keys on the keyboard.
Pan the model	Do either of the following: • Hold down the left mouse button, and drag the model as needed. • Press the A and D keys on the keyboard.
Rotate the model	1. Place the mouse pointer over the point around which you want to rotate the model. 2. Hold down the left mouse button. 3. Drag the model as needed.

Click  on the Trimble Connect Visualizer side pane to further adjust the scene. You can change:

- The used skybox, or background, and its rotation
- The position of the sun
- The brightness of the scene
- The visibility and position of the ground plane

Take and view snapshots

All snapshots that you take in Trimble Connect Visualizer are saved in the `C:\Users\<username>\Pictures\TrimbleConnectVisualizer` folder.

- To take a snapshot of the current view, click  in the Trimble Connect Visualizer side pane.
- To open the `C:\Users\<username>\Pictures\TrimbleConnectVisualizer` folder and see all snapshots that you have taken, click  .

Create animations

You can create animations that show the model from different angles, or views.

To start creating animations, click  on the Trimble Connect Visualizer side pane.

Then, click **+** to add the views that you want to include in the animation.

You can also adjust the speed of the animation and the sun position, and preview the animation.

1.2 Switch between manual and automatic applying in the property pane

In Tekla Structures 2019i, when you modify properties in the property pane, you can use the new **Set default values automatically** option to switch between automatic and manual applying of properties for the next objects of the same type.

Previously, Tekla Structures always automatically saved the modified properties and applied them for the next objects of the same type. The **Set default values automatically** option makes the property pane more consistent with the dialog boxes, where you use the **Apply** button to set the properties for next objects of the same type. Now you can follow the same workflow both in the property pane and in the dialog boxes.

The **Set default values automatically** option is not dependent on the selected object type. You can switch between manual and automatic applying at any time.

Enable manual applying of properties

1. Select an object in the model.
2. Click the **Property pane settings** button in the property pane to open a drop-down menu.
3. Ensure that the **Set default values automatically** option is **not** selected.

   A **Set as default** button appears at the bottom of the property pane.

   Note that if you have selected multiple objects in the model, the **Set as default** button does not appear.
4. Change the property values as needed.
5. Select how to proceed.

- To modify only the selected object, click **Modify**.
- To modify the selected object and to use the current values for the next objects of the same type, click the **Set as default** button and then click **Modify**.
- To use the current values for the next objects of the same type, but not to modify the selected object, click the **Set as default** button.

Depending on your actions, Tekla Structures either modifies the selected object or creates the next object of the same type using the current values.

Enable automatic applying of properties

This is the default option.

1. Select an object in the model.
2. Click the **Property pane settings** button in the property pane to open a drop-down menu.
3. Ensure that the **Set default values automatically** option **is** selected.

   When the **Set default values automatically** option is selected, Tekla Structures automatically uses the current values for the next objects of the same type.
4. Change the property values as needed.
5. Click **Modify**.

Tekla Structures modifies the object and creates the next object of the same type using the current values.

The PropertyPaneSettings.xml file

When you modify the property pane settings, the current settings are saved to the `PropertyPaneSettings.xml` file in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyPane\` folder. If you do not change the settings, the `PropertyPaneSettings.xml` file is not created.

The settings in the `PropertyPaneSettings.xml` file are:

- `FilterMode`: `ByData` for **Show properties that have a value** in the property pane settings
- `FilterMode`: `ByGroup` for **Show properties based on visibility settings** in the property pane settings
- `AutoApply`: `True` when **Set default values automatically** in the property pane settings is selected

- `AutoApply`: `False` when **Set default values automatically** in the property pane settings is not selected

The `PropertyPaneSettings.xml` file is read when Tekla Structures is started and a model is opened.

If the settings in the `PropertyPaneSettings.xml` file are customized, the company administrators can distribute the customized property pane settings to other users in the company. The `PropertyPaneSettings.xml` file needs to be placed in the `\PropertyPane\` subfolder in a model, project (`XS_PROJECT`), firm (`XS_FIRM`) or environment (`XS_SYSTEM`) folder. The property pane settings in the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyPane\` folder has the highest priority, and after that Tekla Structures uses the default search order.

If the `PropertyPaneSettings.xml` file is placed in several different folder locations, Tekla Structures reads the settings from different folders and merges them.

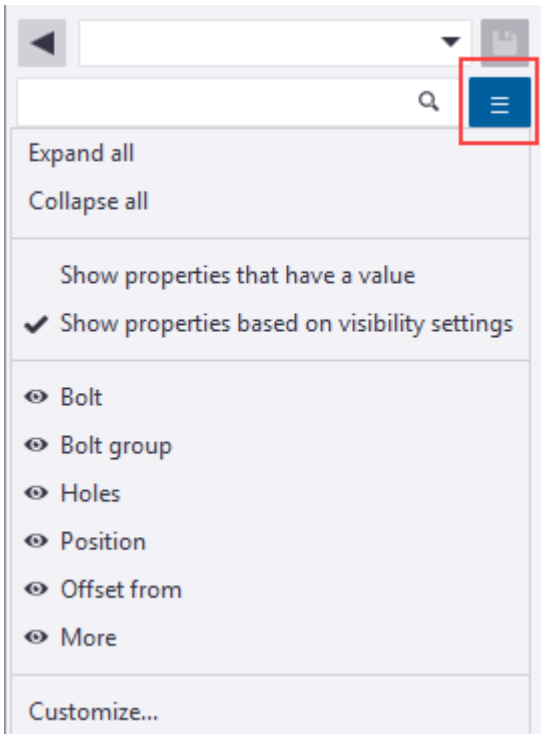
1.3 Updates to the property pane, UDAs, and to the Property pane editor

Tekla Structures 2019i introduces improvements in the property pane and the **Property pane editor**. With these updates, especially the viewing and modifying of user-defined attributes (UDAs) is now easier and more straightforward.

New options to control the visibility of properties and user-defined attributes in the property pane

You can now control which properties are shown in the property pane without customizing the property pane layout.

Click the **Visibility** button to open a drop-down menu in the property pane. When you open the property pane for the first time without any customizations in firm, project, or environment folders, the **Show properties based on visibility settings** option is selected by default.



Expand all or Collapse all

Use to expand or collapse all the property groups.

Show properties that have a value

Select to show only those properties that have a value. This is useful especially with user-defined attributes (UDAs). UDAs that have a value are always shown, even if they have not been added to the property pane layout. This means that you can view and modify the UDA values in the property pane without customizing the property pane layout.

1. Select objects in the model.

   Property pane shows all the properties and UDAs for which you or someone else has entered a value. Properties and UDAs which do not have a value are hidden.

   UDAs that are not included in your current property pane layout but which have a value are listed in the **Additional matches** property group.

2. Modify the property values as needed.
3. If you want to enter a value to an empty property, use the search to temporarily show the needed properties, or select the **Show properties based on visibility settings** option.

The **Show properties that have a value** option is common for all object types. For example, if you select a steel beam in the model and use the **Show properties that have a value** option, and then select a concrete beam in the

model, only those properties that have a value are shown for the concrete beam as well.

Show properties based on visibility settings

Select which property groups are visible and which are hidden. You can show and hide property groups by clicking the property group names. The eye symbols indicate which property groups are visible and which are hidden. You can show and hide only the main level property groups, not nested groups.

1. Select objects in the model.

   Property pane shows all the property groups which are visible in the property pane.

   Property groups with the icon are visible. Property groups with the icon are hidden.

2. Modify the property values as needed.
3. If you want to make a hidden property group visible, click the eye icon again.

The **Show properties based on visibility settings** option is common for all object types. If different object types have property groups of the same name, the visibility of a property group is adjusted for all the object types. For example, if you select a steel beam and hide the **Position** property group, and then select a concrete beam, the **Position** property group is hidden for the concrete beam as well.

To easily define the default visibility of property groups, use the **Property pane editor**. Note that the changes in the visibility settings in the property pane override the default settings defined in the **Property pane editor**.

Customize...

Use to open the **Property pane editor** and customize the property pane layout

Updates in the Property pane editor

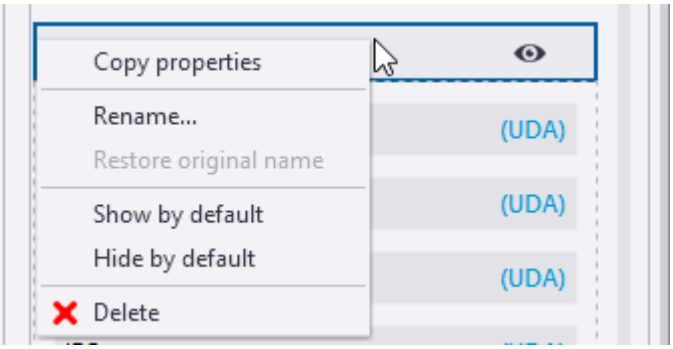
Set property groups hidden or visible

You can define whether the property groups in the property pane are visible or hidden by default.

For example, if you are an administrator, you can create property groups for different user-defined attributes (UDAs) in the **Property pane editor**, and then set the default visibility for each of the property groups.

1. In the property pane layout on the right, select the property groups you want to hide.

2. Right-click and select **Hide by default**.



   The eye symbol changes to hidden: . The selected property groups are now by default hidden in the property pane.

3. To have the property groups again by default visible in the property pane, right-click and select **Show by default**.

   The eye symbol changes to visible: . The selected property groups are now by default visible in the property pane.

Note that visibility changes in the property pane override the default settings defined in the **Property pane editor**.

Copy multiple property groups

In the **Property pane editor**, you can now select multiple property groups to be copied.

1. In the property pane layout on the right, select the property groups to be copied.

2. Right-click and select **Copy properties**, or click .

   The copied property groups and the nested groups inside the property groups are shown in the middle column. The copied property groups are expanded and the content of the groups is shown.

3. Add the copied properties to a property pane layout by dragging the **Copied properties** box from the middle column to the property pane layout on the right.

   All the copied property groups are added to the property pane layout as they are. Previously, the copied properties were nested inside a **Copied properties** container.

Additionally, when you add copied properties to the property pane layout and the property group would be empty as a result of duplicate or incompatible properties, the group is not created at all. Previously, an empty **Copied properties** container was created without any properties.

Improved search in the property pane

Search in the property pane has been improved. Now the search finds all the properties and user-define attributes (UDAs) that are available for the object type.

If you have several object types selected in the model, the search finds properties that are common to all the selected object types. UDAs that match to the search criteria are shown even if they have not been added to the property pane layout. This means that you can view and modify the UDA values in the property pane without customizing the property pane layout.

Properties and UDAs that are not included in your current property pane layout are listed in the **Additional matches** property group.

Note that the search results may vary depending on the environment you are using. Different environments can have different sets of properties available.

Additionally, if you enter a single asterisk ***** in the search box, all properties and UDAs available for the selected object type are shown. You can then easily enter a value for a property or for an UDA, even if the property or the UDA is not visible in the property pane by default.

Improvements in copying of properties

You can now press **Enter** to finish the copying of properties instead of clicking the **Modify** button.

1.4 Snapping improvements

Tekla Structures 2019i introduces new colors and other visual cues for snapping. Also, the behavior of the orthogonal snapping has been slightly changed.

Orthogonal snapping has lower priority among the snap points than previously

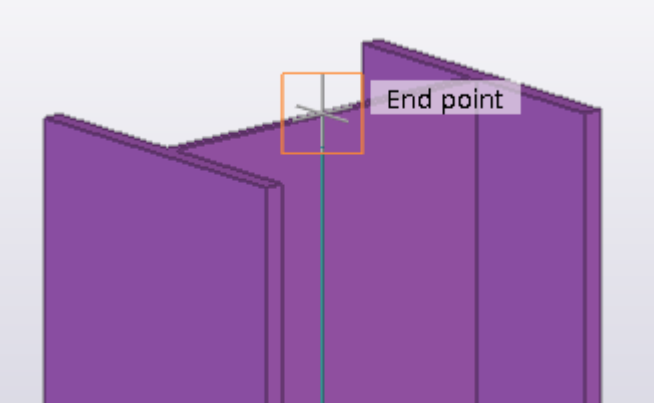
The behavior of the **Ortho** tool has been changed. Now the orthogonal snap points have the lowest priority among the snap points. If Tekla Structures detects any other possible snap point than an orthogonal point, Tekla Structures uses the found snap point instead of the orthogonal snap point. If

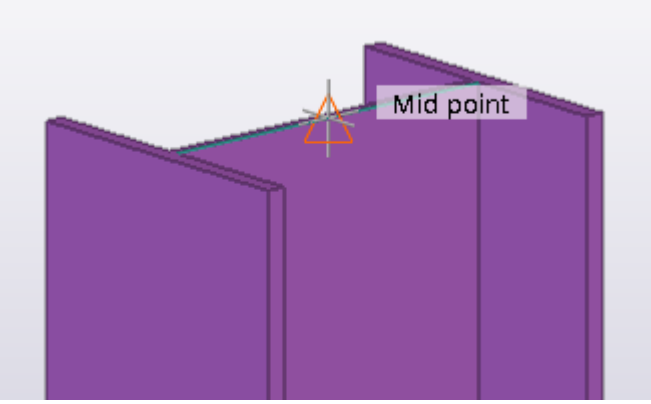
there are no other possible snap points found, then Tekla Structures uses the orthogonal snap point.

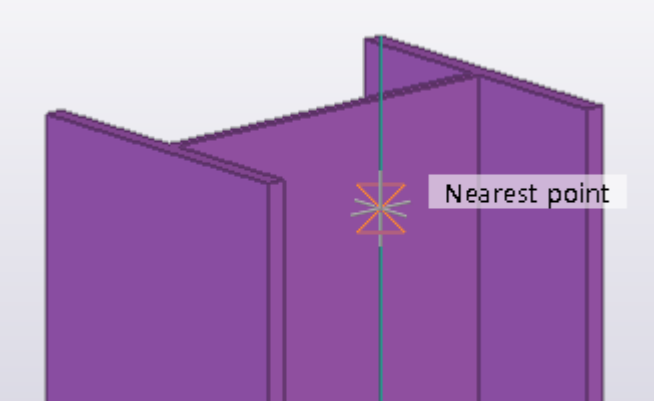
Snap tooltips for snap points

Now when you start a command that requires picking points and you move the mouse pointer over objects in the model, Tekla Structures displays a snap tooltip that shows the name of the snap point.

For example:







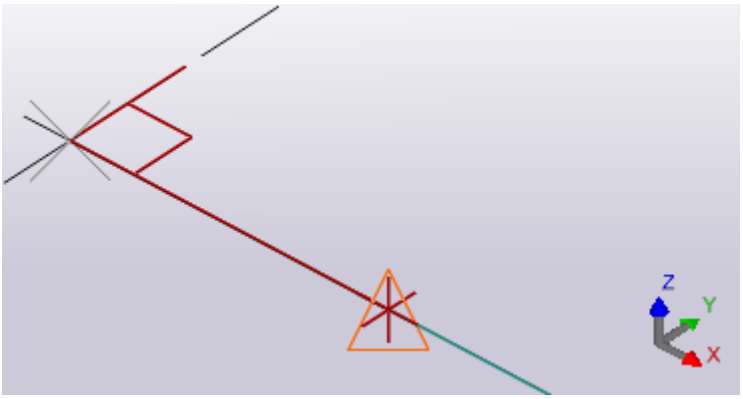
To show or hide these snap tooltips, click **File** --> **Settings** and select the **Snap tooltips** check box.

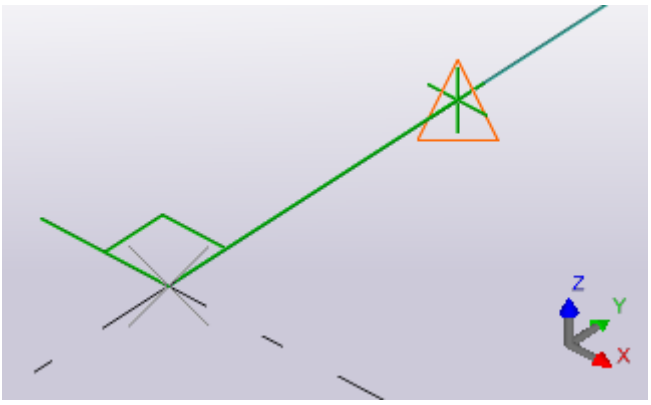
Snapping color changes

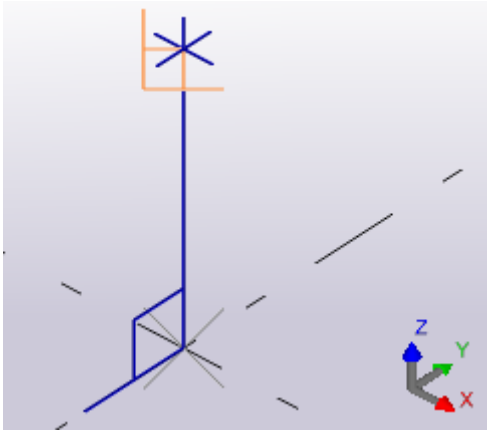
The colors related to snapping have been enhanced to make the snapping easier and more accurate. The different visual cues in the model help you to pick correct positions when you create model objects.

- When the **Ortho** tool is active and you start a command that requires snapping to two or more points, for example a beam or polybeam, Tekla Structures displays a rubber band line between the last point picked and the snap point. The color of the cursor, line, and the angle symbol follows the color of the work plane axis: red for x-axis, green for y-axis and blue for

z-axis. For any other direction the line between the last point picked and the snap point and the cursor is gray.

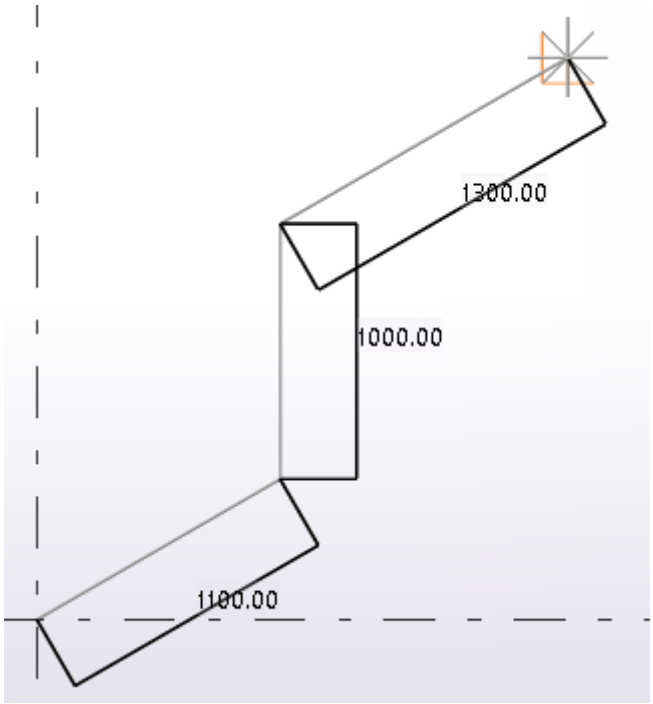






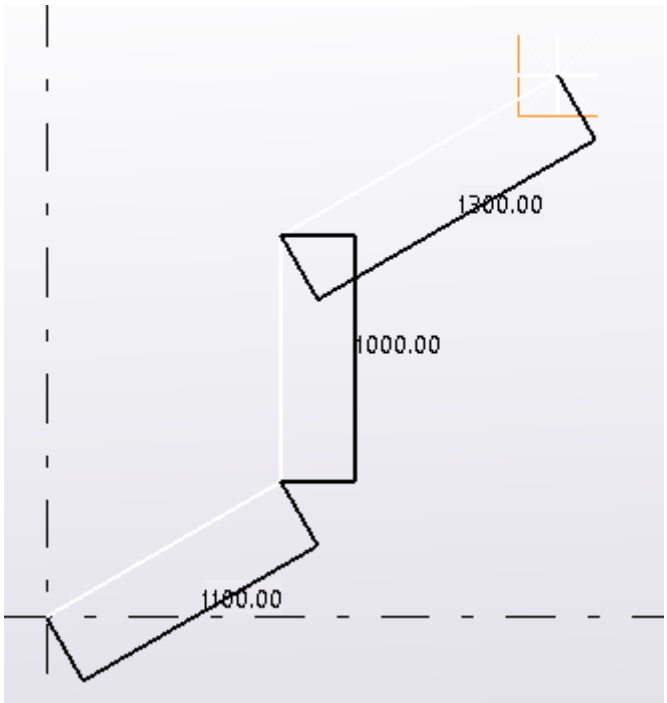
- If you are using the DirectX rendering:

  when you start a command that requires snapping to several points, for example a polybeam or a slab, Tekla Structures now displays the lines between picked points as light gray and dimension lines as black.



If you are using the OpelGL rendering:

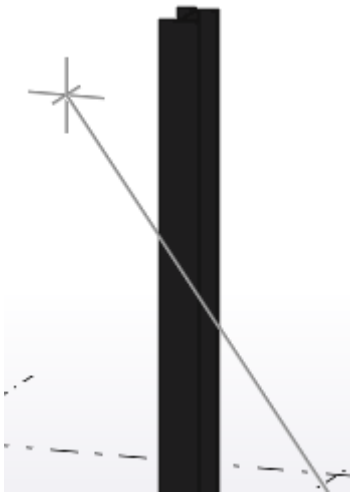
the lines between picked points are white and the dimension lines are black.



- If you are using the DirectX rendering:

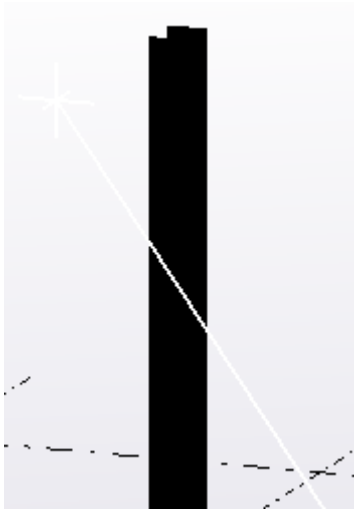
  the rubber band line between the last point picked and the snap point now has a new line type and color which is clearly visible regardless of the

background color of the model. The color of the rubber band line and the color of the reference point symbol, which is the last picked point, is now light gray.

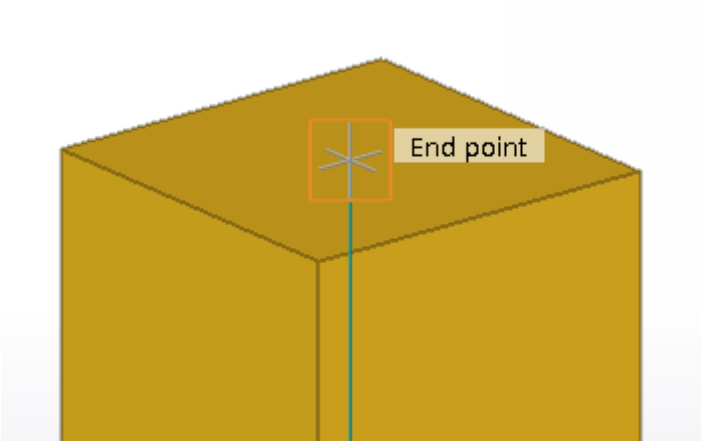


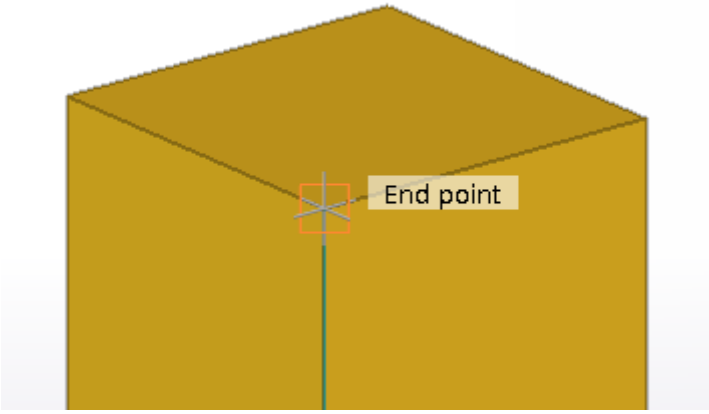
If you are using the OpenGL rendering:

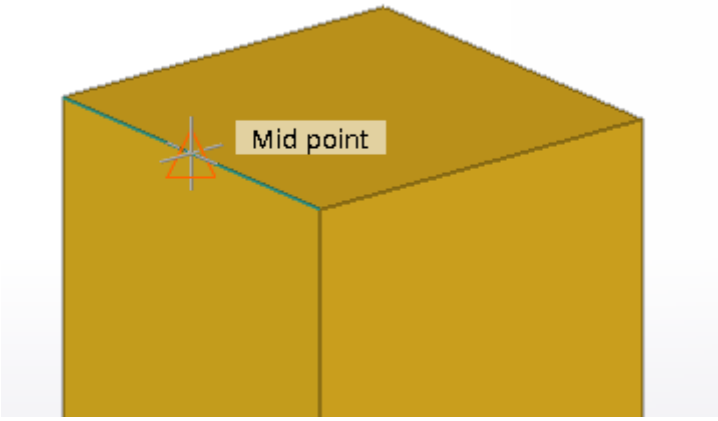
the color of the rubber band line and the color of the reference point symbol, which is the last picked point, is now white.



- Tekla Structures now displays a turquoise reference line or geometry line of the object showing the line or the edge to which the snap point belongs to.







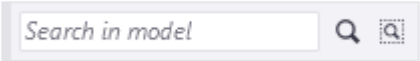
Setting the temporary reference point by using a right-click command

In Tekla Structures 2019, the handling of temporary reference point information was changed. Starting from Tekla Structures 2019, the reference point information is cleared when you interrupt a command. If you wanted to use the reference points in Tekla Structures 2019, you had to set the reference point manually by pressing the **Ctrl** key and picking a point when you run a command.

Now in Tekla Structures 2019i, you can set the temporary reference point also by right-clicking when a command is running and selecting the **Define temporary snap reference point** option. If you use the **Define temporary snap reference point** command, you need to activate it for every reference point you pick.

1.5 Search in model

Now you can quickly search for objects in the entire model or within the selected model objects by using the **Model search** toolbar.



When you run a search in the model, Tekla Structures searches for objects whose property values contain the search term, and then highlights and selects the objects that have matching property values.

For more information, see Search for model objects.

