Tekla Structures 2019

Upgrade to this version

March 2019

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1 Tekla Structures 2019 release notes

Welcome to Tekla Structures 2019!

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

- Changes in Tekla Structures installation (page 8)
- Licensing updates (page 10)
- Updates to start screen, side pane, Quick Launch, and project properties (page 15)
- Updates to part labels, clip planes, and window options (page 21)
- New way to find and select objects in model and drawings: Select by identifier (page 22)
- Radial grids and grid properties in the property pane (page 25)
- New plate type for bent plates: stand-alone bent plate (page 29)
- New curved construction objects and other improvements (page 35)
- Modeling and detailing improvements (page 38)
- Rounding, step tapering, cranking, and other rebar set improvements (page 43)
- Clone selected in drawings (page 49)
- Improvements in Drawing content manager, marks and notes (page 53)
- Layout editor improvements (page 59)
- Dimensioning improvements (page 60)
- Other drawing improvements (page 67)
- Improvements in Template Editor 3.8 (page 74)
- Printing improvements (page 75)
- Version control for drawings (page 76)

- Improvements in Tekla Model Sharing (page 78)
- DWG export improvements (page 81)
- Other interoperability improvements (page 85)
- Updates in tools for concrete fabrication (page 89)
- Tekla BIMsight and Web Viewer replaced by Trimble Connect for Desktop (page 94)
- Improvements in components (page 96)
- Changes in advanced options (page 108)
- Changes in template attributes (page 109)
- Tekla Structures 2019 fixlist

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 2019, you cannot open it in older versions due to database differences.

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

See the Tekla Structures 2019 Hardware Recommendations for more information.

Tekla Structures 2019 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 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 158).

Tekla Open API release notes

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

1.1 Changes in Tekla Structures installation

Tekla Structures 2019 introduces the following main changes to installation:

- Environment installers are now `.msi` installers that contain the `.tsep` installers related to the environment.

  Tekla Structures 2019 environment installers are available in Tekla Downloads like in earlier Tekla Structures versions.
- The installation folder structure has changed so that the folder path under `\ProgramData` and under `\Users` now contains `Trimble`:
  - Tekla Structures software is still by default installed under `\Program Files`.
  - Tekla Structures environments are still by default installed under `\ProgramData`. The folder path now contains `Trimble` as follows: `..\ProgramData\Trimble\Tekla Structures\<version>\Environments`. This default location is used when you install the software under `\Program Files`.
  - User-specific settings are still installed under `\Users`. The folder path now contains `Trimble` as follows: `..\Users\<user>\Appdata\Local\Trimble\Tekla Structures\<version>`.
- Tekla Structures version number is now written as `2019.0` in the folder structure.
- The Windows registry installation settings are now saved to the `HKEY_LOCAL_MACHINE\SOFTWARE\Trimble\Tekla Structures\<VERSION>` registry key. This path now also includes `Trimble`.
- The RPC interface message buffer size has been increased to 4096. All RPC-based connections, details and detailing tools need to be compiled with the new developer kit.
- Starting from this version, all Tekla Structures installations can be used with online licenses, so it is no longer necessary to separately install standard, partner and learning (Tekla Campus) versions. See Licensing updates (page 10) for more information.
- A new environment is now available for Canada.
- There is now only one US environment. You can switch between imperial and metric modeling by using roles.
- In the Default environment, the role **All** is not available anymore.

Environment installers now contain .tsep installers

As a new feature in Tekla Structures 2019, the environment `.msi` installers include sets of `.tsep` installers that contain the actual environment files and settings. When installing a new version of Tekla Structures, you still install the software first and then the environments. Running the `.msi` installers requires

administrator rights. The `.msi` installers are installed to your computer before opening Tekla Structures.

When you run the environment `.msi` installer, the installer creates the environment folder and copies the `.tsep` installers to the `..\Tekla Structures\2019.0\Extensions\To be installed` folder.

The `.tsep` installers are run when you open Tekla Structures for the first time. Running the `.tsep` installers does not require administrator rights. Tekla Structures opens a dialog box that shows the installation progress of the `.tsep` installers. The `.tsep` installers install the environment files to the `..\Tekla Structures\2019.0\Environments\<environment>` folder.

In Tekla Structures version updates, Tekla Structures will only install the changed `.tsep` installers.

The installed environment .tsep installers are listed in **Extension manager** in Tekla Structures.

Environment folder structure

The environment folder structure has been renewed so that it is easier to keep the folder content up to date.

The folders are now logically organized based on roles or materials, for example, `\Concrete`, `\Steel`, `\Engineering`. The `\General` folder includes content that is common for all roles and settings that are specific to modeling and drawings, for example. Note that the folder structure and content may vary depending on the environment. Tekla Structures administrators maintain the folder structure under the role and material folders and their subfolders, and define the settings that are used in the environment ini file of their environment.

Use the XS_SYSTEM advanced option to point to the role and material folders. By default, the environments do not have the folder `\Environments\<your environment>\`**system** anymore.

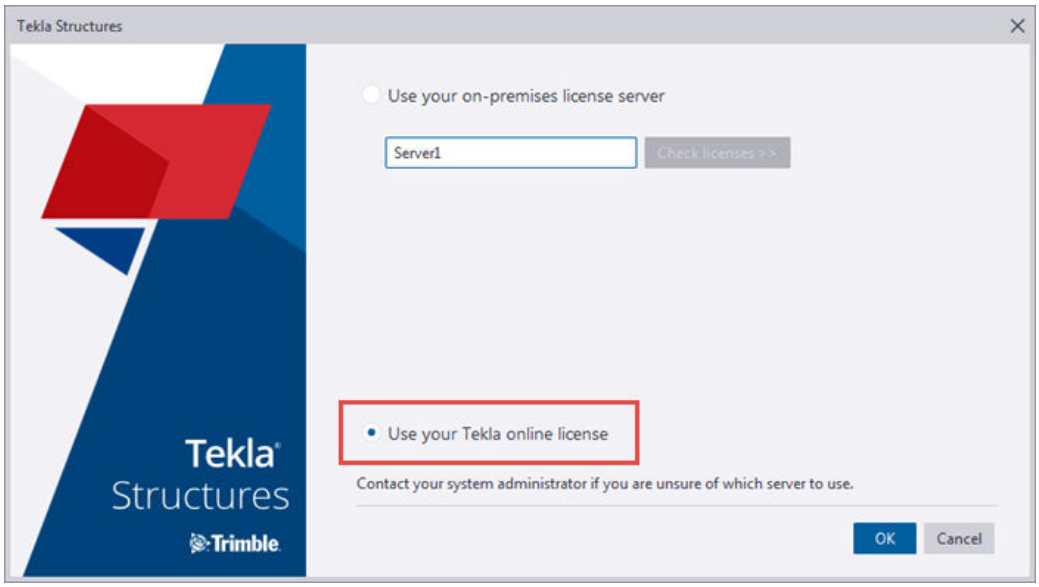
1.2 Licensing updates

Tekla Structures 2019 introduces online licensing in some of the configurations. In Tekla License Borrow Tool, you can now specify the license server and the product ID file more easily in the new **Setup** dialog box. Some product names in licensing have also been changed.

Tekla online licensing

Tekla Structures 2019 has a new option for using Tekla Structures through online licensing. This is at the moment available for some configurations only, and you need a valid Trimble Identity.

- Download and install Tekla Structures 2019.
- When you start Tekla Structures 2019 for the first time, you now have a new option **Use your Tekla online license** available for using Tekla online licensing instead of on-premises licensing.



- If you have a previous version of Tekla Structures installed and you have been using an on-premises license server (FlexNet), Tekla Structures 2019 will use the same license server and show the configuration selection screen.
- If you have not been using Tekla Structures, you will see the above options. Your administrator should inform you which license you have.
- The **Use your Tekla online license** option is at the moment enabled for some licenses only:
  - **Educational** (Tekla Campus) - You get this license by registering at campus.tekla.com
  - **Partner** - Your employer joins the Tekla Partners Program at developer.tekla.com. Once approved, your administrator can assign a license to you in the Tekla Admin Tool.
  - **EPM Modeler** - This configuration is only available with Tekla PowerFab.
- When you select **Use your Tekla online license** and click **OK**, a log in dialog box is displayed. Enter your Trimble Identity and your password. In the start-up dialog box, you can see the configurations that are available for you.

- You can also change the licensing type later on through **File** --> **Change license server** , or by clicking the **Change license server** option in the Tekla Structures start-up dialog box.

Offline use

- **Partner** works without an active internet connection for 7 days at a time: open a model and select the **Stay signed in** check box when signing in online.
- **Educational** works offline for 24 hours.
- **EPM Modeler** works offline for 24 hours.

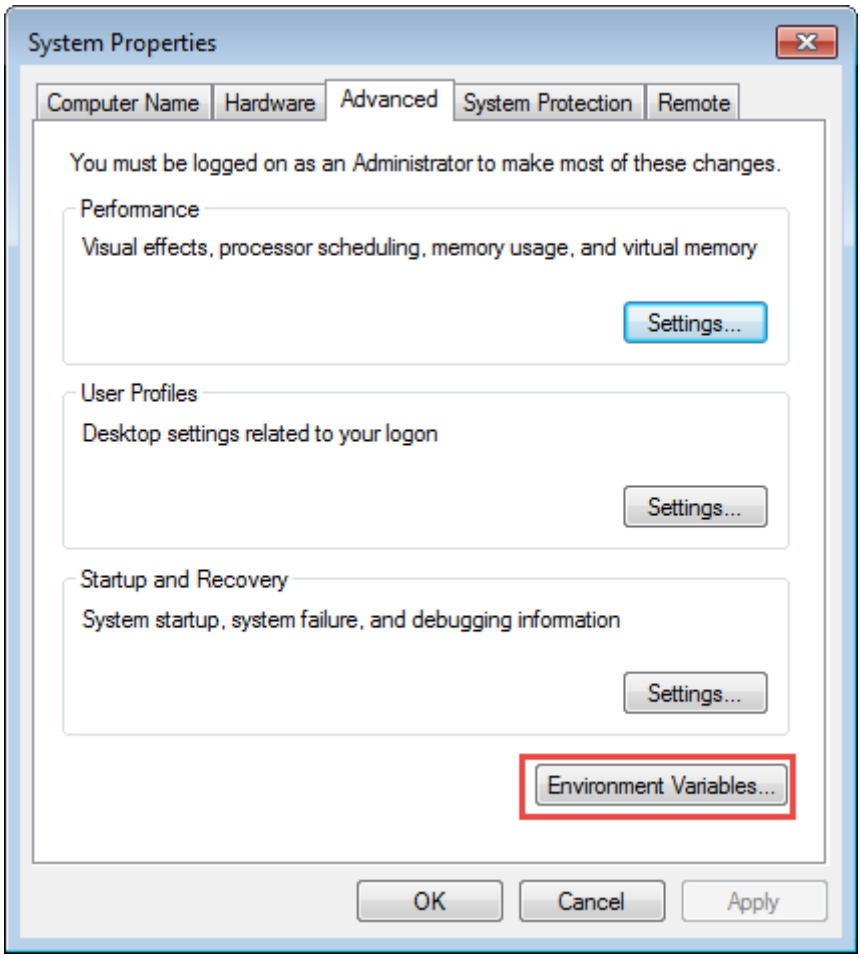
For administrators

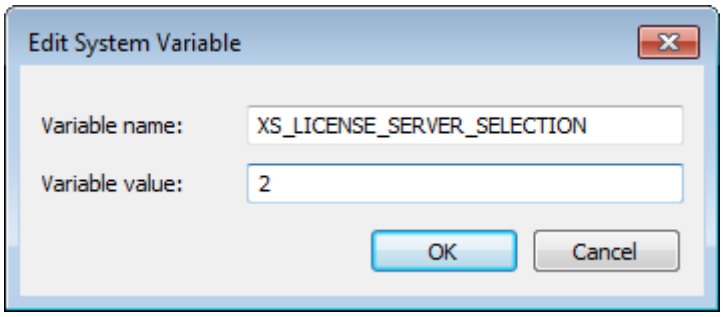
The advanced option `XS_LICENSE_SERVER_SELECTION` can be used to override the behavior of Tekla Structures at start-up and to disable the option:

- **Use your on-premises license server**: The license server info must already be specified in order for this to work.
- **Use your Tekla online license**: Tekla Structures will prompt for sign in to Trimble Identity.

When this advanced option is set to either 1 or 2, Tekla Structures will not show the dialog at start-up, unless the license server info is missing or there is a problem connecting to Trimble Identity. The value 1 will enable the **Use your on-premises license server** option and 2 the **Use your Tekla online license** option. For this advanced option to work, it has to be set using one of the following methods:

- Windows environment variable:
  - Windows 10: Open **Settings**, search for "Edit the system environment variables", click **Environment Variables**, add a user or system variable, enter `XS_LICENSE_SERVER_SELECTION` for the name, and 1 or 2 for the value.
  - Previous versions of Windows: Open **Control Panel**, click **System** --> **Advanced system settings** --> **Environment Variables** , add a user or system variable, enter `XS_LICENSE_SERVER_SELECTION` for the name, and 1 or 2 for the value.





- Batch file for starting Tekla Structures:
  - Create a batch file (a text file that has either `.bat` or `.cmd` file extension) with the following content:

    ```
    set XS_LICENSE_SERVER_SELECTION=2

    start /D "C:\Program Files\Tekla Structures\2019\nt\bin
    \" TeklaStructures.exe

    exit /B 0
    ```

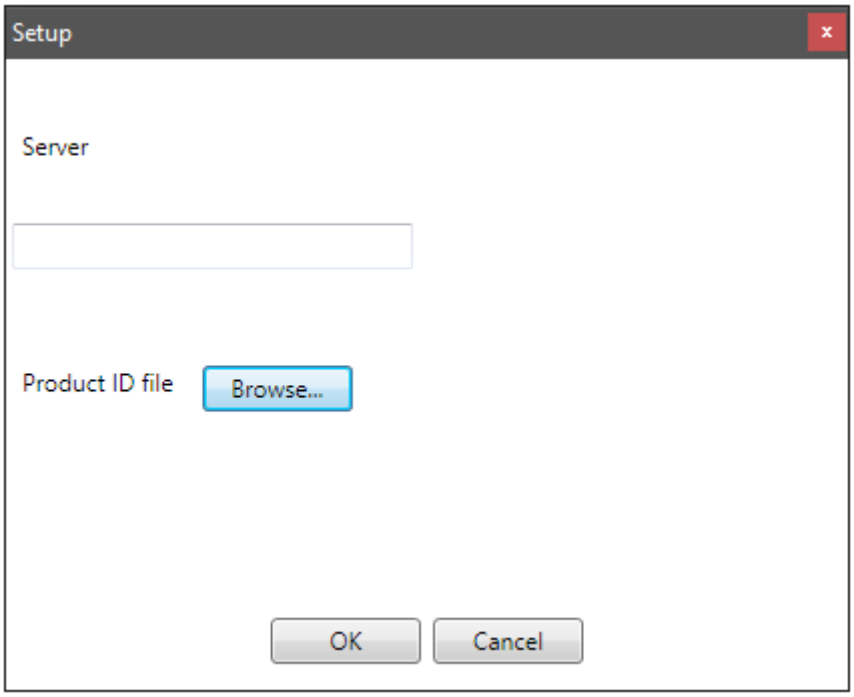
Also see the following articles:

- How to set a license server address without using the Tekla Structures user interface
- Managing Tekla accounts and model sharing licenses

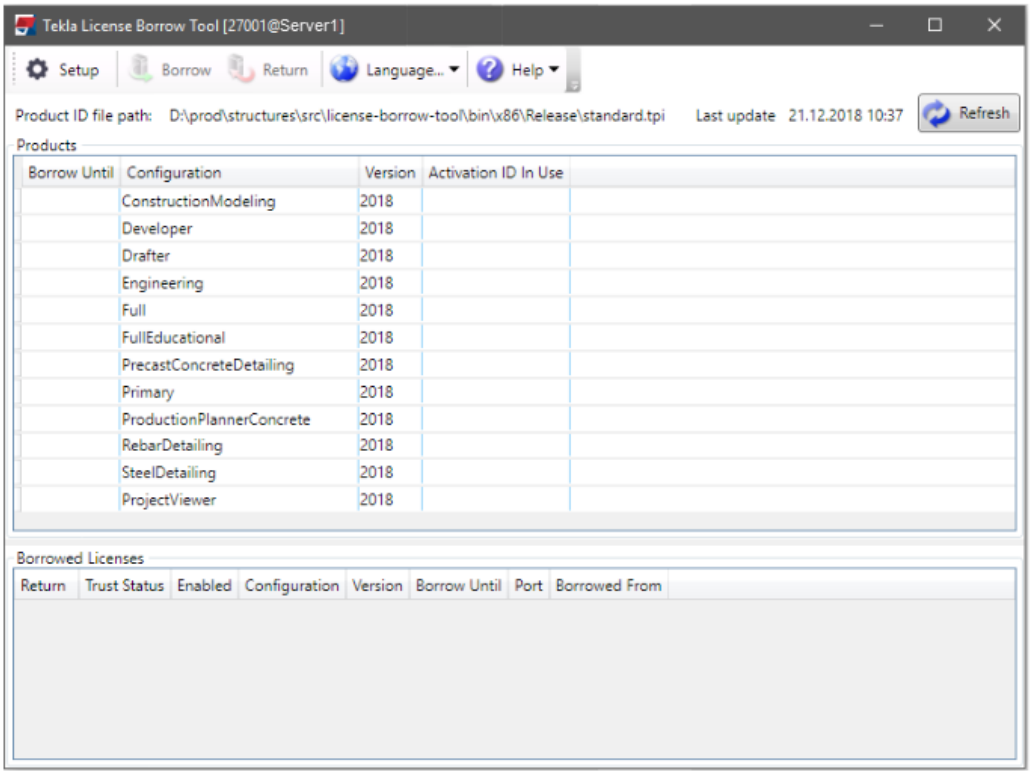
Updates in Tekla License Borrow Tool

To borrow a license using Tekla License Borrow Tool, you need to specify the license server and the product ID file (`.tpi`) that is specific for the license server. Now you can do this in one dialog box.

- Open Tekla License Borrow Tool.
- When you open Tekla License Borrow Tool for the first time, the new **Setup** dialog box is displayed, where you can enter the port number and the hostname (computer name) of the license server in the **Server** box in the format port@hostname, for example, `27007@server_hostname`. Then click **Browse** and select the product ID file.



When you click **OK**, the **Products** area in the Tekla License Borrow Tool is updated showing the available licenses, which you can now borrow.



- There is also a new button **Setup** in the window, which you can use to change the license server or the product ID. You no longer need to restart to borrow from another license server.
- You can now return all licenses at the same time to multiple license servers.

For more information about license borrowing, see Borrowing licenses for using Tekla Structures offline.

Product name changes in licensing

Old name	New name
Tekla Structures License Server	Tekla License Server
Tekla Structures Licensing Service	Tekla Licensing Service
Tekla Structures License Administration Tool	Tekla License Administration Tool
Tekla Structures License Borrow Tool	Tekla License Borrow Tool

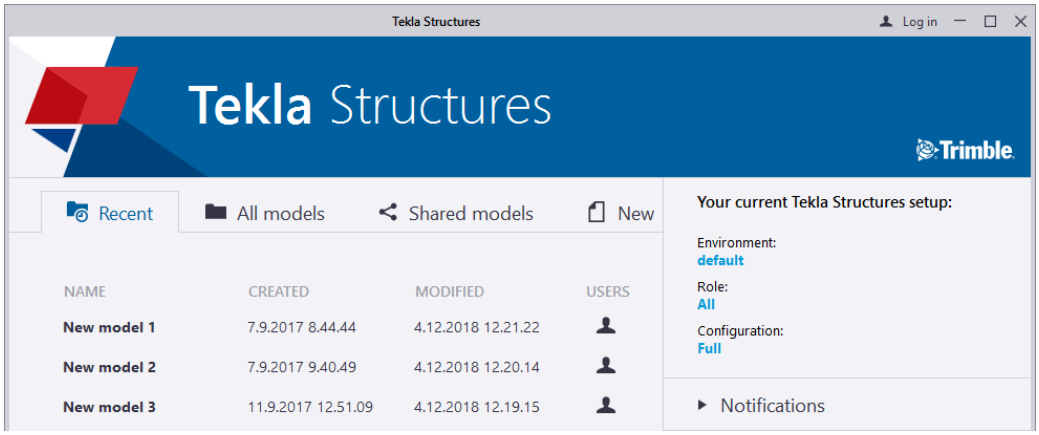
1.3 Updates to start screen, side pane, Quick Launch, and project properties

Tekla Structures 2019 comes with a renewed user interface. The Tekla Structures 2019 user interface introduces a new, neutral color scheme, emphasizing the clarity of the ribbon and icons. This new blue-based color scheme is in accordance with the color scheme of other Trimble products.

Start screen updates

The start screen of Tekla Structures 2019 has been updated.

- All tabs of the start screen now have their own dedicated views.



- There is a new **Shared models** tab that includes the Tekla Model Sharing models. If you want to open a model that has been shared by using Tekla Model Sharing, you need to be logged in with your Trimble Identity.
- When you select a model on the **Recent** or on the **All models** tab, and the selected model does not have a thumbnail yet, a hyperlink is shown. When you click the hyperlink, Tekla Structures displays a message which gives instructions on how to create a thumbnail.
- When you select a model on the **Recent** or on the **All models** tab, the **Open** button has a small arrow that opens a drop-down menu that contains the **Convert to multi-user model**, **Convert to single-user model** or **Exclude from sharing** button, depending on the type of the model.
- On the **Recent** and **All models** tabs, you can sort each of the columns. Additionally, you can change the order and size of the columns by dragging them.
- If the **Recent** tab is empty, then the **All models** tab is shown.

  If the **All models** tab is empty, then the **New** tab is shown.
- If you want to remove a model from the list of models on the **Recent** tab, right-click a model and select one of the options.

- **Delete the selected item**: remove the selected model from the list
- **Clear all**: remove all the models from the list
- **Clear invalid entries**: remove all invalid models from the list, such as deleted models that cannot be opened anymore

- On the **New** tab, you can hide the model templates that you do not need, or mark the important templates as favorites.

  1. Select a model template in the list.
  2. Right-click and select **Favorite** or **Hidden**.

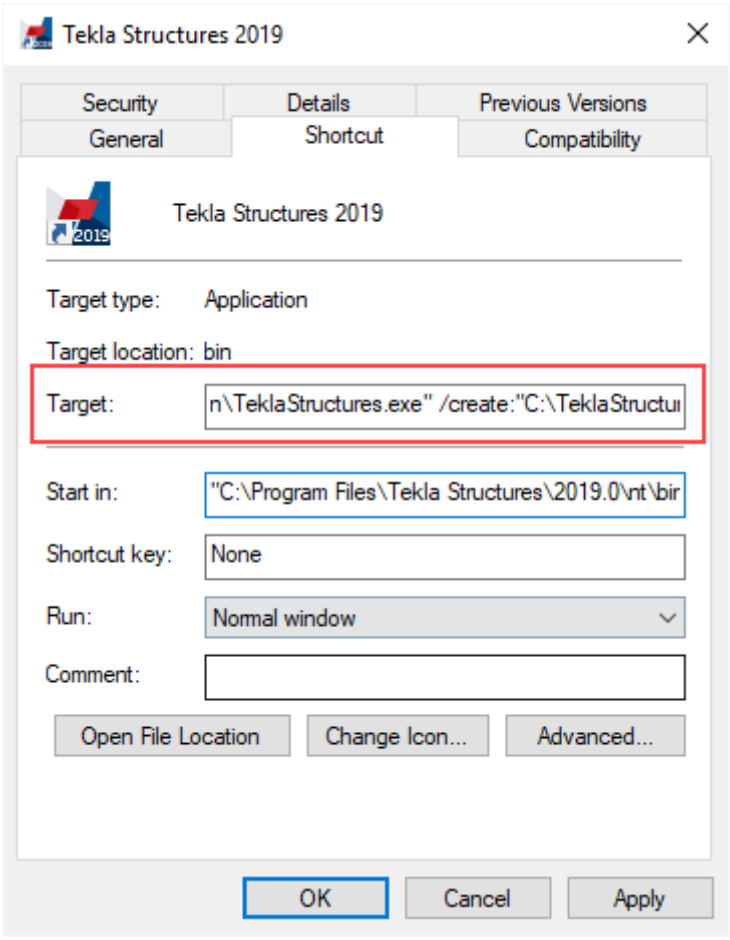
     If you marked a template as **Favorite**, it is placed on top of the template list. Alternatively, use the star icon on the template to mark it as **Favorite**, or to remove the marking.

     If you marked a template as **Hidden**, it is removed from the template list. Select the **Show hidden items** check box to show it again.

- If you have collapsed the side sections, such as **Your current Tekla Structures setup** and **Notifications**, the side sections now remember their collapsed state.
- New command line capabilities have been added. You can now create new models or open an autosaved version of the model by adding the target in the Tekla Structures shortcut.