1.6 New part types: lofted plate and lofted slab

Tekla Structures 2019i introduces new part types: steel lofted plate and concrete lofted slab. Use lofted plates to model rolled plates and plates with double-curved form, for example. Use lofted slabs to model curved and double-curved slabs or walls, for example.

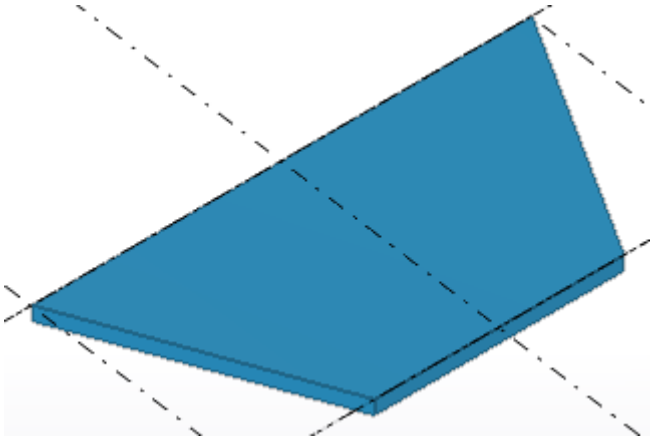
Prerequisites and examples of lofted plates and lofted slabs

Before you can create lofted plates or lofted slabs, you need to have construction objects in your model. Tekla Structures creates the shape of the lofted part according to the geometry of the used construction objects.

You can connect the following construction objects as a lofted plate or a lofted slab:

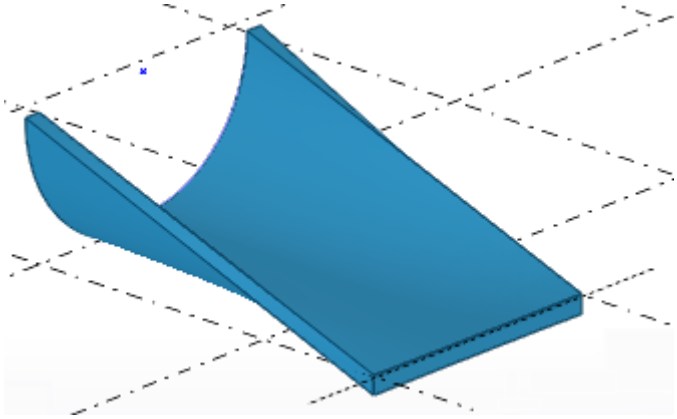
- construction line to construction line

  For example:



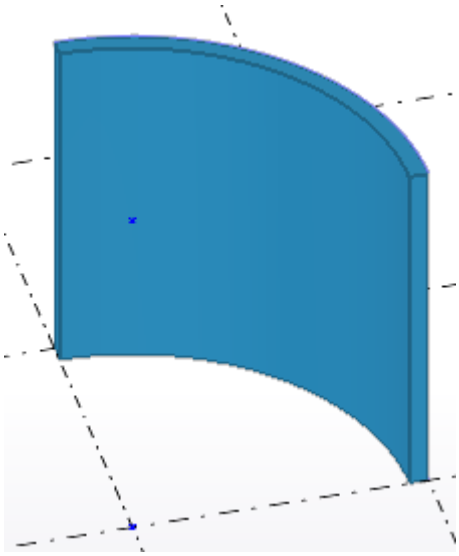
- construction line to construction arc

  For example:



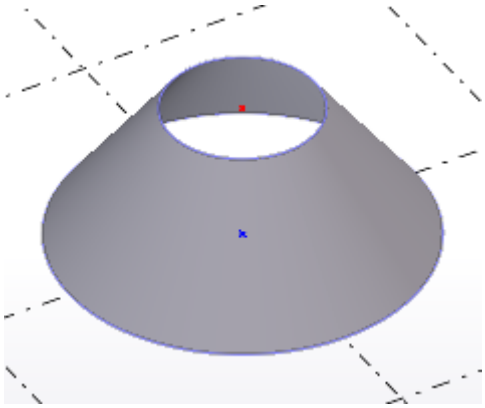
- construction arc to construction arc

  For example:



- construction circle to construction circle

  For example:



Create a lofted plate or a lofted slab

1. Create the needed construction objects in the model. The shape of the lofted part is based on the construction object shape.

   You need to have

   - construction lines
   - construction arcs

     OR

   - construction circles
2. Depending on whether you are creating a lofted plate or a lofted slab:

   - On the **Steel** tab, click **Plate** --> **Create lofted plate**  .

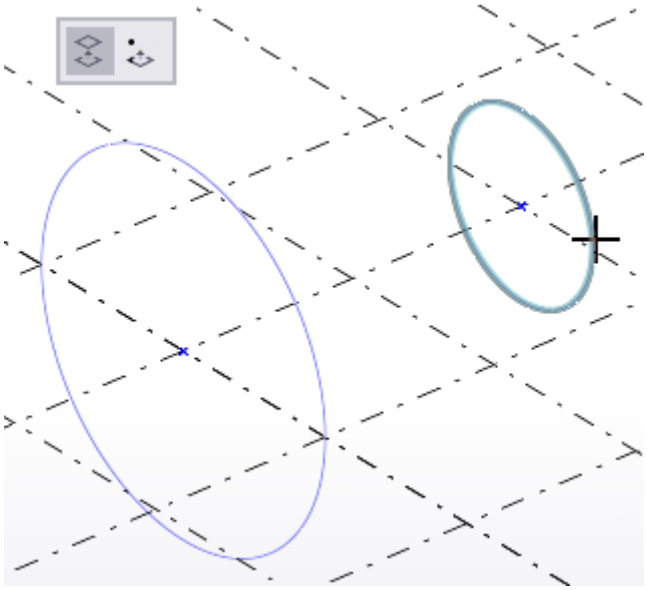
- On the **Concrete** tab, click **Slab Create lofted slab** 

3. On the toolbar that appears  , click a button to specify whether to create the part by using two construction objects, or by using a construction object and a point.

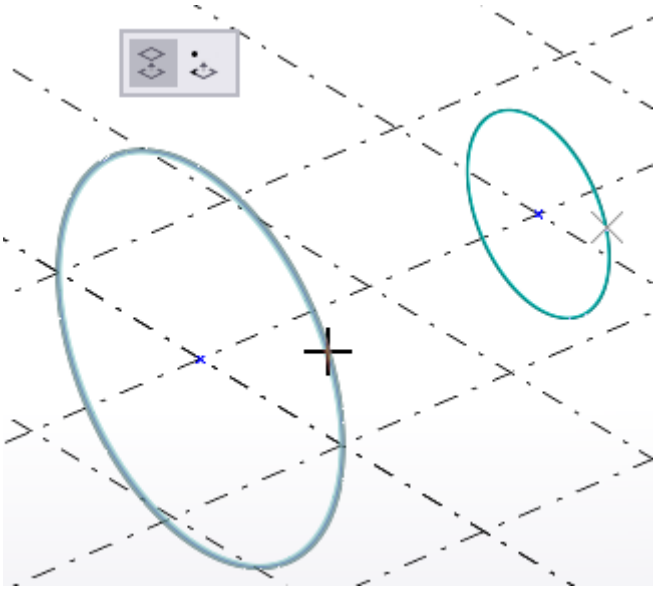
   - If you selected **Using two construction objects**  :

     a. Select the first construction object: line, arc, or circle.

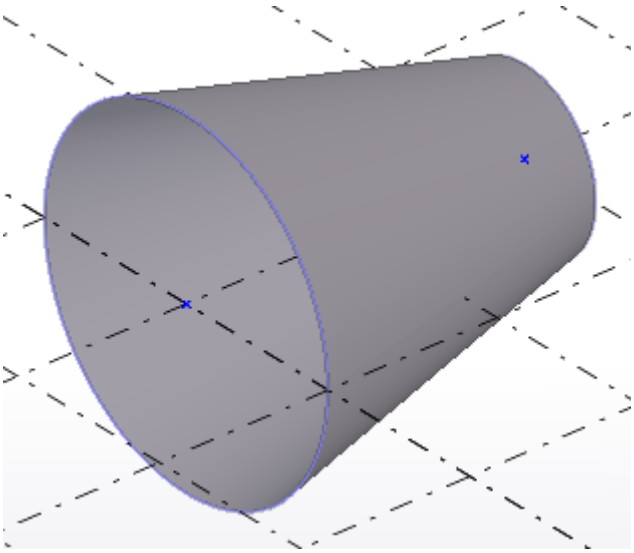
     For example, if you are using two construction circles to create a lofted plate:



b. Select the second construction object:

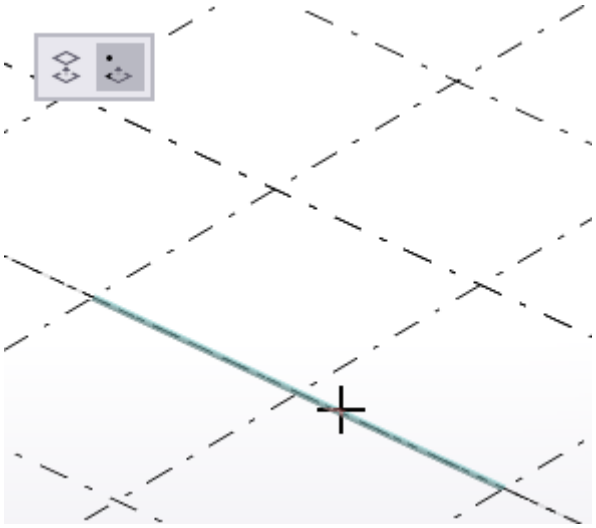


Tekla Structures creates the lofted plate between the selected construction objects.



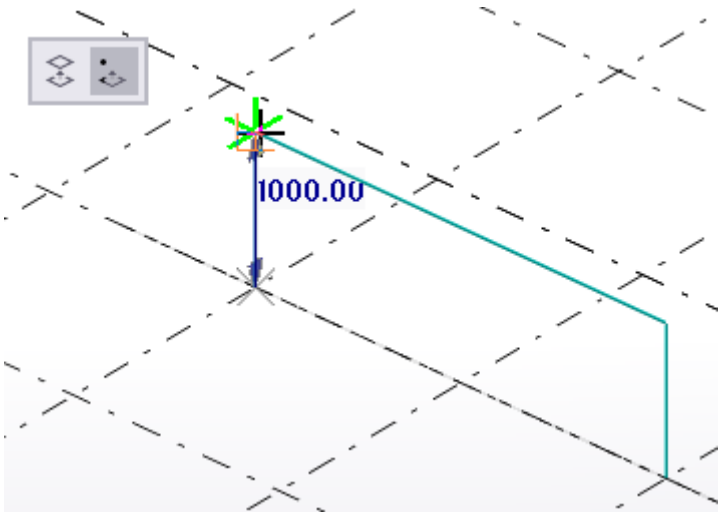
- If you selected **Using one construction object and a point**  :
  a. Select the first construction object: line, arc or circle.

     For example:

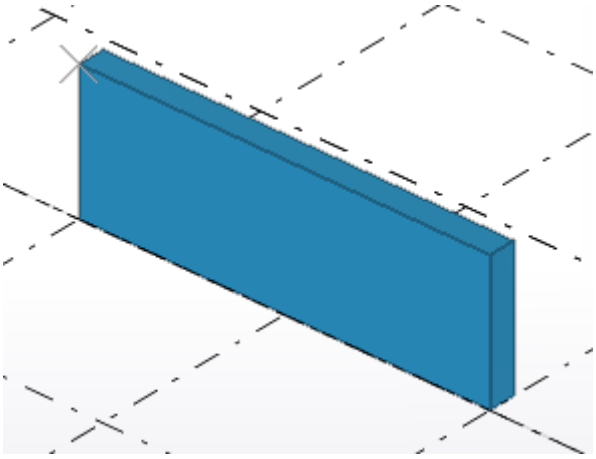


Tekla Structures shows a preview of the part geometry. Use the preview to set the direction and the height of the lofted part.

b. Pick a point.

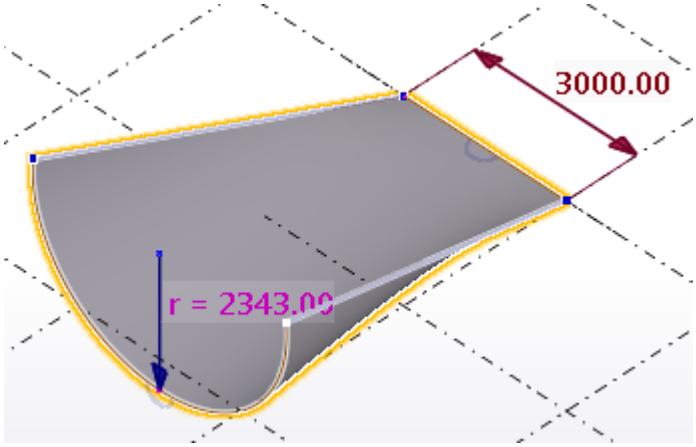


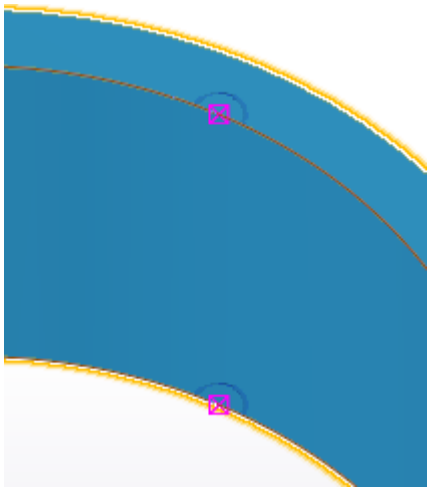
Tekla Structures creates the lofted slab based on the preview.



4. If you want to modify the shape of the lofted part, use the direct modification dimension handles and dimension values.

   For example:





Correct the geometry of a lofted plate or split a lofted plate

- In some cases when you try to create a lofted plate or a lofted slab by using construction lines, arcs, or circles, the geometry of the part would become self-intersecting. In these situations the part is not created, and Tekla Structures displays the following status bar message: **The resulting surface would be self intersecting**.

  With construction lines or arcs you can try to resolve the situation by changing the modeling direction of the construction lines or arcs. Select the construction line or arc, and on the contextual toolbar click **Swap ends**.

  With construction circles you can try to resolve the situation by moving either of the circles.

- If needed, you can split lofted parts. You cannot split closed cylindrical or conical lofted parts.

  Use the **Split** command on the **Edit** tab.

Limitations

- You can create unfolded single-part drawings of non-closed cylindrical and conical lofted plates, meaning that the lofted plate was created by using construction arcs but not construction circles. Other types of lofted plates cannot be unfolded.
- Rebar sets do not work with lofted parts.

New template attribute IS_LOFTED_PART

Use the IS_LOFTED_PART template attribute in filtering, fox example, to check whether the part is a lofted part. The attribute returns `1` if the object is a lofted part, otherwise it returns `0`.

1.7 Weld clash check, pour management, and other modeling improvements

Tekla Structures 2019i contains the following new features and improvements in modeling:

Detect clashes between welds and other objects

When you run a clash check using Tekla Structures 2019i, you can check the model for duplicate and overlapping welds and for clashes that occur between welds and other objects such as parts and bolts.

To do this:

1. Click **File menu** --> **Settings** --> **Options** to open the **Options** dialog box.
2. Go to the **Clash check** settings.
3. In the **Exact solid weld clash check** list, select **Yes**.
4. Modify the other clash check settings if needed.
5. Run the clash check.

Tekla Structures checks the welds against other welds, against bolts, and against the real geometry of the part profiles including roundings, and using the weld solid dimensions with normal accuracy.

When you review the clash check results, note that you can now show a new column, **Object Type**, in the **Clash Check Manager** dialog box.

Numbering improvements

Now if a part has a single-part drawing and you modify the part so that it becomes identical to another part, the following things happen when you number the model:

- Both parts receive the number of the unmodified part.
- The drawing is automatically cloned using the original drawing of the modified part as a cloning template. The original drawing is saved with the **Quantity decreased** comment in the **Changes** column in **Document manager**.

  Note that the cloning happens only if the **Automatic cloning** option is selected in the **Numbering Setup** dialog box.

Performance improvements in pour management

Pour resolving speed has been improved. When opening a model that contains pours, the initial pour resolving is now faster than before. This is especially noticeable when opening models containing a large number of pours.

New ways to create item shapes and edit model geometry

In addition to importing item shapes or downloading them from Tekla Warehouse, you can now create shapes using existing geometry and parts in Tekla Structures models. For example, you can create a shape using a single part or several parts that have been attached to each other.

To create a shape, do one of the following:

- Select a part, right-click, and then select **Create shape from geometry**.
- Go to **Quick Launch**, search for and select the **Create shape from geometry** command, and then select a part.

Tekla Structures adds a new shape to the shape catalog using the part name as the shape name.

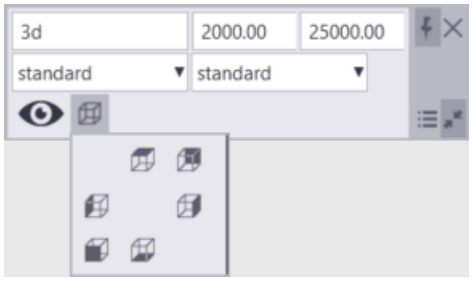
You can then use the shape when you create items in the model. You can also modify items and shapes further in the **Geometry editing** mode by dragging vertexes, edges, and faces. This gives you an alternative way to model complex structures such as slabs that slope to drains, for example.

1.8 View improvements

Starting from Tekla Structures 2019i, you can now show model views, assemblies, and components in different view angles.

Show model views in a selected view angle

Model views now have a *View angle* option on the contextual toolbar.



You can examine the current model view in different view angles by selecting a top, back, right, bottom, front, or left view.

To return to the original 3D view, click the button in the middle of the view angle options.

Show assemblies and components in a selected view angle

Assemblies and components, including connections and custom parts, now have a *View angle* option on the contextual toolbar.

You can show the selected assembly or component in different view angles by selecting a top, back, right, bottom, front, or left view.

The view angles are based on the assembly main part's coordinate system. Because of that, the objects may not always appear as expected when you select a view angle. Note that the full object is not always shown.

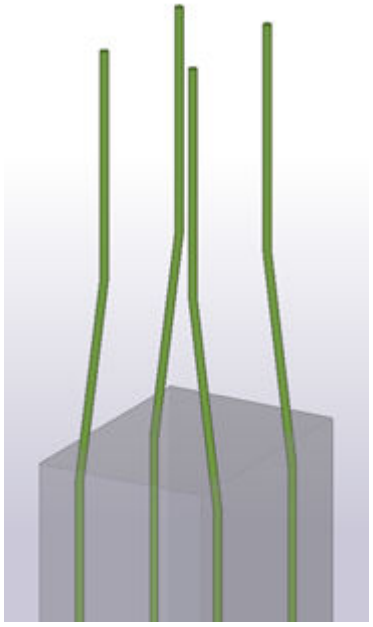
To return to the original 3D view, click the button in the middle of the view angle options.

1.9 Improvements in rebar sets and Rebar shape manager

Tekla Structures 2019i comes with many new features and improvements related to rebar sets. **Rebar shape manager** has also been improved.

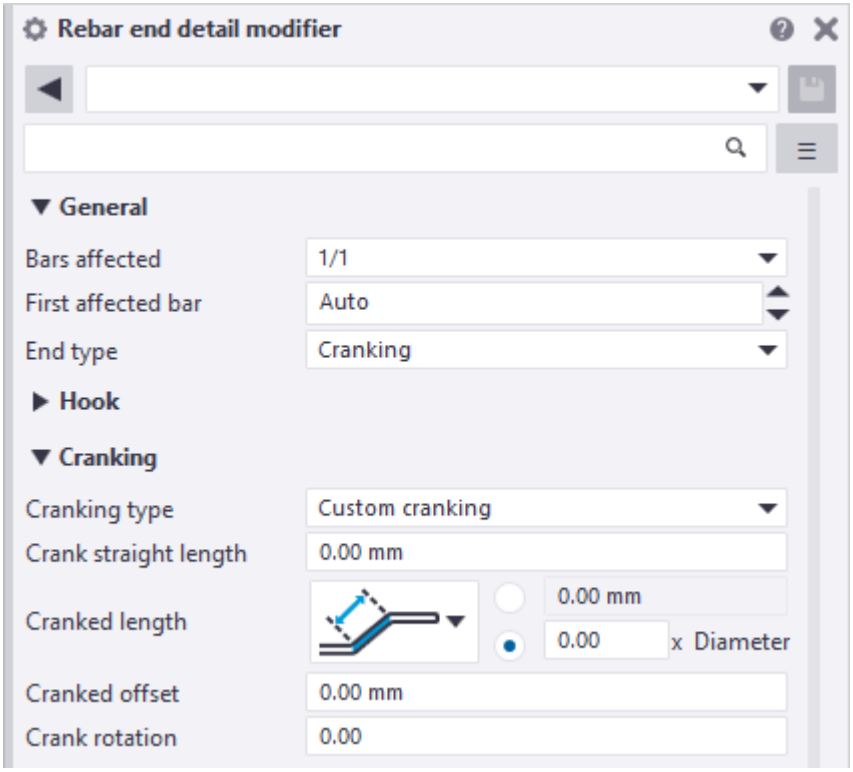
Create cranking using end detail modifiers

In addition to the existing bar end options, such as hooks, you can now create cranks using rebar set end detail modifiers.



In the **Rebar end detail modifier** properties, there is a new setting **End type** where you can select **Hook**, **Cranking**, or an empty option if you do not want to create hooks or cranks.

The new **Cranking** option is useful when you reinforce and splice walls or columns of different size in successive floors, for example. In the **Cranking** section, you can then define the crank properties.



Group rebar set bars manually using property modifiers

You can now manually group rebar set bars using property modifiers. By grouping bars you can combine their bar marks in drawings and keep bar lists simple and organized. Manual grouping is useful if you want to group bars regardless of their geometry or arrangement, or when you want fine-tune the automatic grouping.

To manually group rebar set bars:

1. Create a rebar set.
2. Create a property modifier for the bars that you want to group.
3. Set the property modifier properties.

   In the **Grouping** list in the **General** section, select **Manual**.

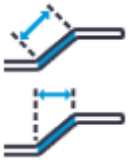
Other modifier improvements

- End detail modifiers have a new setting (user-defined attribute) **Align bar ends** that you can use for aligning bar ends that are nearest to the

modifier. This is useful when the lengths of straight bars are rounded and/or step tapered.

By default, the end detail modifiers do not align bar ends, and the rounding and step tapering happens at the tapered edge of the rebar set, and if both edges are tapered, at the edge that has a larger angle.

- In the **Rebar splitter** properties, the user interface of the **Cranked length** setting has been improved, and the options now have images:



Face-specific concrete covers for rebar sets

You can now use surfaces for defining face-specific concrete cover thicknesses for rebar sets. This is useful, for example, when you want the concrete cover of the rebar sets to be thicker at a specific part face or pour object face than at other faces, or when you want the cover thickness to vary from face to face.

To do this:

1. Add a surface to the object face at which you want to change the concrete cover.
2. Double-click the surface to modify its properties in the property pane.
3. In the **Rebar set** section, enter the concrete cover thickness in the **Concrete cover** box.
4. Click **Modify** to apply the changes.

Tekla Structures will use this concrete cover thickness for rebar set bars at this specific face.

Show or hide rebar set guidelines and modifiers

- You can now show or hide rebar set guidelines in model views. To do this, click **Concrete** --> **Rebar display options** --> **Guideline visibility** . The guidelines are by default shown when you select rebar set bars.

  To switch between showing and hiding the guidelines, you can also use the new advanced option XS_REBARSET_SHOW_GUIDELINES or keyboard shortcut **Alt+2**.

- If you want to show the rebar set modifiers that have been created by using components, set the advanced option XS_REBARSET_SHOW_MODIFIERS_CREATED_BY_COMPONENTS to `TRUE`. By default, this advanced option is set to `FALSE` and these modifiers are hidden.

- The rebar set display options on the **Concrete** tab on the ribbon now have the following order and new keyboard shortcuts by default:
  - **Leg face visibility**: **Alt+1**
  - **Guideline visibility**: **Alt+2**
  - **Property modifier visibility**: **Alt+3**
  - **Splitter visibility**: **Alt+4**
  - **End detail modifier visibility**: **Alt+5**
  - **Rebar dimension visibility**: **Alt+6**
  - **Color rebar groups**: **Alt+7**

Keyboard shortcuts for reinforcement selection switches

The reinforcement selection switches  now have the following keyboard shortcuts by default:

- **Select rebar sets**: **Alt+Q**
- **Select rebar groups**: **Alt+W**
- **Select single rebars**: **Alt+E**

Improvements in leg faces

- You can now use the **Leg face visibility** option (**Concrete** tab > **Rebar display options**) also with rebar set bar groups and bars. Previously, the option only applied to entire rebar sets and you had to have the **Select rebar sets** selection switch active. Now you can have any reinforcement selection switch active: either for rebar sets, bar groups, or single bars.
- Use the new advanced option XS_REBAR_MINIMUM_LEG_DEVIATION to define whether rounding settings are applied to certain reinforcing bar legs or not.
- Use the new advanced options XS_REBARSET_CREATION_ANGLE_TOLERANCE_FOR_CROSSING_REBARS and XS_REBARSET_CREATION_ANGLE_TOLERANCE_FOR_LONGITUDINAL_REBARS to control at which part faces rebar set leg faces are created.

New .inp file for rebar set user-defined attributes

Tekla Structures 2019i introduces a new input file, `objects_rebar_set.inp`, that contains the user-defined attribute definitions for rebar sets. The rebar

set related user-defined attributes are now easier to maintain in one file than in the several separate `.inp` files previously.

The `objects_rebar_set.inp` file is by default located in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\system` folder.

Improvements in Rebar shape manager

- **Rebar shape manager** has been changed so that multiple sequential bar bendings that form an arc are combined into one or more bendings (90 degrees or less) with the arc radius. This makes it possible to define bending shapes containing a large radius bending no matter how many individual bendings appear in the original bar geometry.

  This functionality is in use when the new XS_REBAR_COMBINE_BENDINGS_IN_EVALUATOR advanced option is set to `TRUE` (which is the default value).

  If you set the advanced option to `FALSE`, the bendings appear as multiple bendings and the shape is recognized as before.
- In **Rebar shape manager**, a new tolerance value, **Curve tolerance**, has been added to the **Tolerances** tab. When XS_REBAR_COMBINE_BENDINGS_IN_EVALUATOR is set to `TRUE`, the **Curve tolerance** value is used for recognizing the arc in a bar that has multiple sequential bendings.

  If the deviation of a bar leg from the arc is less than the tolerance, multiple bendings are combined to one bending (or two bendings) with the arc radius as the bending radius.

  If the deviation is more than the tolerance, if **Curve tolerance** is set to 0, or if `XS_REBAR_COMBINE_BENDINGS_IN_EVALUATOR` is set to `FALSE`, bendings are not combined, but they appear as multiple bendings.
- **Rebar shape manager** has been changed so that when you right-click a **Bending schedule fields** cell, if the list that opens contains a lot of items, new sub-lists are now shown to keep the list sizes more compact.

1.10 Improvements in drawings

Tekla Structures 2019i contains several drawing enhancements in section views, view frames, reinforcement group marks, dimensioning and **Document manager**.

Improvements in drawing views

New settings for section views

In single part, assembly and cast unit drawings on the **Attributes** tab of the **Section view** properties, there is a new **Size** check box for the new **Fit by parts** setting and the existing settings **Section depth** and **Distance for combining cuts**. Now you can set **Fit by parts** for all section views in drawing properties before creating a drawing. Earlier, you had to open each drawing and manually readjust view depth for each section view in the opened drawing .

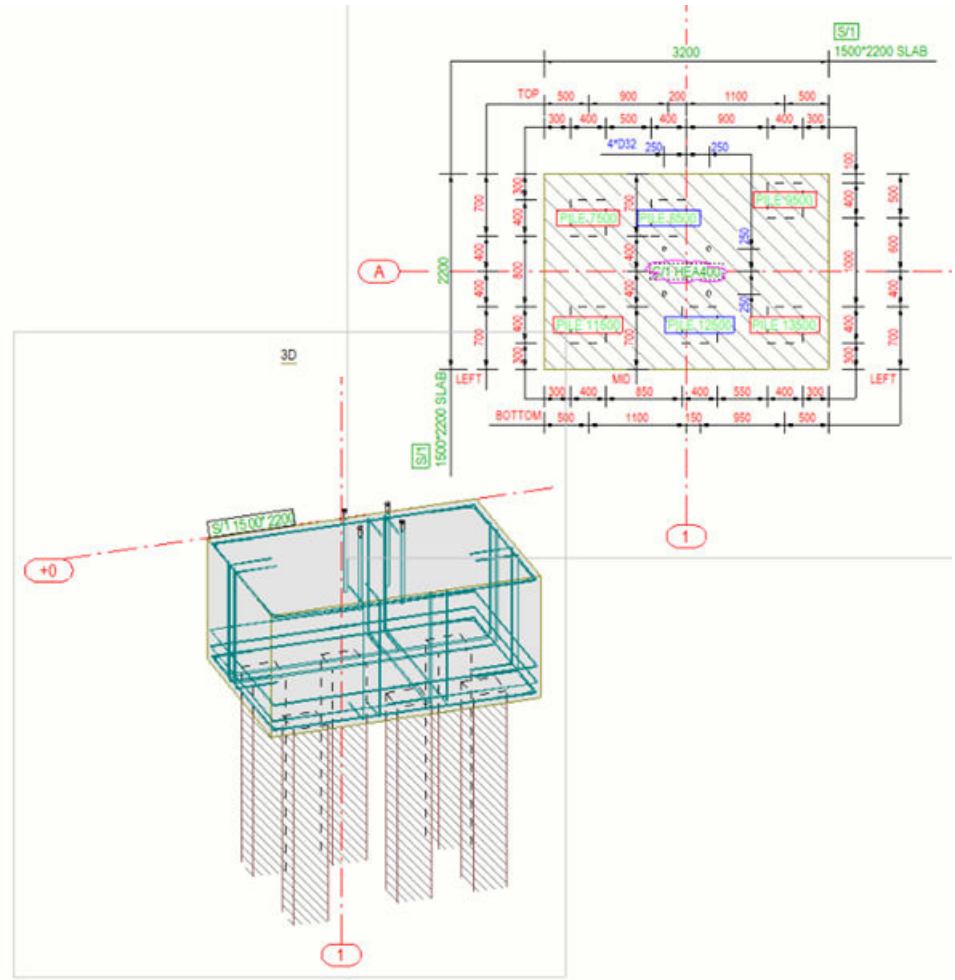
The **Fit by parts** setting works as an alternative to **Section depth** and **Distance for combining cuts**, and it shows the whole part in the sections. If you select this setting in **Section view** or **End view** properties in an existing drawing, it overrules the drawing level setting.

For more information, see Section view properties.

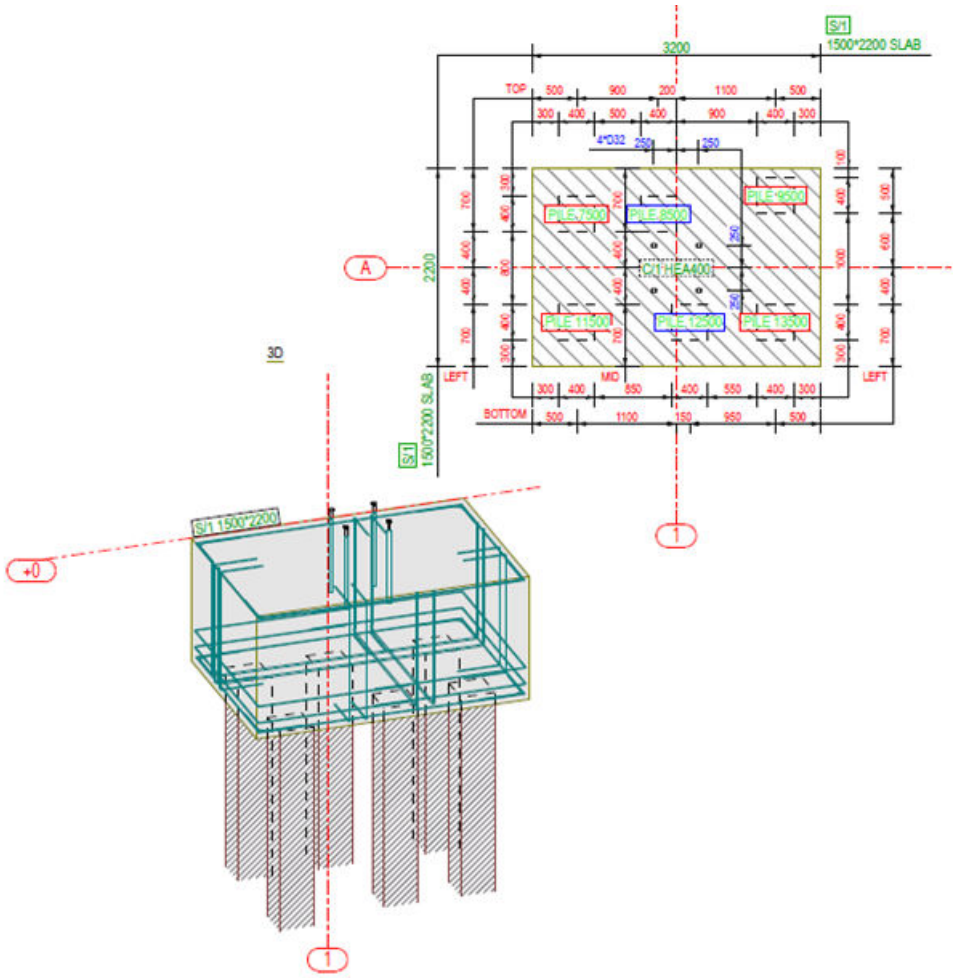
Drawing view frames now hidden

The drawing view frames are now hidden until you move the cursor over the view. If you select a view, the drawing view frame stays visible.

Drawing view frames are overlapping and shown:



Drawing view frames are overlapping and hidden, new functionality:

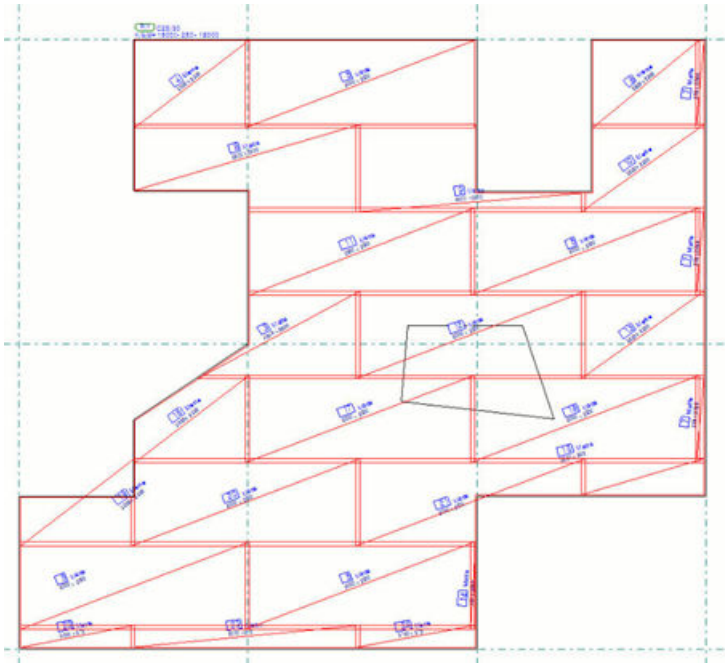


Improvements in reinforcement drawing properties

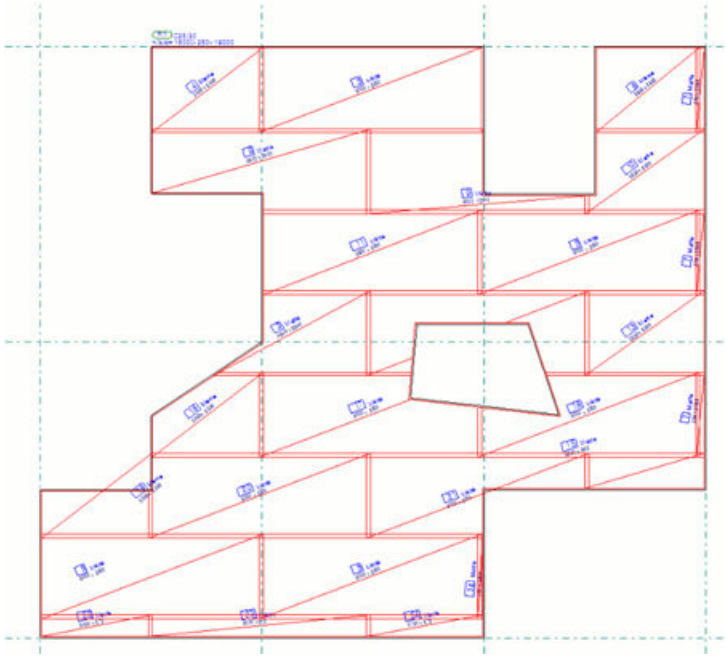
- A new representation option **outline (ignore holes)** has been added for meshes on the **Mesh content** tab in **Reinforcement** drawing properties properties. This option ignores holes and draws over them.

  Additionally, the missing representation option **single line with filled ends** was added on the **Mesh content** tab for reinforcement meshes.

Below is an example of the new **outline (ignore holes)** option.



As a comparison, below is an example of the **outline** option.

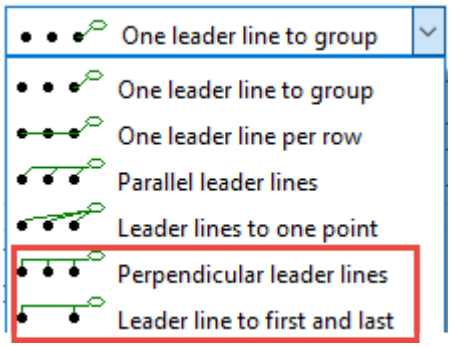


Improvements in reinforcement group marks

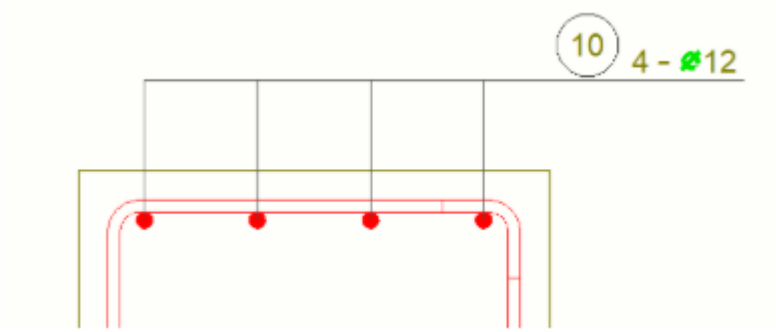
The drawing reinforcement group marks functionality has been improved. The number of available leader line options for reinforcement group marks has been increased: now it is possible to create marks with perpendicular leader lines to reinforcement group plane, to all rebars in a group, and to the first and

last rebar in a group. The new options are available in cast unit and general arrangement drawings.

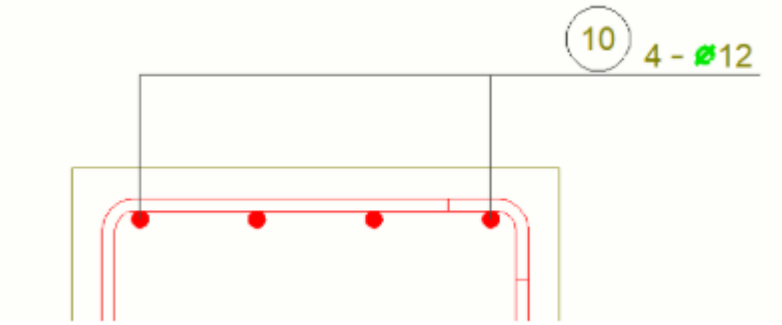
The new options are **Perpendicular leader lines** and **Leader line to first and last**. Both new options allow you to create marks with perpendicular leader lines to rebar group plane: **Perpendicular leader lines** creates marks with leader lines to each rebar in a group and **Leader line to first and last** to first and last rebar in a group.



Perpendicular leader lines:



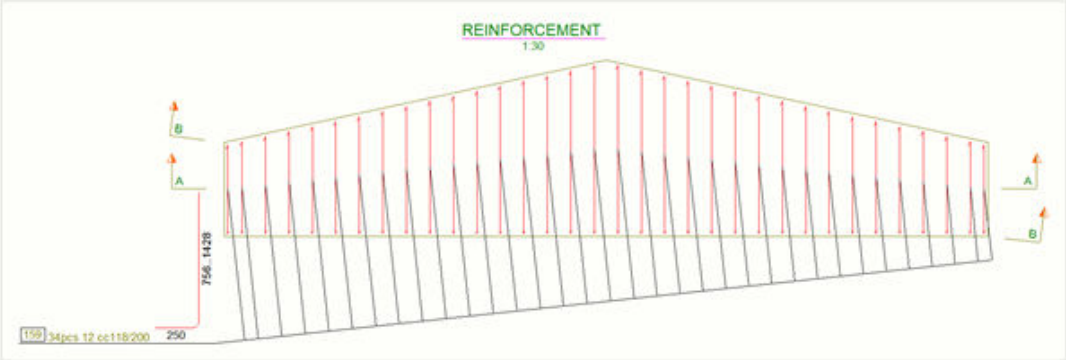
Leader line to first and last:



You can control the length of the perpendicular leader line with the new advanced option `XS_MARK_LEADER_LINE_LENGTH_FOR_PERPENDICULAR` (**File** --> **Settings** --> **Advanced options** --> **Marking: General**). The default value is 0 mm.

Note that rebar mark leader lines created with the new options are always placed horizontally or vertically in a drawing, even in tapered rebar groups.

Earlier:



Now:

You can select to apply the new leader line options in the following locations:

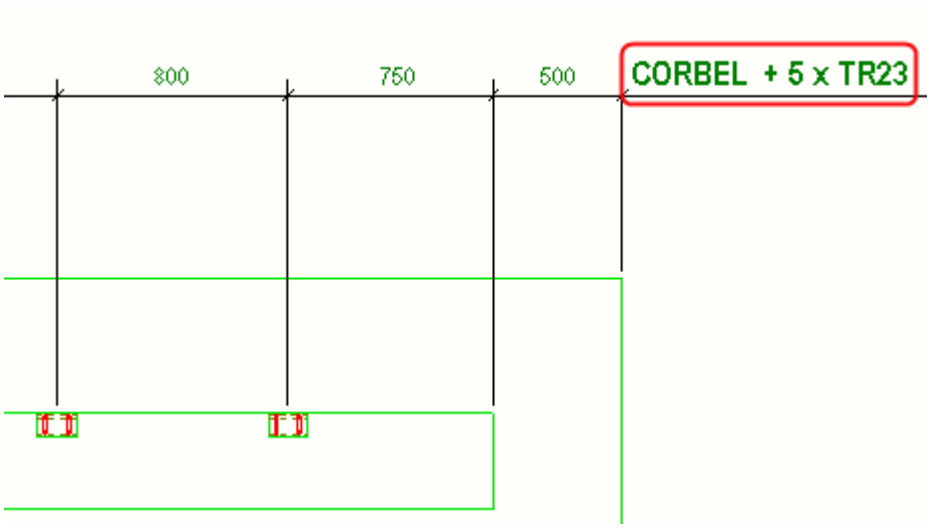
- Before you create a cast unit drawing, in the cast unit drawing properties for each view separately: Select the view in cast unit drawing properties, click **View Properties**, and click **Reinforcement mark** or **Neighbor reinforcement mark** from the options tree.
- Before you create a GA drawing, in the drawing properties of the GA drawing: Click **Reinforcement marks...** or **Neighbor reinforcement marks...** in the GA drawing properties.
- In the view properties of an existing drawing: Double-click the view frame, and click **Reinforcement mark** or **Neighbor reinforcement mark** in the options tree.
- In reinforcement mark properties in an open drawing: Go to **Drawing** --> **Properties** --> **Reinforcement mark** .
- In reinforcement mark properties for an individual reinforcement group mark: In an open drawing, double-click an individual reinforcement group mark. To select and modify the properties for several reinforcement group marks, use **Drawing content manager** or select the reinforcement group marks using appropriate selection filters.

Improvements in dimensioning

- **View-specific dimensioning**: The dimensioning type **Shape dimensions** has new options for controlling which faces will be dimensioned. By selecting the **Visible faces** option, dimensions will be created only to faces that are visible in the drawing view. The other option **All faces** dimensions all faces, similarly as shape dimensioning was doing previously. **All faces** is the default value, and it will be used if the dimension settings file does not contain any value for the new setting.
- It is now possible to associate dimensions to object center lines outside the object area.
- Dimensioning plug-ins DLLs can now be found in sub-folders of `<Tekla Structures binary folder>\plugins\Tekla\Drawings\Dimensioning\` and in environment in the sub-folders of `\common\extensions\custom\dimensioning\`. Previously all the DLLs were expected to be at the same level in those folders. This enables a better separation of each plug-in dependencies.

Improvements in dimension tags

Tags allow you to display the properties and other related information of the associated building objects in dimensions and dimension sets. This feature has now been improved in several ways to make it work more consistently and reliably.



Display any object type in dimension tag marks

In the **Dimension Properties** dialog box on the **Tags** tab, you can define the contents of the dimension tags of building object dimensions. The logic for displaying the contents has changed, and now all the building object categories are checked for content availability. The properties in the first found

category that has content are read and displayed in the tag. If you do not want to display tag contents for some building objects, you can create an appropriate exclusion filter for this building object type. This means that you can now display properties related to any associated object regardless of its type and order in the hierarchy.

The reading order of building object content categories is the same as in earlier versions:

1. **Surface treatment**
2. **Bolt**
3. **Rebar**
4. **Part/Pour object**

Earlier, when a dimension was associated to several different building object types, the properties of one category only were read and displayed in the tags. The category from which the properties were read based on a hidden reading order. The main problem was that if several object types were selected for creating dimensions, only the properties of object type that was higher in the reading order hierarchy were displayed in the tag. For example, if all the other categories were empty, and the **Part** category had content, nothing was displayed in the tag, because the **Surface treatment** category had no content.

Dimension tag contents now updated correctly

- Dimension tag contents are now updated correctly when you drag dimension points.
- Dimension tag contents are now updated instantly when you add or remove dimension points. Previously, the contents were not updated when the dimension became associative to another building object.

Improvements in Document manager

For more information about **Document manager**, see Document manager.

New indicator for cells that cannot be edited

- When the edit switch  is active in **Document manager**, and you move the mouse cursor over a cell that cannot be edited, the cursor now changes to indicate that you cannot edit the cell:

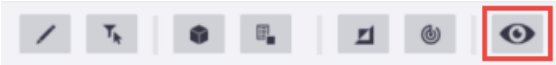
New category association options

The **Edit category** and **New category** dialog boxes in **Document manager** now have a new setting **Association type**, which defines if a category is search based, manual, or both.

- If the category is of type **Search only** or **Manual and search**, you need to define a **Search string** in the dialog box.
- If you create a category by first selecting documents from the documents list, the association type is **Manual only** by default.
- If you create a category from the category list, the association type is **Search only** by default.
- You can change the association type later. If you change the type from **Search only** to **Manual only**, a message is displayed telling that the search string for that particular category will be cleared. If you change the type from **Manual only** to **Search only** or **Manual and search**, you need to define a **Search string**.

New button Show all documents

- A new button **Show all documents** has been added to **Document manager**. This button resets the document list so that all documents are visible, and all searches and filtering are cleared. Excluded categories remain excluded. This new feature also provides a convenient way to restore the document list to a default state when recording macros.



Invert document visibility/Reset document visibility

Now when you activate the  **Invert document visibility** switch, the name of the switch changes to **Reset document visibility** to indicate that clicking the button again will reset the visibility and not invert the visibility a second time.

Other Document manager improvements

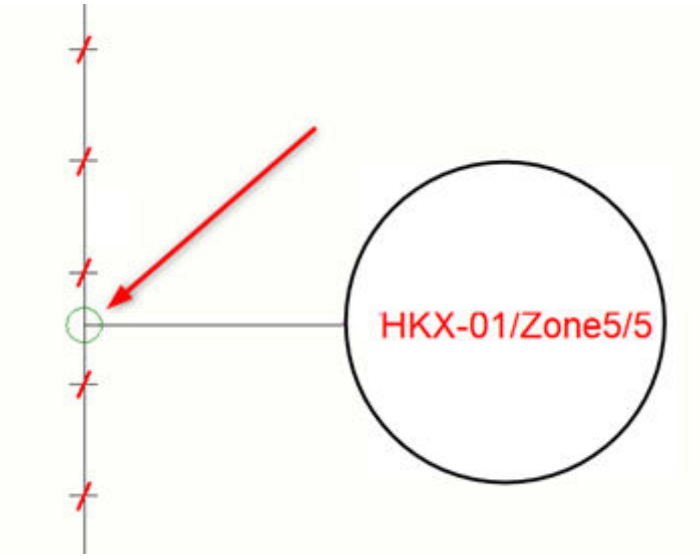
- **Document manager** search box now supports macro recording and playback.

1.11 Improvements in rebar drawing tools

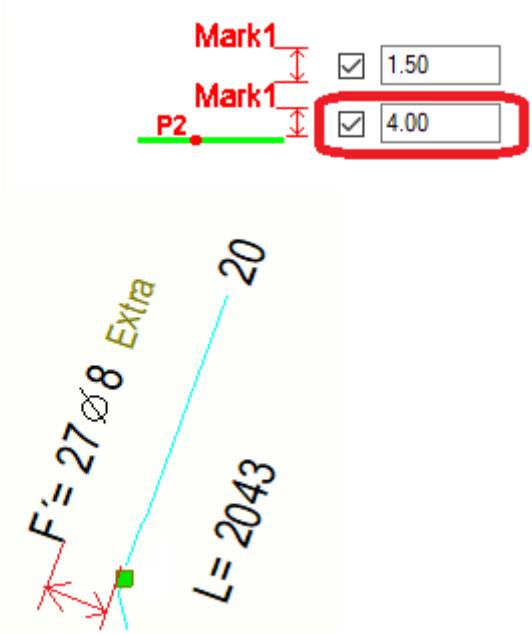
Tekla Structures 2019i introduces some improvements in **Rebar group marking**, **Rebar pull-out picture and marking**, and **Rebar group dimensioning**.

Rebar group marking

- The **Rebar group marking** application now works with circular rebar groups.
- The **Lines and symbol** tab has new settings for drawing a symbol at the intersection of distribution lines and leader lines. The functionality for rebar symbols has been moved to the new **Symbols on rebars** tab.



- A new setting has been added on the **Mark 1** tab to set the mark distance from the leader line.



For more information, see Add reinforcement marks with Rebar group marking application.

Rebar pull-out picture and marking

- On the **Dimensions** tab, you can now select whether to round according to the user settings or according to the `rebar_config.inp`.
- **Rebar pull-out picture and marking** no longer creates duplicate pull-out pictures. The same fix was made in the **Draw rebar pull-outs** application.

For more information, see Draw rebar pull-out pictures with Rebar pull-out picture and marking application.

Rebar group dimensioning

- A new **Group dimensions** setting was added on the **Advanced settings** tab to control if dimensions are grouped or not. Grouping now works also when the distance between the groups is zero.
- Invisible color can now be applied on rebar lines and symbols.
- Rebar group dimensioning now dimensions rebar groups in polybeams.

For more information, see Dimension rebars with Rebar group dimensioning application.

1.12 Printing to multiple printers and other printing improvements

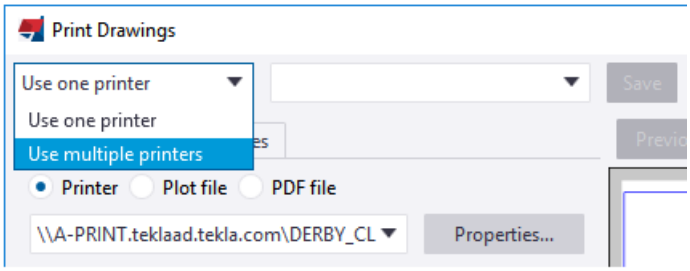
Starting from Tekla Structures 2019i, you can print to more than one printer in one go based on the paper size of each selected drawing. When printing to multiple printers you typically have different printers for handling different paper sizes. Tekla Structures automatically selects the appropriate printer for each drawing.