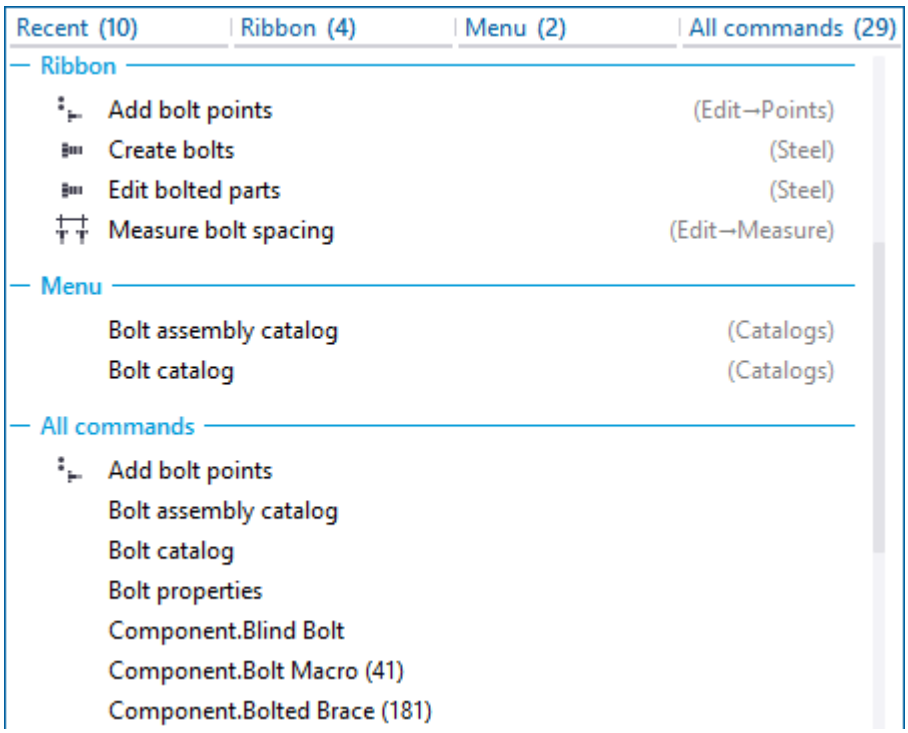
  For example:

Open an existing model	`TeklaStructures.exe "C:\TeklaStructuresModels\My Existing Model"`
Open an existing model (autosaved)	`TeklaStructures.exe "C:\TeklaStructuresModels\My Existing Model" /autosaved`
Create a new model (no template)	`TeklaStructures.exe /create:"C:\TeklaStructuresModels\automatically created"`
Create a new model (with template)	`TeklaStructures.exe /create:"C:\TeklaStructuresModels\automatically created" /modelTemplate:"Cast-in-Place"`
Create a new multi-user model	`TeklaStructures.exe /create:"C:\TeklaStructuresModels\automatically created" /server:"my-server:1234"`

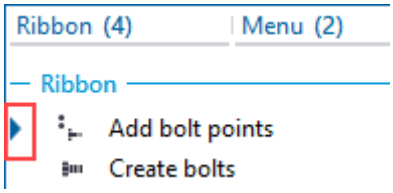

Tekla Structures 2019
Security
Details
Previous Versions
General
Shortcut
Compatibility
Tekla Structures 2019
Target type: Application
Target location: bin
Target: n\TeklaStructures.exe" /create:"C:\TeklaStructu
Start in: "C:\Program Files\Tekla Structures\2019.0\nt\bir
Shortcut key: None
Run: Normal window
Comment:
Open File Location
Change Icon...
Advanced...
OK
Cancel
Apply

Quick Launch updates

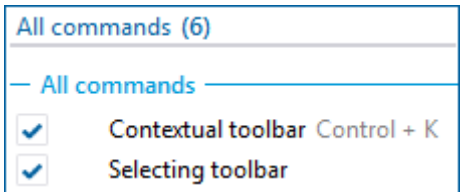
Quick Launch has been improved and redesigned for Tekla Structures 2019.



- Now the search results show the location of the command, and the commands are listed by the location. You can easily navigate in the search results by clicking the **Recent**, **Ribbon**, **Menu**, and **All commands** tabs. The **Recent** tab list the 10 most recently started commands from the search results, making it easier to access the most used commands repeatedly.
- You can navigate in the search results by using the up and down arrow keys on the keyboard. Start the selected command by clicking **Enter**.



- The search box is not cleared automatically anymore when you select a command from the search results list. The search word remains visible and when you click the search box, the previous search results list opens automatically. To clear the **Quick Launch** box, click the ✖ button or press the **Esc** key.
- If the command you have searched by using **Quick Launch** is in the side pane, Tekla Structures opens the side pane window if it is not open already.
- Commands and toolbars that can be switched on or off can now be switched on or off without closing the search results list.



- The **Quick Launch** search results on the ribbon, in the file menu, and in the side pane are highlighted with yellow color.
- The **Quick Launch** search list now lists separately the local Tekla Warehouse collections, instead of listing all the local collections and local packages. The Tekla Warehouse search content is visible only if there are any search results to be shown. **Quick Launch** shows the number of found items on a button that opens the actual search in a web browser.

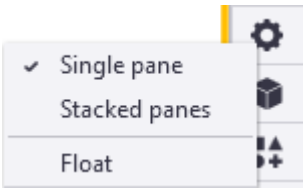
Side pane changes

Tekla Structures now opens only one side pane window at a time by default.

When you right-click a side pane button, you can select whether to use the **Single pane** or the **Stacked panes** option.

Single pane: Tekla Structures opens a new side pane window and closes all the other open side pane windows.

Stacked panes: Tekla Structures opens a new side pane window and keeps the other open side pane windows stacked on top of each other.

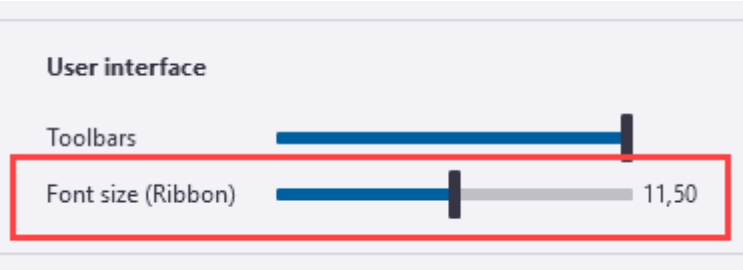


Alternatively, you can click **Ctrl+side pane button** to open the side pane windows stacked on top of each other.

Note that the **Single pane** or the **Stacked panes** options do not affect the floating panes. You can have one or more floating panes open while you are using the **Single pane** option.

New control for ribbon font size

You can now resize the ribbon font size. Use the **Font size (Ribbon)** slider in **File** --> **Settings** --> **User interface** to adjust the ribbon font size.



You can set the ribbon font size between 9p and 14p. The default font size is 11p. The setting is remembered when you close and start Tekla Structures.

New style for Project properties in the File menu

The **Project properties** in the **File** menu now works more like the property pane.

- You can now start modifying the text fields without first enabling the editing.
- The changed text fields are highlighted with a light yellow background color.
- When you have modified the **Project properties**, the **Modify** button becomes active. Click **Modify** to apply the changes.

New scalable icons

All commands, for example on the ribbon and in the file menu, now have scalable vector icons. Vector icons scale sharply to any size without the loss of quality.

Previously the commands only had either a small or a big raster icon available.

1.4 Updates to part labels, clip planes, and window options

In Tekla Structures 2019 the part labels have new options, deleting clip planes has been made easier, and the listing of view windows has changed.

New Part label options

Part labels on the **View Properties** --> **Display** dialog box now have new options.

Part labels have a new **Show for** list, where you can select for which parts you want to show the part labels.

- **All**: Part labels are shown for all parts in the view.
- **Selected**: Part labels are only shown for the parts you select.
- **Main part for selected**: Part labels are only shown for the main parts of the assemblies you select.
- **Main part for all**: Part labels are shown for all main parts of all assemblies.

  Note that if you select the **Selected** or the **Main part for selected** option, you need to first apply the changes to the view when the view is selected. Then continue to select the objects for which you want to show the part labels.

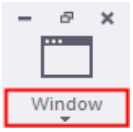
Additionally, the **Part label** check box is now automatically selected when you click **Add >** to add a property to the **Part label** list.

New clip plane command: Delete all clip planes

You can now delete all the clip planes at once. To delete all the clip planes in all the open views, click **View** --> **Delete all clip planes** .

View windows in alphabetical order

When you now click **Window** to open the view list, the views are listed in alphabetical order.

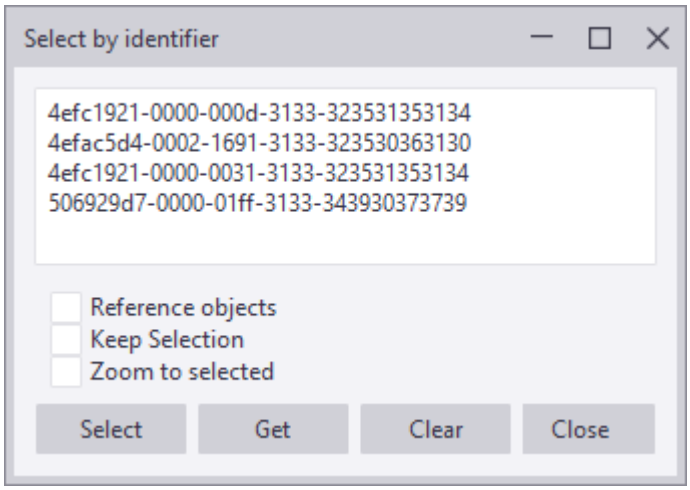


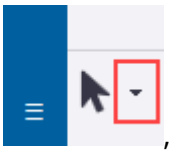
1.5 New way to find and select objects in model and drawings: Select by identifier

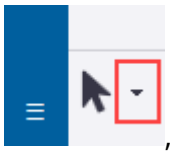
In Tekla Structures 2019 you can easily locate and select objects when you know the GUID (globally unique identifier), the ID of an object, or the IFC GUID of a reference object. This works both in the modeling mode and in the drawing mode.

Reports and log files often contain information about the object GUID or ID. Previously, if you wanted to find these objects in the model or drawings, you had to define a view filter or selection filter with the specific GUIDs or IDs. Now you can use the new **Select by identifier** command to find the objects based on their GUID or ID. You can also use the IFC GUIDs of IFC reference objects. This is useful if you need to track updates and changes in IFC reference models.

Additionally, by using the **Select by identifier** command, you can inquire the GUIDs of selected objects, instead using the traditional inquiry.



To	Do this
Find objects based on the object GUID, ID, or IFC GUID identifier	1. • In the modeling mode: on the ribbon, click the small down arrow next to the arrow button  , and then click **Select by identifier**. • In the drawing mode: in **Quick Launch**, type **Select by identifier**. The **Select by identifier** dialog box opens. 2. Copy the object identifier, for example from a log file, to the dialog box. You can enter multiple identifiers in the dialog box. Either enter each identifier on its own row, or separate them with semicolon `;`. 3. To define the search, select the needed check boxes.

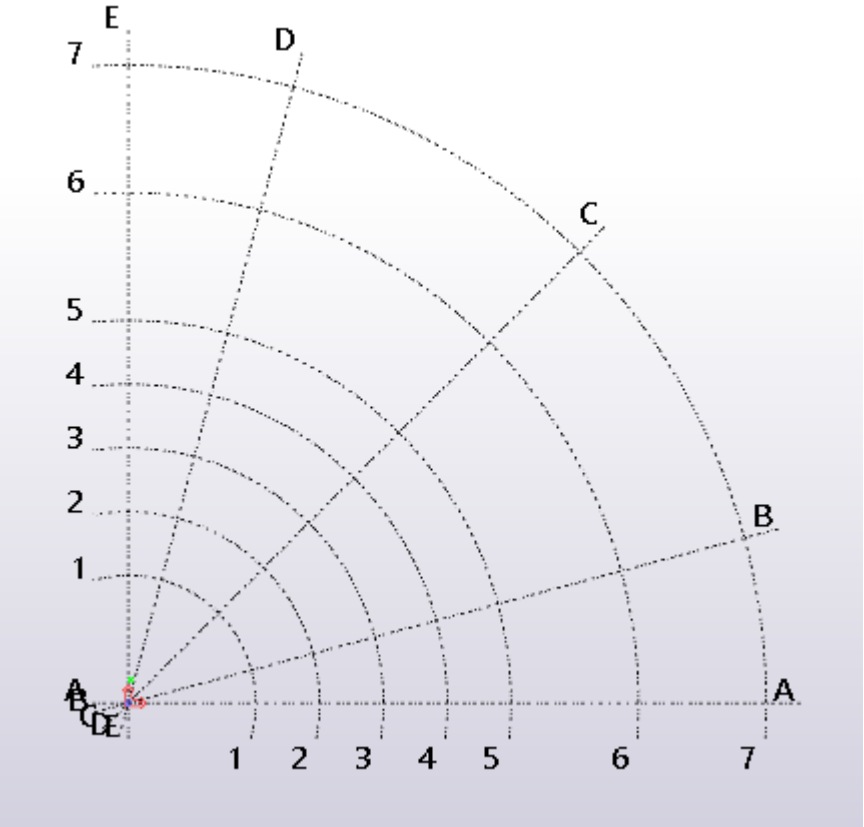
To	Do this
	• **Reference objects**: Tekla Structures selects IFC objects based on their GUID or IFC GUID. • **Keep selection**: Tekla Structures keeps the currently selected object and appends it with new selection. • **Zoom to selected**: Tekla Structures selects the object and zooms to it. 4. Click **Select**. Tekla Structures selects the objects based on the GUID in the model or in the drawing. If there are identifiers that are not found in the model or in the drawing, they are listed in the status bar as `identifier?`.
Find a model object in a drawing	You can select an object in a model, get its identifier, and then find it in a drawing based on the identifier. 1. In the modeling mode: on the ribbon, click the small down arrow next to the arrow button  , and then click **Select by identifier**. The **Select by identifier** dialog box opens. 2. Select an object or objects in the model. 3. Click **Get**. The **Select by identifier** dialog box lists the identifiers of the selected objects. If you want to get IFC GUIDs, ensure that the **Reference objects** check box is selected. 4. Keep the dialog box open. 5. Open a drawing. 6. In the drawing mode, click **Select** to find the objects in the drawing. You can then continue working with the found objects.

To	Do this
Find a drawing object in a model	You can select an object in a drawing, get its identifier, and then find it in a model based on the identifier. 1. In the drawing mode: in **Quick Launch**, type **Select by identifier**. The **Select by identifier** dialog box opens. 2. Select an object or objects in the drawing. 3. Click **Get**. The **Select by identifier** dialog box lists the identifiers of the selected objects. 4. Keep the dialog box open. 5. Close the drawing. 6. In the modeling mode, click **Select** to find the objects in the model. You can then continue working with the found objects.

1.6 Radial grids and grid properties in the property pane

You can now create truly radial grids. Previously, you could create only rectangular grids. Use the radial grids when you model round or curved structures, such as round columns, towers, tanks, circular platforms, and so on. If needed, you can create a full 360 degree grid.

Additionally, now the properties of rectangular grids, radial grids, and single grid lines are accessed through the property pane.



1. On the **Edit** tab, click **Grid** --> **Create radial grid** .

   Tekla Structures shows a preview of the grid.

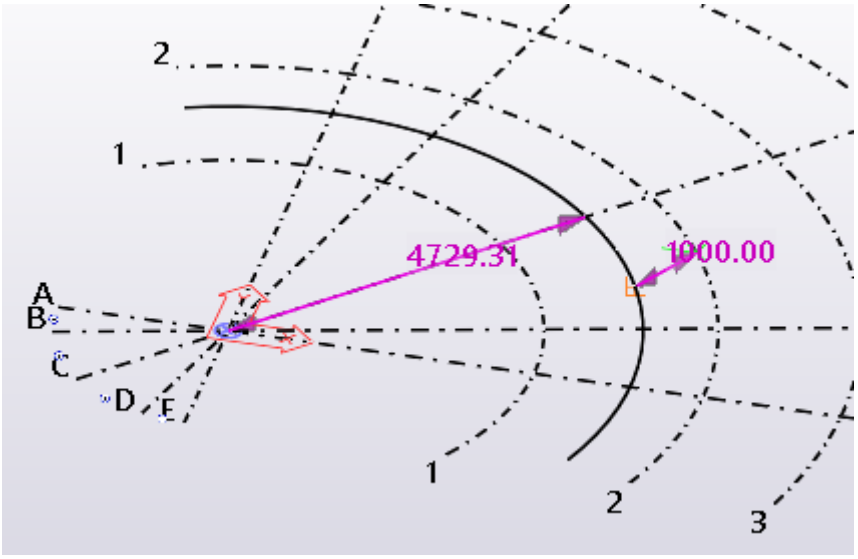
   You can modify the **Radial grid** properties in the property pane before inserting the grid. The grid preview changes according to the changes in the property pane.

2. Pick a point in the model to indicate the origin of the grid, or click the middle mouse button to accept the **Radial grid** property pane values.
   - If you pick an origin point to the grid, the grid is created using the properties in the property pane, and the origin is the location you picked.
   - If you click the middle mouse button, the grid is created using the properties in the property pane, and to the origin defined in the property pane.

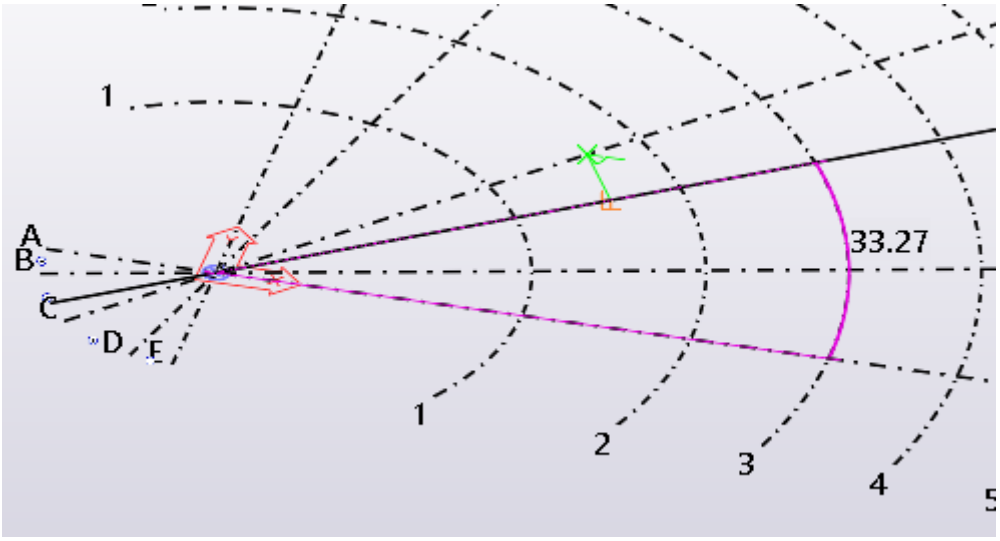
Modify radial grid

In addition to the **Radial grid** properties in the property pane, you can use direct modification and the contextual toolbar to modify radial grids. Ensure that  **Direct modification** is switched on.

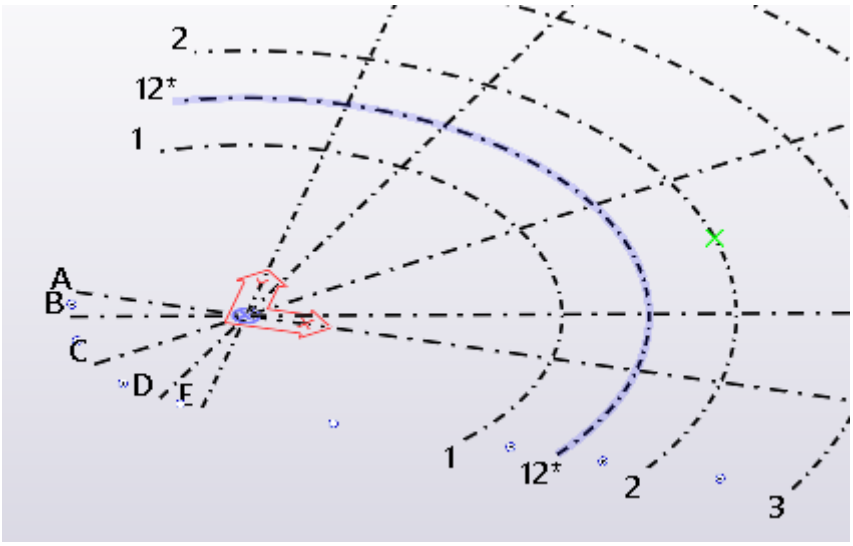
- You can drag the arc lines to change the radius.



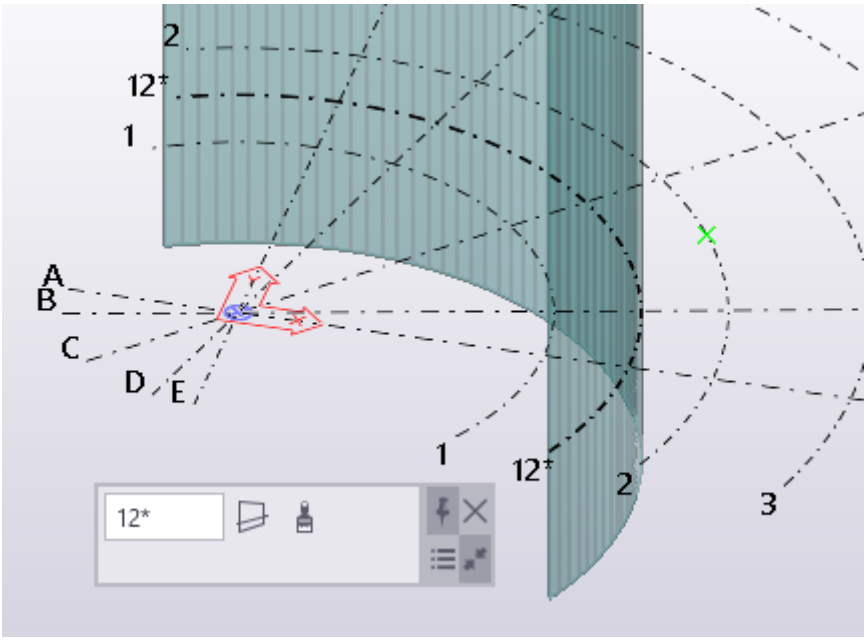
- You can drag the straight lines to change the angle.



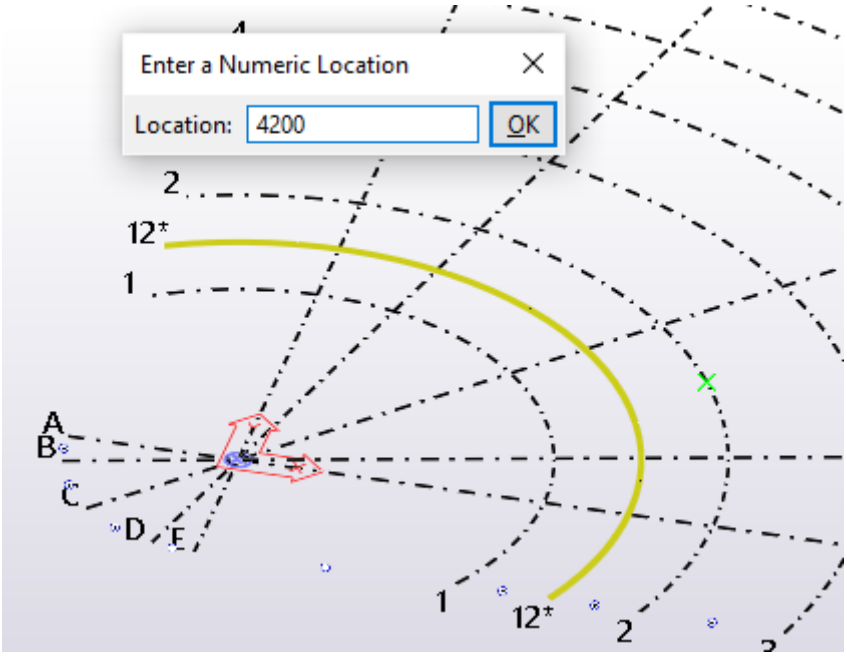
- You can add new grid lines between the existing grid lines, both arc lines and straight lines.



- You can change the grid labels by using the contextual toolbar.



- You can change the radius and the angle by using the keyboard.



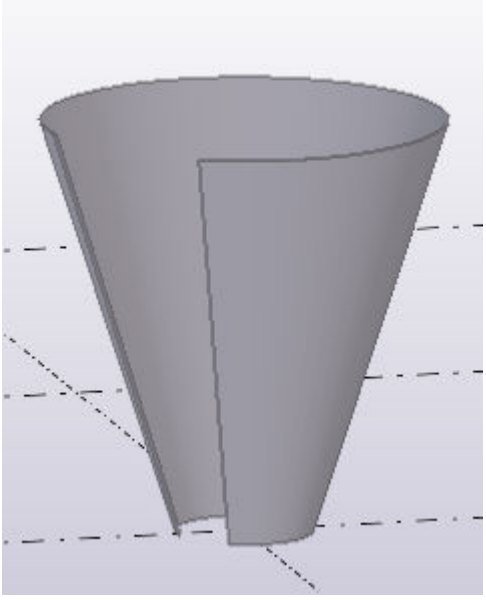
Property pane for grids and grid lines

Now the properties of rectangular grids, radial grids, and single grid lines are accessed through the property pane.

The grid properties now include **Grid color** and **Label font size and color**. Previously, these were available in advanced options.