For more information about printing, see Print to a .pdf file, plot file (.plt) or printer.

Print drawings to multiple printers in one go

The **Print Drawings** dialog box now has a new control for printing to multiple printers: **Use multiple printers**. When you want to print to a single printer, or

define single printer settings to be used in multiple printing, select **Use one printer**.



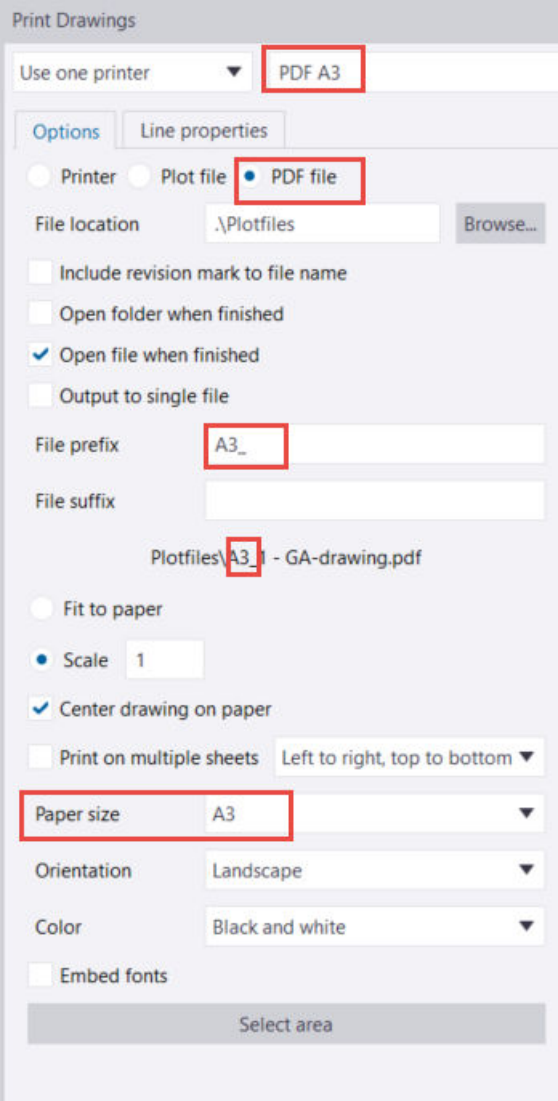
Create single printing settings

To print to multiple printers, you first need to create single printing settings for each of the printers you want to print to:

- Select **Use one printer**, and define the printing properties as desired. Select the output type and printer, and define the paper size that this printer will handle in the **Use multiple printers** mode. Then give the settings a unique name and click **Save**. Repeat this for each of the desired paper sizes. Do not use the size option **Auto**.

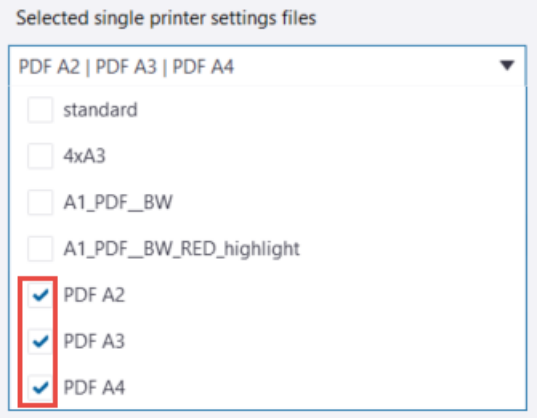
  For example, you can create the following single printer settings files with the output type set to **PDF file**:

  - `PDF A4`: Paper size set to A4, file prefix set to `A4_`
  - `PDF A3`: Paper size set to A3, file prefix set to `A3_`
  - `PDF A2`: Paper size set to A2, file prefix set to `A2_`
- When printing a set of drawings in the multiple printers mode using the above single printer settings files, all A4 drawings will generate `.pdf` files with prefix `A4_`, all A3 drawings will have prefix `A3_`, and all A2 drawing will generate `.pdf` files with prefix `A2_`.
- If you want to print more than one sheet size to the same printer in the **Use multiple printers** mode, create a single printer settings file for each paper size, and specify the same printer in all of these files.

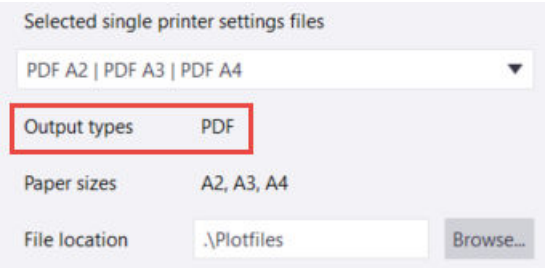


Print to multiple printers

Change to the **Use multiple printers** mode, and in the **Selected single printer settings files** list, select the settings files to use in printing. You can select all or just some of the single printer settings files.



The output type (printer, plot file, PDF file) is defined by each selected single printer settings file. Typically you would select settings files with the same output type. **Output types** lists the output types that are specified in the selected single printer settings files.



Change other necessary settings. When the output type of the selected settings files is **Plot file** or **PDF file**, you can change the following properties. These settings cannot be changed if the output type is **Printer**:

- **File location**: Where to create the output files. If the selected settings files specify a subfolder, then the output path is the combination of the main path and the subfolder path, which allows each settings file to specify a different subfolder. You can also specify an absolute path in each selected settings file, which will override the main path.

  Example:

  Main path: `.\Plotfiles`

  Settings file 1 subfolder path: `A4`

  Output result for settings file 1: `.\Plotfiles\A4\`
- **Include revision mark to file name**
- **File prefix**: Each selected settings file can override this.
- **File suffix**: Each selected settings file can override this.
- **Fit to paper**
- **Scale**
- **Center drawing on paper**

- **Print on multiple sheets**
- **Orientation**
- **Number of copies**
- **Collate**
- Note that you cannot change the paper size, it is already included in the selected settings files. You can see the selected paper sizes listed in the dialog box.
- You can also save the multiple printing settings to a settings file for future use. Note that the multiple printing settings files are saved in the same location as the single printer settings files (`<model>\attributes`) but with a different file name suffix `PdfMultiPrintOptions`. For single printer settings, the suffix is `PdfPrintOptions`. This ensures that the settings are kept separate from the single printer settings.
- Click **Print** to print to multiple printers.

Other printing improvements

- The **Print Drawings** dialog box now displays a message in the status area if it is not possible to print due to invalid printing settings.

1.13 Improvements in Tekla Model Sharing

Tekla Structures 2019i introduces several improvements regarding Tekla Model Sharing. For example, reasons of write out failures are now stored in log files to simplify troubleshooting, and pour management is more robust than ever before.

Reasons of write out failures are stored in log files

If writing out model changes fails, the reasons for the failure are now saved in the error log and the model sharing log.

In the `error_<user>_<YYYYMMDD>_<HHMMSS>.log` file, you can find the reasons why Tekla Structures has failed to restore or save a file, or to write a material report export file or profile export file.

In the `modelsharing.log` file, you can find the reasons why creating data in the write out has failed. These errors can happen because of several reasons, such as low disk space, database errors, or using a user role that does not permit making certain changes.

Improved pour management

Pour management in shared models has been improved significantly. Unexpected conflicts have been addressed, so working with pour units is safer and more efficient than ever before.

Earlier, pour management could cause conflicts when reading in other users' changes, and as a result, objects in pour units might have been accidentally removed.

Improved and more robust sharing operations

Sharing operations now work more reliably even when other software are locking some of the files needed to perform the operations. For example, if a file that is needed to create a packet is opened by anti-virus software, Tekla Structures can still create the packet without errors.

1.14 Changes in Tekla Structures installation

Starting from Tekla Structures 2019 SP1, you can select in the environment installation wizard that the environment `.tsep` files are installed when running the installation wizard. If you do not select to install the `.tsep` files automatically, the files are installed when you start Tekla Structures for the first time after installation.

Note that if you are installing more than one environment for the first time, we recommend that you install the `.tsep` files by starting Tekla Structures.

1.15 New structure of firm and project folders

You can now create user-defined sub-folders under the firm and project folders and store property files in the sub-folders. This means that you can have a more organized folder structure in the project and firm folders. Tekla Structures can read and copy the property files from the sub-folders when needed. For example, property files are copied when you start sharing a model.

Note that property files cannot be read from the following pre-defined sub-folders under the firm and project folders:

- `ProjectOrganizerData`
  - `ProjectOrganizerData\DefaultCategoryTrees`
  - `ProjectOrganizerData\PropertyTemplates`

    - `ProjectOrganizerData\ExcelTemplates`
- `AdditionalIPSets`
- `macros`
    - `macros\drawings`
    - `macros\modeling`
- `Drawing Details`
- `extensions`
    - `extensions\drawings`
    - `extensions\model`
- `CustomInquiry`
- `PropertyRepository\Templates`
- `symbols`
- `template`
    - `template\mark`
    - `template\settings`
    - `template\tooltips`
- `profil`
    - `profil\ShapeGeometries`
    - `profil\Shapes`
- Environment folders

Tekla Structures searches for property files in the sub-folders of the firm folder or the project folder as follows:

1. The search starts from the root folder (`XS_FIRM` or `XS_PROJECT`).
2. If Tekla Structures finds the first property file with a corresponding file name suffix and file name prefix, the property file is selected.
3. The search continues so that each sub-folder of the root folder is searched in alphabetical order.
4. Tekla Structures ignores each attribute file with the same file name suffix and file name prefix as the previously selected file, and stores each file name in the error log.

1.16 Interoperability improvements

Tekla Structures 2019i contains improvements in reference models, IFC object conversion, IFC export, and point cloud functionality.

Reference models

Reference model object locking

- Reference model objects can no longer be locked. Locking prevented model update, caused confusion and increased the size of the database. Object lock has been used for locking model location. We recommend that you use model lock instead and set `XS_REFRESH_ALSO_LOCKED_REFERENCE_MODELS` to `TRUE`.

  For more information about locking reference models, see Lock reference models.

.db1 as reference model format

- The `.db1` format has been removed from the supported reference model formats. You can still enable the `.db1` format in the **Add model** dialog box by setting the advanced option `XS_ENABLE_NATIVE_MODEL_AS_REFERENCE_MODEL` to `TRUE` in an `.ini` file. Originally, this format was added in the **Add model** dialog box for testing purposes.

Calculate new offsets when Location by is changed

- Reference model **Location by** change logic has been improved. By default, the location by change does not keep the reference model location. A new check box was added to calculate new offsets and keep the current reference model location.

New reference model template attributes

- Reference model properties **Code**, **Title**, **Phase**, **Description** and **Group** are now available as template attributes for reports.

Other reference model improvements

- When you refresh reference models that have been created with previous versions of Tekla Structures, the reference model information is now updated to match the version of Tekla Structures that you are currently using.
- The performance of the reference model insert has been improved when the Tekla Structures model already contains non-visible unloaded reference models. After the fix, non-visible reference models are not loaded anymore in the reference model insert.
- Now it is possible to use 3D image files (`.obj`) as reference models.

IFC object conversion

- IFC object conversion of steel contour plates now uses the prefix defined for plates in **Components** settings (**File** --> **Settings** --> **Options** --> **Profile name** --> **Plate**) as the prefix for Tekla Structures native plates. You can use prefixes that are supported by your environment.
- Arbitrary profile mapping by name does not need to match the dimensions. Arbitrary profile mapping by name can be set to require dimensions to match by setting the new advanced option `XS_CONVERSION_ARBITRARY_PROFILE_MAPPING_BY_NAME_MUST_MATCH_DIMENSIONS` to `TRUE`. The default is `FALSE`.
- Parametric profile conversion by profile name mapping does not need to match the dimensions. Parametric profile conversion tries to find a corresponding library profile and if a profile does not match the parameters, the default parametric profile will be used.

For more information, see Convert IFC objects into native Tekla Structures objects.

IFC export

IFC2x3 export

- You can now also export radial grids in the IFC2x3 export.
- Edge chamfers are omitted from the exported IFC model. This is to enable better interoperability with plant design systems. If the geometry with edge chamfers is needed, you can set the IFC export type to B-rep separately for those objects in the objects' user-defined attributes dialog box on the **IFC export** tab.

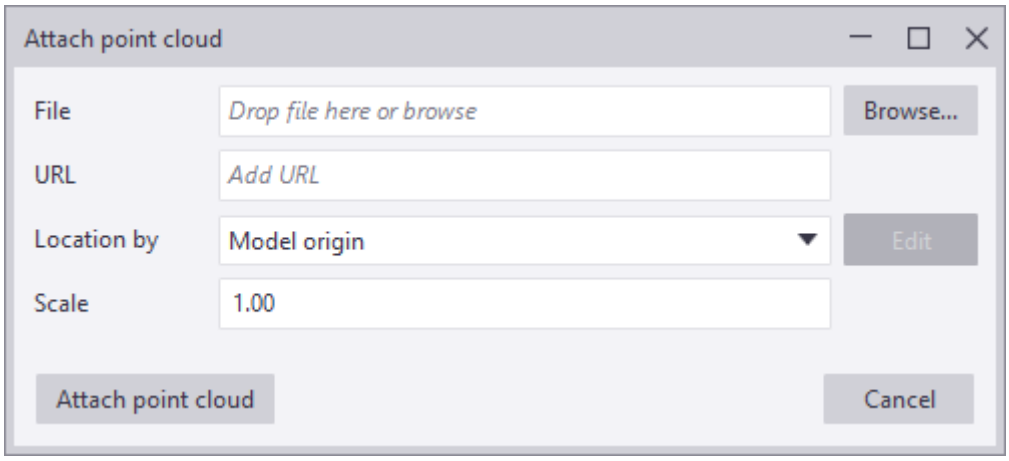
IFC4 export

- The **IFC4 Export** now contains a new export type **IFC4precast view**. The **IFC4precast view** aims to support the fabrication data transfer workflow of precast elements. At the first phase it covers the fabrication of precast walls and slabs including all the needed reinforcement and embeds.

For more information, see Export a Tekla Structures model or selected model objects to an IFC file and IFC4precast.

Point clouds

- You can now use point clouds through internet. There is a new **URL** option in the **Attach point cloud** dialog box where you can enter the URL address.



- Point cloud web streaming cache has been added. The cache is a common cache with Trimble Connect for Desktop. You can define the cache folder using the advanced option `XS_POINT_CLOUDS_WEB_CACHE` in the **File Locations** category of the **Advanced Options** dialog box. The cache usage improves the performance of the web streamed point clouds.

For more information, see Point clouds.

1.17 Export to 3D DGN v8 - New 3D DGN export

The 3D DGN export has been renewed.

The new 3D DGN v8 uses Teigha libraries and has some new features:

- The 3D DGN export now has the requested v8 format, and base point functionality.
- There are several new export settings available in the new 3D DNG v8 export. In the old 3D DGN export, you could only define the export file name and location, and select whether to export all objects or selected objects.
- The surface presentation of the parts is exported. Bolt holes are not included in the export.
- You can now export objects relative to the model origin, to the base point you define, or to the work plane.
- You can now export in layers by name, phase or any template attribute or user-defined attribute.
- Colors can be exported by class or by stored object representation.

- You can export all objects or selected objects. You can use the **Select parts** and **Select objects in components** selection switches for selecting the objects to export.
- The old 3D DGN v7 export is still available in **File** --> **Export** --> **3D DGN** .

Create object group color representations

If you want to use object group color representations in the export, you need to create the object groups first and then set the colors for the object groups. Note that the transparency setting is not included in the export.

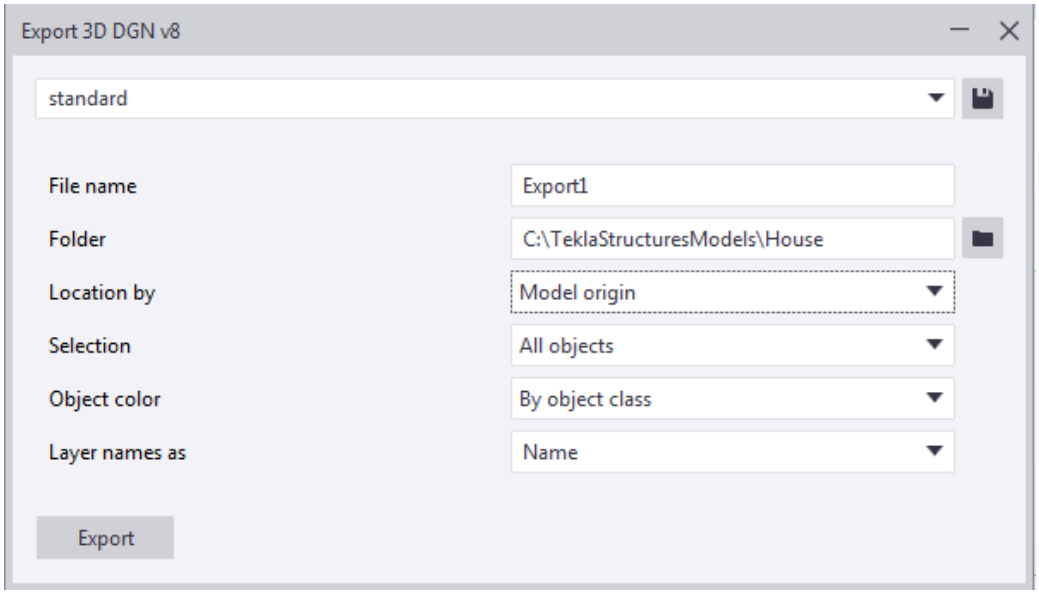
For more information, see Create object groups, and Change the color of an object group.

Create base points

If you want to export objects relative to a base point, you need to create a base point in your model. For more information, see Base points.

Export to 3D DGN v8

- To start the export, go to the **File** menu, and click **Export** --> **3D DGN v8** .



- Define the file name and folder.
- In **Location by**, select whether you want to export by model origin, by work plane, or by a defined base point.
- Select **All objects** or **Selected objects**.

- If you want to export selected objects, select the objects with the appropriate selection switches:
  - If you activate the parts selection or the objects in components selection, all the selected parts will be exported.
  - If you activate the assembly selection, nothing will be exported.
  - If you activate the component selection, nothing will be exported.
- In **Object color**, select whether you want to export objects using object class colors or object group colors. You can use phases, part names, or template attributes as layer names for exported objects. Select **Name** or **Phase** from the list, or type the attribute name in the box. You can also use user-defined attributes as a layer name.
- When you are done, click **Export** to export the objects according to the defined settings.
- For more information about the export, see Export to 3D DGN.

1.18 Export to 3D DWG - New 3D DWG export

The 3D DWG export has been renewed.

The new 3D DWG uses Teigha libraries and has some new features:

- The 3D DWG export now has the base point functionality.
- There are several new export settings available in the new 3D DWG export.
- The surface presentation of the parts is exported. Bolt holes are not included in the export.
- You can now export objects relative to the model origin, to the base point you define, or to the work plane.
- You can now export in layers by name, phase or any template attribute or user-defined attribute.
- Colors can be exported by class or by stored object representation.
- You can export all objects or selected objects. You can use the selection switches for selecting the parts or objects in components to export.
- The old 3D DWG/DXF export is still available in **File** --> **Export** --> **3D DWG/DXF** .

Create object group color representations

If you want to use object group color representations in the export, you need to create the object groups first and then set the colors for the object groups. Note that the transparency setting is also included in the export.

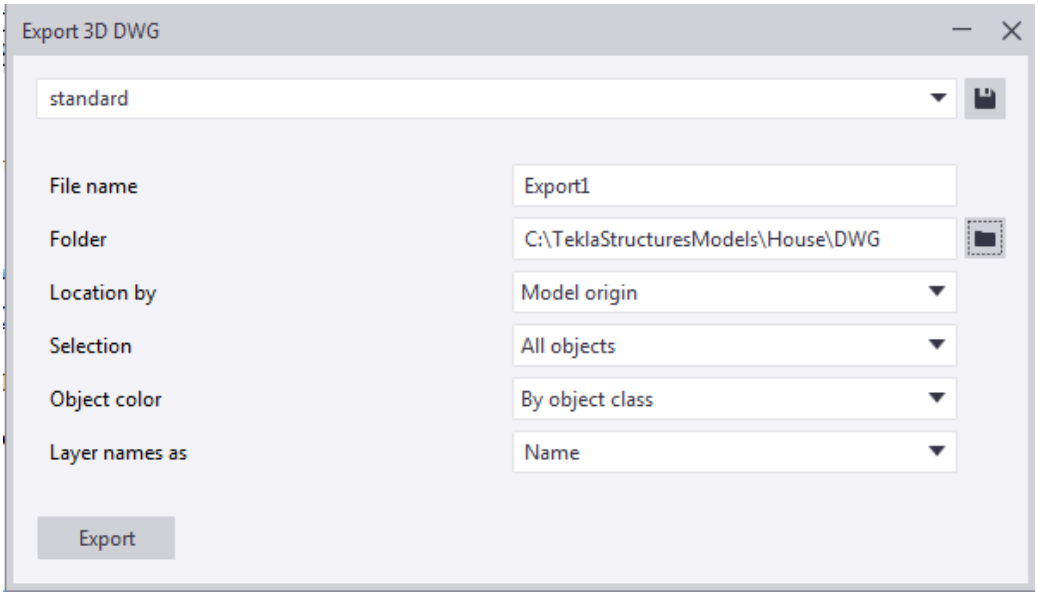
For more information, see Create object groups, and Change the color of an object group.

Create base points

If you want to export objects relative to a base point, you need to create a base point in your model. For more information, see Base points.

Export to 3D DWG

- To start the export, go to the **File** menu, and click **Export** --> **3D DWG** .



- Define the file name and folder.
- In **Location by**, select whether you want to export by model origin, by work plane, or by a defined base point.
- Select **All objects** or **Selected objects**.
- If you want to export selected objects, select the objects with the appropriate selection switches:
  - If you activate the parts selection or the objects in components selection, all the selected parts will be exported.
  - If you activate the assembly selection, nothing will be exported.

    - If you activate the component selection, nothing will be exported.
- In **Object color**, select whether you want to export objects using object class colors or object group colors. You can use phases, part names, or template attributes as layer names for exported objects. Select **Name** or **Phase** from the list, or type the attribute name in the box. You can also use user-defined attributes as a layer name.
- When you are done, click **Export** to export the objects according to the defined settings.
- For more information about the export, see Export to 3D DWG or DXF.

1.19 Updates in tools for concrete fabrication

Export Unitechnik (79), **Export EliPlan file**, and **Export BVBS** contain several improvements.

Export Unitechnik (79)

Export Unitechnik (79) has been improved in the following ways:

- The settings **Name of order** and **Drawing number** on the **HEADER block data specification** tab and **Slab number** on the **SLABDATE block data specification** tab now have a new option **File name sections**. Select this option and specify a string consisting of numbers referring to the 6 sections of the exported file name mask that are specified on the **Main** tab. You can type numbers 1 to 6, and delimiters , . _ and - in the free input field to export any combination of strings used in the file name, in any order. For example, 1-2-3, or 2_5_6. Use this option to ensure that both the strings in the file name and within the file content match the expected project and drawing numbers for successful file import.
- When using file name block options it is now possible to specify input text without delimiters.
- **Main** tab:
    - It is now possible to use a selection filter to select the parts for export with the new **Export using filter** setting. You can use the selection filter for including or excluding the parts from the export.
- **SLABDATE block data specification** tab:
    - It is now possible to export the unloading type using the new **Unloading type** setting. Also, it is possible to set **Unloading type** and **Transport type** on the **Unitechnik** tab for precast concrete parts, which overrides the export dialog box setting.
    - It is now possible to specify a user-defined concrete volume template property for export using the **Concrete volume** setting.

    - There is a new option for the **Export project coordinates** setting. Use the new **Yes, special variant A** option to export Unitechnik files that are compatible with the IDAT stacker software. The new option is only available for the 5.2b version of Unitechnik.
- **Pallet** tab:
    - A **Profile centerline to pallet centerline** option has been added for the **Align in Y axis** . With the **Profile centerline to pallet centerline** option, you can automatically align hollow-core slabs to the center of the pallet in Y direction.
- **Validation** tab:
    - A new option **Exclude all** has been added for the setting **Export others** to exclude the whole mesh from the export when it fails the validation. The option **No** has been renamed to **Remove invalid mesh wires**, and now this option only excludes invalid mesh wires and not the whole mesh when some of the mesh wires fail the validation.
- **TS configuration** tab:
    - New settings have been added on the **TS configuration** tab. The **Rotate geometry** setting applies the rotation angle calculated with the settings **Extra rotation** and **Auto-rotate on pallet**. The **With SLABDATE rotation angle** setting rotates the element and exports the rotation angle as a value in the respective SLABDATE field.
    - The **Extend contour and add formwork** option has been improved in situations where the contour needs to be extended into the -X or -Y direction.

For more information, see Unitechnik.

Export EliPlan file

Export EliPlan file has been improved in the following ways:

- It is now possible to specify a selection filter using the setting **Export using filter** on the **Parameters** tab. The parts are selected on the basis of the specified selection filter.
- Plotter data export has been improved.

For more information, see EliPLAN.

BVBS Export

BVBS Export has been improved in the following ways:

- The BVBS export now reports the diameter value as the nominal rebar diameter regardless of the `XS_USE_ONLY_NOMINAL_REBAR_DIAMETER` setting, according to the specification.
- The Partner and Developer configurations were added to the list of allowed configurations.
- **Parameters** tab:
  - You can now use multiple assembly template properties in the file name. Type the template properties in the **File naming template** box and separate them with spaces. The combination will be separated by underscores in the exported file name.
  - The **Drawing name source** setting has a new option **Assembly template**, and the **Template** option has been renamed to **Reinforcement template**.
- **Checking** tab:
  - **Check cutting length** has been renamed to **Check reinforcement**, and new checking options have been added:

    - **Reinforcement diameters** (separated with spaces)

    - **Minimum leg length** for straight sections between the bends

    - **Maximum weight** of individual bars
- **Advanced** tab:
  - Click the **Edit** or **New** button under **Private data block**. The list of property data types has been updated, and the following options are now available:

    - Reinforcement report property Integer, Float or Text

    - User-defined attribute Integer, Float or Text

    - Open API object property

    - Assembly report property Integer, Float or Text
  - You can now move up, move down, edit and remove private data block export items.
  - **BVBS Export** now contains new options for rounding rebar lengths for 2D bent bars. Mesh and 3D rebars are not affected.

    To round the lengths, first select an option for the **Round** setting. The options are:

    YesUp - Uses the nearest rounding value.

    Up - Rounds the lengths up.

    Down - Rounds the lengths down.

The new option **Round lengths to** rounds the total rebar lengths in the corresponding BVBS field in the header block, and the available values are 1, 5, 10, and 25.

The new option **Round leg lengths to** rounds the leg lengths in the geometry block, and the available values are 1, 5, and 10. 1 is the default value for both options.

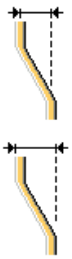
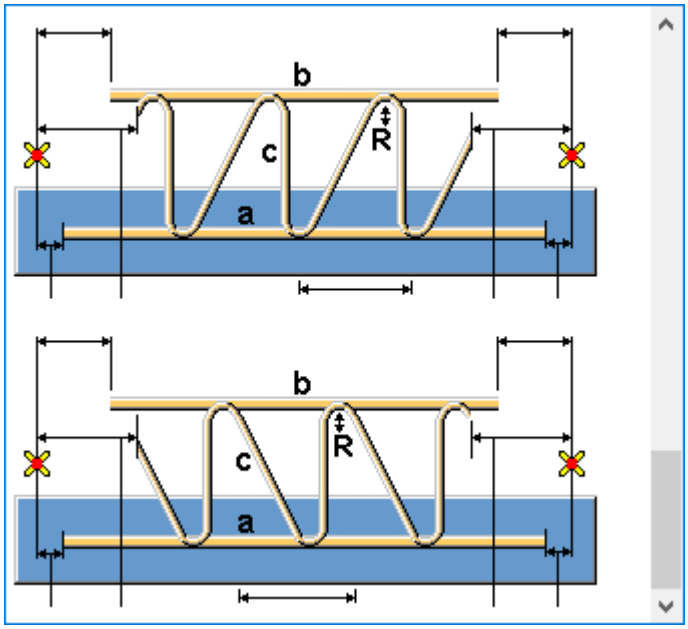
For more information, see BVBS.

1.20 Improvements in components

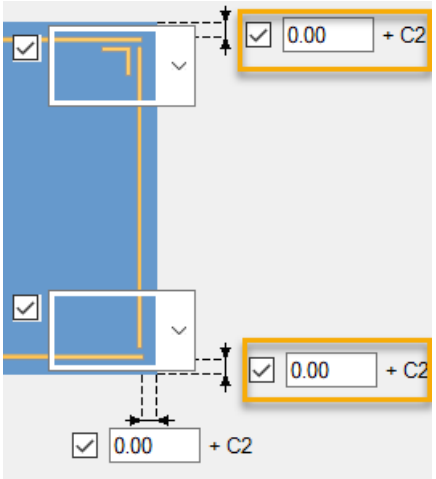
There are several improvements in concrete components and steel components in Tekla Structures 2019i.

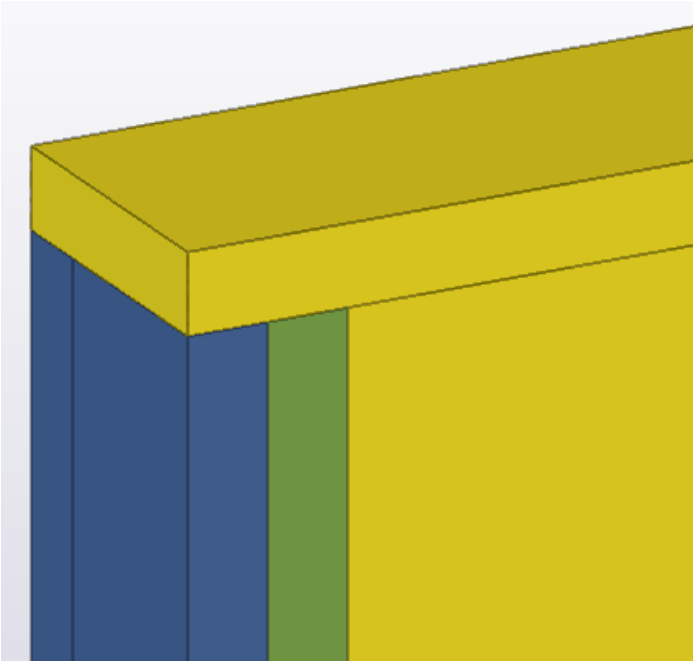
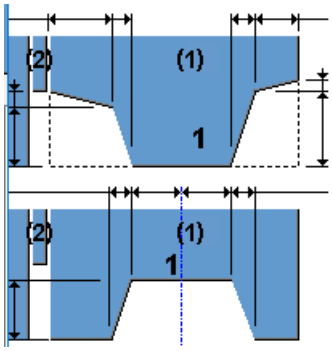
Concrete components

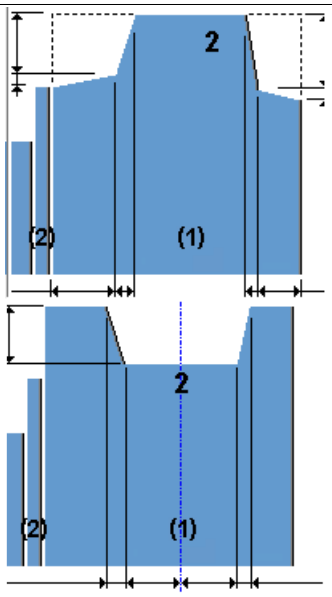
Rectangular area reinforcement (94)	You can use the new Rectangular area reinforcement (94) component to reinforced rectangular areas. You can create column and beam section reinforcement to the inside of a wall or a slab. Select the part where the reinforcement is placed and pick two points to create the reinforcement. The part defines the thickness of the reinforced area, and the two points define the geometry and the location of the reinforced area.
Automated reinforcement layout - Double tee beam (51)	On the **Strand profile** tab, a new option has been added to depress the strand in 3 positions instead of 2 positions.
Pad footing reinforcement (77)	You can now define custom hooks for the primary and secondary rebars.
Round column reinforcement (82)	• On the **Main bars** tab, you can now define the horizontal dimensions of the top and bottom

	cranked bars as a distance between the center of bars or as the outer distance of bars.  • On the **Advanced (main bars)** tab, you can now select whether the main bars are created as a rebar group or as single rebars.
Braced girder (88), **Braced girder (89)**	There are now two new girder shapes available. 
Rebar in beam (90)	On the **Stirrups**, **Stirrups 2** and **Stirrups 3** tabs, you can now select in **Create stirrups** whether stirrups are created **As separate groups** or **As one group**. Define the stirrup group spacings for the separate groups on the stirrup spacing tabs.
Reinforced concrete stair (95)	• The stairs part now has a new `STAIR_WIDTH_TOTAL` UDA that counts the total stair width including the stringers. • For bar type H, you can now set the name, class, prefix and start number separately for the top and bottom rebar.

	• You can now enter a comment in the **Comment** box for all types of rebars that the component creates. • On the **Stairs and landings** tab, you can now create openings or recesses (screed tray) in the bottom or the top landing. The rebars defined on the following tabs automatically avoid the openings created by these new opening/recess options: **Bottom anchor bars**, **Top anchor bars**, **Z anchor bars**, **Mesh bars** (top/bottom), **Bar A**, **Bar B**, **Bar C**, **Bar E**, **Bar G**, **Bar K**, and **Landing end bars** (bottom/top).
Concrete console (110), **Concrete console (111)**	On the **Connection** tab (**Concrete console (110)**) and **Anchor tab** (**Concrete console (111)**), you can now enter 79 characters in the **Tube bottom Comment** box. Previously, you could only enter 19 characters. Note that due to this change, the components and property files created with older Tekla Structures versions may have incorrect content in the **Comment**s of **Tube bottom** and **Washers**. We recommend that you check and update your property files.
Floor layout	• On the **Advanced** tab, you can now use the **Create cut-outs** option to control whether the cut-outs (notches or openings) are created for the slabs. If you set the option to **No**, the slab is created without any cuts. Slabs at break lines or openings which are cut at the whole width are still split and created as two or more slabs. Note that the other options on the **Advanced** tab related to the minimum slab width/neck width still control whether the slab is created/split or not. You can create automatic cut-outs for parts penetrating the floor layout areas by entering up to three lists of part classes or names. • On the **General** tab, you can now select to create slabs and parts by default part width or maximum part width, or the number of parts. • You can now enter a negative value for the break line offset on the **Default offset** tab.
Wall layout	You can now use the **Copy special** > **Mirror** and **Move special** > **Mirror** commands to mirror wall layouts.

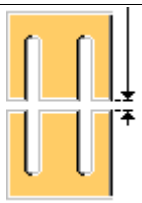
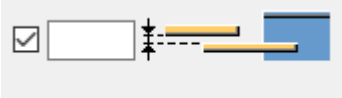
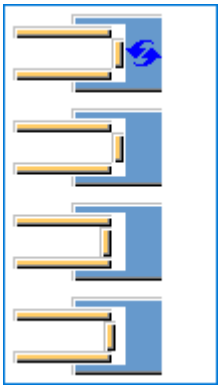
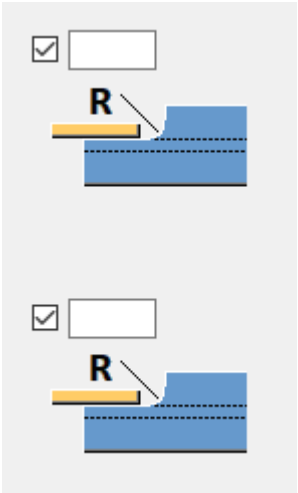
Wall panel reinforcement	• On **Picture** tab, there is now a minimum bar length option that you can use for filtering rebars smaller than the defined length. • On the **Picture** tab, you can now define the top and bottom extra offset. 
Double wall edge and opening reinforcement, **Wall panel reinforcement**	You can now define the type of door and notch reinforcement on the new **Door** and **Notch** tabs.
Sandwich and double wall	• On the **Parts** tab, there is now a new material definition option for insulation, **Edge strips in split case**, which can be used to define a different material for the insulation parts that are on the edge of the wall. • On the **Parts** tab, you can now set the cast unit type of the inside shell, insulation, and outside shell. Set the **Cast unit type** to **Enabled** to do this. • On the **Vertical section** tab, there is a new option for creating concrete all over the top surface. In the list of thicken innershell options, select  to cover the insulation and the outer shell.

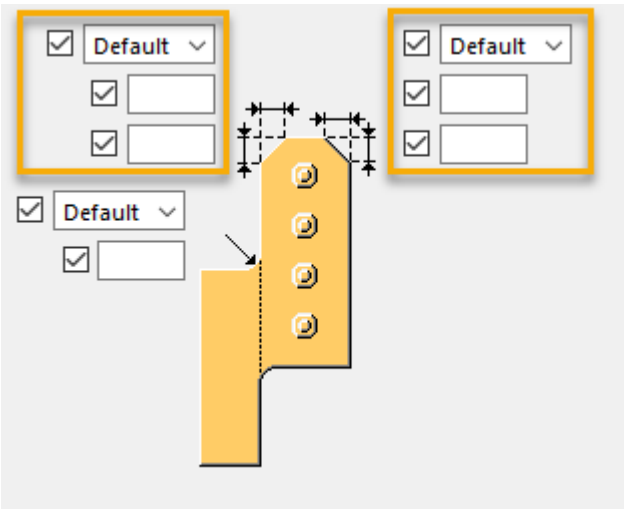
	
Sandwich wall horizontal seam	On the **Rabbets** tab, you can now select a tongue or groove joint connection for both sides of the sandwich wall. If you create one tongue and one groove connection, it is possible to have the parts overlap. 

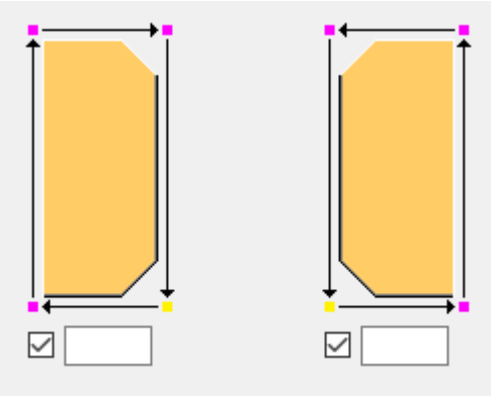
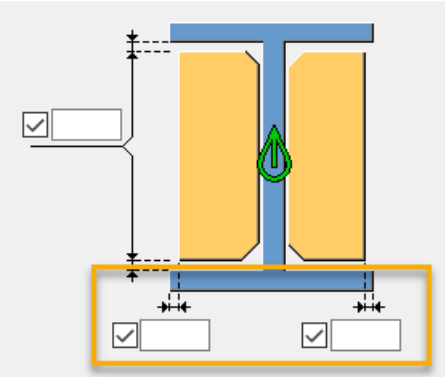
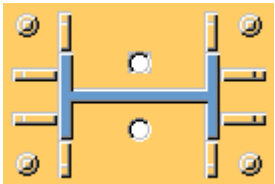
	
Mesh bars/Mesh bars by area	• When detailing without grid on the **Detailing** tab, you can now select whether the distances are the same or different for the top and bottom bars. Using different distances helps in placing top and bottom hooks so that they do not collide, for example. • When defining the **Spacing type** on the **Picture** tab, you can now select to set the spacing by exact spacings. List the distances between the bars in the **Spacing** box.

Steel components

Base plate (1004), **Stiffened base plate (1014)**, **U.S. Base plate (1047)**, **Joining plates (14)**, **Stiffened end plate (27)**, **Partial stiff end plate (65)**, **Two sided end plate (142)**, **End plate (144)**	It is now possible to create two new types of shim plates where the shim plate is created as two separate plates divided horizontally or vertically with the corresponding slots. 

	
Tube crossing (22)	On the **Brace conn** tab, you can now define a gap between the gusset and the connection plates. 
Tube gusset (20), **Tube crossing (22)**	On the **Brace conn** tab, you can now to set the position of the middle end plate. 
Shear Pl to tube column (47)	• You can now define the bolt properties separately for the primary and secondary bolts. • You can now define the radius of the top and bottom beam cut on the **Primary** and **Secondary** tabs. 

Purlin 1 (61)	On the **Bolts** tab, you can now select from the **Slots in** list the parts in which slotted holes are created.
Partial stiff end plate (65)	You can now define the distance between an L profile end and the top of the main part.
Railings (S77)	You can now define separate position and rotation settings for the top and bottom rails on the **Rails** tab and for the middle rails on the **Middle Rails** tab.
Bridging (80)	There are now 4 new bridging types available on the **Parameters** tab: **Stratco**, **Safebridge**, **Metroll**, and **Steel and Tube**.
End plate (101)	You can now align the end plate with the secondary part slope using the **Adapt to secondary part slope** option on the **End plate** tab.
Stub connection (119)	You can now set the thickness, material and name separately for the top, back and middle stiffeners on the **Parts** tab.
Full depth (184), **Column with stiffeners (186)**, **Column with stiffeners (188)**	On the **Plates** tab, you can now select whether the shear tab is cut parallel to the main part web. 
JP Full depth special (185)	You can now define the inner shear tab chamfers and the chamfer dimensions on the **Plates** tab. 

Stiffeners (1003)	• You can now rotate the stiffener polygons on the **Parameters** tab. You can set the rotation for both the right and the left stiffener.  • You can now define the stiffener plate distance from the beam flange on the **Picture** tab. 
Stiffened base plate (1014)	You can now select to create two grout holes on the **Parameters** tab. 
Doubler plate (1022)	You can now use separate settings for horizontal and vertical welds.
Stiffeners (1034)	It is now possible to create a weld between the bottom flange of the main part and the stiffener plate using weld 2, and a weld between the top flange of the main part and the stiffener plate using weld 3.

1.21 Changes in advanced options

New advanced options

- XS_REBARSET_SHOW_GUIDELINES
- XS_REBARSET_SHOW_MODIFIERS_CREATED_BY_COMPONENTS
- XS_REBARSET_CREATION_ANGLE_TOLERANCE_FOR_LONGITUDINAL_REBARS
- XS_REBARSET_CREATION_ANGLE_TOLERANCE_FOR_CROSSING_REBARS
- XS_REBAR_MINIMUM_LEG_DEVIATION
- XS_REBAR_COMBINE_BENDINGS_IN_EVALUATOR
- XS_CONVERSION_ARBITRARY_PROFILE_MAPPING_BY_NAME_MUST_MATCH_DIMENSIONS
- XS_MARK_LEADER_LINE_LENGTH_FOR_PERPENDICULAR
- XS_POINT_CLOUDS_WEB_CACHE

2 Tekla Structures 2019i administrator's release notes

Upgrade guide from Tekla Structures 2019 to Tekla Structures 2019i

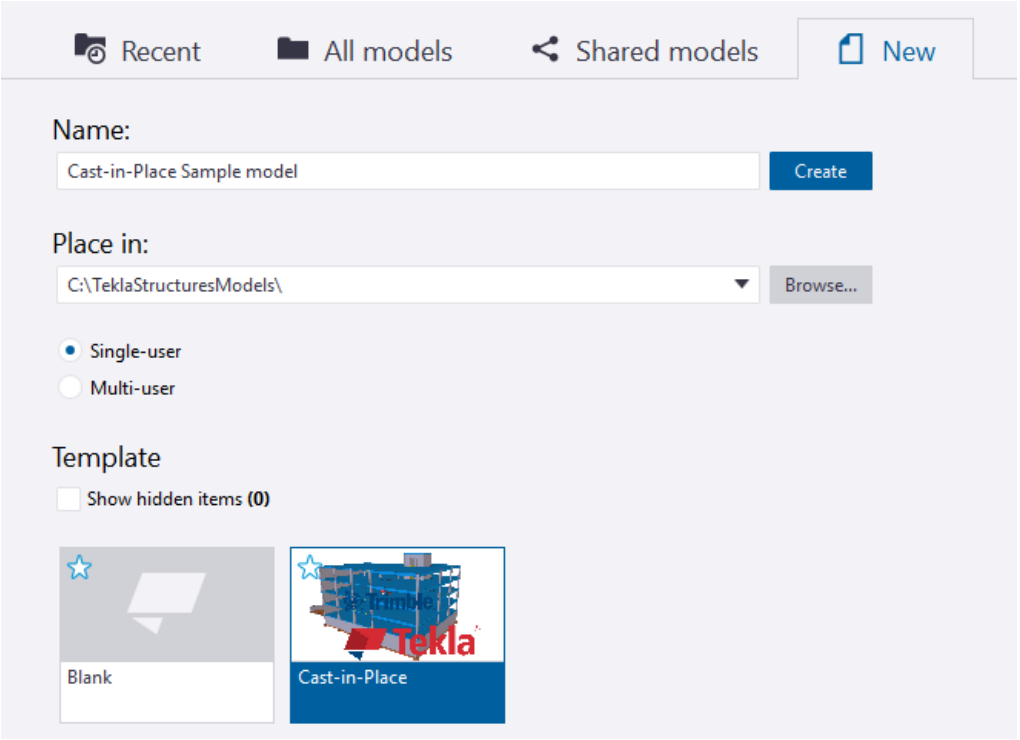
Administrator's release notes are intended to provide advanced users with instructions on how to apply the additional customizations available in a new Tekla Structures version.

2.1 Administrator's release notes: General settings

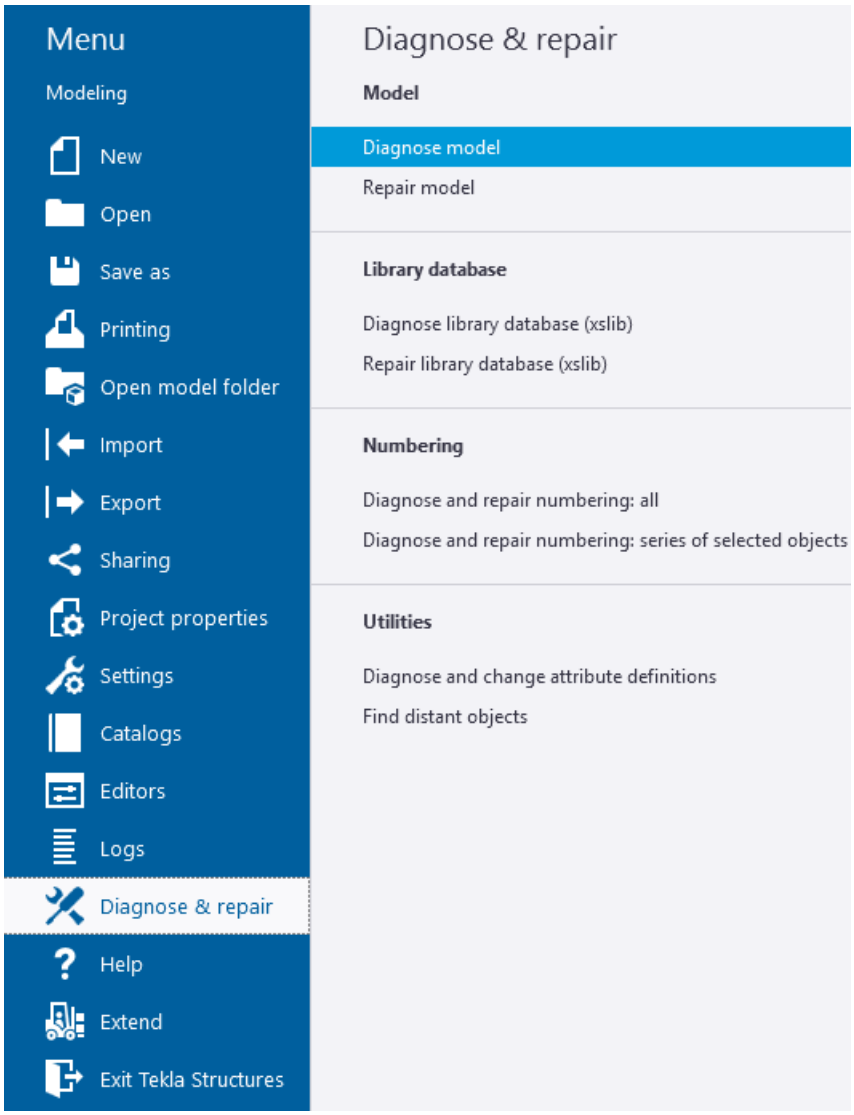
General customization settings apply to all user groups. Use these settings together with your own user group settings.

Administrator's release notes: Model templates in version update

1. Open Tekla Structures 2019i.
2. Create a new model using an existing model template.
3. Give the model the same name as in the previous Tekla Structures version.

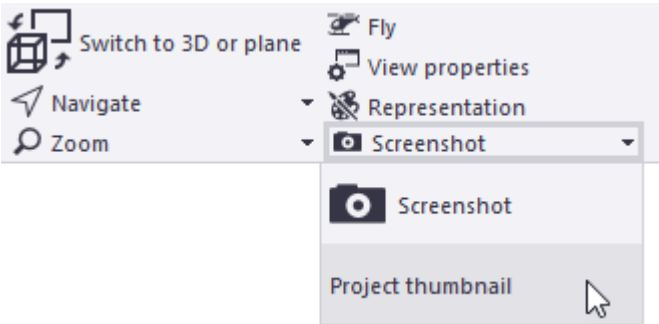


4. Open a 3D view.
5. Diagnose and repair the model.



6. Create a project thumbnail, or add a custom image named `thumbnail.png` in the model folder.

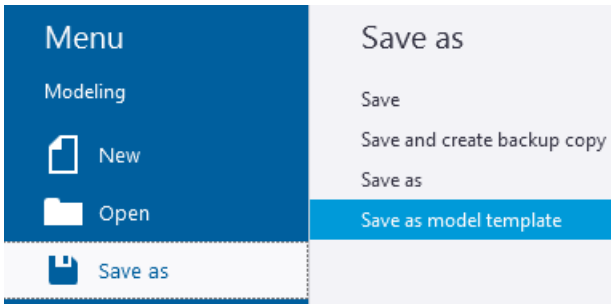
   The preferred size of the image is `120 x 74` pixels.



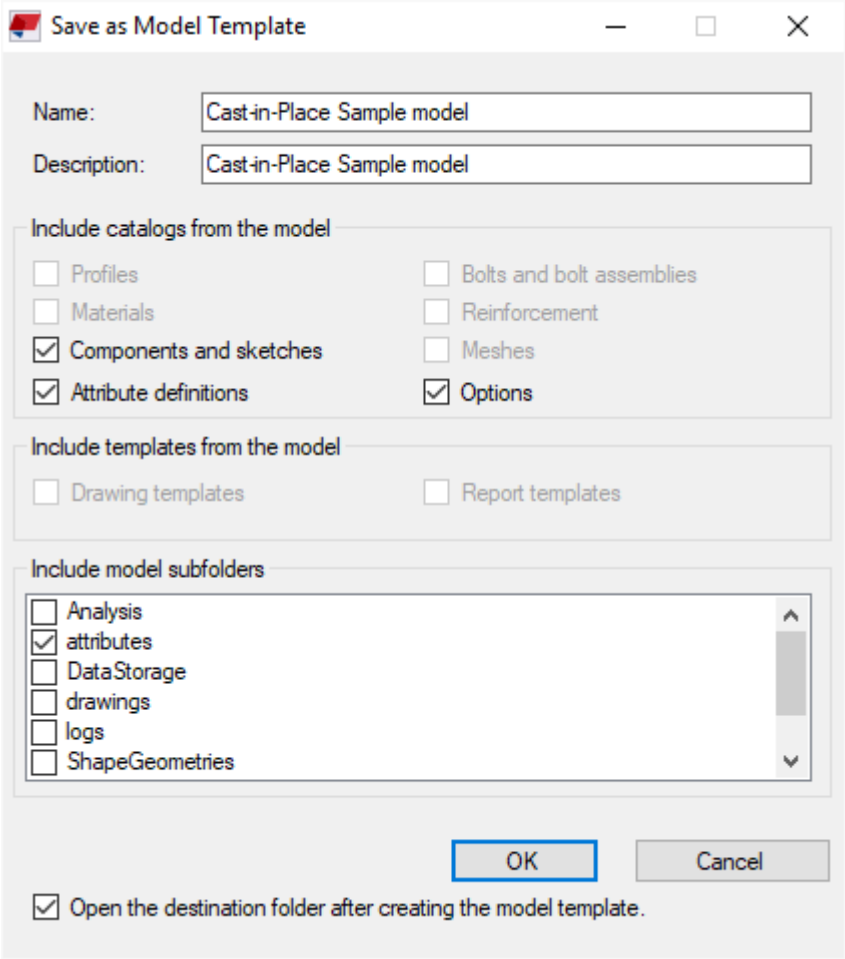
7. Save the model.