1.7 New plate type for bent plates: stand-alone bent plate

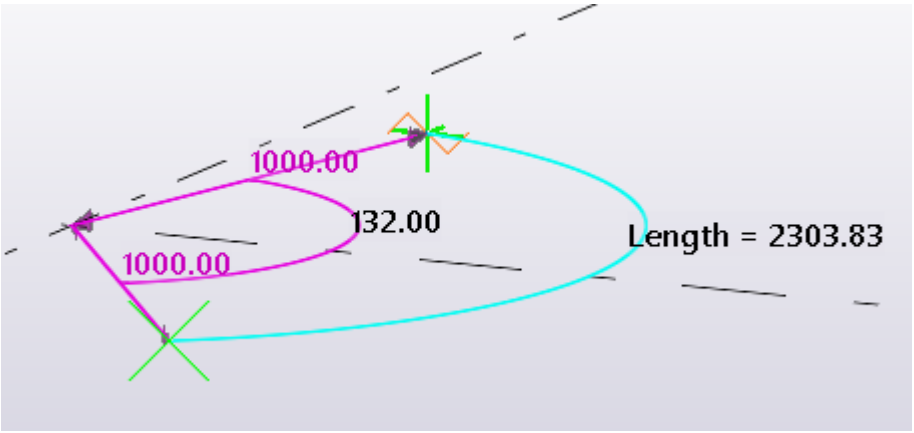
You can now create stand-alone bent plates that do not require any input parts. Use stand-alone bent plates to model both cylindrical and conical parts, such as hoods, hoppers, cones, and so on.



Before you start to create stand-alone bent plates, ensure that **Direct modification** is switched on.

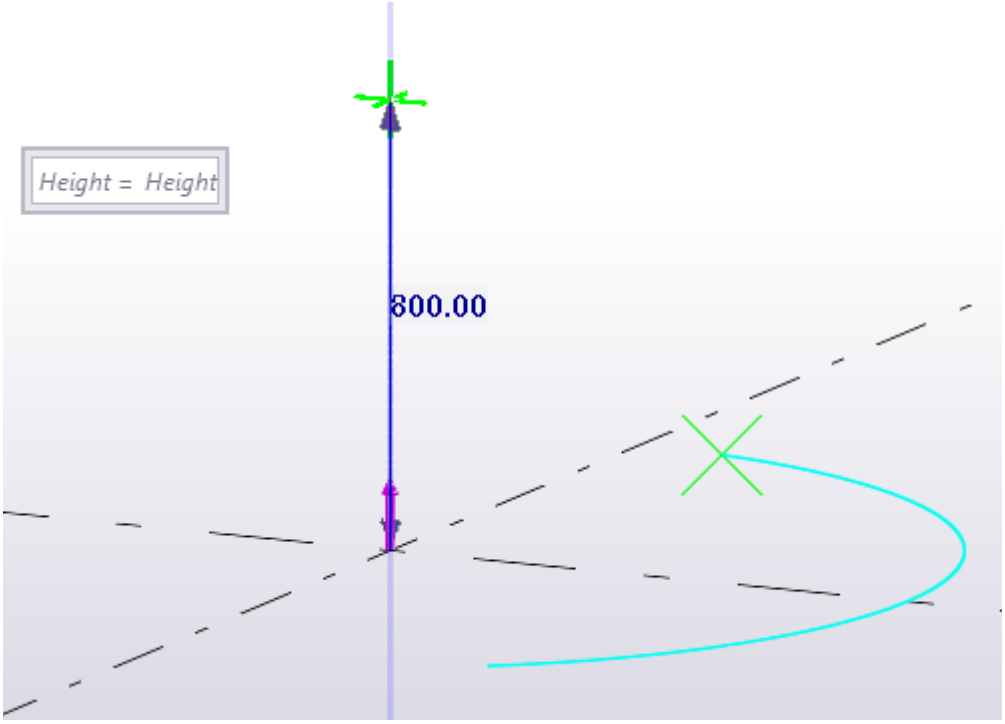
1. On the **Steel** tab, click **Plate** --> **Create stand-alone bent plate** .
2. Define the first radius of the bend:
   a. Pick the center point.
   b. Pick the start point for the arc.
   c. Pick the end point for the arc.

   The picking order defines the up direction. For example, if you create an arc on the xy plane in the counterclockwise direction, the up direction points to the positive z axis, according to the right-hand rule.



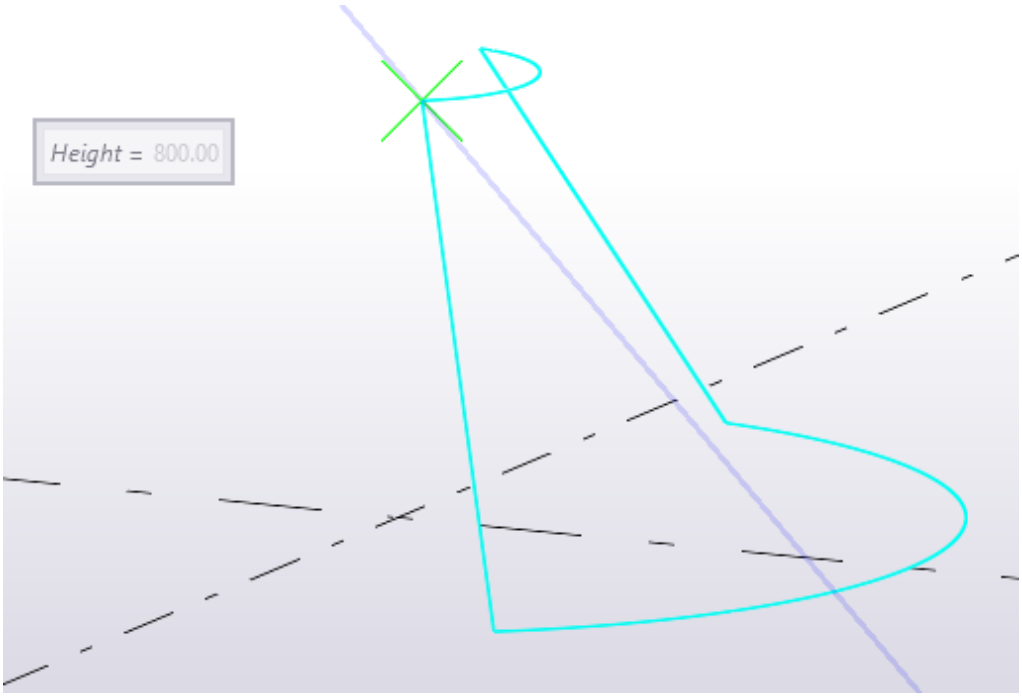
3. Pick a point to define the height of the bend.

Alternatively, you can enter the height in the bent plate contextual toolbar.

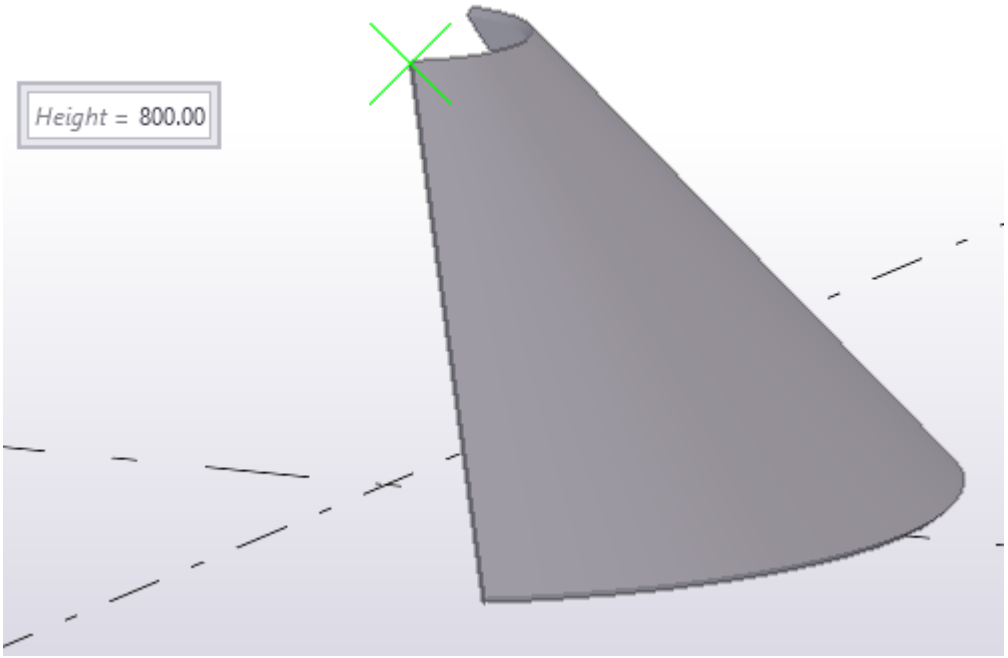


4. Define the second radius of the bend:
   a. Pick a point based on the preview of the plate.
   b. If you want to change the direction of the plate after you have picked a point, click the left mouse button.

      Alternatively, if you want to create a cylindrical bend, click the middle mouse button. In this case radius1=radius2.

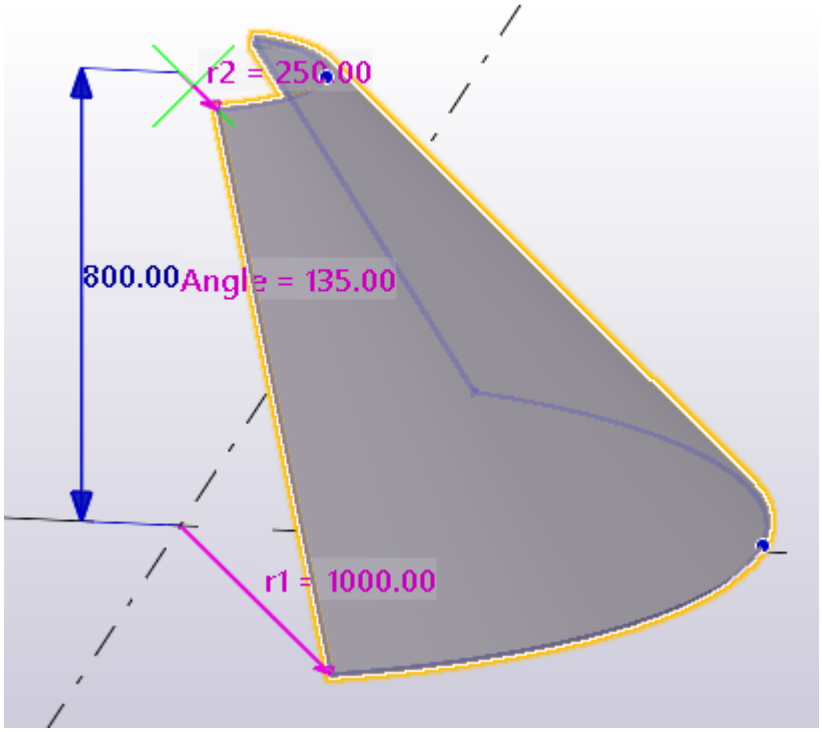


5. To complete the bent plate creation, click the middle mouse button.

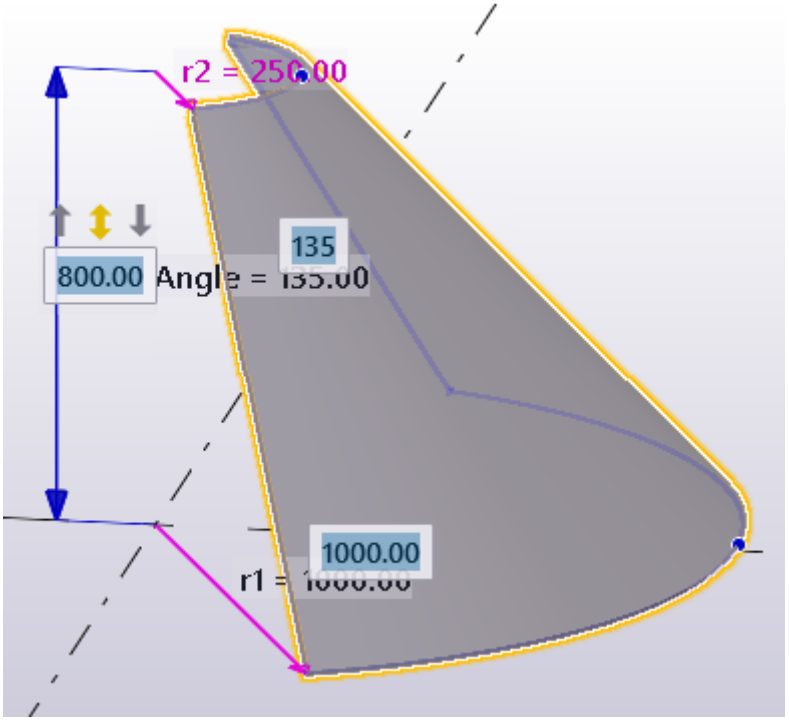


Modify the shape of a stand-alone bent plate

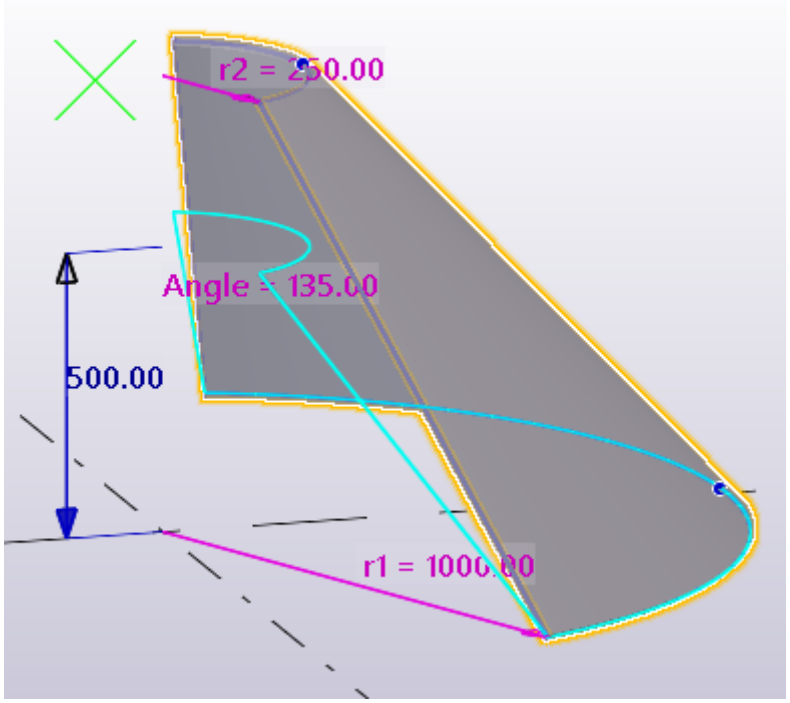
Use direct modification dimension values and handles to modify the bent plate shape.

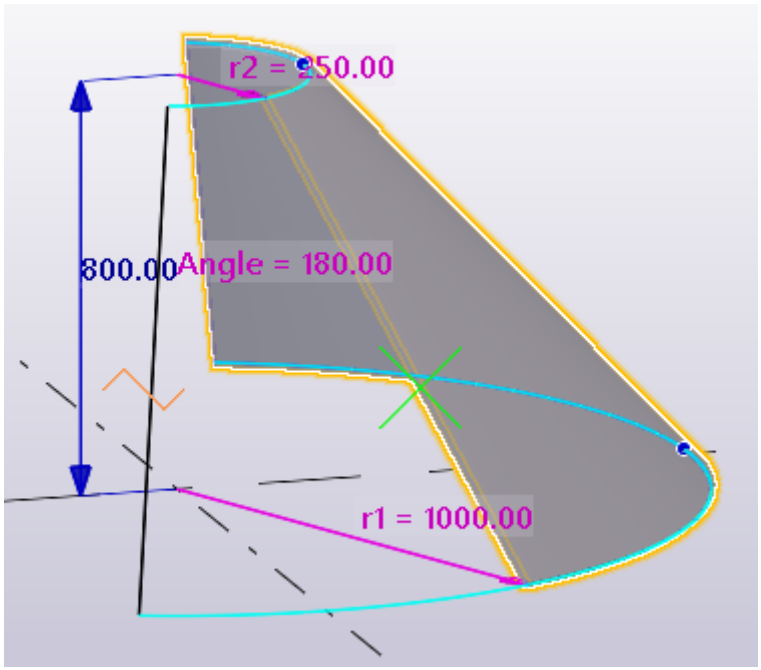


- You can change the angle, radiuses and height of the bend by entering new dimension values.

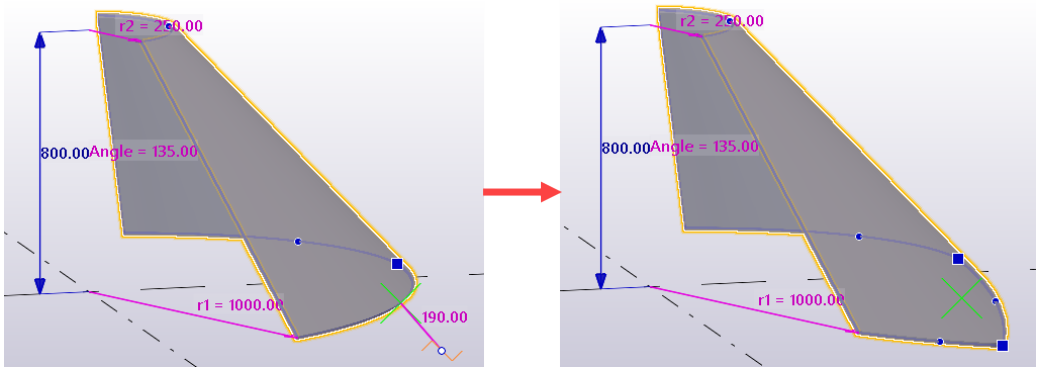


- You can drag and stretch the edges of the bent plate.





- You can add and delete intermediate points.



- You can create unfolded drawings of the stand-alone bent plates.

Limitations

- Tekla Structures does not support full 360 degree stand-alone bent plates. However, you can create 359 degree plates instead.
- Use the local coordinate system in drawing creation.
- Unfolded drawings of less than 180 degree conical bent plates work correctly. However, with more than 180 degree conical bent plates there might be some unexpected results in the drawing creation.

1.8 New curved construction objects and other improvements

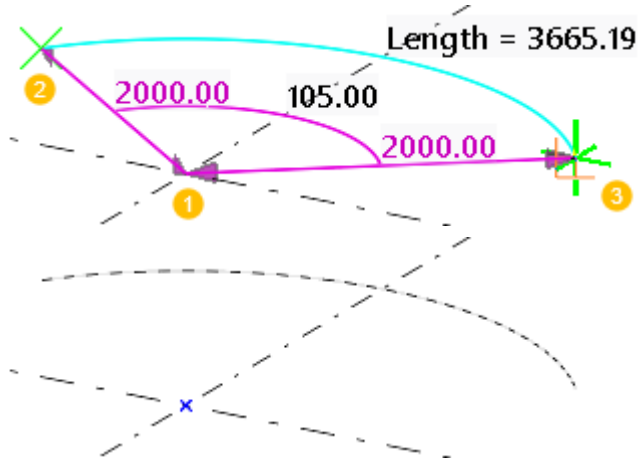
Tekla Structures 2019 introduces two new construction objects, construction arc and construction polycurve, and a new command to copy construction objects. Construction circles and lines have also been improved.

Construction arc

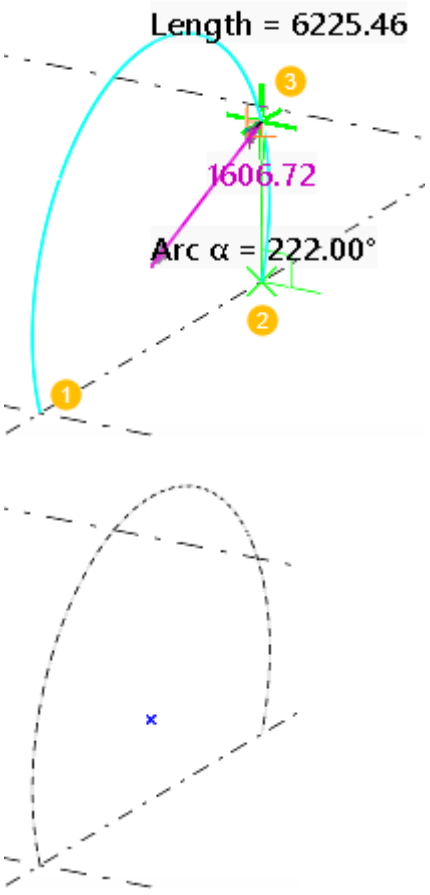
You can create construction arcs by picking three points in the 3D space in the model.

Start the **Construction object** --> **Arc** command on the **Edit** tab, and then use the contextual toolbar to specify which set of point you want to pick:

For example, you can pick the center point, start point, and end point of the arc:



Or the start point, end point, and a point along the arc:

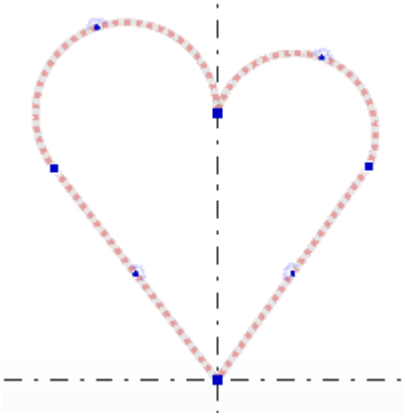


For more information, see Create a construction arc.

Construction polycurve

You can create 3D construction polycurves that pass through the points you pick and that can have straight and curved segments.

Start the **Construction object** --> **Polycurve** command on the **Edit** tab. Use the contextual toolbar to switch between creating straight and curved segments, and then click the middle mouse button to complete the polycurve.



For more information, see Create a construction polycurve.

Copy construction objects with offset

You can copy construction lines, circles, arcs, and polycurves in the direction that you indicate, and using the offset values that you specify. For example, you can create new circles and arcs centered in the same location as the original circle or arc, and adjust the radiuses using the offset values.

For more information, see Copy a construction object with offset.

Modify construction objects

You can now change a construction line to an arc. Just drag the arc symbol  at the line midpoint.

To change a construction arc to a line, delete the arc midpoint  .

For more information on how to use direct modification handles to modify construction objects, see Modify a construction object.

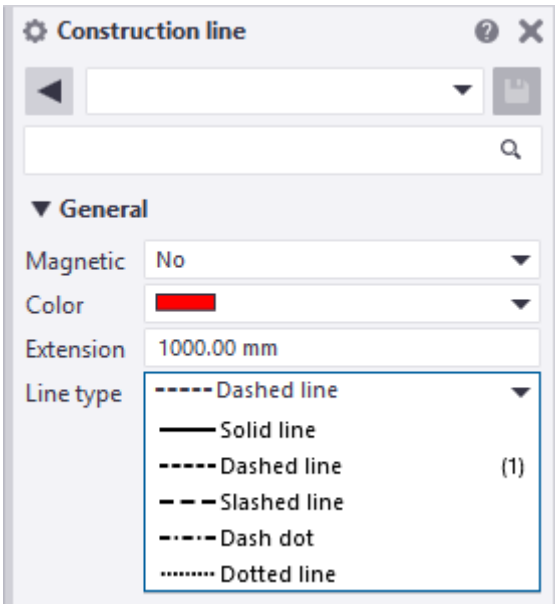
Improvements in construction circles and lines

- The command **Edit** --> **Construction object** --> **Circle** replaces the two previous commands **Circle using center point and radius** and **Circle using three points**.

  You can now specify using the contextual toolbar which three points you want to pick in the 3D space in the model to create a construction circle. The contextual toolbar appears after you have started the command.

- You can now change the line type of the construction lines and circles using their property panes.

  The advanced options `XS_CONSTRUCTION_LINE_LINE_TYPE` and `XS_CONSTRUCTION_CIRCLE_LINE_TYPE` that were previously used for changing the line types have now been removed.

- Construction circles now have the standard file.

  You can also save other property files for construction circles.

1.9 Modeling and detailing improvements

Tekla Structures 2019 comes with many improvements in modeling and detailing features.

Improvements in orthogonal snapping

- Snapping has been improved in Tekla Structures 2019 to make it work better with the **Ortho** tool.

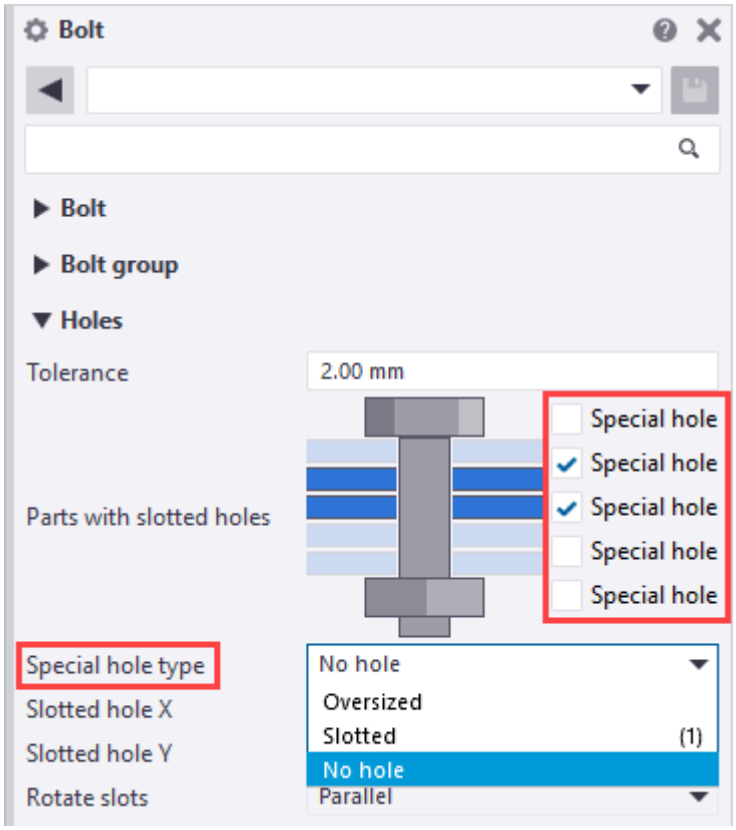
  Previously, when **Ortho** was on, Tekla Structures remembered the last plane and used the last picked point as a reference point, and continued to snap to the plane where you had last picked a point. This resulted in unwanted snapping results, for example, parts were created to a different plane than expected.