   If you do not do this, a message may appear warning about the model being created with a previous version.

8. Save the model as a model template.



9. Include the needed catalog files and subfolders from the model folder, and click **OK**.



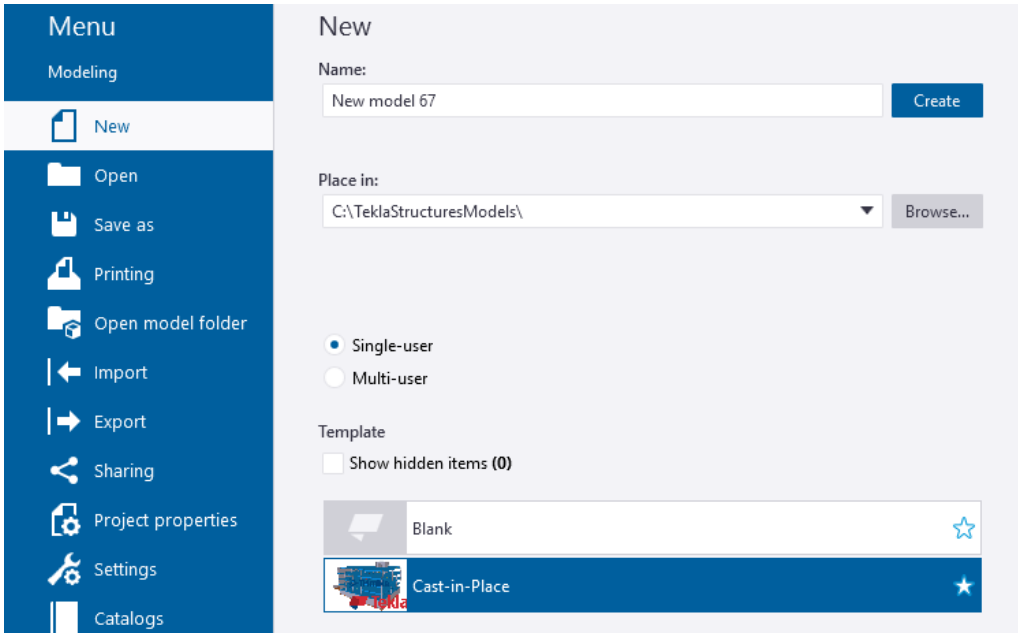
10. Remove manually all `*.db` files (environment database, options databases) from the model folder.

The `*.bak`, `*.log` and `xs_user` files are automatically removed from the model folder.

The `.idrm` files (`db.idrm` and `xslib.idrm`) should be kept as they are part of the model.

The model template is saved in a location pointed by `XS_MODEL_TEMPLATE_DIRECTORY`.

You now have a sample image for your model template. The **Applications & components** catalog is now also in order and easy to use.



Administrator's release notes: Applications & components catalog maintenance

Keep the **Applications & components** catalog in shape and usable. For more information about the **Applications & components** catalog, see How to use the Applications & components catalog.

Set `XS_COMPONENT_CATALOG_ALLOW_SYSTEM_EDIT` to `TRUE` to be able to edit the **Applications & components** catalog definition files that are located in the `XS_SYSTEM` folders.

Check and fix the following:

1. Add the items to groups

Check **Ungrouped items** and add the items to the appropriate group.

2. Check the logs for errors

The **Applications & components** catalog shows the message log button in the lower-right corner of the catalog if there are errors or warnings in the catalog definition files, for example.

If there are references to missing plug-ins, go to the referred `ComponentCatalog.xml` and remove the references manually:

```
<ComponentCatalogItemPlaceholder>
  <ItemIdString>CatalogMacroModelingItem?CreateSurfaceView?GLOBAL</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
  <ItemIdString>CatalogPluginComponentItem?CopyModelDirectoryPlugin</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
  <ItemIdString>CatalogMacroModelingItem?CloseViewsExceptSelected?GLOBAL</ItemIdString>
</ComponentCatalogItemPlaceholder>
<ComponentCatalogItemPlaceholder>
  <ItemIdString>CatalogMacroModelingItem?CloseTemporaryViews?GLOBAL</ItemIdString>
```

Delete selected lines for each missing plugin

Test thoroughly that these changes do not create any further errors, or change the structure of your **Applications & components** catalog. Check at least the **Ungrouped items** and **Legacy catalog** groups.

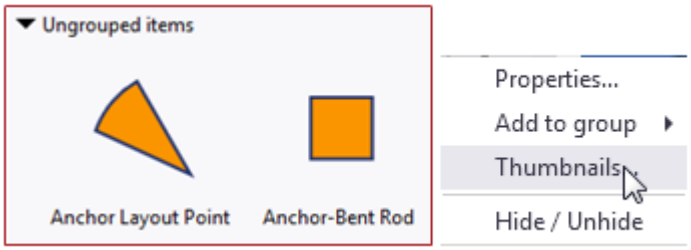
As in the example above, there may be errors for:

- `CatalogPluginComponentItem?CopyModelDirectoryPlugin`
- `CatalogPluginComponentItem?SaveAsModelTemplatePlugin`

3. Hide all non-related applications and components from roles

1. In the **Ungrouped items** catalog, select the **Show hidden items** check box at the bottom.
2. Right-click an application or a component and select **Hide / Unhide**.

4. Create custom thumbnails



Publish a component in the Applications & components catalog

You may need to use the same component with different settings in different cases. To easily use the component, you can define the settings for each case and publish the component in the catalog. This feature can be useful for some roles.

Administrator's release notes: New structure of firm and project folders

You can now create user-defined sub-folders under the firm and project folders and store property files in the sub-folders. This means that you can have a more organized folder structure in the project and firm folders. Tekla Structures can read and copy the property files from the sub-folders when needed. For example, property files are copied when you start sharing a model.

Note that property files cannot be read from the following pre-defined sub-folders under the firm and project folders:

- `ProjectOrganizerData`
  - `ProjectOrganizerData\DefaultCategoryTrees`
  - `ProjectOrganizerData\PropertyTemplates`
  - `ProjectOrganizerData\ExcelTemplates`
- `AdditionalIPSets`
- `macros`
  - `macros\drawings`
  - `macros\modeling`
- `Drawing Details`
- `extensions`
  - `extensions\drawings`
  - `extensions\model`
- `CustomInquiry`
- `PropertyRepository\Templates`
- `symbols`
- `template`
  - `template\mark`
  - `template\settings`
  - `template\tooltips`
- `profil`
  - `profil\ShapeGeometries`
  - `profil\Shapes`
- Environment folders

Tekla Structures searches for property files in the sub-folders of the firm folder or the project folder as follows:

1. The search starts from the root folder (`XS_FIRM` or `XS_PROJECT`).
2. If Tekla Structures finds the first property file with a corresponding file name suffix and file name prefix, the property file is selected.
3. The search continues so that each sub-folder of the root folder is searched in alphabetical order.
4. Tekla Structures ignores each attribute file with the same file name suffix and file name prefix as the previously selected file, and stores each file name in the error log.

Administrator's release notes: Lofted plate and lofted slab

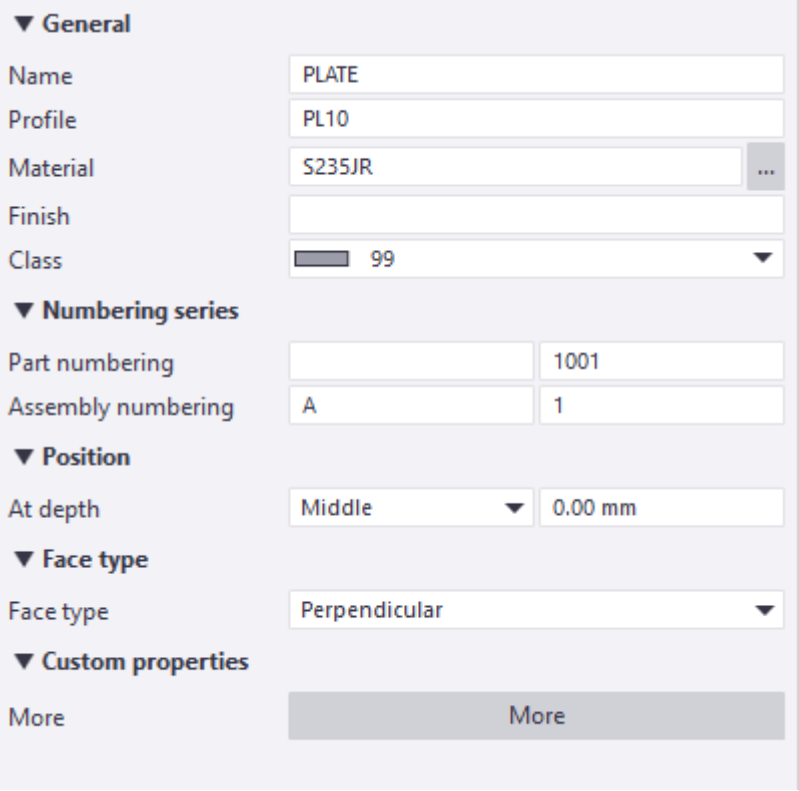
Tekla Structures 2019i introduces new part types: steel lofted plate and concrete lofted slab. Use lofted plates to model rolled plates and plates with double-curved form, for example. Use lofted slabs to model curved and double-curved slabs or walls, for example.

For more information, see New part types: lofted plate and lofted slab (page 22)

Lofted plate

Current configuration in the common environment

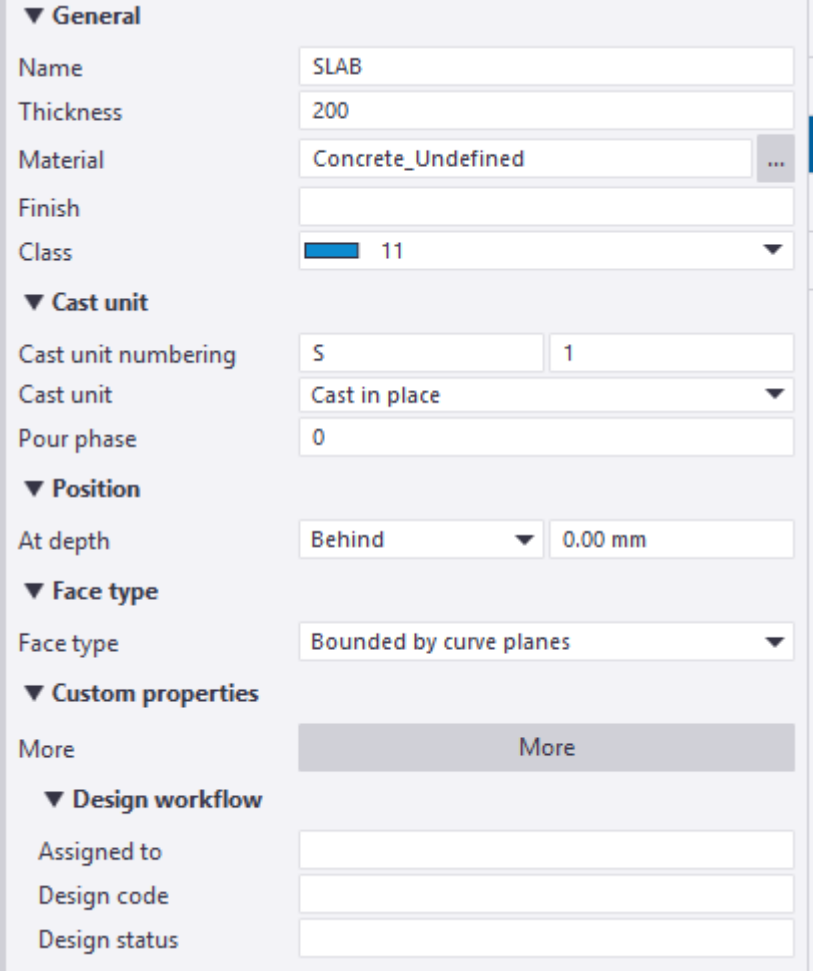
`...\2019.1\Environments\common\system\standard.lpl`



Lofted slab

Current configuration in the common environment

`...\2019.1\Environments\common\system\standard.lsl`



To do

Create new settings and save them. The new settings files can be found from:

`\<model>\attributes\<SettingName>` - **lsl**.

`\<model>\attributes\<SettingName>` - **lpl**.

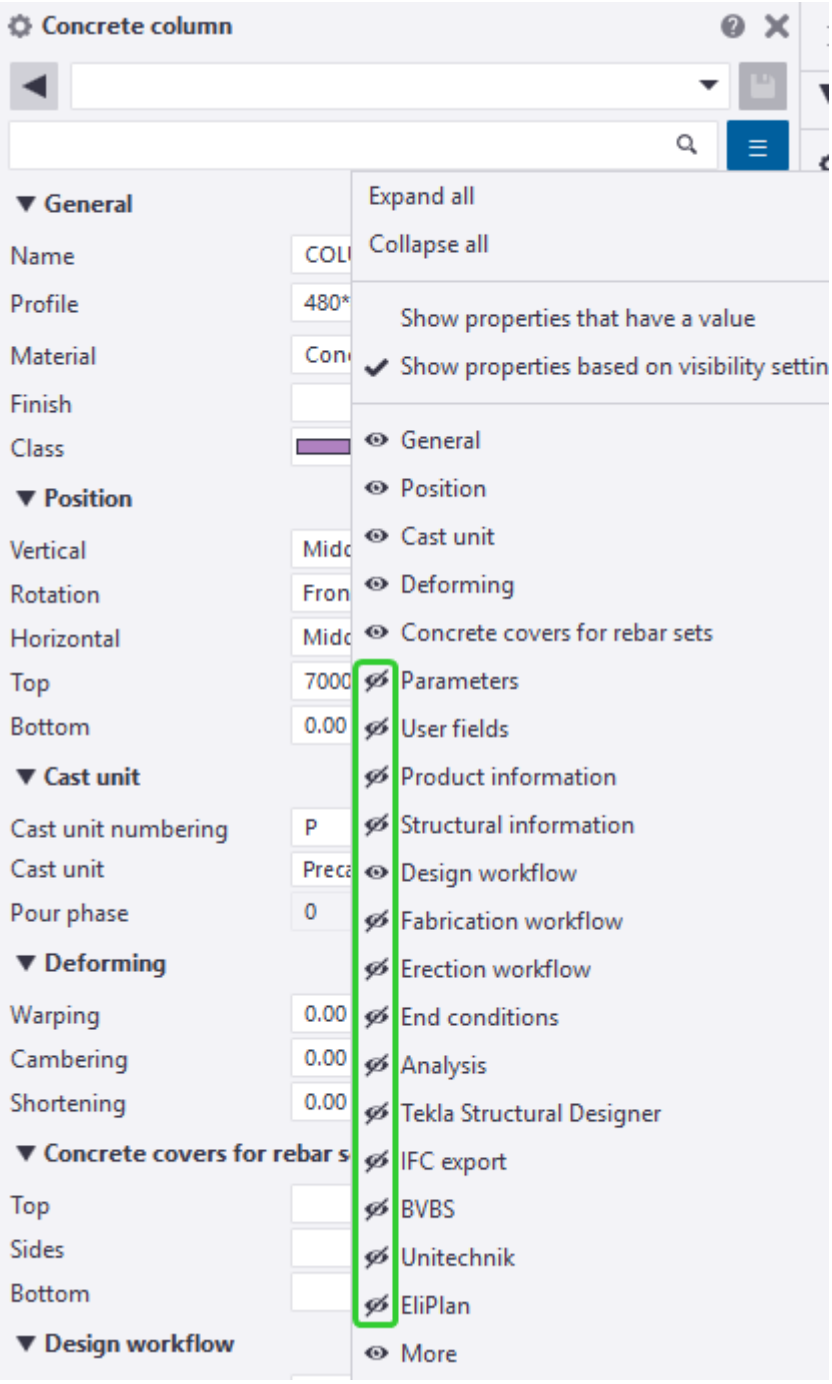
Save the files to the wanted folder in the `XS_SYSTEM` path.

The files will be searched from `XS_PROJECT`, `XS_FIRM`, `XS_DRIVER`, `XS_SYSTEM` and `XS_USER_SETTINGS_DIRECTORY`.

Administrator's release notes: UDA handling in the property pane

Tekla Structures 2019i introduces improvements in the property pane and the **Property pane editor**. With these updates, especially the viewing and modifying of user-defined attributes (UDAs) is now easier and more straightforward.

For more information, see Updates to the property pane, UDAs, and to the Property pane editor (page 11).



To do

Configure the wanted area-specific UDAs to the property pane. You can select to add them all or just the most commonly used UDAs.

The customized settings files can be found from: `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyTemplates\PropertyTemplates.xml`.

Move the file to the wanted folder in the `XS_SYSTEM` path `...\PropertyRepository\Templates\`.

Note

The property pane searches the configuration files from the model folder, and `XS_PROJECT`, `XS_FIRM`, `XS_DRIVER`, and `XS_SYSTEM` folders.

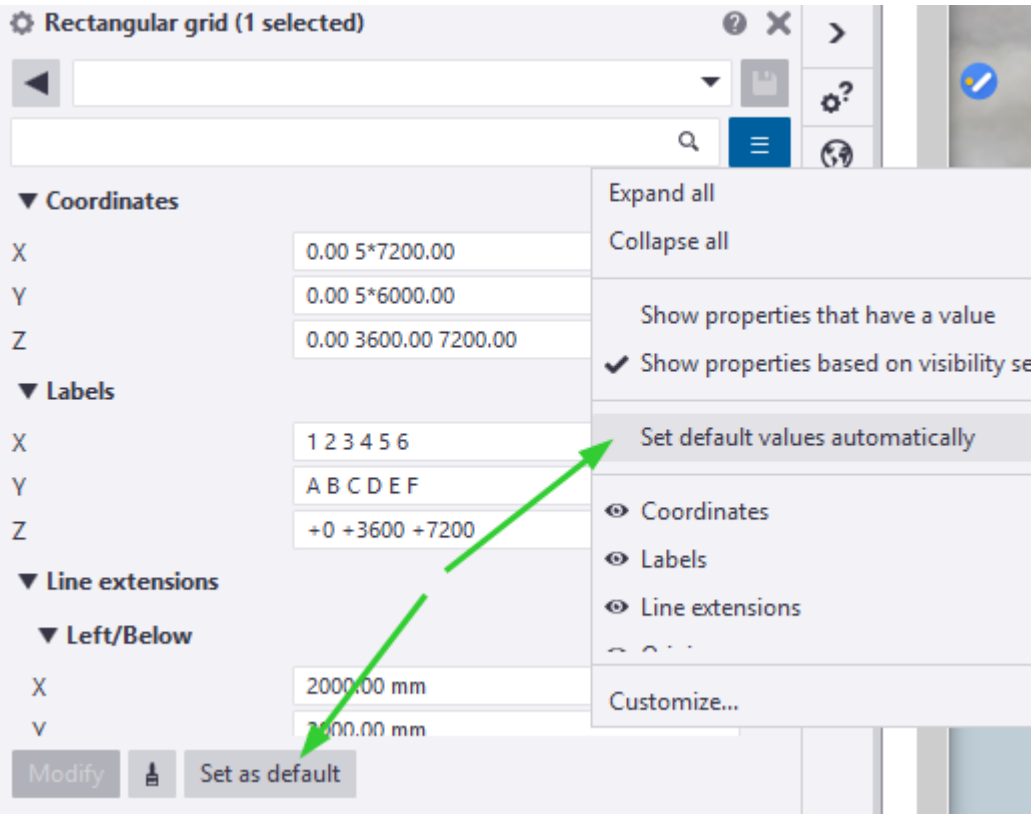
Groups that are defined in different `PropertyTemplates.xml` files are not merged for object types. However, if the property template in a higher priority folder does not contain any definition for an object type, the definition in a lower priority folder will be used for that object type. **Merging does not work within object types but it works between object types.**

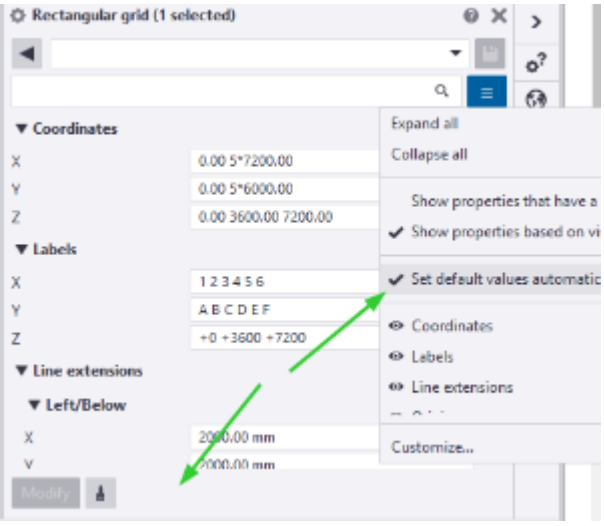
If the file exists in `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyTemplates\`, it will be used.

Set default values automatically -option

Set default values automatically option is under the Visibility of properties button. The default status of the option is checked and **Modify** button works as before. When it is unchecked, **Set as default** button will be visible in property pane and works as the old **Apply** button. In this state, the **Modify** button does not automatically apply the edited properties for the next object creation.

This is also possible to configure in the `PropertyTemplates.xml` file.



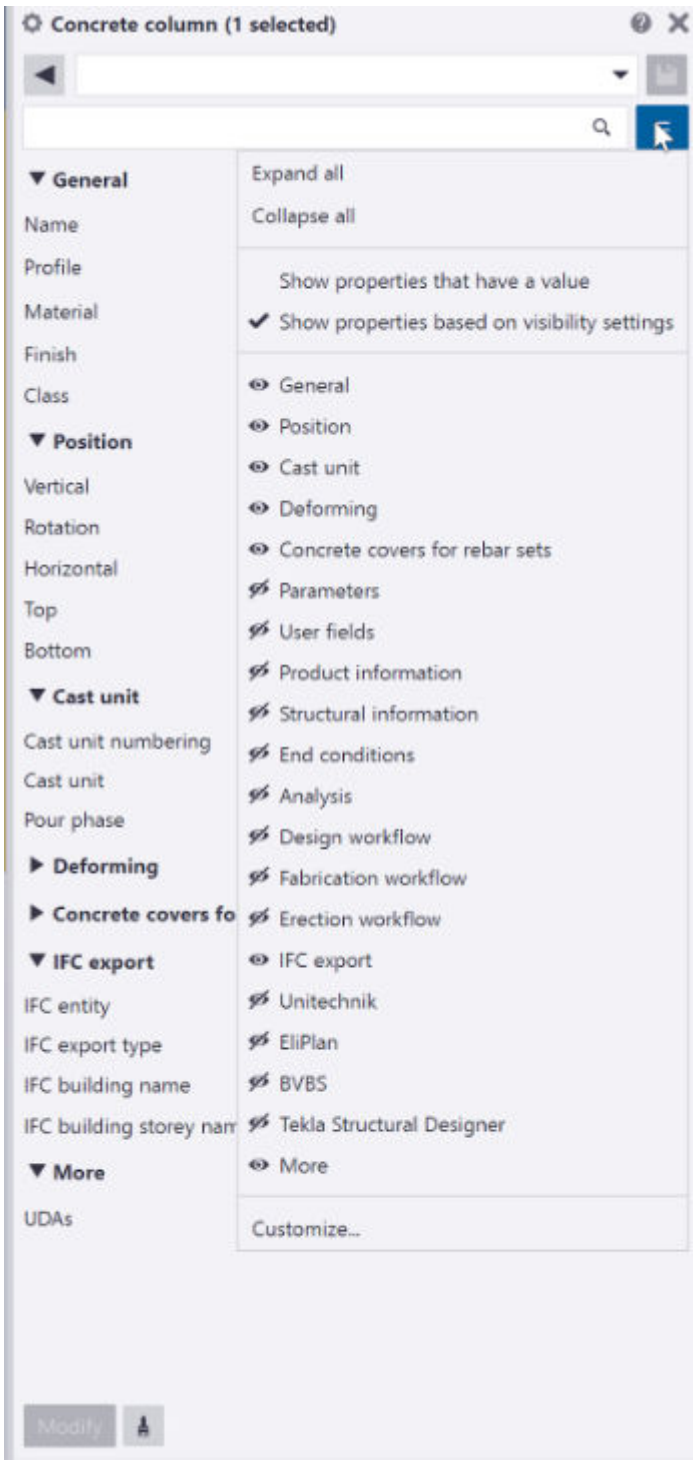


Localization tasks

The aim is to have good UDA grouping for all available UDAs within each role, and to choose which carefully chosen groups should be visible by default in

each role. The result should be clean, practical and easy-to-understand, without reporting any warnings to user due to missing UDAs.

We recommend that you create the grouping in line with the content of UDA tabs but this is a great opportunity to streamline them and sub-categorize them to improve the user experience.



Which environments and roles need to be localized

- The `PropertyTemplates.xml` files for an environment need to be updated if the environment contains environment-specific UDAs.
- The `PropertyTemplates.xml` file for a role needs to be updated if the role contains role-specific UDAs.

PropertyTemplates.xml files to be used as a starting point

The common environment contains four property template files with UDAs defined in the common environment. When starting to localize your property templates, you can use them as a starting point.