  Now, when you interrupt a command, the reference point information is cleared. This means that there is no reference point information, meaning the last picked point, that the orthogonal snapping could use. This results in more accurate snapping.

  When you need to use the reference points, set the reference point manually by pressing the **Ctrl** key and picking a point when you run a command.
- Previously, when the **Ortho** tool was active, the snapping distances were incorrectly rounded. This has now been fixed.
- When using orthogonal snapping, the snap points are now shown with perpendicular snap symbols.

Improvements in bolt holes

There is now a new option in the **Bolt** properties that you can use to specify which plies of the connection do not get holes.



To do this:

1. Go to the **Holes** section in the **Bolt** property pane.
2. Next to **Parts with slotted holes**, select the desired **Special hole** check boxes.
3. In the **Special hole type** list, select **No hole**.
4. Click **Modify**.

The **No hole** option is also available for bolts in the system and custom components.

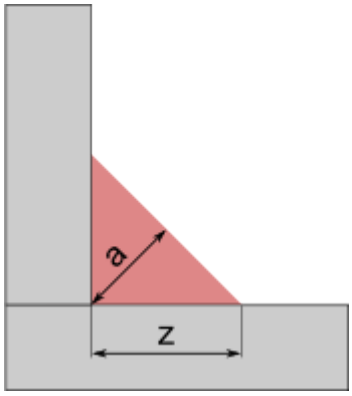
Improvements in welds

If you are following the ISO standard (2553) for welds and have the advanced option XS_AISC_WELD_MARK set to `FALSE`, you can now specify whether the fillet weld size determines the leg length or the throat thickness.

Set the new advanced option XS_ISO_LEG_LENGTH_AS_WELDSIZE to:

- `TRUE` to use the weld size as the leg length (z) of the fillet welds.

- `FALSE` to use the weld size as the throat thickness (a) of the fillet welds.



This advanced option is model specific and the setting is saved in the options database. This advanced option also applies to the fillet welds in compound welds.

Note that setting a weld prefix that affects the weld size overrides the value set in `XS_ISO_LEG_LENGTH_AS_WELDSIZE`.

Adding and removing pour unit content

The **Pour** --> **Add to pour unit** and **Pour** --> **Remove from pour unit** commands are now visible on the context menu for more combinations of selected objects when right-clicking.

The following commands are also available in **Quick Launch**, and you can assign keyboard shortcuts to them:

- **Add to pour unit**
- **Add selected objects to pour unit**
- **Remove from pour unit**
- **Remove selected objects from pour unit**

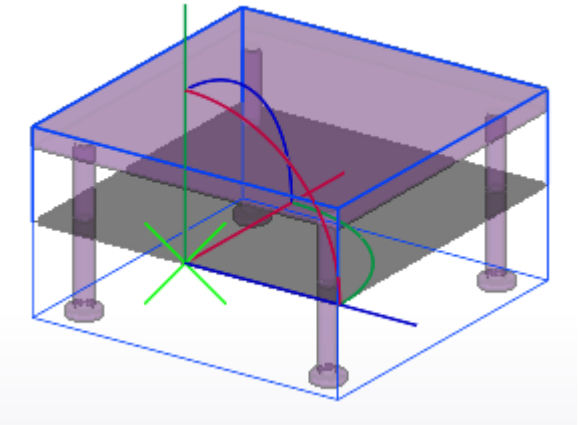
Using these commands makes it easier to add allowed objects to pour units, or to remove them, even when you have a set of objects selected that also includes objects that cannot be added to a pour unit.

If you need to reset pour unit contents and relations defined using the **Calculate pour units** command and/or the **Add to pour unit** command, you can use the following commands in **Quick Launch**:

- **Reset all pour unit relations**
- **Reset all manually assigned pour unit relations**
- **Reset all pour unit relations except manual assignments**

Improvements in placing items in the model

It is now easier to add and move items in the model in the same way as custom parts, and to adjust item location and rotation using the axis and rotation handles.



Shape cleaner tool

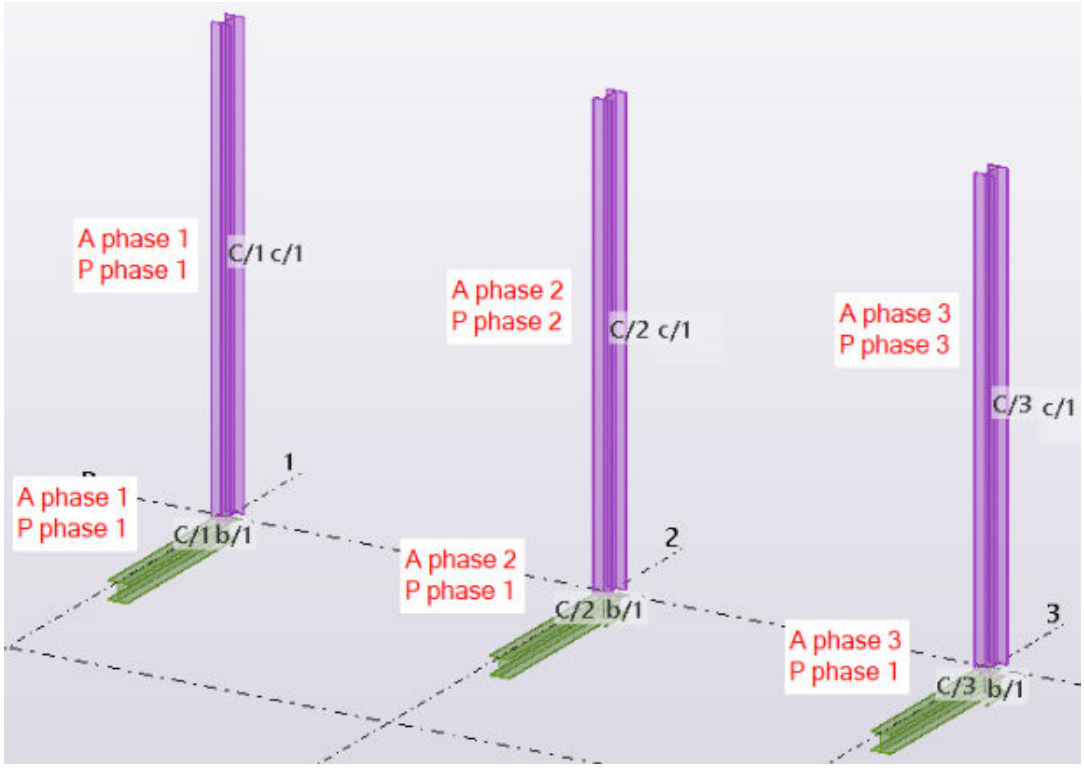
If some previously imported shapes cause missing faces or edges in items or drawings, you can use the new **Shape cleaner** application for cleaning the shape geometries in Tekla Structures models. Cleaning means that Tekla Structures investigates and corrects the shape geometry and tries to create solid objects. This is useful with shapes that have been imported to Tekla Structures models prior to version 2018i and are migrated to version 2018i or newer. **Shape cleaner** provides an option to create backups of the shape geometry files and to revert to the original files if you are not happy with the cleaning result.

Shape cleaner is available in the **Applications & components** catalog.

Numbering improvements

In the **Numbering Setup** dialog box, **Phase** has been changed to **Assembly phase**. Now the **Assembly phase** setting only affects the numbering of assemblies, not the parts. This means that only the assembly phase of

assemblies is compared in numbering, not the part phase nor the assembly phase of parts.



1.10 Rounding, step tapering, cranking, and other rebar set improvements

Tekla Structures 2019 introduces many new settings and useful features related to rebar sets.

Rounding bar lengths in the model

Previously you could only round reinforcing bar lengths in report and drawing templates using the settings defined in the `rebar_config.inp` file.

Now you can round rebar set bar lengths in the model. The new rounding settings are available for the current model in the **Options** dialog box, for entire rebar sets in the **Rebar set** properties, and for certain rebar set bars in the **Rebar property modifier** properties.

You can define separate settings for straight bars, first and last legs, and intermediate legs, and you can round bar lengths up, down, or to the nearest

suitable number according to the rounding accuracy. There is also a separate setting for defining how the bar lengths are rounded up at splitter locations.

Report and drawing templates continue using the rounding settings in the `rebar_config.inp` file. If the rebar set bar lengths have already been rounded in the model, and the rounding settings in the model and in the `rebar_config.inp` file are in line, no additional rounding is done in templates.

Step tapering

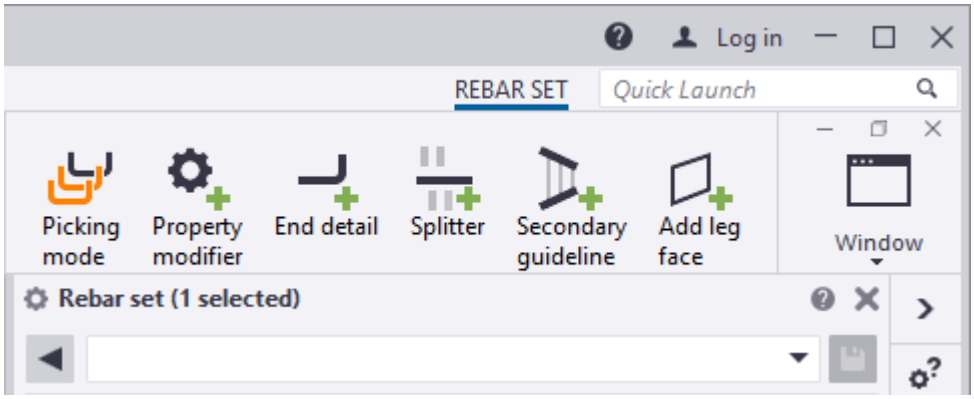
You can now define whether rebar set bars are tapered at slanted part edges, for example, and how the tapering steps are created. There are new step tapering settings for the current model in the **Options** dialog box, for entire rebar sets in the **Rebar set** properties, and for certain rebar set bars in the **Rebar property modifier** properties.

You can define tapering step values separately for straight bars, first and last legs, and intermediate legs. Using the rebar set or property modifier properties, you can also define the number of bars in the one tapering step.

Create rebar set modifiers using new contextual tab

You can now create rebar set modifiers for entire rebar sets, or for selected bar groups or bars. Use one of the three reinforcement selection switches  to select the rebar set bars for which you want to create a modifier.

Then use the modifier commands on the new **Rebar set** contextual tab that appears at the right end of the ribbon. The contextual tab is only visible when you have rebar set bars selected.



The first button on the contextual tab is for defining how to place the modifier in the model and how many points to pick. In addition to the previous single point and multiple points picking modes, a new picking mode  is now

available for the selected rebar set bars. Click the **Picking mode** button to cycle through the three modes.

The **Rebar set** contextual tab also has commands for adding secondary guidelines and leg faces to rebar sets.

Splitter improvements

- You can now define standard and custom lapping and cranking properties for rebar set bars using splitters. Use the new settings in the **Rebar splitter** properties in the property pane, for example **Split type**, **Lapping type**, and the entire **Cranking** section.

  The standard values of the lapping and cranking properties are read from the `rebar_database.inp` file in the environment, firm, and/or project folders.
- The **Bars to split** setting is now **Bars affected** with the new additional **1/4** option.
- The previous **Lap type** setting has been removed.
- When you are adding a splitter or when you select a splitter, the lengths of the affected bars are now shown in the model.
- If you want to create a splitter at a certain or rounded distance from a bar end, and the dimension shown is measured from the other bar end, hold down **Shift** when you place the splitter in the model to switch the measuring point to the other bar end.

Improvements in end detail modifiers

The following new settings are now available in the **Rebar end detail modifier** properties in the property pane:

- **Hook rotation**: You can rotate bar end hooks out of the bar plane. For example:

- **Adjustment type**: You can extend or shorten the bar length according to an end offset or a specified leg length.
- The previous **Threading** section is now **End preparations** with some new settings.
- The **Custom properties** section: Click the **More** button to access the user-defined attributes (UDAs) of the end detail modifiers.

New rebar display options on the ribbon

On the **Concrete** tab on the ribbon, there are now new commands for **Rebar display options** in the model:

- **Leg face visibility**

  Click to show or hide the rebar set leg faces in the model.

  This is the same as setting the advanced option XS_REBARSET_SHOW_LEGFACES to `TRUE` or `FALSE`.

- **Rebar dimension visibility**

  Click to show or hide the dimensions of a selected reinforcing bar, bar group, or rebar set in the model.

  This is the same as setting the advanced option XS_DISPLAY_DIMENSIONS_WHEN_SELECTING_REBARS to `TRUE` or `FALSE`.

- **Property modifier visibility**

  Click to show or hide the rebar set property modifiers.

  This is the same as setting the advanced option XS_REBARSET_SHOW_PROPERTY_MODIFIERS to `TRUE` or `FALSE`.

- **End detail modifier visibility**

  Click to show or hide the rebar set end detail modifiers.

  This is the same as setting the advanced option XS_REBARSET_SHOW_END_DETAIL_MODIFIERS to `TRUE` or `FALSE`.

- **Splitter visibility**

Click to show or hide the rebar set splitters.

This is the same as setting the advanced option XS_REBARSET_SHOW_SPLITTERS to `TRUE` or `FALSE`.

- **Color rebar groups**

  Click to use colors to indicate the bar groups within rebar sets instead of the rebar set classes.

  This is the same as setting the advanced option XS_REBARSET_COLOR_BARGROUPS to `TRUE`.

Improvements in modifying leg faces

When you modify rebar sets by dragging leg faces, the following new and improved methods are now available:

- If you drag a leg face, the connected leg face planes remain intact.
- If you hold down **Alt** and drag a leg face, the leg face size remains the same, but the connected leg face planes may change.

  This is what previously happened when you dragged a leg face.
- If you hold down **Shift** and drag a leg face, the leg face is detached from the connected leg faces.

  This is what previously happened when you held down **Alt** and dragged a leg face.
- If you hold down **Ctrl** and drag a leg face, a new parallel leg face is created.

Other improvements

- When you create crossing rebar set bars, you can modify the distribution length of the bars by adjusting the length of the rebar set guideline before the bars are added to the model. When the **Rebar set** --> **Create crossing rebars** command is running, click the new button  on the contextual toolbar and then shorten or lengthen the guideline by dragging its end handles  .
- You can now work with rebar set modifiers, splitters, guidelines, and leg faces also using the **Select rebar groups** selection switch or the **Select single rebars** selection switch. Previously this was only possible using the **Select rebar sets** switch.

- All rebar set modifiers including splitters have the following new settings:
  - **Bars affected** for defining how many bars can be modified in the same location.

    This is similar to the **Bars to split** setting that the splitters previously had, with the new additional **1/4** option.
  - **First affected bar** for defining which is the first bar to be modified, starting from the first end of the modifier.
- An arrowhead symbol  close to the midpoint of each rebar set modifier now indicates the direction of the modifier, and the left and right sides of a splitter, for example. The arrow points from the start towards the end of the modifier.

  The primary and secondary guidelines of rebar sets also have the direction arrow.
- When you select a single rebar set bar or bar group, the modifiers and splitters that affect the selected bars are shown in the model. Also, the other bars that are not selected in the rebar set are shown as semi-transparent.

  When you select a modifier or splitter, the rebar set bars that are affected by this modifier or splitter are indicated in the model. The other, unaffected bars are shown as semi-transparent.

  With the rendering option **Show only selected part (Ctrl+5)**, the affected bars are made visible when you select a modifier or splitter.
- The rebar set modifiers are now shown more clearly in the model, using thicker and solid lines on top of other objects.
- When you create rebar sets for concrete parts using the **Create longitudinal rebars**, **Create crossing rebars**, and **Create planar rebars** commands, Tekla Structures automatically cuts the new rebar sets using the existing cuts in the concrete parts. This means that you do not need to create separate cuts for new rebar sets.

  However, you can separately modify and delete the cuts of rebar sets and the cuts of concrete parts. Also, if you add a new cut to a concrete part with rebar set, the rebar sets are not automatically cut.
- You can now create rebar set bars at the inner sides of cuts and hollow profiles.
- It is now possible to inquire rebar set bar groups in the model and in drawings.
- If rebar set group coloring is active, all rebar set bars whose group type is unknown are now colored using different colors.
- New template attributes (page 109) are available for reinforcement.

1.11 Clone selected in drawings

When editing GA drawings, you often need to add annotations, dimensioning and styles for building objects as a repetitive task. The new **Clone selected** feature clones existing annotation objects, drawing object representations and styles from selected source objects to selected target objects in GA drawings. With this feature, you can reduce manual repetition considerably.

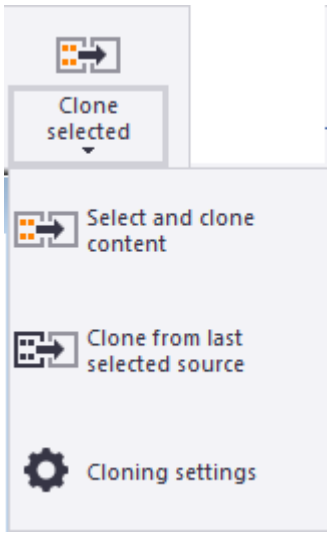
The **Clone selected** command allows you to clone previously created annotation objects and drawing object representations among the assemblies or cast units with the same type and similar shape.

You can clone annotation objects and drawing object representations inside one drawing view or among different drawing views.

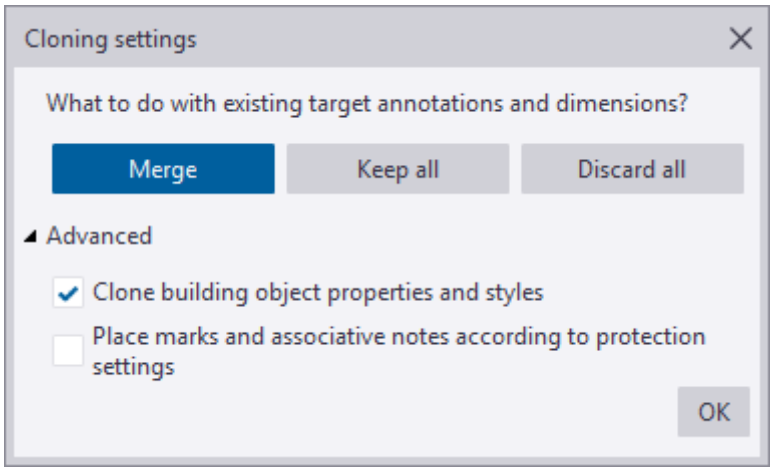
Clone selected recognizes the following types of drawing content:

- Associative and independent annotation objects: dimensions, marks, texts, symbols, text files, and DWG/DXF files
- Sketch objects, such as circles, rectangles, and polygons
- Object representations and styles: line colors, line types, hatches

The commands related to **Clone selected** are located on the **Drawing** tab in the drawing mode. These commands are only active when you have a GA drawing open.



- Before you clone, you may want to define how and what to clone. To do this, select **Cloning settings**:

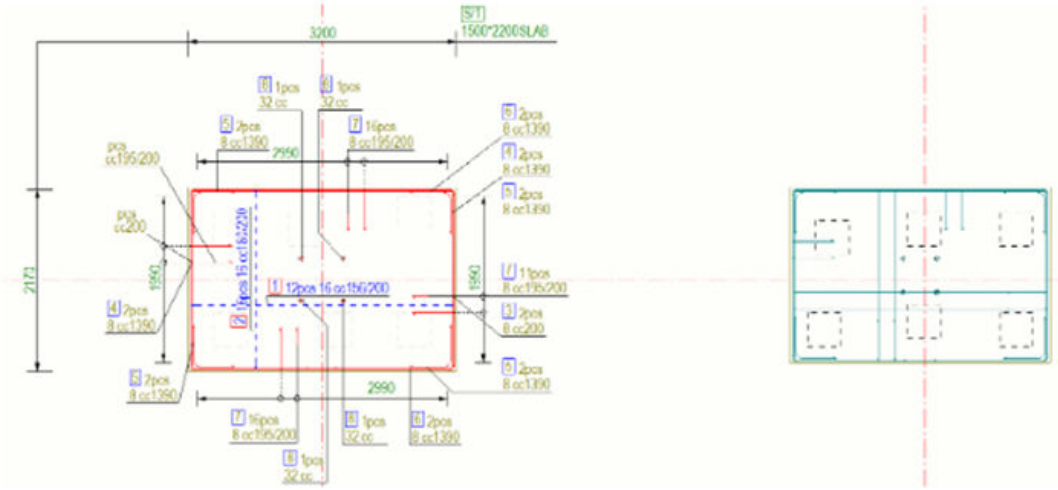


  - **Merge**: Overrides all annotation objects and building object properties in the cloning target by cloning matching content from the cloning source. This is the default mode.
  - **Keep all**: Keeps the existing annotation objects and building object properties in the cloning target and only clones the missing ones from the cloning source.
  - **Discard all**: Discards all annotation objects and building object properties in the cloning target and clones all selected content from the cloning source.
  - **Clone building object properties and styles**: Clones building object properties such as line colors and types, hatching styles and other representation properties in the building object properties dialog box for parts, reinforcement, bolts and welds. This option is selected by default.
  - **Place marks and associative notes according to protection settings**: Automatically runs the **Arrange drawing objects near current location** command for all associative annotation objects except for level marks, weld marks, dimensions and independent annotation objects. This option positions the annotation objects in the target so that they do not overlap other objects. Objects located in a free location are not moved, and overlapping objects are moved as close to the current location as possible.
- Before you clone, first modify the source object so that it contains the desired dimensions and annotations, and adjust the source object properties.
- To clone, click **Clone selected** on the **Drawing** tab. Next, select the source objects by clicking the objects or using area selection. Press the middle

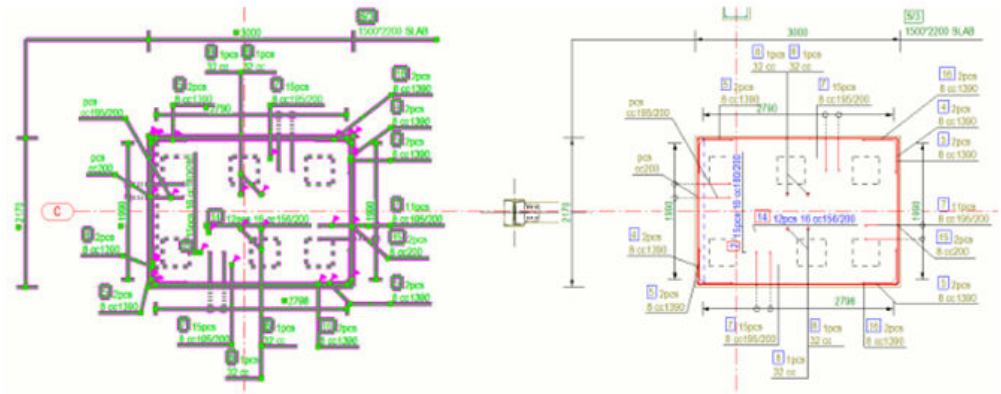
mouse button to complete the selection. Next, select the target objects by clicking the objects or using area selection. Press **Esc** to stop the cloning.

- You can also select the objects using **Drawing content manager** and selection filters. You can deselect objects by holding down **Ctrl** and clicking the selected object.
- You can also clone from the source that you selected last. To do this, click **Clone from last selected source** on the **Drawing** tab.
- When cloning dimensions, remember to set the dimension associativity rules before cloning to avoid the situation where it is unclear which object a dimension point is associated to. For more information, see Display dimension associativity.

Below on the left a detailed footing and on the right a similar footing that will be the target of cloning:



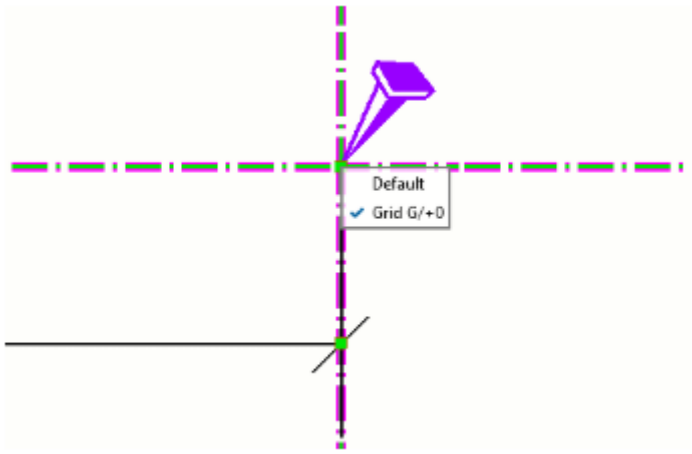
Below, the detailed footing on the left has been used as source for the target on the right. The details have been cloned to the target.



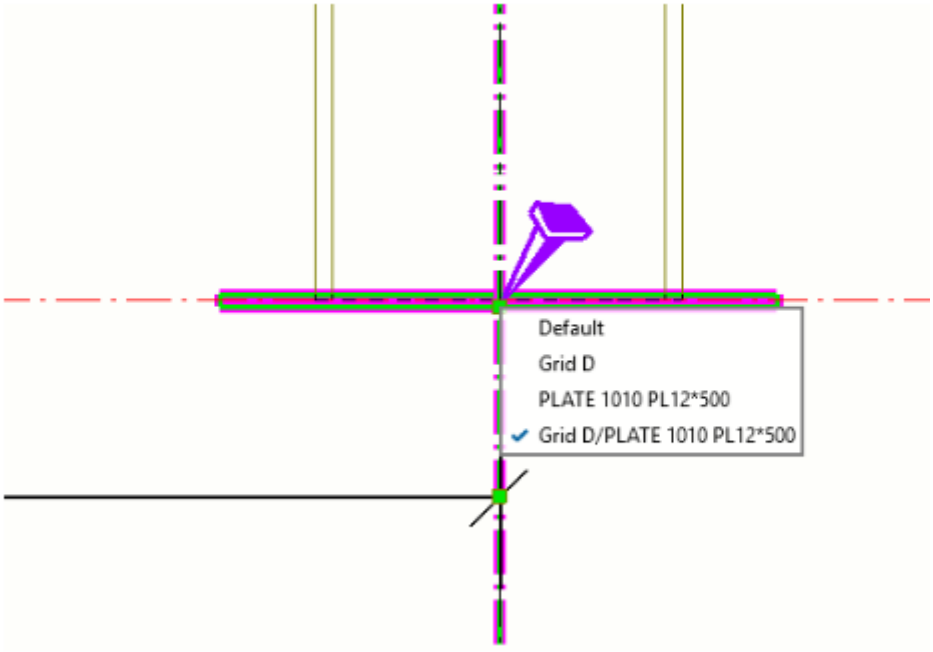
Limitations

- Some drawing objects cannot be used as source objects, such as grid lines, section view symbols, drawing view names, neighbor parts and neighbor reinforcement. These objects types will not be highlighted during/after area or single selection. Messages on the status bar indicate if an object cannot be selected.
- **Clone selected** cannot be used with pour units.
- To achieve accurate cloning results, all dimensions should be associated either to grid line intersection points or to intersections of building objects and grid lines.

  Dimension point associated to intersection of two perpendicular grid lines:



  Dimension point associated to intersection of part side and grid line:



Note that all dimension points that are located in an arbitrary position along the grid lines in the source selection will be cloned to wrong coordinates in the target.

- **Clone selected** cannot be used for cloning radial or curved dimensions.
- Cloning of annotations to mirrored objects created with the **Mirror** command in the model does not produce accurate results.
- Cloning modes do not affect cloning of independent annotation objects or sketch objects. Listed object types will be copied to target as many times as **Clone selected** is applied to the target objects.
- Dimensions will not be cloned if the viewing directions of the source and target drawing views do not match. In this case, a message is shown on the status bar.

For more information about cloning selected annotations and object representations and styles, see Clone selected in drawings.

1.12 Improvements in Drawing content manager, marks and notes

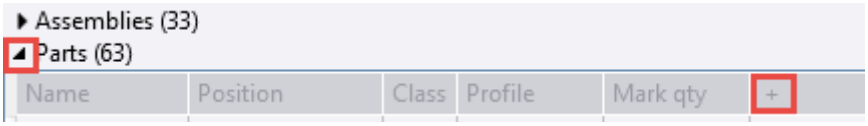
There are several improvements related to marks and notes. In **Drawing content manager**, you can now add new property columns to the list, and modify, move and hide existing property columns. There are now some new building object categories included. There is also a new command available on the ribbon that aligns selected marks around a point.

Improvements in Drawing content manager

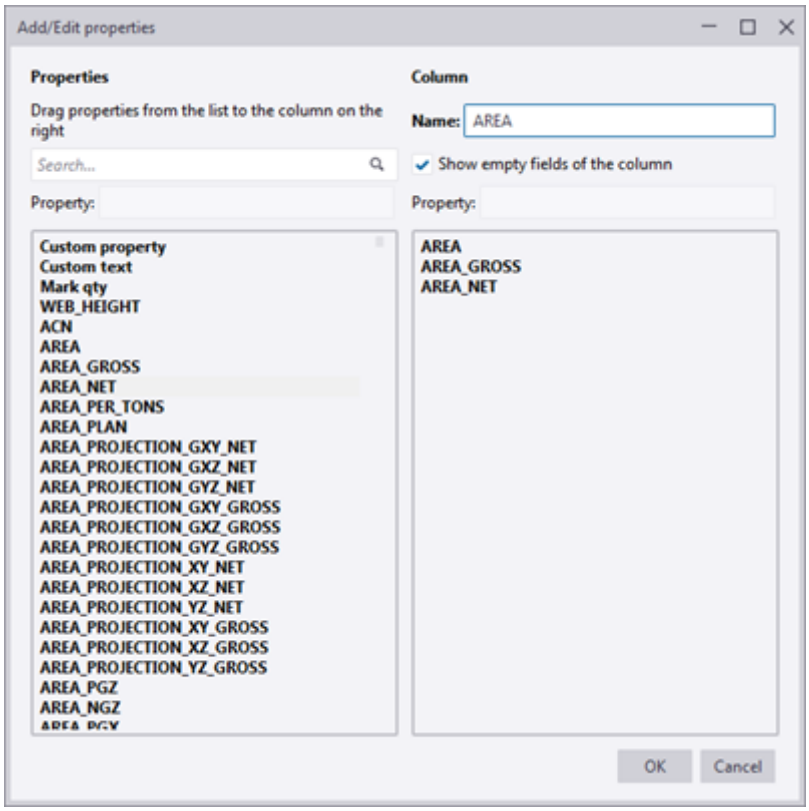
Add and modify property columns

You can now add new property columns to the **Drawing content manager** list, and modify the existing property columns. Previously, the property columns could not be edited, and the number of columns was fixed. You can also remove columns, and change the column order. In addition, the editing done to content manager categories is now saved in a specific xml file. The generated file can be localized and used as a user-defined setup.

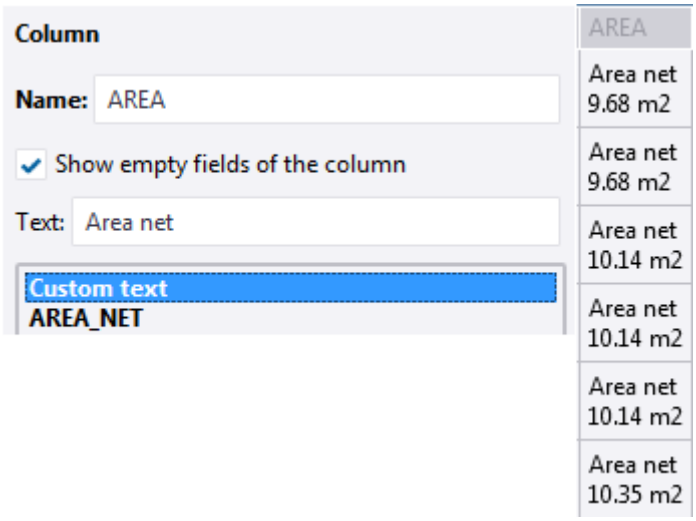
- To add a new property column in **Drawing content manager**, click the arrow button next to a category to expand the category, and then click the + button on the property column title row.



- In the new **Add/Edit properties** dialog box, select the required property from the list on the left and drag it to the list on the right. Use the **Search** box for searching properties. You can add several properties to the same column. Then enter the name for the property column and click **OK**.

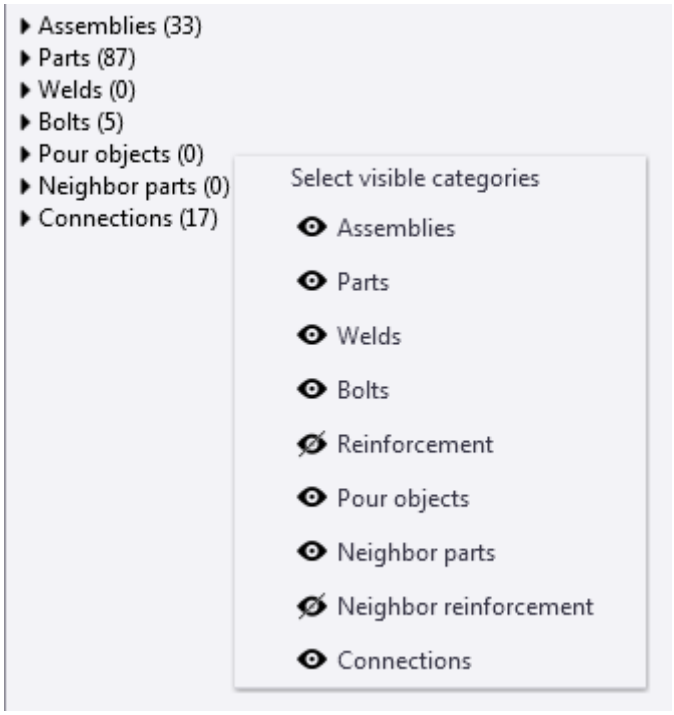


- To add custom text in a column cell, select **Custom text** and type the required text in the displayed **Text** box. The press **Enter** to add the custom text in the list on the right.



- To add any required property that is not listed in the available properties list, or to add a user-defined attribute defined in the `object.inp` file, select **Custom property** and type the required property or UDA in the displayed **Property** box. Then press **Enter** to add the property in the list on the right.
- To show the property cells even though there is no value, select the **Show empty fields of the column** option.
- To change a property column, right-click the column name and select **Edit**.
- To remove a property column, right-click the column name and select **Remove**.
- You can change the order of the existing columns in **Drawing content manager** by simply dragging the columns to the new position.

- You can hide category types from the list of visible categories by right-clicking **Drawing content manager** pane when no category is selected, and clicking the categories on the displayed list.



- In Tekla Structures 2019 onwards all generic properties are saved in the `DrawingContentManagerCategories.xml` file located by default in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\system` folder. All property column modifications (new columns, edited columns, column order) are saved in the `DrawingContentManagerCategories_<user>.xml` file in the `\attributes` folder under the current model folder.

  First, Tekla Structures tries to find the user-specific setting file `DrawingContentManagerCategories_ <user>.xml`. If it cannot be found, Tekla Structures will next look for `DrawingContentManagerCategories.xml`.

  You can convert the user-specific file to a generic one just by removing `_<user>` from the file name.

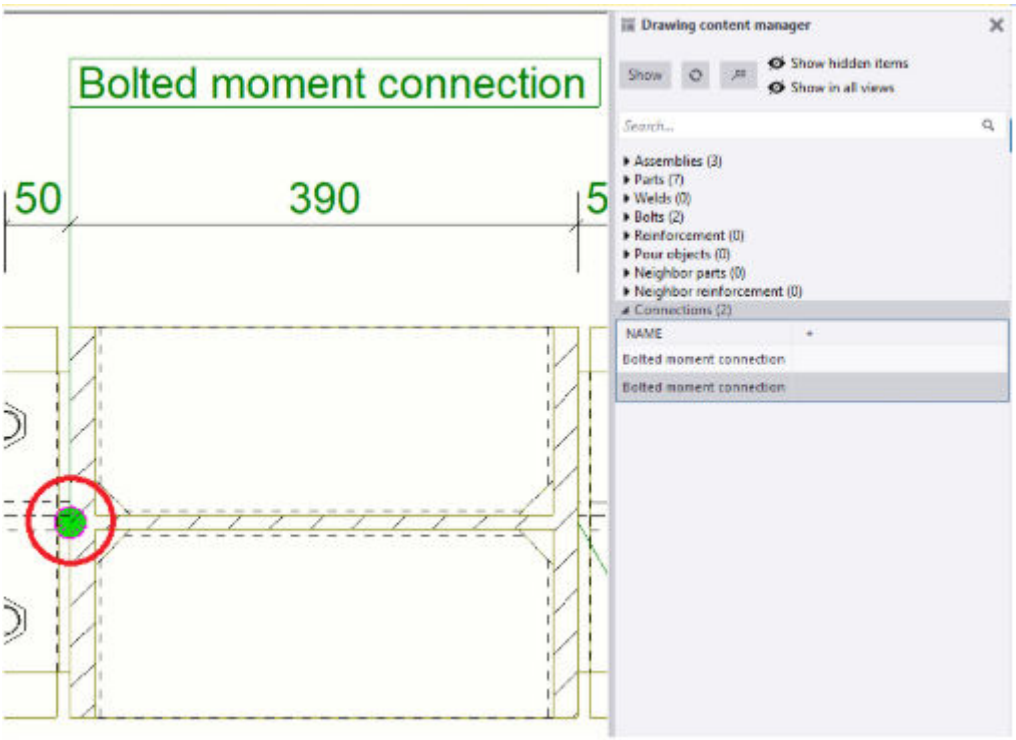
  The folder search order for the generic settings file is the following:

  - `\attributes` folder under the model folder
  - Project folder (`XS_PROJECT`)
  - Firm folder (`XS_FIRM`)
  - System folder (`XS_SYSTEM`)
  - Folder defined by the advanced option `XS_USER_SETTINGS_DIRECTORY`

New building object categories

- **Connections** and **Neighbor reinforcement** category types are now available in **Drawing content manager**. Now you can check and edit drawing content for connections and neighbor reinforcement objects, such as marks and associative notes, in the current drawing.
- All commands related to neighbor reinforcement objects and neighbor reinforcement marks are available in the context menu. You can quickly and easily:
  - Add single rebar marks or associative notes to the selected single rebars or group of rebars
  - Add dimension marks, tag dimension marks or dimension lines to the selected group of rebars
  - Adjust the location of the rebars in rebar groups
  - Hide/show the reinforcement objects in drawings
  - Add, modify or remove reinforcement marks
- Connection objects now have a symbol representation in drawings. By default, the connection representation symbol is the symbol number 142 in the `xsteel.sym` file in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\symbols\` folder. You can modify the connection representation symbol in Symbol Editor. For more information about Symbol Editor, see Symbol Editor User's Guide.

- Connection objects are only highlighted in a drawing when you have selected the objects from the **Drawing content manager** list, otherwise connection symbols are hidden.



- When you have selected a connection object from the **Drawing content manager** list, you can add, modify or remove connection marks.
- Note that only connection type of components are shown in the **Connections** category.

Align selected marks to a point

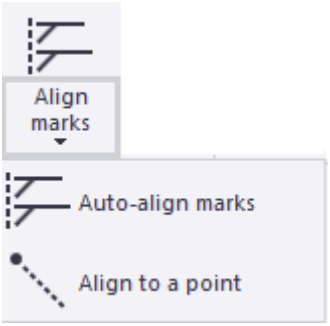
- The **Annotations** tab in the drawing mode has a new command **Align to a point** for aligning selected marks around a point. This new command tries to avoid crossing leader lines.

  If **Ortho** is on, the lines are placed in a 0, 90, 180, or 270 degree angle.

  You can also hold down the middle mouse button during the command to change the angle of the marks.

  To use the command, select the marks to be aligned, select the command and pick a point.

- The mark aligning commands are located in the new **Align marks** menu.

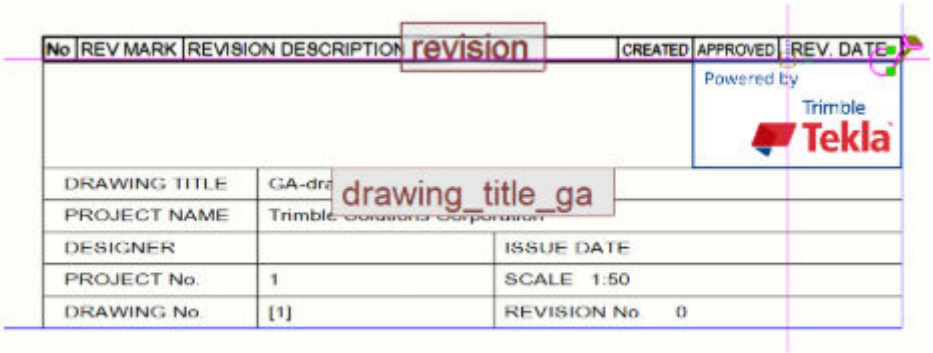


1.13 Layout editor improvements

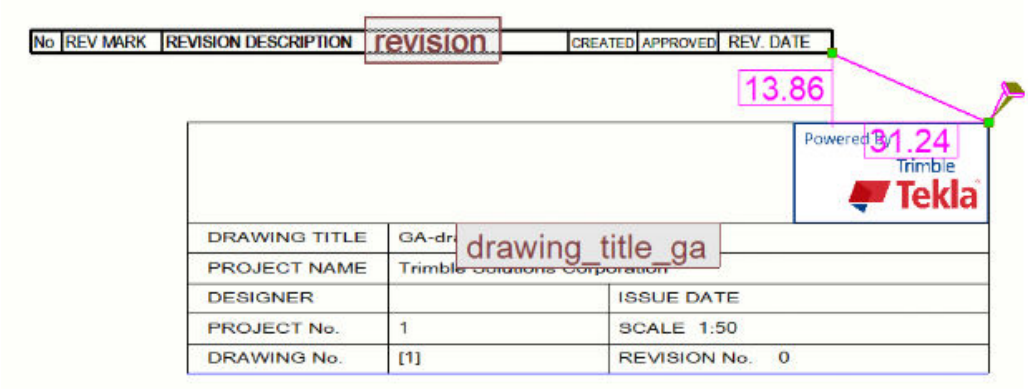
Placing and moving templates in drawing layouts is now much easier. Saving and closing of templates has also been changed.

- In **Layout editor**, placing templates in the drawing layout has been improved, and the templates are positioned automatically when you pick a corner or a midpoint on the drawing frame or on an existing template. The templates now try to avoid overlapping with the existing templates. The anchor snaps automatically to the closest corner or middle point of the drawing frame or the existing template.

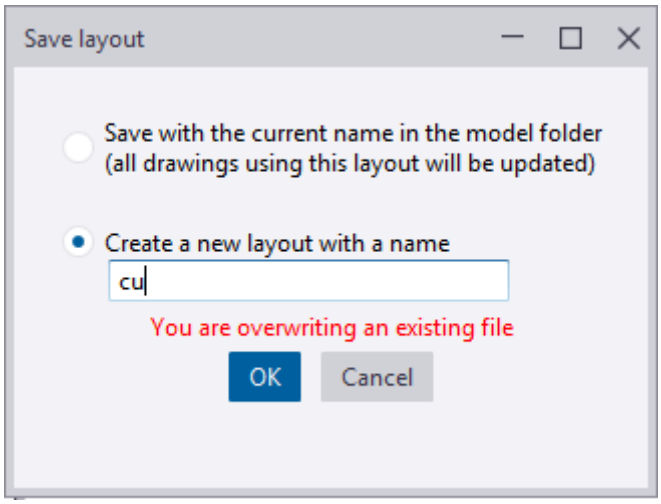
  Anchoring suggestion while dragging revision template on top of drawing title template:



  Snap point suggestion while dragging revision template over drawing title template:



- In addition, moving the templates is now more straightforward, and you can move templates just by dragging. When you drag, the template attempts to position itself automatically, avoiding overlapping with the existing templates. In the same way as when you are placing templates, the anchor snaps automatically to the closest corner or middle point of the drawing border or the existing template.
- The **Save as** button has been changed to **Save**.
- The **Close** button has been removed. The layout editor mode closes when you close the **Layout editor** pane.
- The name of the first option **Overwrite current layout** in the **Save layout** dialog box has been changed to more descriptive **Save with the current name in the model folder (all drawings using this layout will be updated)**.

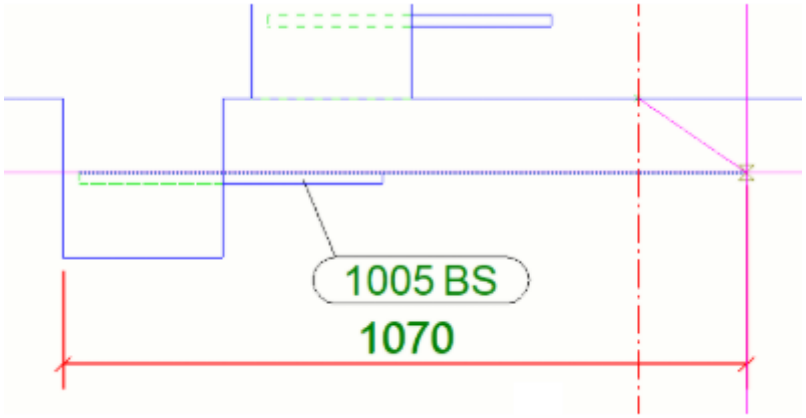


1.14 Dimensioning improvements

There are some important improvements in drawing dimensions. For example, you can now drag dimension points from handles, and display and change the dimension point associativity.

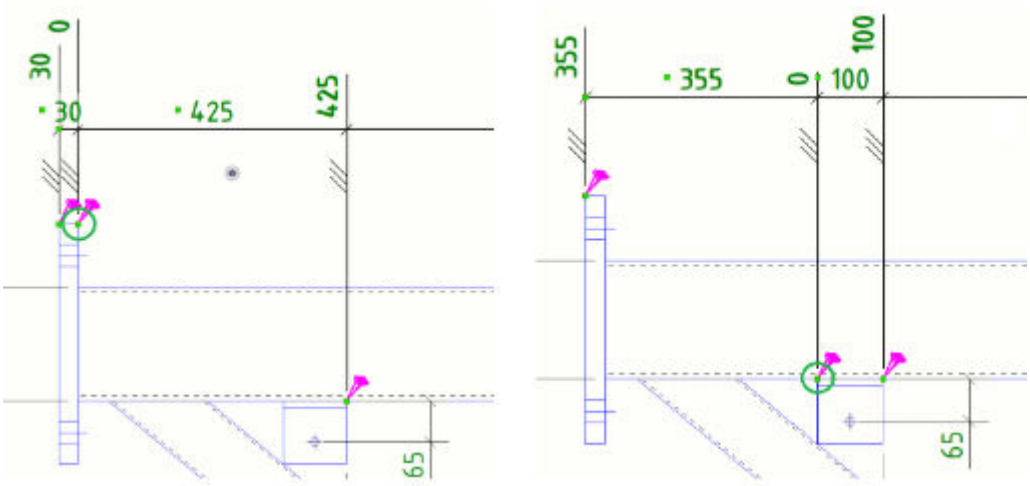
Dragging dimension points

- Straight (linear) dimensions in drawings can now be modified by dragging the dimension points from dimensio point handles.



- Dragging in single dimension lines: If you try to drag a dimension point to a new position that is located behind an existing dimension point, the selected dimension point will be deleted from the old position and recreated in the new, preferred position. If you try to drag the point to the same coordinate position where the existing point is already located, the dragged dimension point is dropped back automatically to the initial position.
- Dragging in dimension sets: If you try to drag the dimension point into the area between two points of neighbor dimension line, the selected dimension point will be deleted from the old position and recreated in the new, preferred position. If you try to drag the point to the same coordinate position where the existing point is already located, the dragged dimension point will be deleted from the old location and will be combined with the existing one, after dropping to the new location.

- Dragging a dimension point with a zero coordinate in running dimensions allows you to change the coordinate of the start dimension point without running the **Set dimension start point** command.



- Note that if **Drawing drag & drop** switch in the **Settings** section in the **File** menu is activated, the dimension point handle can be dragged without selecting the handle first.

Display dimension associativity

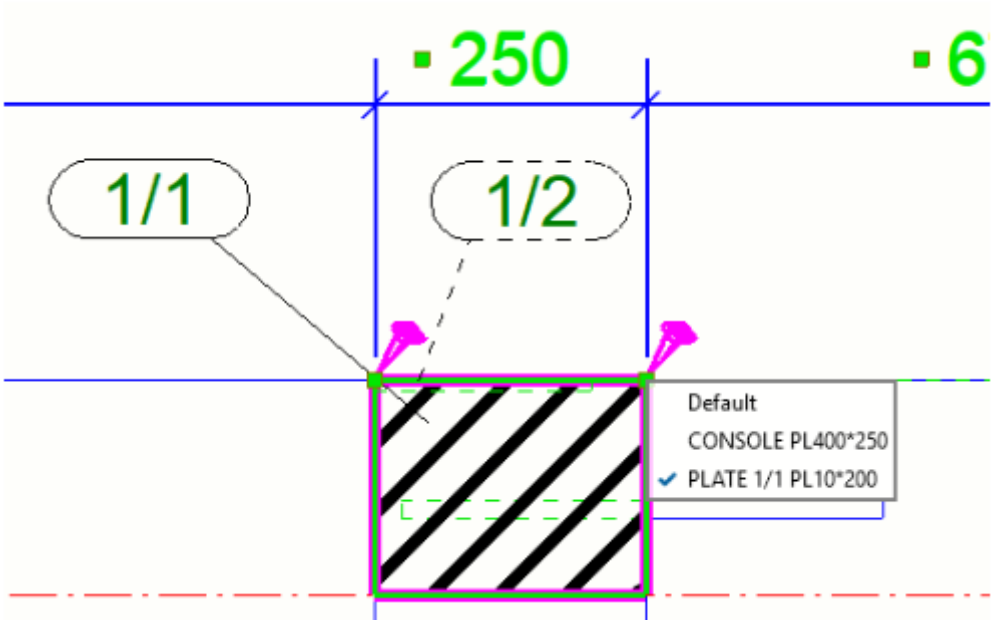
Dimensioning points created in Tekla Structures are associated to the objects where the dimension points have been added. This allows the dimensions to update automatically when the objects are changed during modeling.