Known issues with the property templates:

- Grid UDAs cannot currently be added to the property pane
- All group titles do not have a translation yet

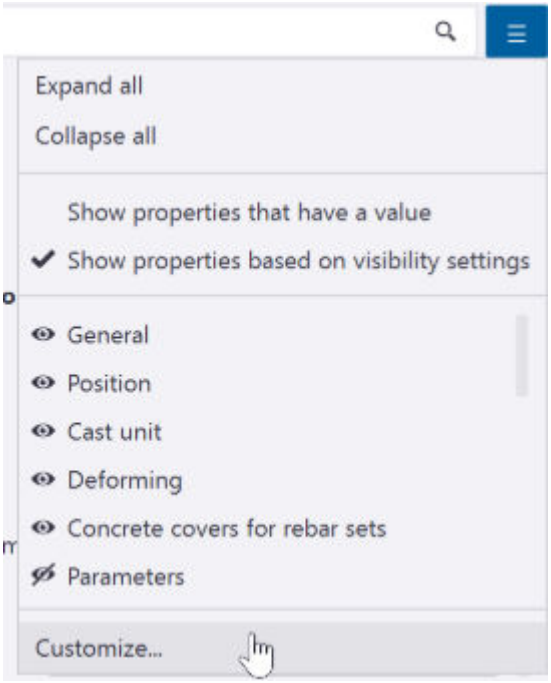
Steps to localize the property templates

1. Remove the existing `PropertyTemplates.xml` files from the environment so that they do not interfere with the new files you are creating.
2. Start Tekla Structures with the role for which you want to localize, or the role with most UDAs if you are creating only one property template for an environment.
3. Set `XS_ENABLE_POUR_MANAGEMENT` to `TRUE` to see pour UDAs.
4. Select the best matching property template for your role/environment to use it as a starting point:

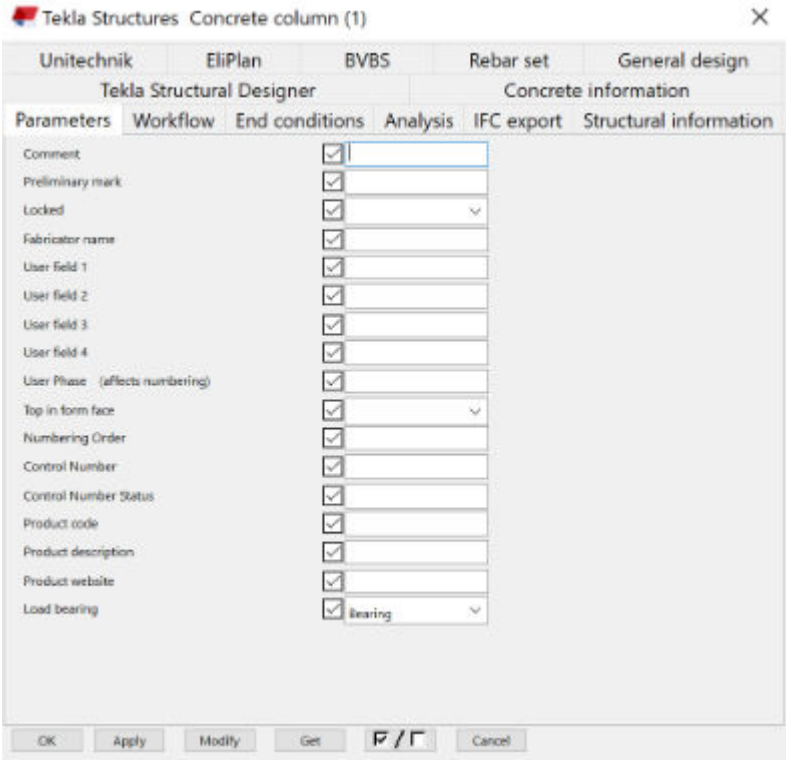
Template in folder	UDAs in template
Common	Parameters, User fields, Product information, Structural information, End conditions, Analysis, Tekla Structural Designer, IFC export, Unitechnik (for rebars), Couplers
ConstructionManagement	All above + Workflow UDAs
CIP	All above + BVBS UDAs
Precast	All above + Unitechnik (for parts), EliPlan, HMS UDAs

5. Store the selected `PropertyTemplates.xml` file to the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyTemplates` folder.

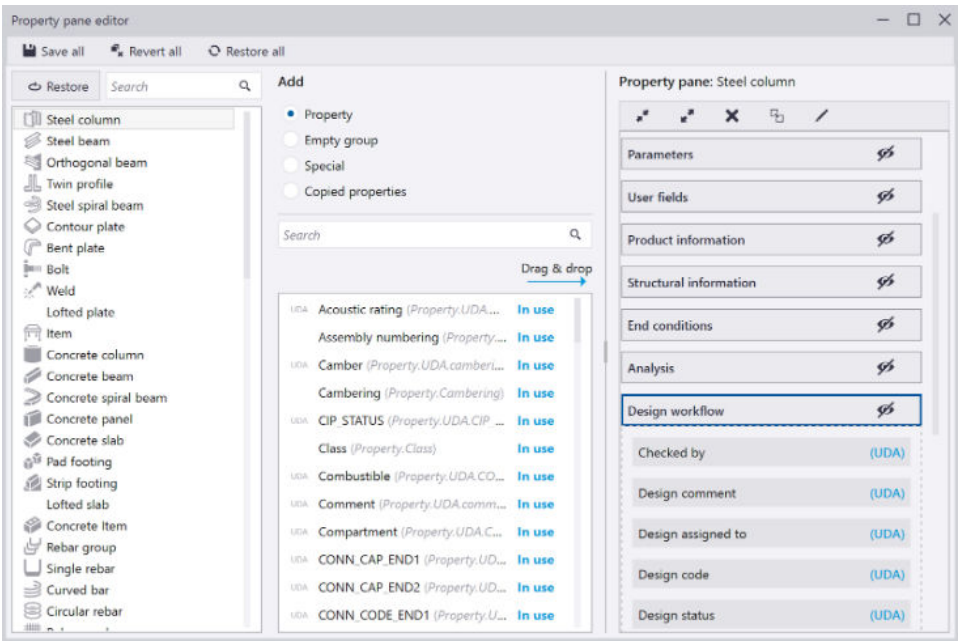
6. Open **Property pane editor**.



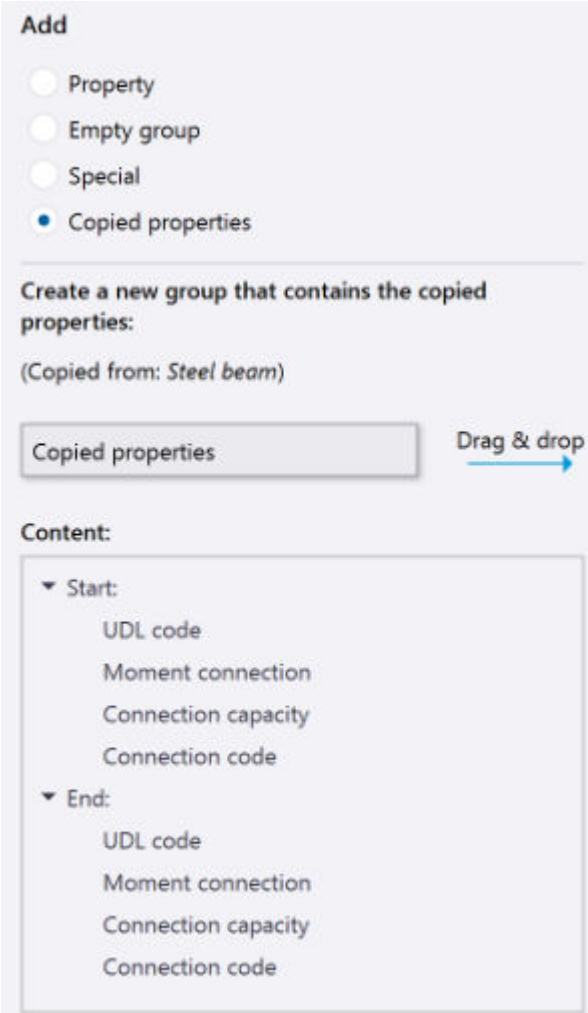
7. For each object type, do the following:
   a. Check which UDA tabs are available in the old UDA dialog box.



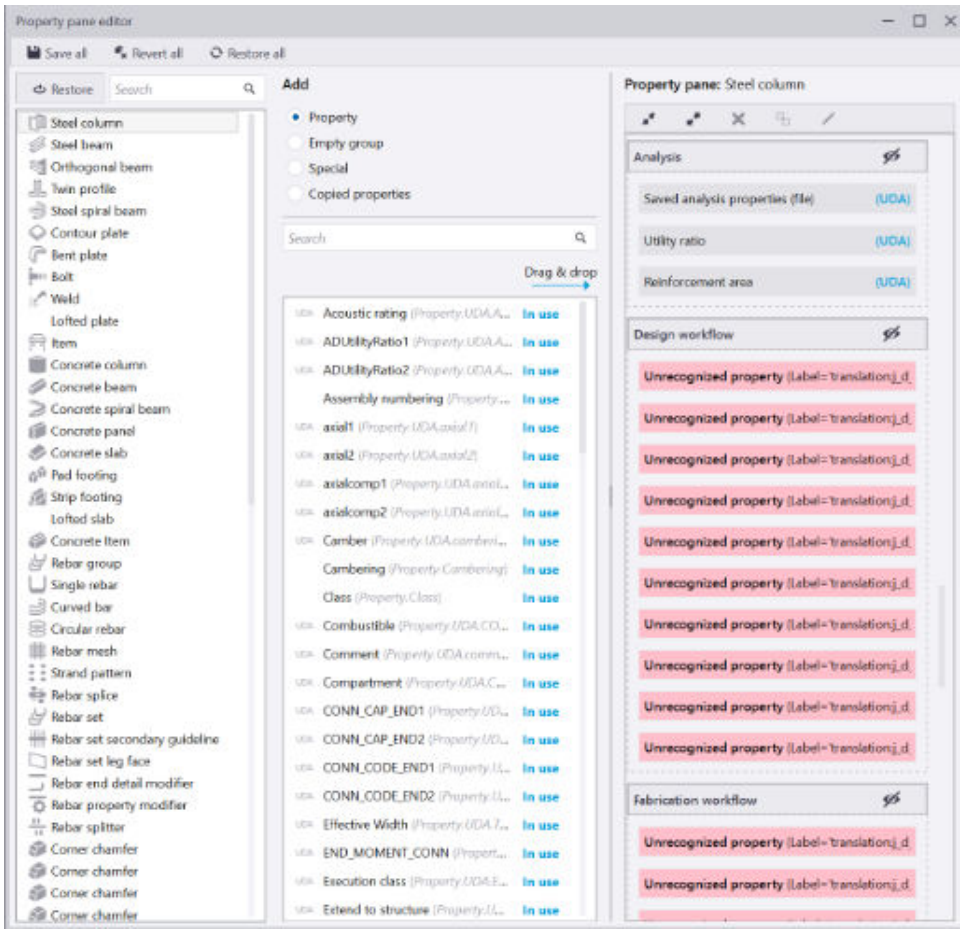
b. Add groups corresponding to the tabs in property pane. You can divide the tabs into several groups if needed.



c. Add the UDAs on each tab to the corresponding group in the property pane. Note! Copy the tabs with the **Copy properties** command for object types that have the same tabs.

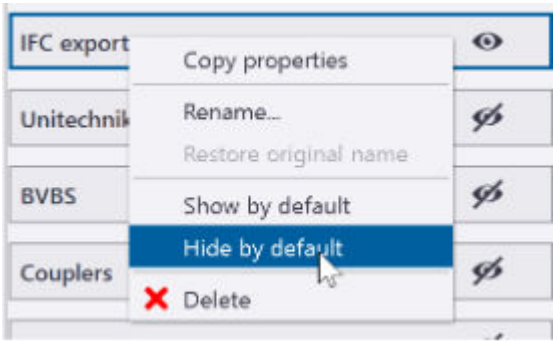


d. Remove any UDAs that are not available in the role, as they will otherwise be reported as missing.



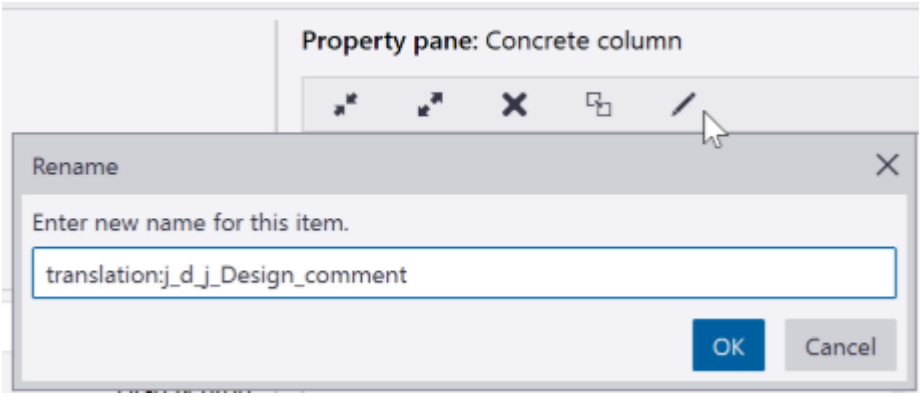
e. If you had a group `Custom properties` in your property template, rename it as `More`.

f. Hide other than the most frequently used groups by clicking the eye icon in **Property pane editor**. This ensures that the property pane only shows the content that you need.



g. Add labels for UDAs with the **Rename** command if the labels have been defined separately from the UDA in the `objects.inp` file.

h. Translations that exist in `joints.ail` or in another file in the messages folder can be used by typing `translation:x_x_xx` to the edit label **Rename** dialog box.



8. When ready, move the `PropertyTemplates.xml` file from `..\Users\<user>\AppData\Local\Trimble\Tekla Structures\<version>\UI\PropertyTemplates` to the `\PropertyRepository\Templates` subfolder in the environment or environment\role folder. Ensure that no property template remains in your `\AppData` folder, because the file in the `\AppData` folder has the highest priority.
9. Open the property pane to test your property template.

The closest matches between the roles in the Default environment and the example property templates:

Role	Property template
CIP role	CIP property template
Precast role	Precast property template
Engineering role	Precast property template
Steel role	Construction management property template

NOTE Groups that are defined in different `PropertyTemplates.xml` files are not merged for any specific object type. However, if a property template in a higher priority folder does not contain any definition for an object type, the definition in a lower priority folder will be used for that object type. So merging does not work within object types but between object types it works.

NOTE If the file exists in `..\Users\<user>\AppData\Local\Trimble\TeklaStructures\<version>\UI\PropertyTemplates\`, it will be used in property pane.

Any changes will only be saved to the file in your user data folder. Therefore, copy the environment file to be edited to the `..\Users\<user>\AppData\Local\Trimble\Tekla Structures`

\<version>\UI\PropertyTemplates folder to ensure that all changes are included in this one file. If you need to re-edit the file later, copy the environment file again to the user data folder.

NOTE If your role is using a shared folder that is listed on the left side of the role-specific folder in the XS_SYSTEM path, ensure that there is no property template in that shared folder. Otherwise, the shared property template will override your role-specific property template, because folders on the left have higher priority.

As mentioned, the files do not merge within an object type, so the folder path with highest hierarchy will override the other property templates, which ensures there will not be any mismatch due to roles. However, All roles might be missing UDA grouping for UDAs from lower-ranking roles.

Administrator's release notes: Multiple printing settings

You can print to more than one printer in one go based on the paper size of each selected drawing. You typically have different printers for handling different paper sizes. Tekla Structures automatically selects the appropriate printer for each drawing.

To do

Create the new settings and save them. The new PdfMultiPrintOptions.xml settings file can be found from \<model>\attributes\<SettingName>.

Save the file to the wanted folder in the XS_SYSTEM path.

The file will be searched from XS_PROJECT, XS_FIRM, XS_DRIVER, XS_SYSTEM, and XS_USER_SETTINGS_DIRECTORY folders.

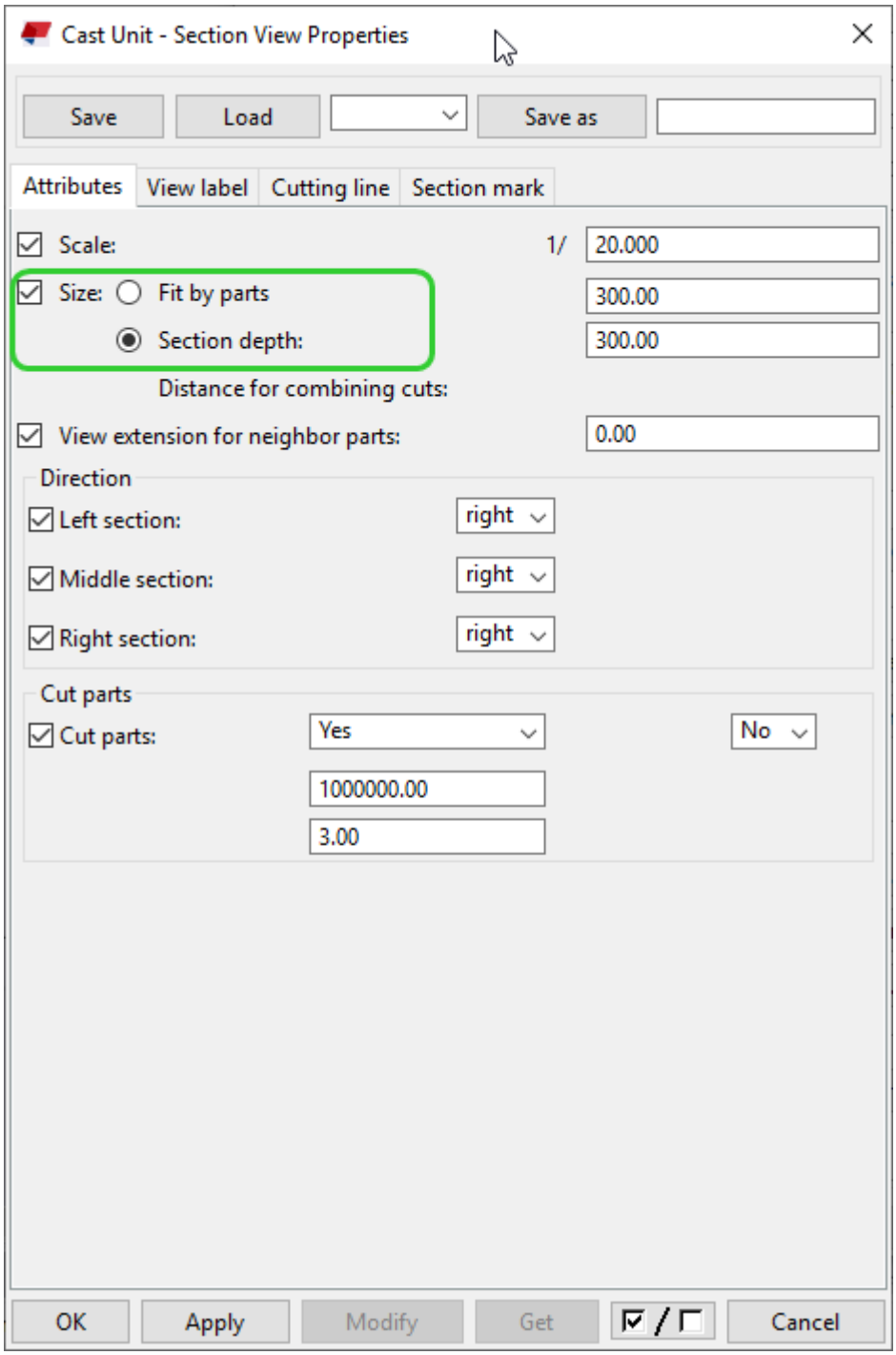
For more information about the new option to print to multiple printers in one go, see Printing to multiple printers and other printing improvements (page 48).

Administrator's release notes: Improvements in drawings

You can now set the **Fit by parts** option for section views also before creating the drawings. There are also improvements in rebar drawing tools.

Cast unit drawing creation

- In the drawing properties for section views, it is now possible to select **Fit by parts** as an option to be used for the created section views.



Improvements in rebar drawing tools

Rebar group dimensioning

A new **Group dimensions** option has been added to the **Advanced settings** tab for controlling if dimensions are grouped or not. Grouping now works also when the distance between the groups is zero.

Rebar group marking

- There is a new feature that adds symbols on the distribution and leader line intersection. To add this feature, the **Lines and symbol** tab is now divided into 2 separate tabs.
- There is a new option on the **Mark 1** tab to determine the offset from the mark to the leader line.

For more information about improvements in rebar drawing tools, see Improvements in rebar drawing tools (page 46).

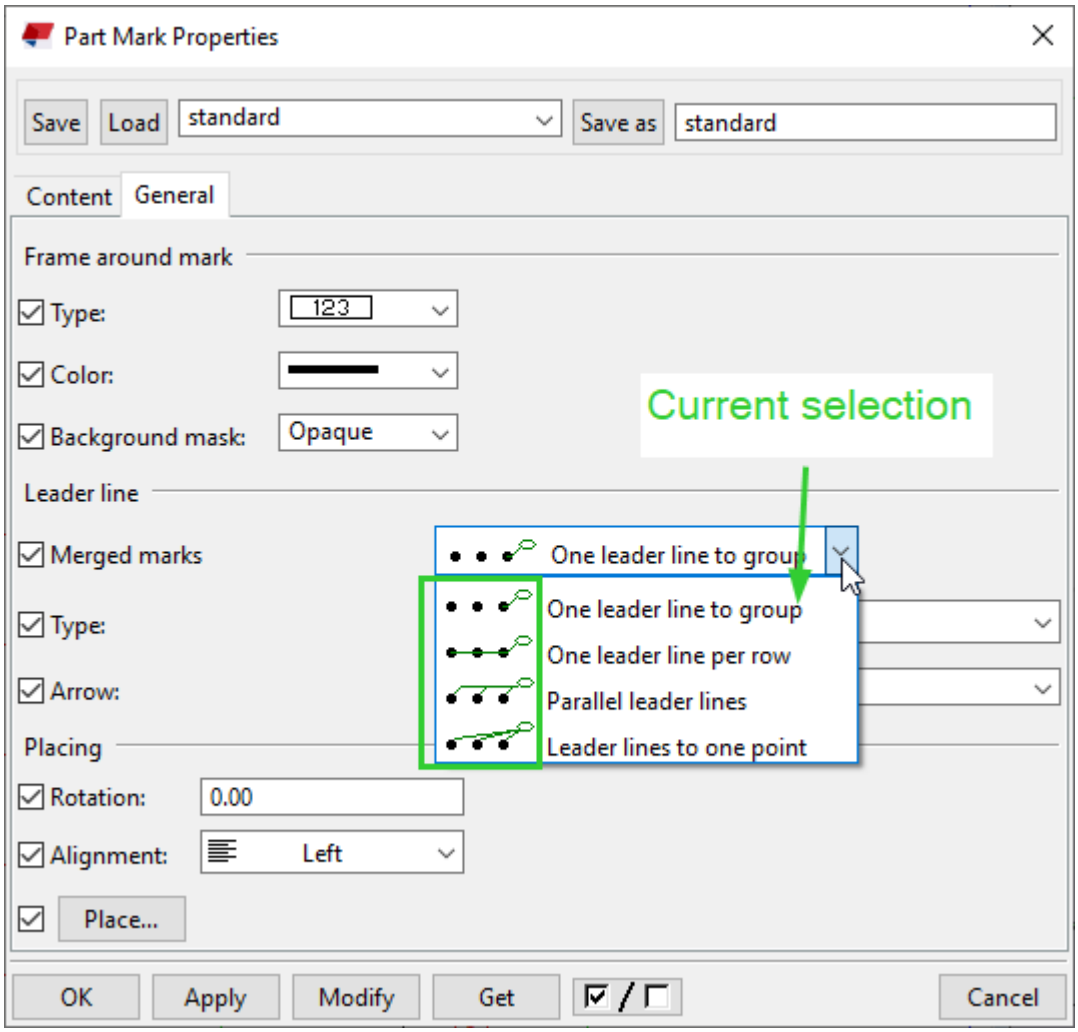
Administrator's release notes: Improvements in marks

There are new options for rebar group marks. We also recommend that you change the leader line default option for merged marks.

Merge marks

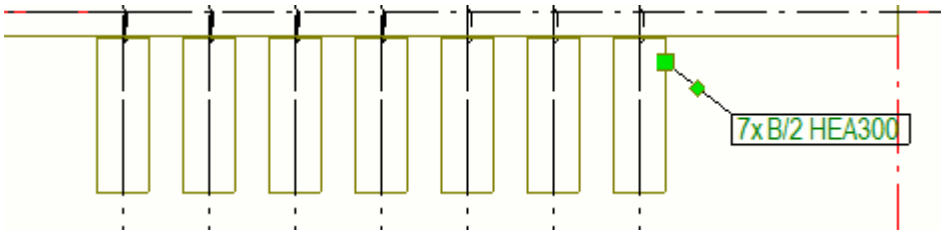
Currently, there is an option **One leader line to group** that shows only one leader line. This could cause a misunderstanding because the mark is pointing to only one object in the group instead of all. This is difficult to notice because the merge functionality is automatic. Any other option adds leader lines to all objects in the group.

For detailed instructions on how to merge marks, see Merge marks.

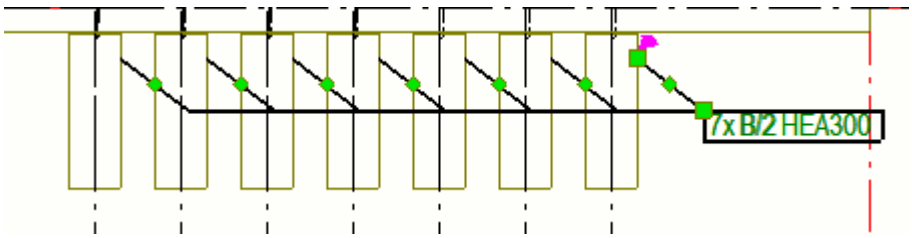


Examples

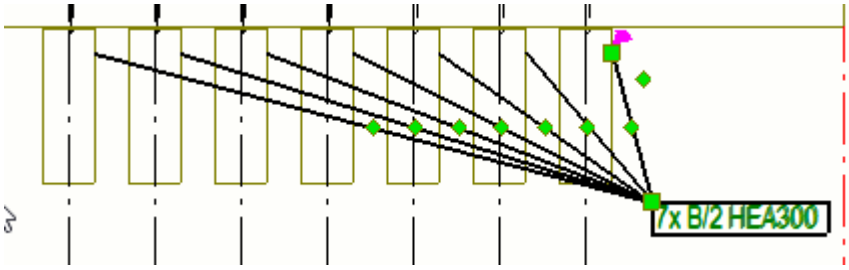
One leader line to group



Parallel leader lines



Leader lines to one point



To do

Localize the merged marks property to some other value than **One leader line to group**.