Sometimes the dimension point locations may be unclear due to orthogonal projection. A dimension point might be not be associated to the desired object because there are various other objects in the same point location. In drawing update or cloning, this may lead to unwanted dimensioning values or associativity.

To avoid incorrect associativity, or to simply make the associativity selection distinct, there is now a new feature that allows you to check and change the dimension associativity rules in all types of drawings. This feature works only with straight dimensions.

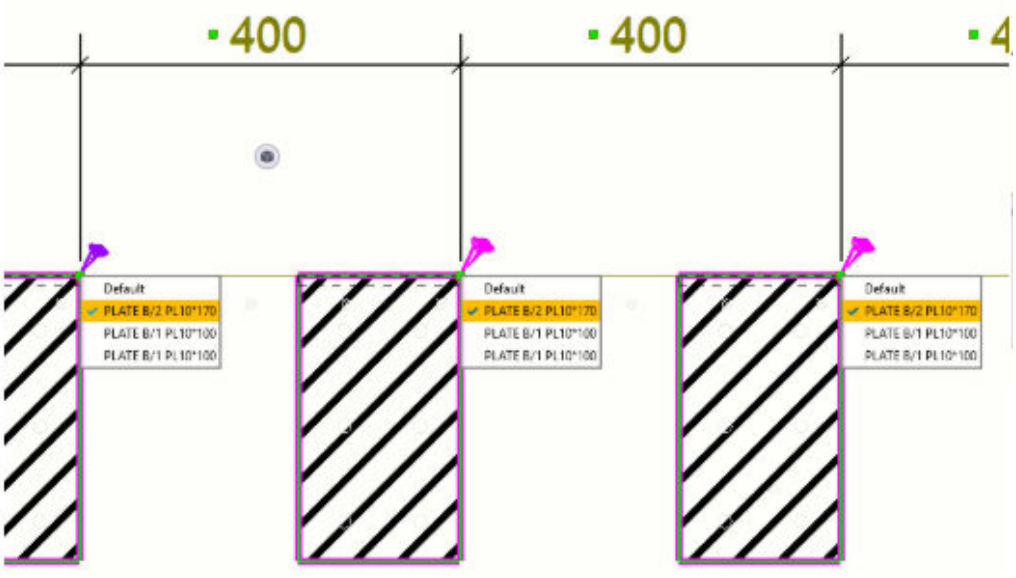
- To change the dimension point associativity rule, select the desired dimension or dimension set. Next, click a dimension point associativity anchor. This displays the dimension associativity rule list, which shows the objects where the dimension point can be associated. The **Default** associativity rule is automatically selected by Tekla Structures. Click a rule in the list to select it and associate the dimension point to a new object. When you click the rule, the corresponding object is highlighted in the drawing.

The corresponding grid lines are also highlighted. Click the drawing background to close the rule list.



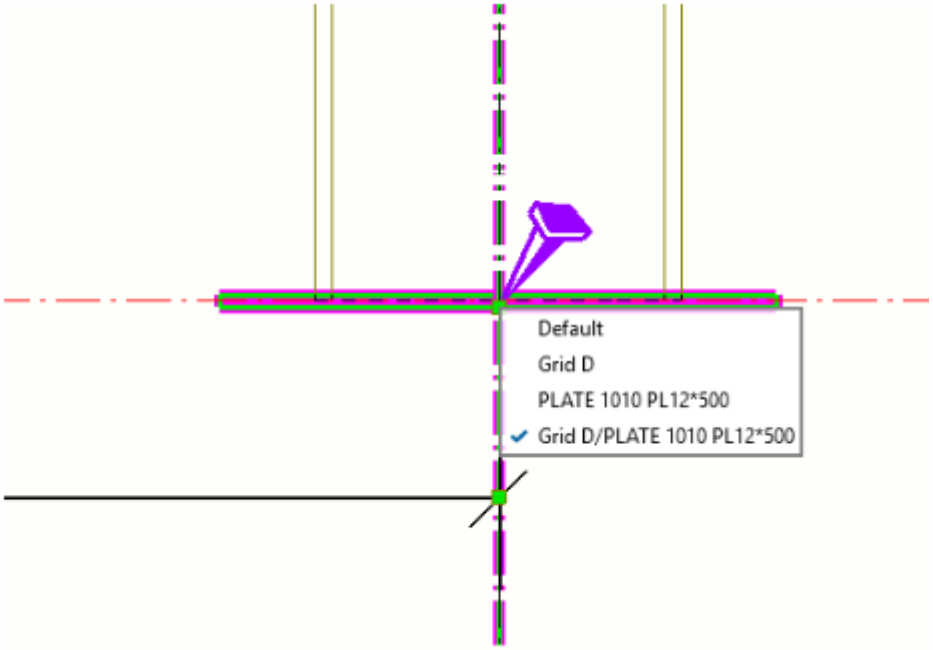
- You can open several dimension associativity rule lists at a time by holding down **Ctrl** or **Shift** and clicking dimension point associativity anchors, or holding down **Alt** and using area selection.
- To open all associativity rules related to a selected dimension set, click the dimension set and select **Show dimension associativity rules** from the contextual menu.
- You can change associativity rules by scrolling the mouse wheel while the mouse cursor hovers over a rule list.

- To select associativity rules related to same object types in all opened rule lists, double-click the desired rule. Selected rules will be highlighted with yellow color in all opened rule lists.

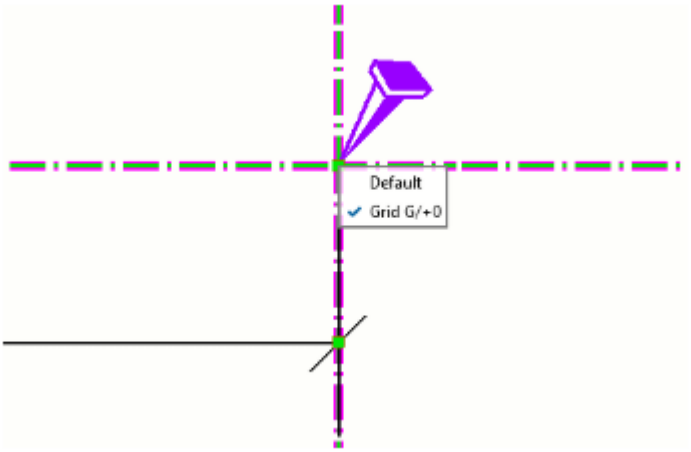


- The maximum number of shown rules in the rule list can be controlled with the advanced option `XS_INTELLIGENCE_MAX_RULE_COUNT`. If the needed associativity option is missing from the rule list, increase the number of the shown rules by changing the `XS_INTELLIGENCE_MAX_RULE_COUNT` value.
- The following attributes are shown in the rule list for the following building objects:
  - Steel parts: "NAME", "PART_POS", "PROFILE"
  - Concrete objects: "NAME", "PROFILE"
  - Polygon cuts: "NAME", "PROFILE"
  - Reinforcement: "NAME", "REBAR_POS"
  - Bolts: "NAME"
  - Grid: Grid "NAME"

- Intersection of grid line and building object side: Grid “NAME” or the label of the building object:



- Intersection of grid lines: Grid “NAME”/”NAME”:



- Pour units: Pour object "POUR_TYPE", # "POUR_NUMBER"
- If the **Default** option is selected, the dimension point will automatically select which object to follow during the dimension update based on the new position of the objects. Note that there might not be any rule in the rules list that would correspond the behavior of the **Default** option. Selecting another option than the **Default** option makes it possible to control which object will be followed during the dimension update.

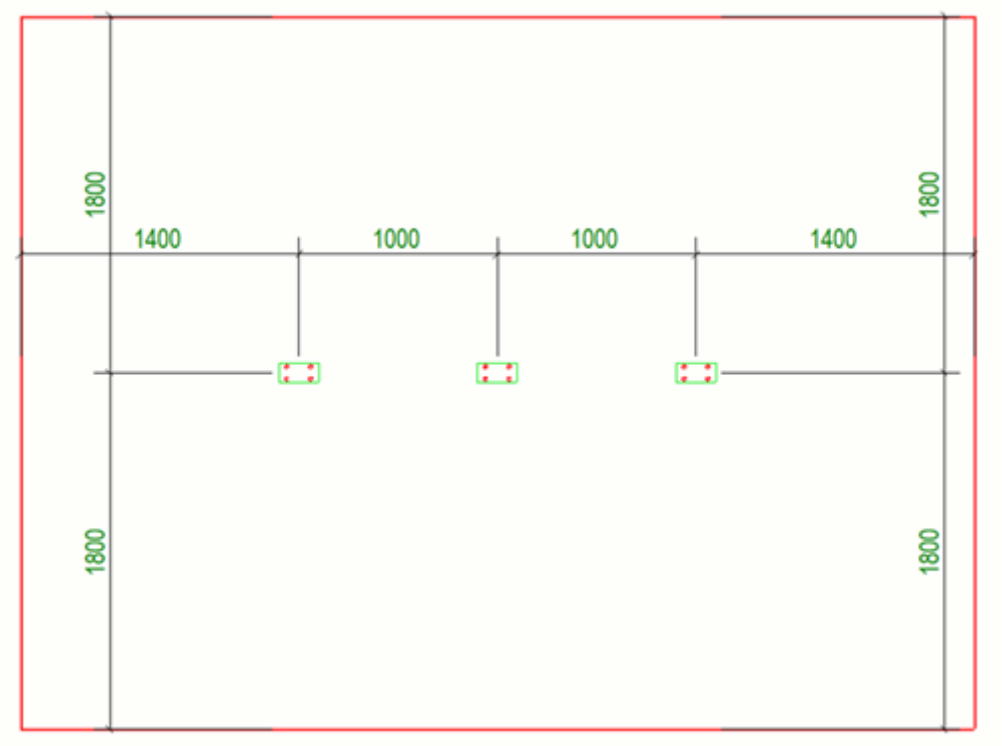
- Display dimension associativity with the **Clone** and **Clone selected** commands:
  - Changing associativity rules in selected dimension points allows you to achieve more accurate results in cloning dimensions in drawings. An associativity option selected in a rule list will be preserved in the cloned dimension if the selected rule corresponds to a similar object in a cloned drawing or in a target selection in a GA drawing. Objects are not considered to be similar if they have been modeled by using different commands, such as steel beam, steel plate, reinforcement, or bolt. When an appropriate object is missing in the cloned drawing or in the target selection in a GA drawing, the dimension point will be associated to an object that is located in the same coordinate points. In this case, the associativity rule in the point in question will be returned to the **Default** option.
  - Note that when the drawing is cloned automatically due to renumbering, the associativity rules are recomputed from scratch and any preferred rules set by the user are lost.

Other dimensioning improvements

New option for placing dimensions inside a cast unit, assembly or part

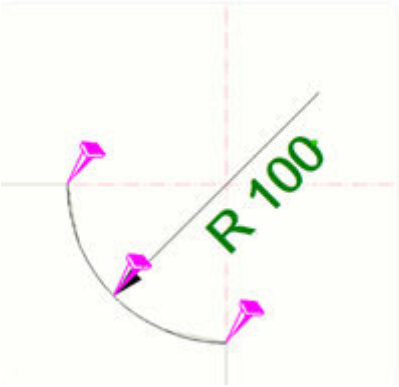
- In view-based dimensioning, in the **Dimensioning rule properties** dialog box, there is a new setting **Place dimensions inside** for the dimensioning type **Filter dimensions**. When you select this setting, the dimensions can be placed inside a cast unit, assembly or part.

  Example of the **Place dimensions inside** setting:



Radius dimension mid point associativity anchor

- There is now a associativity anchor drawn for radius dimension mid points. The mid point has always been associative, but previously, the associativity anchor was not drawn.



Curved dimension lines working with radial rebar set groups

- Curved dimension lines now work also with radial rebar set groups, similarly as with radial rebar groups.

1.15 Other drawing improvements

There are a lot of other improvements in many of the drawing features. For example, you can now organize your documents in manual categories in **Document manager**. Dragging in drawings has been made much easier and simpler, and the rebar drawing tools have also been updated. Furthermore, drawing view labels have new alignment options.

Improvements in Document manager

Drawing list button name changed to Document manager

- On the **Drawings & reports** tab on the ribbon, the command button name has been changed to **Document manager**.
- In **Quick Launch**, you can enter either `document manager` or `drawing list`. The actual command name is `Document manager (drawing list)`.

Document manager category dialog box resizable

- The **Document manager** category dialog box has been improved to allow resizing in order to make search strings and other properties more easily visible. The category dialog box width is saved and restored from the data saved in the model as the dialog box is closed and then re-opened.

Performance improvements

- Performance of some **Document manager** operations on drawings has been improved.

Organize your documents in manual categories

Sometimes you may need to have a document category in **Document manager** for documents that would be difficult to categorize using the search. Now you can simply select documents, create a manual category and add your documents there. You can also add documents to and remove documents from existing manually created categories, and combine categories, both search-based and manual ones. A manual category may contain both drawings and file documents.

Creating a manual category may be useful, for example, when you have enabled the **Show changes from the checkpoint set when the button is activated** feature in **Document manager**, and then when some documents have changed and are listed, you can add the changed documents in a manual category.

To	Do this
Create a new manual category and add documents there	• Select the documents from the list, right-click and select **Manual category** --> **Add to new** . Then type a name for the category, an optional

To	Do this
	tooltip, and define other necessary settings. Then click **Save**. Options are the same as in the search-based categories, except that the functionality related to search strings, and the **Test** button are missing if there are documents associated. If there are no documents associated, then the search controls are visible and the category could become a search-based category or a manual category. The newly created or modified manual categories are saved to the `DocumentManagerCategories_<user>.xml` file under the current model folder.
Add documents to an existing manual category	• Select the documents from the list, right-click and select **Manual category** --> **Add to existing** and then select the desired category. All compatible manual categories are listed. You can add the selected documents to several categories.
Save recently changed documents in a new manual category	• When you have enabled the **Show changes from the checkpoint set when the button is activated** switch in **Document manager**, and then when you disable this switch, you will get the following message:**Turning off 'Show changes' will reset the changes checkpoint and lose the history of which documents have changed since the checkpoint was set. Are you sure you wish to continue?**. Select **Create new category**. You can also select to turn the switch off and lose the history.
Edit a manual category	• Right-click the category in the category list and select **Edit**.
Remove documents from a manual category	Do one of the following: • Select the documents from the list, right-click, select **Manual category** --> **Remove from** and then select the category from which to remove the documents. • Select manual categories first so that all documents in those categories are listed, right-click the list, and select **Manual category** --> **Remove from selected** .

To	Do this
Delete a manual category	• Right-click the category in the category list, and select **Delete**.

Improvements in Document manager search

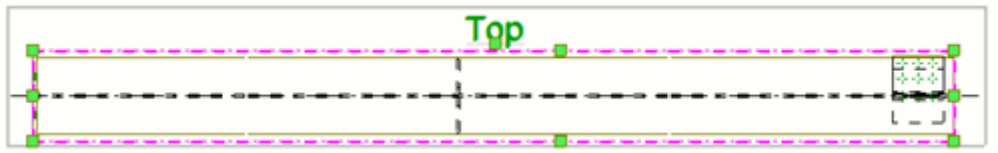
- In **Document manager**, when you carry out a general search, which means that you are not defining specific properties to search for in the search string, the values you are searching for are only checked against properties that are visible, and hidden column properties are now ignored.

New options for aligning view labels

Previously, you could only center view labels horizontally by view frame or by view restriction box in drawing view label properties. Now you have more options available:

- **Left aligned to view frame**

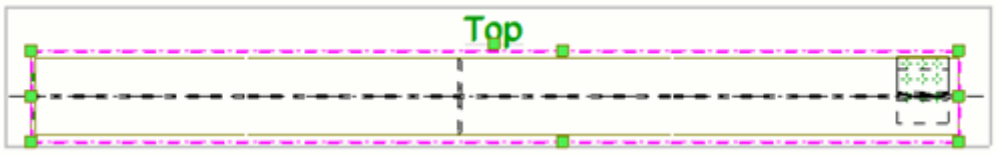
- **Center aligned to view frame**



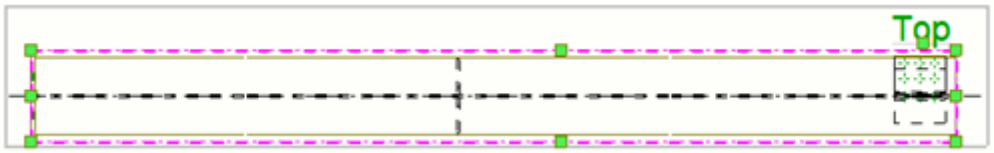
- **Right aligned to view frame**

- **Left aligned to view restriction box**

- **Center aligned to view restriction box**



- **Right aligned to view restriction box**



Dragging in drawings

- The **Settings** section in the **File** menu in the drawing mode contains a new switch **Drawing drag & drop**. You can now move drawing objects such as annotations, sketch objects and grid lines without selecting the objects first.
- You can also move handle points of sketch objects without first selecting the handles when you have activated **Drawing drag & drop**: Hold down the left-mouse button close to the handle point and drag the handle point to the new position.

  Note that if you want to drag the handle points of grid labels, you still need to select the grid line first.
- **Smart select** has been removed from the drawing mode. The new drag-and-drop functionality contains this functionality. With the new drawing drag-and-drop it is no longer necessary to deselect the previous object when starting to drag a new one.

Zoom selected now works in drawings

- Now when you select a drawing object or a drawing window, right-click and select **Zoom** --> **Zoom selected** , Tekla Structures zooms to the selected object or view. Earlier, **Zoom selected** only worked in the modeling mode. Zooming to the selected view is especially handy in large GA drawings containing a lot of views.

Changes in snapshot creation

- The functionality of the advanced option `XS_DRAWING_SNAPSHOT_CREATION` has changed. When you save a

drawing, you are no longer asked if you want to create a snapshot. When this advanced option is set to `TRUE` (default), the snapshot is always taken when you save a drawing, and never taken if set to `FALSE`.

Drawing creation

- When you create several drawings at a time, Tekla Structures shows a progress dialog with a **Cancel** button. However, clicking the **Cancel** button did not stop creating new drawings, but created them without templates. This has now been fixed. Moreover, now the dialog box also shows two progress bars: the first bar shows what is done for each drawing, and it goes back and forth. The second bar proceeds steadily after every drawing.

Improvements in reinforcement drawing tools

Rebar group marking

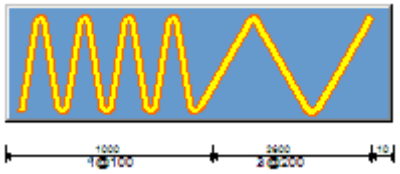
- On the **Mark 3** tab you can now define how to rotate the mark text using the new setting **Mark rotation**. You can rotate the mark text horizontally and vertically or to the mark line direction (default).

- Rebar length output method **Sum values A B C** has been renamed to **Sum of exact lengths** on the **Mark 1**–**Mark 3** tabs.

Rebar group dimensioning

- Text placement has been improved so that texts do not overlap with each other or with rebar.
- The dimension line is now created correctly also in the case the rebar group bars are only partially visible in a drawing view.
- The first and last rebar lines were missing. This has now been fixed.
- Now it is possible to also group together regularly represented groups.

- You can now also dimension circular bar groups.
- The beam type pad footing dimensioning is working again.
- The order of mark content elements is now correct in all use cases. The fix also applies to extra marks.
- Rebar length output method **Sum values A B C** has been renamed to **Sum of exact lengths**.
- The extra marks are now positioned correctly.
- The tool now adds a correct number of dimension lines, and the lines are aligned correctly.
- In one-bar groups, the CC value is now 0.0.
- The static content of the mark placed in the direction of the dimension line is now customizable. You can specify the content on the **Extra marks in front** or **Extra marks behind** tabs.
- The first type in the **Annotation type** list on the **Parameters** tab has changed. The marks behind the dimension line are no longer shown there. Also the image is new.



- Bar grouping has been changed so that the border bar at spacing change goes to the group of smaller spacing.
- Now you can define the space between mark 1 and mark 2 using the new setting **Space between Mark1 and Mark2** on the **Advanced settings** tab. On the same tab, **Next mark spacing** was moved under the new area **Grouping** and renamed to **Group mark spacing**. **Rebar group tolerance** was also moved to the **Grouping** area and renamed to **Grouping tolerance**.
- More space between fields was added to prevent overlapping on 4K screens. The Rebar group marking plugin was also adapted for 4K screens.
- Fixed the incorrectly dimensioned rebar groups in some combinations of distribution bar type and excluding start/end bars. The fix affects the situations when you had selected **Exclude first**, **Exclude last** or **Exclude first and last**, and combined it with one the following types of distribution: **Equal distribution by target spacing value**, **By exact spacing value with flexible first space**, **By exact spacing value with flexible last space**, or **By exact spacing value with flexible first and last space**.
- The dimensions arrows were positioned incorrectly when you were using the setting **Visibility of reinforcing bars in group** with the option **two bars in the middle of group**. This has now been fixed.

Rebar pull-out picture and marking

- The placement and accuracy of rebar segment lengths has been improved.
- There are now more colors available for lines.
- Rebars are now selected from the selected part only.
- Drawing is now not saved in case the tool is called within the opened active drawing
- Prevented a crash when the rebar size contains non-numeric characters, such as "HA20".
- Unit setting "cm m" on the **Dimensions** tab now works correctly.
- The pull-out picture creation of spiral and circular reinforcement now works correctly. Previously it caused Tekla Structures to hang.
- Text placement has been improved so, that texts do not overlap with each other or rebar.
- Dimension text placement has been improved to use less space, when borders are in use.

1.16 Improvements in Template Editor 3.8

Template Editor 3.8 contains the improvements and fixes listed below.

- Fixed changing attributes (color, size, font,...) of multiple texts and value fields.
- The object position was not updated in the work area after setting a new position in the **Move Object** dialog box. This has now been fixed.
- The font type icons were updated in the **Select font** dialog box.
- Double-click now selects the font in the **Select font** dialog box.
- Symbol selection dialog can now be resized.
- The **Extend** command is working again.
- All icons and bitmaps were updated.
- Toolbar preview is no longer far away from the cursor when dragging the toolbar to another location.
- Added DpiAwareness (bigger icons when highDpi is used).
- Template Editor again allows the formula to be changed in the formula dialog box.

For more information about Template Editor 3.8, see Template Editor user's guide.

1.17 Printing improvements

Printing in **Tekla Structures** 2019 has been further improved, and there are updates especially in visualizing the line colors, adjusting frames and fold marks, defining file name content, and closing the dialog box.

Printer colors and line widths shown instantly in drawings

- When you have a drawing open, and you open the **Print Drawings** dialog box, and change the line colors and line thicknesses on the **Line properties** tab , the changed colors and line thicknesses are now immediately reflected in the drawing. This only happens if you have activated the **Printer line widths** switch and the new **Printer line colors** switch through **File** --> **Settings** in the drawing mode.

Adjust frames and fold marks directly through Print Drawings

- There is a new **Frames** button available in the **Print Drawings** dialog box for adjusting the drawing frames and fold marks in the **Drawing Frame Properties** dialog box. These settings are for the model and impact all drawings.

  If you have a drawing open while you adjust the frames and fold marks, you need to reopen the drawing to activate the changes. If you change the frame and fold mark settings for the drawing that is shown in the **Print Drawings** dialog box preview, the preview does not update, and you need to reopen the dialog box to see the changes in the preview.

  The old `Drawing frames and fold marks` command is still available through **Quick Launch**.

Include revision mark to file name

- The new setting **Include revision mark to file name** adds the revision mark of the latest revision of the drawing to the file name.

Other printing changes

- The separate **Close** button has been removed from the **Print Drawings** dialog box. You can close the dialog box by clicking the **Close** button **X** in the upper-right corner.

1.18 Version control for drawings

You can now list different versions of the same drawing, show their snapshots, and change the current drawing version.

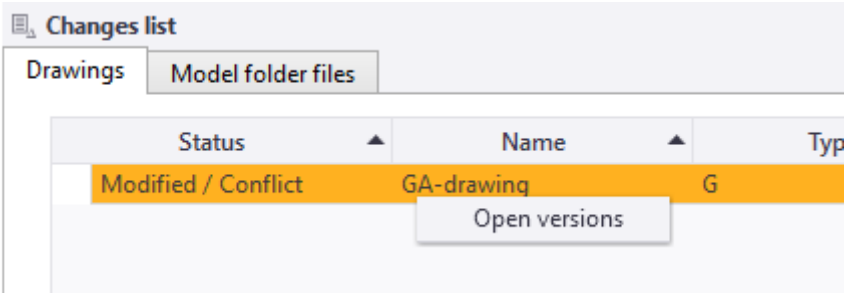
Listing drawing versions is useful when you want to revert to an older version of the drawing for some reason. You can also list the deleted drawing versions that are no longer available in the **Document manager**, and for GA drawings, open a deleted GA drawing as a new drawing. In Tekla Model Sharing, you can now better control unintentional changes made to drawings and revert to the version that has the correct content.

- Every time you save a drawing, a new version of the drawing is saved. To list the different versions of a drawing, open **Document manager**, select a drawing and click the **Drawing versions** button at the bottom.

  The current drawing version appears bolded.

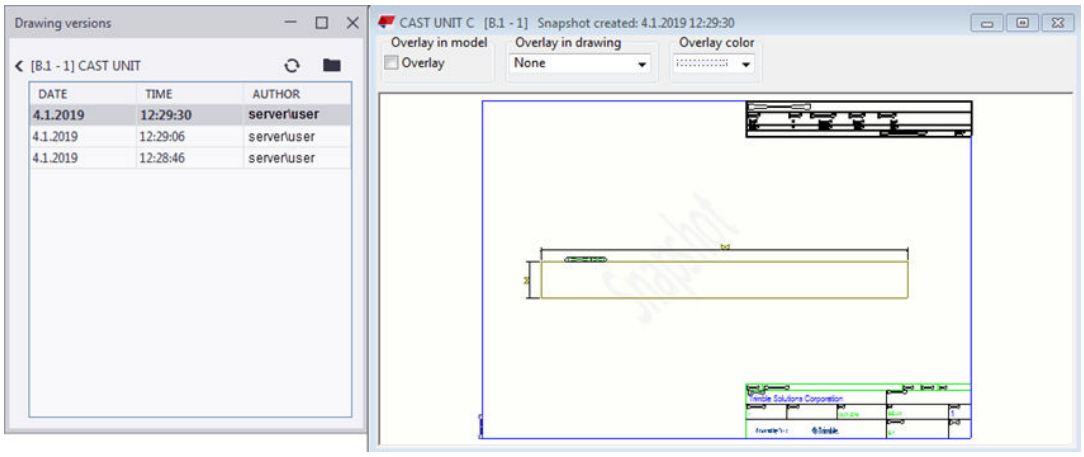
- In Tekla Model Sharing models, you can list the different versions of a drawing in conflict situations. When users modify the same drawing in their local version of the model and one user writes out, the **Changes list** will show a conflict in other users' local version of the model when they read in.

  You can open the **Drawing versions** dialog box from the **Changes list**. Select the changed drawing, right-click and select **Open versions** to view the drawing versions and the changes made to the drawing.

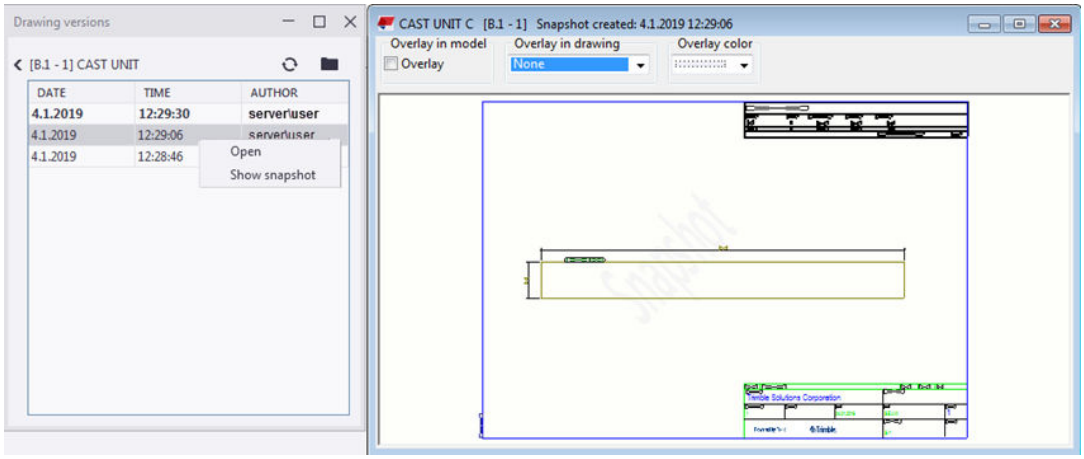


- The drawing snapshot is displayed in a separate window. When you save a drawing, a snapshot is taken by default. The advanced option to control the automatic saving of snapshots is `XS_DRAWING_SNAPSHOT_CREATION`.

  Snapshots are not created at drawing creation if the advanced option `XS_CREATE_SNAPSHOT_ON_DRAWING_CREATION` is set to `FALSE`. If you open a drawing and save it, you get a snapshot if `XS_DRAWING_SNAPSHOT_CREATION` is set to `TRUE`. The advanced option `XS_DELETE_UNNECESSARY_DG_FILES` deletes the dg files older than seven days, which is the default value for the advanced option `XS_DELETE_UNNECESSARY_DG_FILES_SAFETY_PERIOD`.

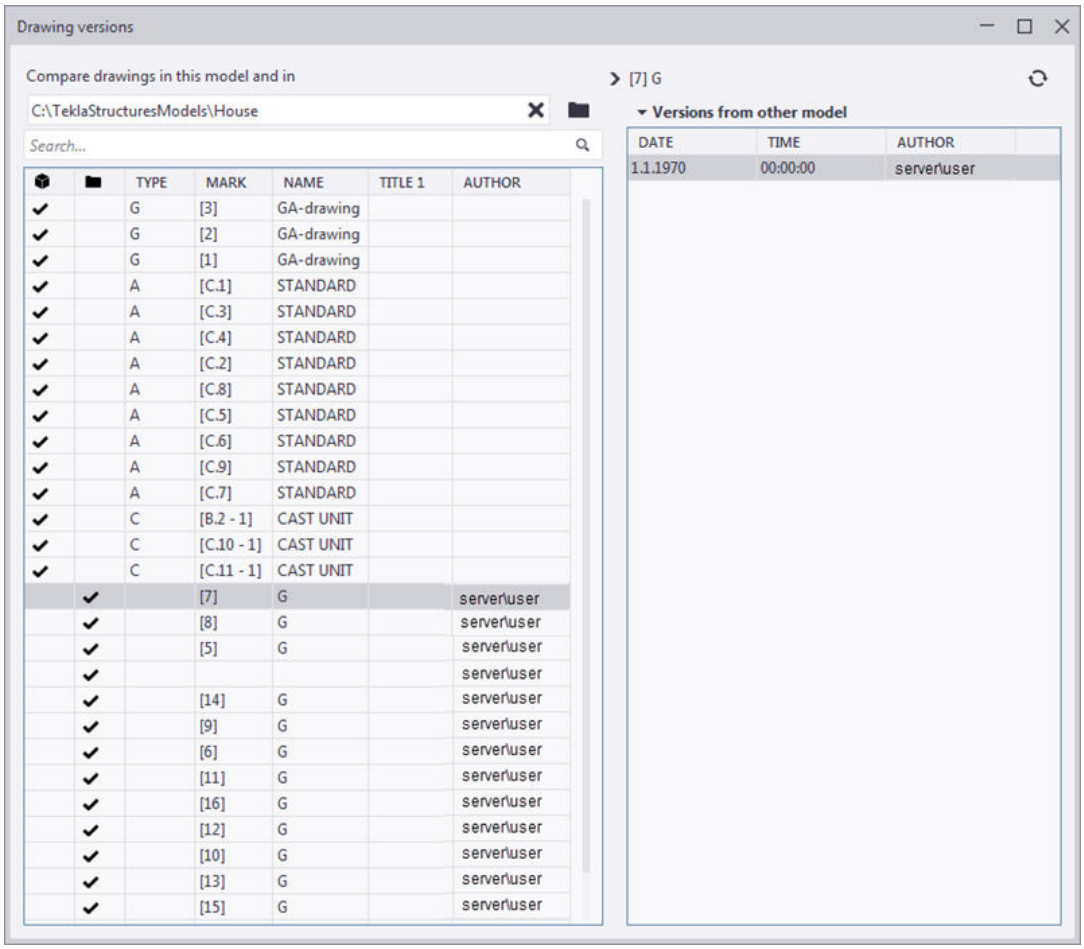


- You can now select an older version of the drawing and show its snapshot or open it.



- If you want to change the current version of the drawing, open another version, close the drawing, and when you are asked **Do you want to keep the changes to the drawing?**, answer **Yes**. This makes the drawing version the current drawing version.
- To show all drawings and their versions related to the model, even the deleted drawings, go to **Document manager**, and click **Drawing versions** without selecting a drawing in the **Document manager** list. In this dialog box, you can see the drawing versions, open the different versions and show the snapshots.

  You can also compare drawings in two different models: from the current model and from a model that you select at the top left corner of the **Drawing versions** dialog box.



- You can open a version of a deleted GA drawing by selecting the drawing from the list in the **Drawing versions** dialog box, right-clicking and selecting **Open as new**.

1.19 Improvements in Tekla Model Sharing

Tekla Structures 2019 introduces several improvements to Tekla Model Sharing.

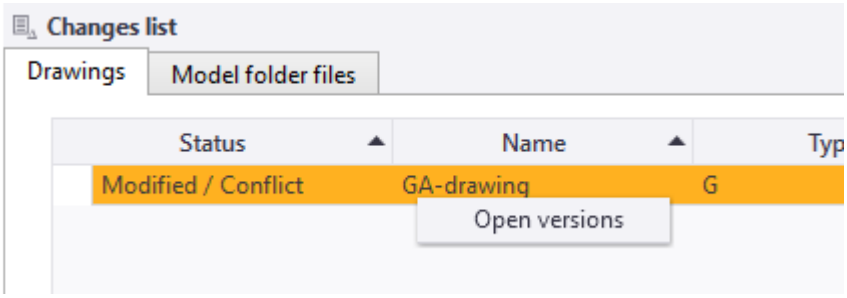
Version control for drawings

In Tekla Model Sharing models, you can now list the different versions of a drawing (page 76) in conflict situations and show drawing snapshots. You can

now better control unintentional changes made to drawings and revert to the version that has the correct content.

When users modify the same drawing in their local version of the model and one user writes out, the **Changes list** will show a conflict in other users' local version of the model when they read in.

To open the **Drawing versions** dialog box and a snapshot of the drawing, select the changed drawing in the **Changes list**, right-click and select **Open versions**.



In the **Drawing versions** dialog box, you can select a drawing version, right-click and open the selected version. You can save the drawing version and write out to make it the current version for all users.

Check for regional settings

When you join a shared model, Tekla Model Sharing now checks if the current Windows system locale is compatible with the system locale that was used when the model was shared. If the current system locale is not compatible, Tekla Structures asks you to change the system locale. This is useful especially for new Tekla Model Sharing users, as the effort and time in joining a shared model is minimized.

The checking helps to avoid issues when distributed teams are using the model. Tekla Structures may function incorrectly when a shared model is opened with a system locale that is not compatible with the one that was used when starting to share the model.

Printer device settings (plotdev.bin) shared

The plotdev.bin file is now shared when it is in the model folder. This way all team members can produce printer outputs with the same settings that are managed by one user.

The `plotdev.bin` file contains the print device definitions that you create in **Printer Catalog** (old printing), and that can be used for printing to pdf, for printing to a file or to different printers, and for printing in different sizes.

For more general information about printing drawings, see Print drawings.

Improved sharing operations performance with reference model objects

Reference model object inquiries during read in and write out have been optimized to be faster than before. This will speed up the read in and write out operations especially when there are a large number of reference model objects in the shared model.

In the **Changes list**, the names of new reference model objects are no longer displayed.

Improved handling of parametric profiles

Parametric profiles (`.clb`) are now displayed correctly in shared models.

Earlier, the parts with parametric profiles were shown as sticks, and they were shown correctly only after Tekla Structures was restarted. In some cases, users might also have imported the parametric profiles manually, which caused problems.

Improved handling of conflicting modifications

Conflicting modifications of part cuts, site bolts, added parts, edge chamfers, site welds, shop welds, polygon welds, and sub-assemblies are now removed when reading in.

For example, a user deletes a part cut and writes out. Another user has modified the same cut, but needs to read in before sharing the modification. The read in result is now that the part keeps its correct numbering and the part cut is deleted.

Drawing status shown correctly

The drawing status flag in **Document manager** is now shown correctly in a situation where two users perform numbering locally. After the numbering, one user writes out. The other user still modifies a part and reads in. The numbering in the other user's local model is overwritten. Earlier, the drawing status was shown as not up to date for the other user, even though the drawing was actually up to date. Now this status flag is cleared and the drawing status is correctly shown as expected.

Enhanced scalability with the next generation sharing service

Tekla Structures 2019 is the first version using the next generation sharing service (v.2.0) that provides a solid growth path for the explanding use of model sharing.

With the newly released sharing service, the service architecture has been updated. All classic Azure services have been replaced with more current Azure services. Earlier Tekla Structures versions use the classic sharing service that utilizes classic Azure services.

Simplified connectivity to sharing service

With the new sharing service, the required network settings are now more simple.

From Tekla Structures 2019 onward, only TCP port 443 outbound (default HTTPS) must be open outbound. Typically, this is open by default.

With earlier Tekla Structures versions, for the best performance, you still need to configure TCP ports 9350 - 9354 open outbound, as recommended by Microsoft.

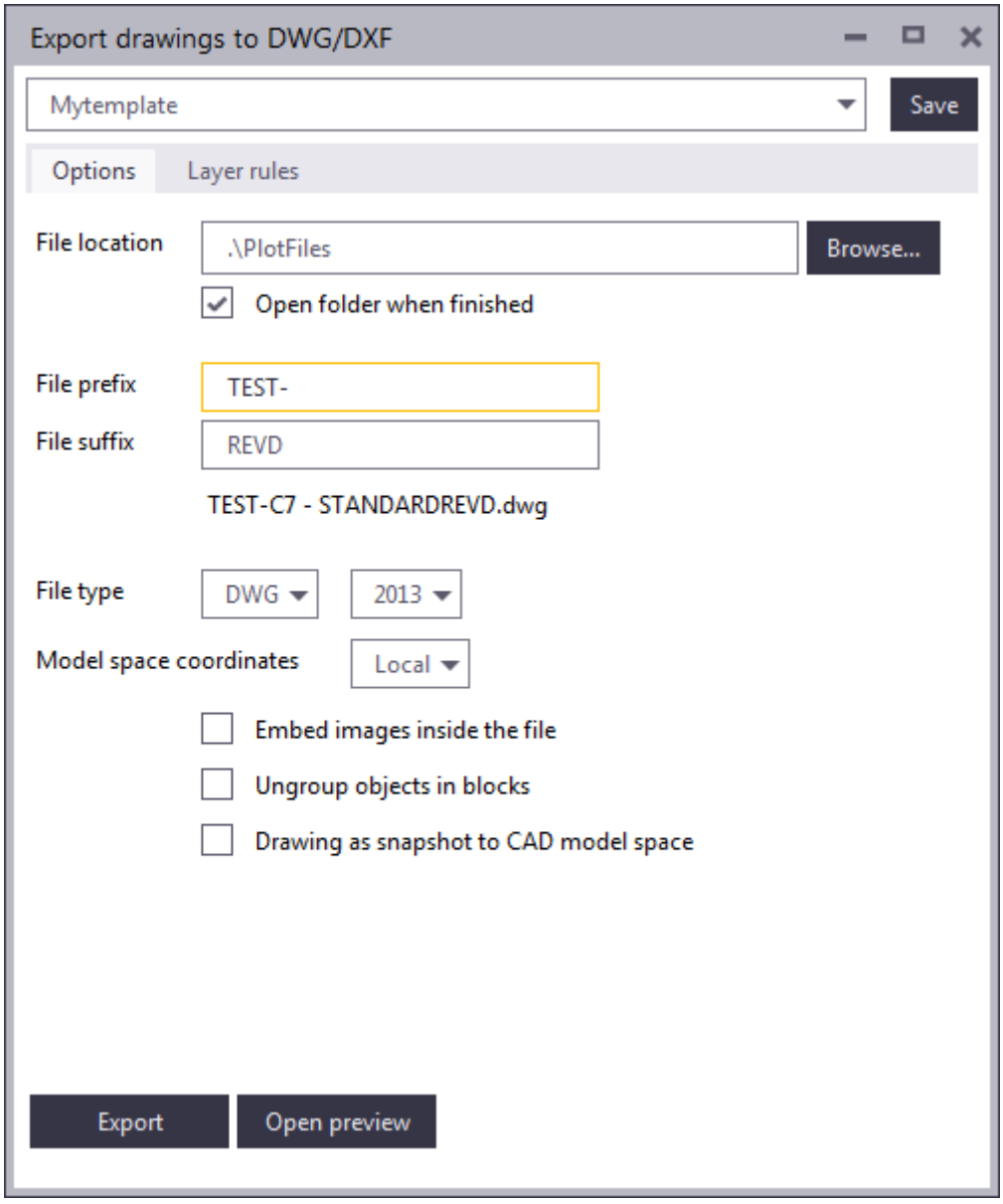
1.20 DWG export improvements

Some improvements have been made in the DWG export dialog box. For example, the preview now opens in a separate window, and on the **Layer rules** tab, there are new color codes indicating when a new DWG file is loaded, and when there are no layers in the DWG file. There are also some new confirmation messages at DWG export. The exported block names now contain a drawing id to help the identification. Furthermore, you can now enter a relative location in the output folder definition.

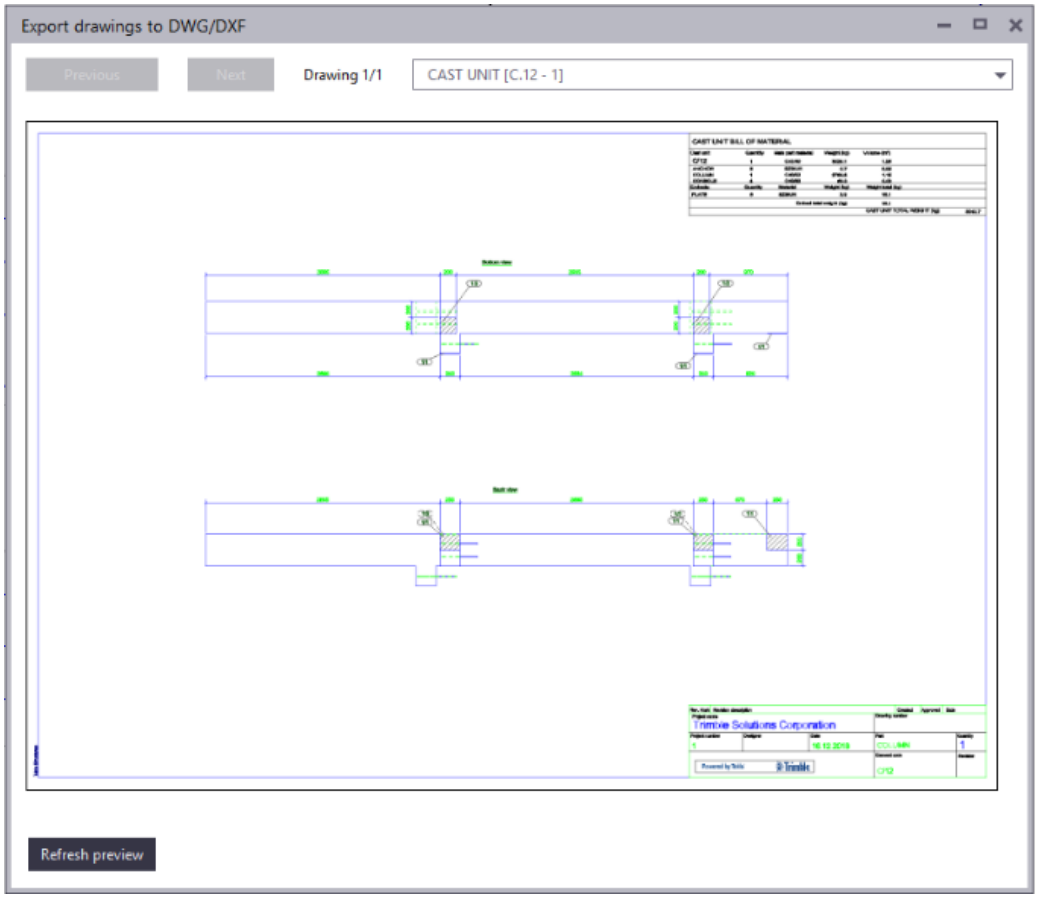
Changes in the export dialog box

The **Export drawings to DWG/DXF** dialog box has been improved in the following ways:

- The layout of the export dialog box is now more user friendly and clear.



- The drawing preview now opens in another window, where you can also change the current drawing. To open the preview, click **Open preview** and then click **Refresh preview**.



- On the **Layer rules** rules tab, the name of the setting **DWG template** has been changed to **Target layers from DWG**. The target layer boxes are briefly colored in yellow when a new DWG file is loaded from the **Target**

layers from DWG list. When there are no layers available in the DWG file, the boxes are colored in red.

- The **DWG file not found** text is displayed next to the **Browse...** button until a DWG or a DXF file is found and loaded.
- When you click the **Export** button, Tekla Structures first checks if the files can be written to before the export starts, and asks you to close the

necessary applications. It also checks if the files already exist and asks if you want to overwrite the existing files.

Other DWG export improvements

- In DWG export, the exported block names now contain a drawing id, which makes them easier to be identified. Earlier, the block names consisted of the object type and exporting order number.
- The DWG export now supports relative location in the output folder definition. The defined output folder is now saved in the export settings. To use relative folder location, add .\ in front of the folder name.
- When using drawing DWG export for multiple drawings, previously it showed a dialog box for each drawing that needed an update before export. Now it shows one dialog box in the end instead.
- In DWG export, if you selected export line type to be following Tekla Structures object and a layer, continuous line type is now exported explicitly as continuous line type. Previously continuous line type was exported as by layer.

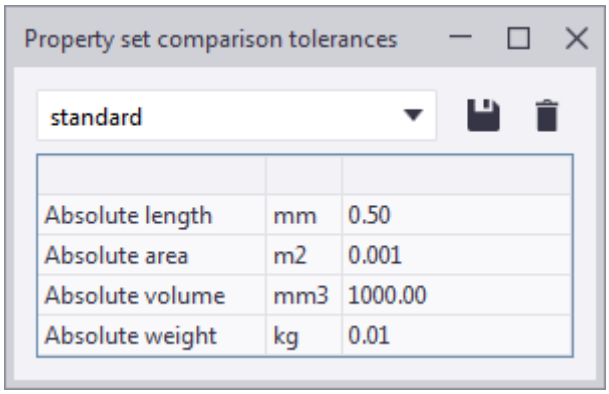
1.21 Other interoperability improvements

In Tekla Structures 2019, there are some improvements in the reference model change detection, IFC object conversion, NC files, and Trimble Connector.

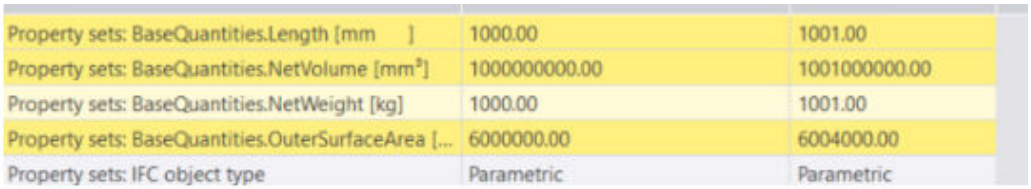
Reference models

Updates in change detection

- The new tolerance settings can be used for getting relevant changes more easily. When you are comparing two versions of the same reference model, in the **Change detection**, click the **Property set comparison tolerances** button  . Change the tolerances by modifying the values, and apply the changes by closing the dialog box and clicking **Update view**. You can also save the tolerances.

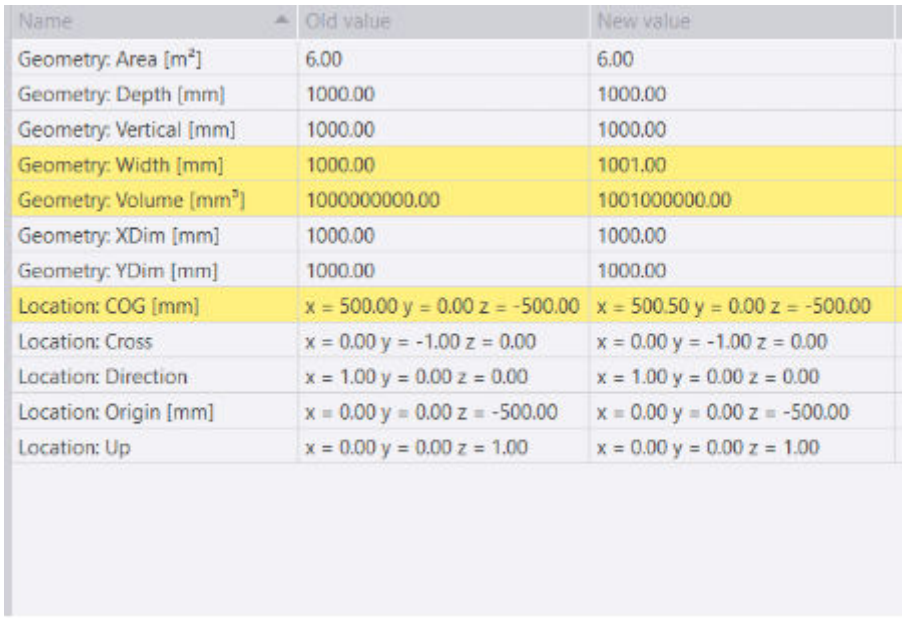


The changed row appears as light yellow if the tolerance is bigger than the difference.



For more information about the property set comparison and comparison set tolerances, see Define a comparison set for reference model change detection.