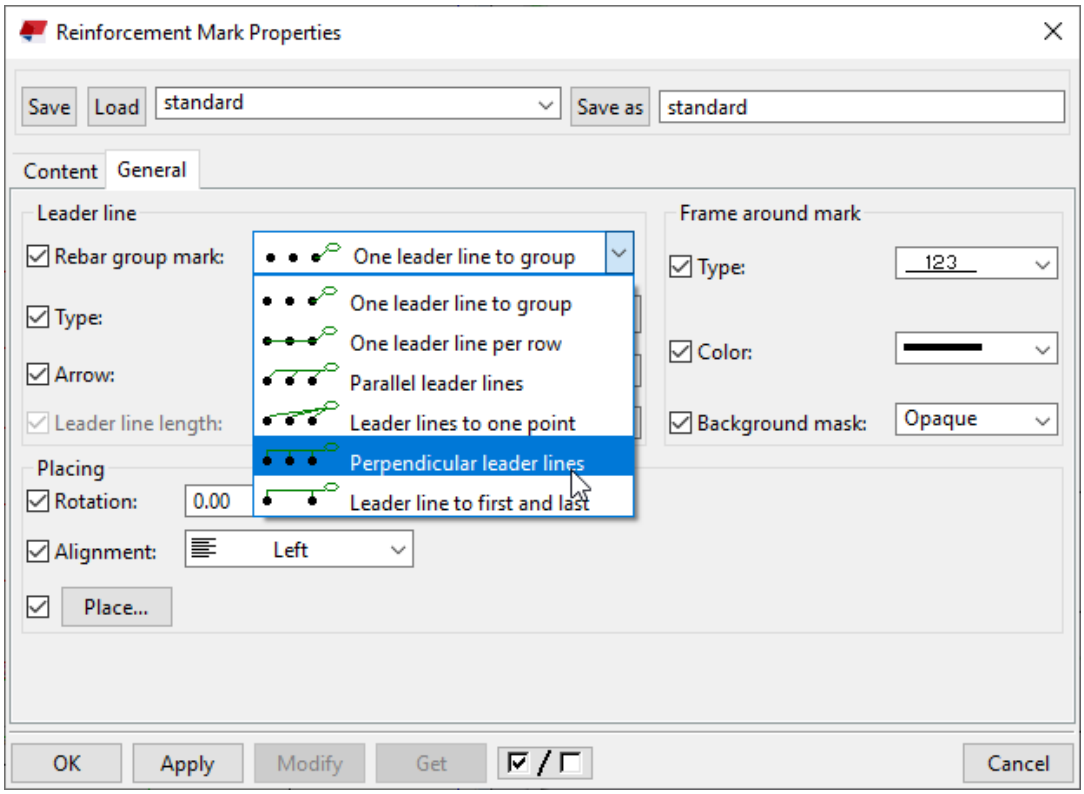
- Drawing setting files (`.ad`, `.wd`, `.cud`, `.gd`)
- View setting files (`.vi`, `.vpm`, `.vsm`)
- Mark setting file (`.pm`)

Perpendicular leader line / Leader line to first and last

- There is a new type of leader line for group rebar marks: Leader line to first and last.
- There is a new advanced option for perpendicular leader line length:

  `XS_MARK_LEADER_LINE_LENGTH_FOR_PERPENDICULAR`

  The `XS_MARK_LEADER_LINE_LENGTH_FOR_PERPENDICULAR` advanced option now controls the leader line length in a similar way as the leader line extension length controlled by `XS_MARK_LEADER_LINE_EXTENSION_LENGTH`.

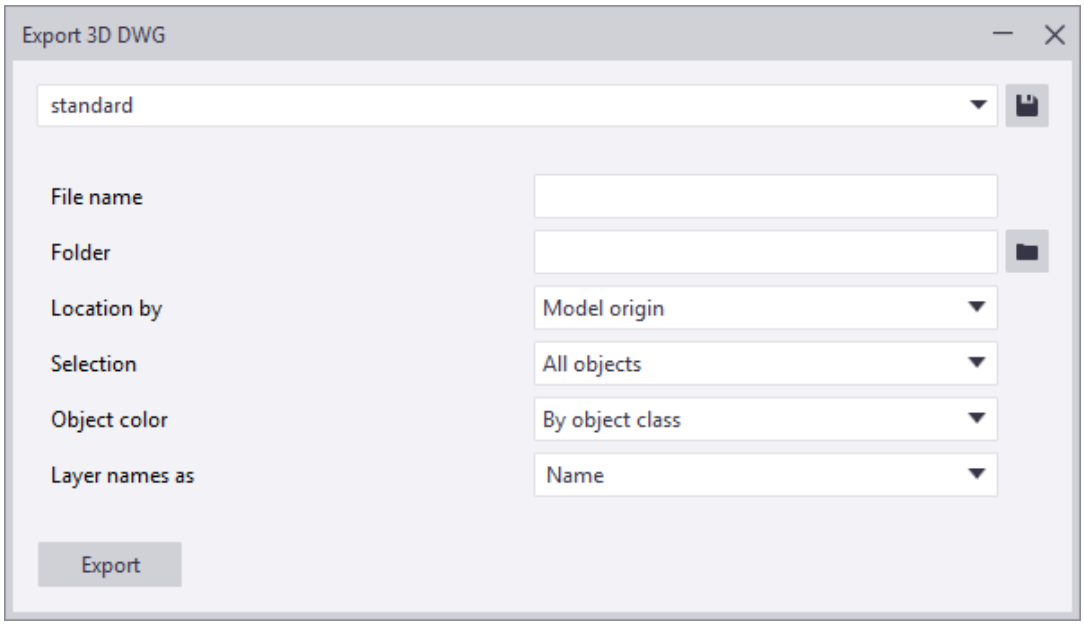


Administrator's release notes: Interoperability improvements

Export to 3D DWG settings

Standard file in the common environment

The standard file can be found in `C:\ProgramData\Trimble\Tekla Structures\2019.1\Environments\common\system\standard.dwgExport.json`.



For more information about the new 3D DWG export, see Export to 3D DWG - New 3D DWG export (page 59).

To do

Create new settings and save them. The new `dwgExport.json` settings file can be found in `\<model>\attributes\<SettingName>`.

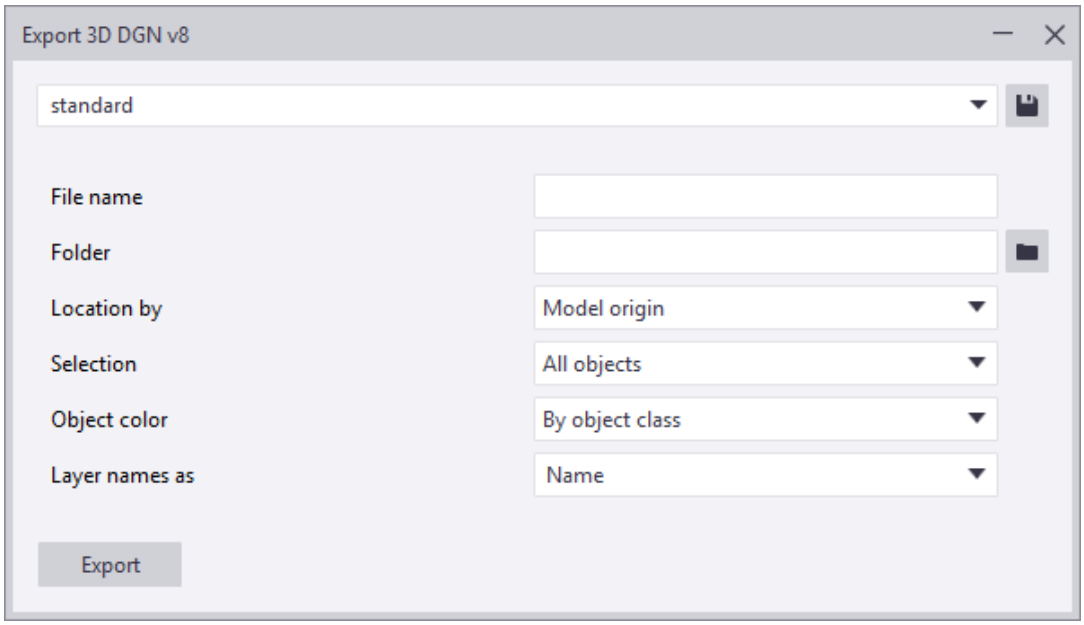
Save the file to the wanted folder in the `XS_SYSTEM` path.

The file will be searched from `XS_PROJECT`, `XS_FIRM`, `XS_DRIVER`, `XS_SYSTEM`, and `XS_USER_SETTINGS_DIRECTORY`.

Export to 3D DGN settings

Standard file in the common environment

The standard file can be found in `C:\ProgramData\Trimble\Tekla Structures\2019.1\Environments\common\system\standard.dgnExport.json`.



For more information about the new 3D DGN export, see Export to 3D DGN v8 - New 3D DGN export (page 57).

To do

Create new settings and save them, if needed. The new `dgnExport.json` settings file can be found in `\<model>\attributes\<SettingName>`.

Save the file to the wanted folder in the `XS_SYSTEM` path.

The file will be searched from `XS_PROJECT`, `XS_FIRM`, `XS_DRIVER`, `XS_SYSTEM`, and `XS_USER_SETTINGS_DIRECTORY`.

2.2 Administrator's release notes: Steel settings

The following customization settings only apply to the steel user group.

Administrator's release notes: Steel components (page 101)

Administrator's release notes: Steel components

There are several improvements in steel components in Tekla Structures 2019i.

Update your standard files if you want to take the new options and features into use.

For more information about these improvements, see Improvements in components (page 64) in Tekla Structures 2019i release notes.

2.3 Administrator's release notes: Concrete settings

The following customization settings only apply to the concrete user group.

Administrator's release notes: Rebar sets and other reinforcement improvements (page 102)

Administrator's release notes: Updates in tools for concrete fabrication (page 104)

Administrator's release notes: Concrete components (page 104)

Administrator's release notes: Rebar sets and other reinforcement improvements

In Tekla Structures 2019i, there are many new features related to rebar sets, and improvements in **Rebar shape manager**.

For additional information about these improvements, see also Improvements in rebar sets and Rebar shape manager (page 32) in Tekla Structures 2019i release notes.

Cranking using end detail modifiers

To do

Ensure that your environment's rebar database (`rebar_database.inp`) is localized to cover the standard lapping and standard cranking functionalities.

Standard file update

Update your environment's end detail modifier standard file (`standard.rst_edm`):

1. Create a rebar set. Interrupt the command. Then select the rebar set.
2. Create an end detail modifier. Interrupt the command. Then select the end detail modifier.

   The property pane opens.
3. Enter suitable standard values and save the file as `standard`.
4. Upload the newly created standard file again to your environment.

Face-specific concrete covers

To do

New standard file

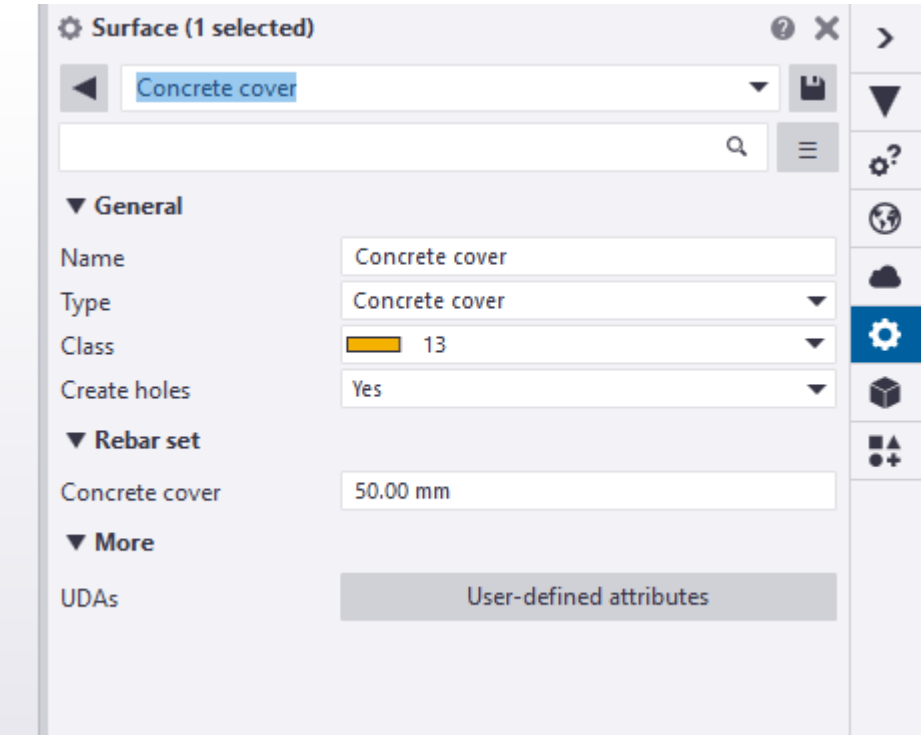
If needed, create a new surface object standard file and add it to your environment (for example, `Concrete cover.srfo` and `Concrete cover.srfo.more`):

1. Create a surface object. Interrupt the command. Then select the surface object.

   The property pane opens.

2. Enter suitable standard values and save the file as `Concrete cover` or similar.

3. Upload the newly created standard file again to your environment.



Manual grouping

To do

Standard file update

Update your environment's property modifier standard file (`standard.rst_pm`):

1. Create a rebar set. Interrupt the command. Then select the rebar set.

2. Create a property modifier. Interrupt the command. Then select the property modifier.

   The property pane opens.

3. Enter suitable values and save the file as `standard`.

4. Upload the newly created standard files again to your environment.

Report template update

Update your report templates to support this new functionality. Use the following updated templates from the Default environment (`\default\Concrete\Shared\ReportsAndTemplates`) as an example:

- `Rebar - Group Bending List - Compact.rpt`
- `Rebar - Group Bending List - Extended.rpt`
- `Rebar - Single Bar Bending List.rpt`

Moving all rebar set related UDAs to one .inp file

Previously, rebar set related UDA definitions were in several separate `.inp` files. Now they are in one file to make it easier to maintain the UDAs.

To do

The `objects_rebar_set.inp` file is now located in the `common\system\` folder. If your environment does not follow `common\system\`, copy this file to your environment's `\inp` folder and check if you get the rebar set UDAs.

Rebar shape manager

The following improvements have been made:

- There is a new tolerance setting **Curve tolerance** on the **Tolerances** tab. This value is used to recognize the 'arc' in a bar that has multiple sequential bendings.
- **Rebar shape manager** has been changed so that multiple sequential bendings that form an arc are combined into one or more bendings (90 degree or less) with the arc radius.

Administrator's release notes: Updates in tools for concrete fabrication

Export Unitechnik (79), and **Export EliPlan file**, and **Export BVBS** have been improved.

For more information about the improvements, see Updates in tools for concrete fabrication (page 61) in Tekla Structures 2019i release notes.

Administrator's release notes: Concrete components

There are several improvements in concrete components in Tekla Structures 2019i.

Update your standard files if you want to take the new options and features into use.

For more information about these improvements, see Improvements in components (page 64) in Tekla Structures 2019i release notes.

3 Localization release notes

Environment-specific Tekla Structures localization release notes introduce new and changed features in the new Tekla Structures version from the localization point of view. It lists the features that have been localized in your environment and also helps you in your own customization tasks. The localization release notes are supplied by the localization teams at your local area and reseller offices.

4 Upgrade Tekla Structures to a new version

You can have many Tekla Structures versions on your computer. When you install and start using a new version, you do not need to uninstall the older versions and you can keep using them. Service packs are cumulative updates, so they replace the previous service pack installation for the same Tekla Structures version.

NOTE We recommend that you complete any models you are already working on using your current version of Tekla Structures. Once you save a model in the new version, you cannot open it in the previous versions anymore.

You can download the installation packages from the Tekla Downloads service.

Complete the upgrade in this general order (follow the links in the text for detailed instructions):

1. Update the Tekla license server (page 108). The updated version replaces the existing version you have installed.
2. Renew your licenses as explained in Renew a Tekla license (page 109).

   The renewed licenses can be used with the version indicated on the license and any previous versions that are compatible with your installed license server version.
3. Install Tekla Structures.

   You can have many Tekla Structures versions and environments on your computer. When you install and start using a new version, you do not need to uninstall the older versions.
4. Copy personal settings to a new Tekla Structures version (page 110).

   You can use the Migration Wizard (page 110) tool to copy some of the personal settings to the new version. You can skip the copying if you do not want to copy the settings, or if you want to copy the settings from some other Tekla Structures version than suggested in Migration Wizard.

5. Transfer customized information to a new Tekla Structures version (page 111).

   In the new Tekla Structures version, you can use the information you have customized in the previous version. We strongly recommend that you create project and firm folders, and store the files you customize in these folders. Tekla Structures does not replace the files in project and firm folders when you install a new version. If you do not use project and firm folders, you need to transfer the customized information to the new version manually.

4.1 Update the Tekla license server

We recommend that you have the newest version of Tekla license server software installed on the Tekla license server. New versions of Tekla Structures do not always work at all with older license server versions.

You can use older versions of Tekla Structures with a newer version of the license server. In some older Tekla Structures versions, this requires that you have installed recent enough updates; for more information about the compatibility between Tekla Structures versions and Tekla license server versions, see Which license server version to use.

To update the Tekla license server:

1. Save the model that you are working with and close Tekla Structures before the server update.
2. Go to **Tekla Licensing** --> **LMTOOLS** through the **Start** menu or **Start screen**, depending on your Windows operating system.
3. On the **Stop/Start/Reread** tab, click **Stop Server** to stop the Tekla license server and any other licensing services.

   When you have completed installing the Tekla license server, you can restart the other licensing services.
4. Backup any files you have modified in the `C:\Tekla\License\Server` folder.

   You do not need to back up `tekla.lic` or `tekla.opt`, because the installer will not changes these files.
5. Download the latest version of the Tekla license server and the optional Tekla License Borrow Tool (if you use it) from Tekla Downloads.

6. Install the downloaded license server with administrator rights using the automatic installation for normal setup. Follow the instructions displayed on the screen.

   If the installation fails or the server does not start after installation, try reinstalling with the local firewall and antispyware/antivirus protection disabled.

7. If you use the Tekla License Borrow Tool, install the new version of the tool on workstations that need it.

4.2 Renew a Tekla license

License renewal means changing the details on an existing license, such as updating the highest allowed software version or extending the validity period of a temporary license. You deactivate the current license and then activate it again with a new license entitlement certificate that contains the updated information.

When you receive your renewed license, you must deactivate the existing license and then activate the new version of the license. Two versions of the same license cannot be active at the same time. License deactivation and activation is done on License server (which can also be the same computer on which Tekla Structures is installed) and requires an internet connection.

NOTE Before you deactivate licenses, ensure that the licenses are not in use or borrowed. To deactivate the licenses, users must return any borrowed licenses as explained in Return a borrowed Tekla Structures license.

To renew a license:

1. Rename your previous entitlement certificate file in the license server installation folder (by default `C:\Tekla\License\Server`) from `EntitlementCertificate.html` to `EntitlementCertificate-OLD.html`.

2. Save the entitlement certificate file to the license server installation folder.

   The person in your organization who has made the license purchase, or someone named as the contact person, receives a new `EntitlementCertificate.html` entitlement certificate by e-mail as an attachment.

3. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

4. In the **Activated Licenses** area, select the **Deactivate** check box next to the license you want to deactivate.
5. Click the enabled **Deactivate** button.

   When deactivation is complete, the License administration tool shows a confirmation message.

NOTE Do not use automatic notification if you are using some other FlexNet license and license server administration tool, such as FlexNet Manager. To notify the license server about license changes manually, see Activating Tekla Structures licensing using manual server notification.

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6. Make sure the automatic license server notification is enabled. Check the status on the  **Notify Server** button in the toolbar and click the button if necessary.
7. Click **Open** and open the `EntitlementCertificate.html` file that contains the license. The license information is displayed in the **Entitled Licenses** area.

Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

8. Click the **Activate** cell and select the number of licenses to activate.

Entitled Licenses

Activate	Quantity	Order ID	Activation ID	Description	Configuration	Version	Type	Start Date	Expiration Date
	1	Tekla HQ	04C1-3F1E-5...	FUD-C	Full	20		1.5.2015	31.5.2015
1	2	Tekla HQ	4B73-A2E9-...	STD-C	SteelDetailing	20		1.5.2015	31.5.2015

9. Click the **Activate** button.

   Your license server contacts the license activation server at Trimble Solutions.

The activated licenses are displayed in the **Activated Licenses** area.

We recommend that you back up the trusted storage (`..\ProgramData\FLEXnet\`) in a safe place away from the computer running the license server. Backups can help you restore your licenses on the same server if active licenses are accidentally erased.

4.3 Copy personal settings to a new Tekla Structures version

You can copy some personal settings from an older Tekla Structures version to a newer Tekla Structures version using the Migration Wizard tool. Migration Wizard opens automatically when you start a new version of Tekla Structures for the first time.

Migration Wizard shows the version number from which the settings are copied and the version number to which the settings are copied. You can select which settings are copied.

1. Start the new Tekla Structures version.
2. In Migration Wizard, click **Next** to start copying the settings.
3. Select the settings you want to copy and click **Next**.
4. Check that you have selected the correct settings.
5. Click **Copy**.

NOTE If you want to copy the settings later, you can start Migration Wizard manually by double-clicking the `MigrationWizard.exe` in the `\Tekla Structures \<version>\nt\bin\applications\Tekla\Migrations` folder. You can select the version from which the settings are copied and the version to which the settings are copied.

See also

Upgrade Tekla Structures to a new version (page 107)

4.4 Transfer customized information to a new Tekla Structures version

You can transfer customized information from a previous Tekla Structures version to the new Tekla Structures version.

1. If you have used project and firm folders to store customized files in a model using a previous Tekla Structures version, go to **File menu** --> **Settings** --> **Advanced Options** and check that the `XS_FIRM`, `XS_PROJECT` and `XS_COMPANY_SETTINGS_DIRECTORY` advanced options point to the folders where the customized files are located.
2. If you have not used project and firm folders to store customized files, you need to transfer the customized files manually to the new Tekla Structures version to use the information.

Many types of files can be copied using a local or private online Tekla Warehouse collection. See Tekla Warehouse instructions for more information.

Check at least the following:

- Advanced options
- Files related to templates, reports and drawings
- Catalog files: profile catalog, material catalog, bolt catalog, bolt assembly catalog, rebar shape catalog
- Conversion files
- Extensions

  You need to re-install extensions for the new Tekla Structures version.
- NC export settings
- Printer catalog settings
- User-defined attributes
- Saved model object properties

You can copy some information automatically to the new version using the Migration Wizard (page 110) tool.

See also

Upgrade Tekla Structures to a new version (page 107)

5 Tekla Structures service packs

Tekla Structures service packs are Tekla Structures version updates.

Service pack software installation files are stand-alone installers that contain the full Tekla Structures version software. You do not need to separately install the related Tekla Structures version or a previous service pack. For example, you can install service pack 2 without installing service pack 1.

- Service packs can include new features, and improvements and fixes to existing features. We recommend that all users install the latest service pack.
- We recommend that you install the latest environments to ensure that the environments work correctly in the service pack. We recommend that you update all the environments that you are using.

You can find the service pack software and environment installation files in Tekla Downloads.

See also

Install a Tekla Structures service pack (page 113)

Install an earlier Tekla Structures service pack (page 115)

5.1 Install a Tekla Structures service pack

You can install a service pack to update a Tekla Structures version or a previous service pack. Service packs can contain new features, and improvements and fixes to existing features.

NOTE Service pack software installation files are stand-alone installers that contain the full Tekla Structures version software. You do not need to separately install the related Tekla Structures version or a previous service pack.

If you have the related Tekla Structures version or a previous service pack installed on your computer, you do not need to remove it before installing a new service pack.

NOTE You need to be logged in with administrator rights to install the Tekla Structures software on your computer.

---

1. Install the Tekla Structures service pack software.
   a. Download the service pack software installation file from Tekla Downloads to your computer.
   b. Double-click the installation file to run the installation.
   c. Follow the steps in the installation wizard to complete the installation.

      Note that if you have the related Tekla Structures version or a previous service pack already installed, you cannot select the installation folder. The service pack will be installed to the same folder as the version that you are updating.

      If you do not have the related Tekla Structures version or a previous service pack installed, you can select the installation folder and the model folder.
2. Install the Tekla Structures environments.

   Note that the location of the environment installation folder depends on where you have installed the software. You cannot select the environment installation folder in the installation wizard.

   You do not need to remove any environments. Installing a newer version of an environment automatically upgrades the older version of that environment.

   a. Download the needed environment installation files from Tekla Downloads to your computer.
   b. Double-click the installation file to run the installation.
   c. Follow the steps in the installation wizard to complete the installation.

      You can select in the installation wizard that the environment setting files (`.tsep`) are installed when running the environment installation wizard.

      If you do not select to do this, the environment setting files are installed to the environment folder when you start Tekla Structures after the installation. Tekla Structures opens a dialog box that shows the installation progress.

Related information

See also

Tekla Structures service packs (page 113)

5.2 Install an earlier Tekla Structures service pack

We recommend that you use the latest Tekla Structures service pack. In certain situations, you may need to take an earlier Tekla Structures service pack, or the related Tekla Structures version, into use even though you are already using a newer service pack.

1. Uninstall the Tekla Structures service pack software you are now using in Windows **Control Panel**.
2. Uninstall the related Tekla Structures environments in Windows **Control Panel**.
3. Install the Tekla Structures service pack software.
   a. Download the software installation file of the service pack from Tekla Downloads.
   b. Double-click the installation file to run the installation.
   c. Follow the steps in the installation wizard to complete the installation.

      You can select the installation folder and the model folder.
4. Install the Tekla Structures environments.

   The latest environments are in Tekla Downloads.
   a. Download the environment installation files related to the service pack that you have installed.
   b. Double-click the installation file to run the installation.
   c. Follow the steps in the installation wizard to complete the installation.

      You can select in the installation wizard that the environment setting files (`.tsep`) are installed when running the environment installation wizard.

      If you do not select to do this, the environment setting files are installed to the environment folder when you start Tekla Structures after the installation. Tekla Structures opens a dialog box that shows the installation progress.

See also

Tekla Structures service packs (page 113)

6 Disclaimer

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