- IFC change detection has improved detailed data for geometry and location comparison.
- Geometry changes have not always provided any visible feedback in the details list about the changes. This has been improved, and some new properties have been added.



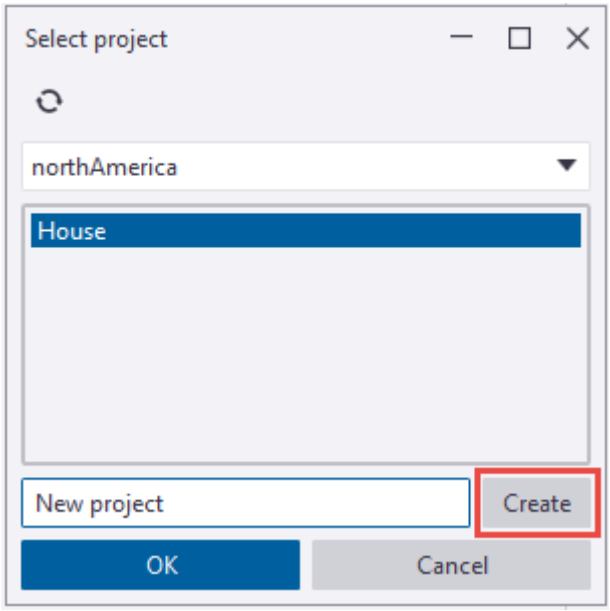
- When you removed a reference model version and did not click **Modify**, and then added a new version, the reference model version handling was broken. Now when you remove a version, you are asked if you want to set the model as current and save changes.
- In change detection, selecting from the changes list and from the model view has been improved. Previously, you could not select a deleted object and a newer inserted object.

Other changes in reference models

- Status bar messages and log entries have been updated for the reference model insert and reference model visibility status. Information about the reference models outside the maximum work area is now available on the status bar. The following messages are now available:
  - Insert succeeded. Objects are located in (Bounding box min X, Y,Z).
  - Insert failed. Objects are located in (Bounding box min X, Y, Z). Objects too far to be visualized.
- Reference model handling speed has been improved if there are several versions of the reference models. For example, the reference models are opened faster now.
- The performance of locking and unlocking multiple reference models in the reference model list has been improved.

Trimble Connector

- You can now create a new Trimble Connect project directly in Trimble Connector. Previously you needed to create the project in Trimble Connect for Desktop or Trimble Connect for Web first.



IFC object conversion

- In IFC object conversion, date now works when copying date type properties to UDAs that are defined as Date. In IFC object conversion settings, the type needs to be set as integer.
- In IFC object conversion, **Copy properties to UDas** has been changed not to use reference object report functionality anymore. This provides faster conversion and Date UDA usage as integer.
- Spaces can now be used in IFC object conversion profile mapping. They are removed in internal mapping. For example, UB 356x171x45 finds UB 356x171x45, not UKB356x171x45, like previously.
- The IFC object conversion has been improved. For example, the arc point calculation, chamfer combining, and the naming of the cut profiles have been improved.
- The IFC object conversion did not handle or convert round cuts for plate. This has now been fixed.

NC files

- Now the bent line information contains the actual length of the bend, and the line no longer extends to the bounding box of the plate.
- Now the DSTV coordinate system gives the coordinate system for the selected part, and not for the representative part.
- Some bolt holes were missing from the NC data. This has now been fixed.
- Sometimes, when using the option **Maximum diameter for circular cuts to be drilled**, the square cuts were recognized as circular. This has now been fixed.
- The sawing angles for flanges are now available even if they are partially cut.
- Now the hard stamp location avoids contour marking.
- When the hard stamps are placed, Tekla Structures now checks for bolts that were modeled on the opposite side, and the end of the bolt hole could overlap the hard stamp.

Import models

- Importing models from older versions of Tekla Structures is not allowed any more.

Other interoperability updates

- Tekla Structures 2019 contains a new LandXML plugin version 1.19.
- Tekla Structures 2019 reference model insert now supports Sketchup version 2019 and earlier.

1.22 Updates in tools for concrete fabrication

Export Unitechnik contains several new useful features, and **Export EliPlan file**, and **Export BVBS** have also been improved.

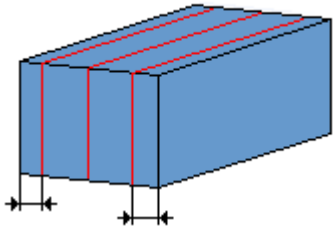
Export Unitechnik (79)

Export Unitechnik has been improved in the following ways:

- The export now automatically recognizes and exports the gap width value between sandwich panel shells.
- The line attribute scanning now recognizes chamfers correctly if the chamfer size is larger that half of the thickness of the element.
- Line attributes export has been improved for double wall 2nd shell.
- Electric tubes are now always exported with Z position as Z=0.
- Previously, when double wall shell was created from more than one part and **Cut outer assemblies** setting was turned on, the embeds were missing from the export. This has now been fixed.
- Mountpart is now exported as a single line with corresponding length and width when it is overlapping with the contour and the **Cut outer assemblies** setting is turned on.
- The width of embeds created as B-rep items is now exported correctly.
- Production thicknesses of double wall shells are now calculated so that the 1st shell thickness reports sub-assembly thickness including braced girders, and the 2nd shell reports complete cast unit thickness regardless of the chosen dialog box option. This is to ensure that the production thickness values comply with the curing chamber slot maximum height.
- You can now use `<VALUE>` to inquire a part UDA and `{VALUE}` to inquire an assembly UDA in the **Text[Template]#Counter** option. This makes it possible to use a shorter string instead of having to use a template property to designate UDAs.
- You can now use all combinations of texts, templates and counter symbols with the option **Text[Template]#Counter**.

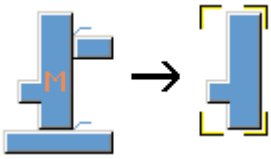
- Rebars and meshes are no longer taken into cast unit extrema calculation when they are excluded from export. Thereby, any protruding reinforcement that is excluded no longer creates an offset.
- You can use the new surface object user-defined attribute **Use surface as pallet base** to orient the object without changing the top-in-form face or the rotation in export settings.
- Double walls are now exported correctly also when there are more than one part specified as the 1st stage (or the 2nd stage) in the cast unit.
- Rebar or mesh wire using the terminal hook flection form will now have their geometrical data series systematically rounded in borderline cases.
- Rebar groups that have been collected to meshes are now correctly unfolded.
- Reinforcing bars exported as embeds are now exported with correct geometry.
- Braced girders are now placed into the 1st double wall shell regardless how they are modeled unless specifically attached to the 2nd shell.
- The embed recognition has been improved in cases where both double wall shells have the same hierarchy level in the assembly.
- Embed bounding boxes are now always exported perpendicular to pallet.
- Coordinate system and scanned geometry is now drawn with simple lines instead of construction lines that where stored in model database.
- Geometrical plotting data is now optimized for embeds that are created out of cut objects, and have varying thickness. The amount of intermediate points in geometrical lines or polygons is kept to a minimum.
- Reading data from the **Mounting part data specification** tab for steel parts is now working correctly.
- **Main** tab:
  - It is now possible to use additional string length options 13, 14, 15, 16, and 20 in the file name mask settings.
- **TS configuration** tab:
  - The setting **Rotate 90° if pallet width exceeded** has been renamed to **Auto-rotate on pallet**, and the functionality has changed. Now you can rotate the coordinate system for export +90° or -90° when the element width exceeds the pallet width, or when the element width exceeds the element length.

- You can scan elements for export in different planes using the setting **Scan position**. There is now a new option available allowing you to scan in three planes simultaneously.

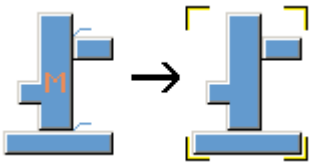


- **Embeds** tab:
  - It is now possible to select not to export surface treatment by setting the option **Export surface** to **No**.
  - You can now export the main part bounding box or all parts bounding box with corner symbol representation. These options were added in the **Export assemblies** list. You can also set the corner symbol width and height.

    The main part bounding box with corner symbols:



    All parts bounding box with corner symbols:



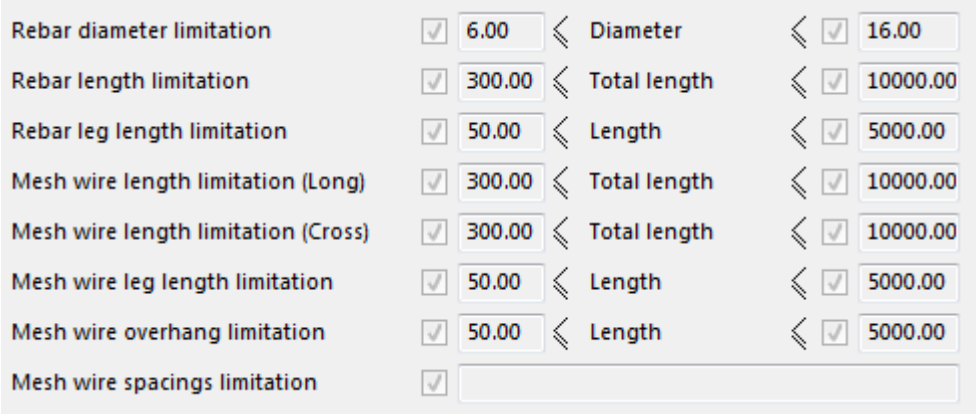
- **Reinforcement** tab:
  - You can now specify if uncollected reinforcement is excluded using the new option **Collected** for the setting **Rebars export**.
  - There are new options for plotting braced girders:
    - **As braced girder top chord** (default): The geometry of the main chord (top chord) with all information is included in the export.
    - **As braced girder bottom chords**: The braced girder is exported as one object but with the quantity number 2 with the spacing included.
    - **As braced girder all chords**: One object like above but with the quantity number 3.

- **As top chord with end symbols**: 2 Mountpart symbols are placed at the top chord end points towards the braced girder direction, line 20 mm long. In addition, the above-mentioned BRGIRDER information.
- **As bottom chords with end symbols**: 4 Mountpart symbols are placed at the bottom chord end points towards the braced girder direction, line 20 mm long. In addition, the above-mentioned BRGIRDER information.
- **Only top chord end symbols**: 2 Mountpart symbols are placed at the top chord end points towards the braced girder direction, line 20 mm long. No BRGIRDER.
- **Only bottom chord end symbols**: 4 Mountpart symbols are placed at the bottom chord end points towards the braced girder direction, line 20 mm long. No BRGIRDER.

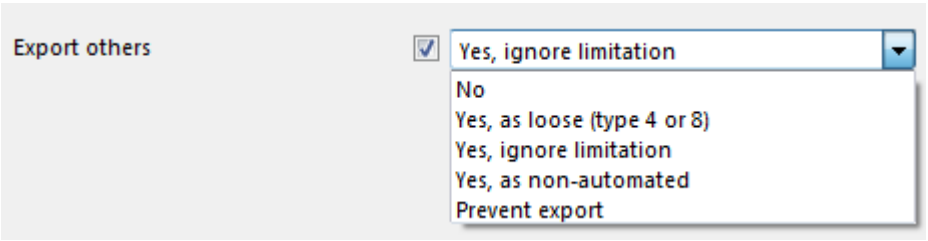
- The setting **Bent reinf. as unfolded** now has a new option **Only meshes**. Using this option you can export bent meshes as unfolded, while other bent reinforcement is exported as bent.
- The setting **Reinforcing bars length** now has a new option **Lines at the edge (all leg lengths)**, which calculates the lengths of the reinforcing bar legs at the edge of the bars.
- You can now group similar rebars with equal spacing using the new setting **Rebar grouping**. Similar rebars are exported using one RODSTOCK row with correct quantity and spacing. The options are **Yes** and **No** (default). The rebar grouping is primarily intended to be used in the production of simple mesh and reinforcement.

- **SLABDATE block data specification** tab:
  - You can designate data about the exported element using the new setting **Item designation**.
  - You can now export the means of transportation information using the new setting **Transport type**.
  - Production thickness export for double walls has been changed. With the option **Cast unit width** the cast unit thickness is exported for both shells.
  - It is now possible to export exposition class using the new setting **Exposure class** .
- **Pallet** tab:
  - You can now align elements in the Y direction using the new setting **Align in Y axis**. You can select whether to align
    - element upper edge to pallet upper edge
    - element upper edge to pallet center line
    - element center line to pallet center line

    - element lower edge to pallet center line
    - element lower edge to pallet lower edge
- **Validation** tab:
    - You can now validate rebar and mesh leg lengths, and mesh overhangs and spacings.



    - Now you can also select to export non-valid rebars as non-automated or to prevent the export.



Export EliPlan file (68)

Export EliPlan file has been improved in the following ways:

- You can now use various product code mappings with the new setting **Product code** on the **Data content** tab.
- The export of length L1 and L2 data has been improved for cut hollow core slabs.
- Cuts created at diagonally cut slabs no longer affect the calculation of L1 and L2 values.

BVBS Export

Export BVBS has been improved in the following ways:

- When multiple segments of a rebar are in 0-degree bendings, then it is exported as a continuous straight section.
- Now the exported circular and spiral rebars get the arc inner radius instead of the center-line radius.This value is inquired from report property DIM_R, and calculated from the rebar geometry if the DIM_R is missing.
- Circular and spiral rebars had incorrect spacing values. This has now been fixed.
- A new UDA `BVBS_BENDING_ROLL` has been added. The `BVBS_BENDING_ROLL` UDA is taken from reinforcements, there is a new **BVBS** tab in reinforcement properties containing a new setting **Bending roll diameter** for this UDA.

1.23 Tekla BIMsight and Tekla Web Viewer replaced by Trimble Connect for Desktop

Tekla BIMsight

Tekla BIMsight is approaching its end-of-life by the end of 2019. As of December 31, 2019, we discontinue to distribute, support and maintain Tekla BIMsight. You can still use it after that date.

As a substitute for Tekla BIMsight, you can use the Trimble Connect for Desktop offline version (free of charge). It has most of the Tekla BIMsight functionalities and some new functionalities as well. See the comparison table below for the specific functionalities:

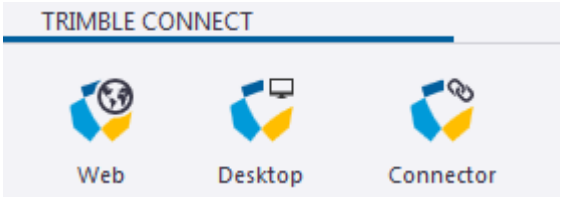
Feature/Software	Trimble Connect for Desktop	Tekla BIMsight
3D navigation	✓	✓
Viewing multiple models	✓	✓
Measuring	✓	✓
Clip planes	✓	✓
Markup	✓	✓
Desktop API	✓	
Customizable user interface	✓	

Feature/Software	Trimble Connect for Desktop	Tekla BIMsight
Enhanced 3D experience (directX)	✓	
Save model views	✓	✓
Object/Model coloring and transparency	✓	✓
Point clouds	✓	
Finding and grouping objects from models	✓	✓
Quantity by object group	✓	
Create notes (ToDos)	✓	✓
Status sharing	✓	
Clash detection		✓
Share notes		✓
Sharing the aggregated project		✓

Check this video about Trimble Connect for Desktop features Trimble Connect Desktop Feature Overview.

To start using Trimble Connect for Desktop:

1. In Tekla Structures, go to the **Trimble Connect** ribbon tab, and select **Desktop** .



2. Log in to Trimble Connect for Desktop using your Trimble Identity.

When you launch Trimble Connect for Desktop:

- Trimble Connect for Desktop opens the desktop project attached to the current Tekla Structures model.
- If you have not attached a project, Trimble Connect projects page is opened.
- If you have not installed Trimble Connect for Desktop, the web page to download Trimble Connect for Desktop https://app.connect.trimble.com/tc/app#/store will be opened.

Tekla Web Viewer

We discontinue to support old Tekla Web Viewer in this version. Trimble Connect provides new, modern web technologies to replace the Tekla Web Viewer usage. We have multiple web technologies to be used, please visit this web page https://www.tekla.com/products/trimble-connect/getting-started/api-documentation for more information or contact us: connect-structures@trimble.com. You can start to explore Trimble Connect at https://connect.trimble.com. You can find more information here: https://www.tekla.com/products/trimble-connect/getting-started .

1.24 Improvements in components

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

Concrete components

Embedded anchors (8)

On the **Placement** tab, it is now possible to move anchors to the closest braced girder. You can select the class and name of the top braced girder bar, and also the maximum displacement of anchors.

Automated reinforcement layout - double tee beam (51)

On the **Strand pattern** tab, you can now use an external .CSV file to define an infinite amount of individual strands.

Automated reinforcement layout - ledge spandrel (55), Automated reinforcement layout - rectangular spandrel (56)

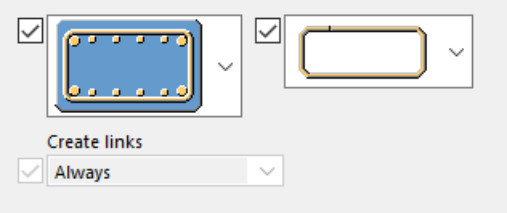
- Stem stirrup and ledge rebar creation has been changed so that the user input spacing value is not exceeded when using **Both** in the **Spandrel End** option. In most cases, this means that in the middle there are two smaller spacings than the input value.
- You can now define advanced hook properties for rebar groups on the **Stem stirrups** (for 55) and **Ledge rebar** tabs. The components are not fully backward compatible with older versions due to these improvements.

Ledge spandrel - automated reinforcement layout (55)

- You can now control the secondary rebar set on the **End rebar** tab.

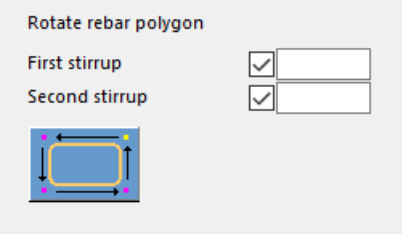
Beam reinforcement (63)

You can now select to create additional links on the **Parameters** tab.



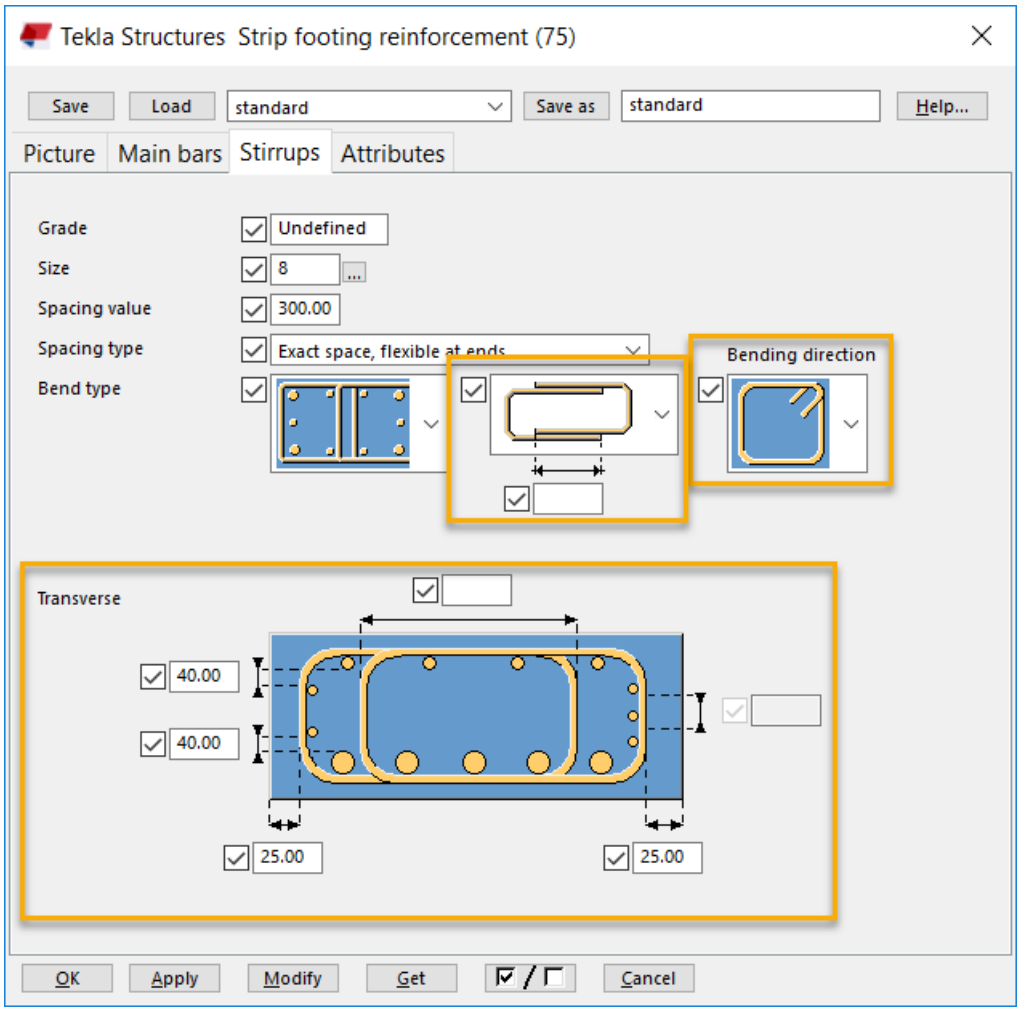
Stirrup reinforcement (67)

You can now rotate the rebar polygon clockwise at each even or odd positions. Entering a value, for example 1,2,3 or 4, in the **First stirrup** box rotates the rebar polygon at odd positions and entering a value in the **Second stirrup** box at even positions.



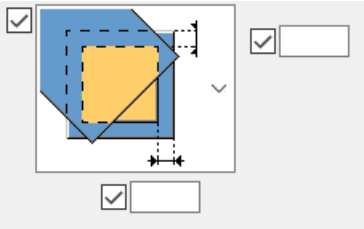
Strip footing reinforcement (75)

You can now create double stirrup bars as a new bend type on the **Stirrups** tab. Transverse settings are now on the **Stirrups** tab and the bending direction is shown as images.



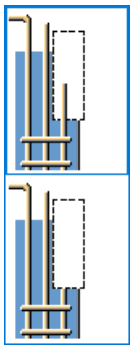
Seating with dowel (75), Two sided seating with dowel (76) , Seating with dowel to flange (77), Two sided seating with dowel to flange (78)

You can now create a bearing plate relative to the column. **Two sided seating with dowel to flange (78)** is not fully backward compatible with older Tekla Structures versions due to the improvements.



Round column reinforcement (82)

You can now select on the **Advanced (main bars)** tab whether to cut the created rebars by the cut in the father part or not.

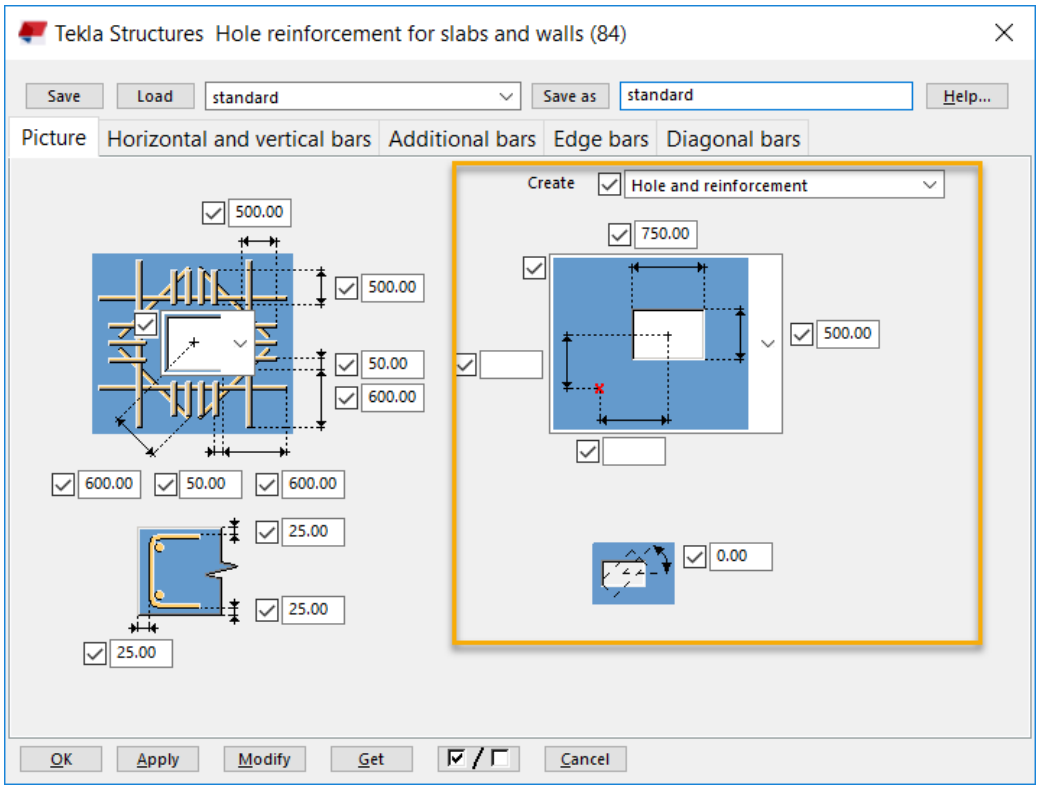


Rectangular column reinforcement (83)

- You can now select whether all the stirrups are created as a single group on the **Intermediate links** tab.
- You can now define gaps between the stirrup groups on the **Stirrups** tab.

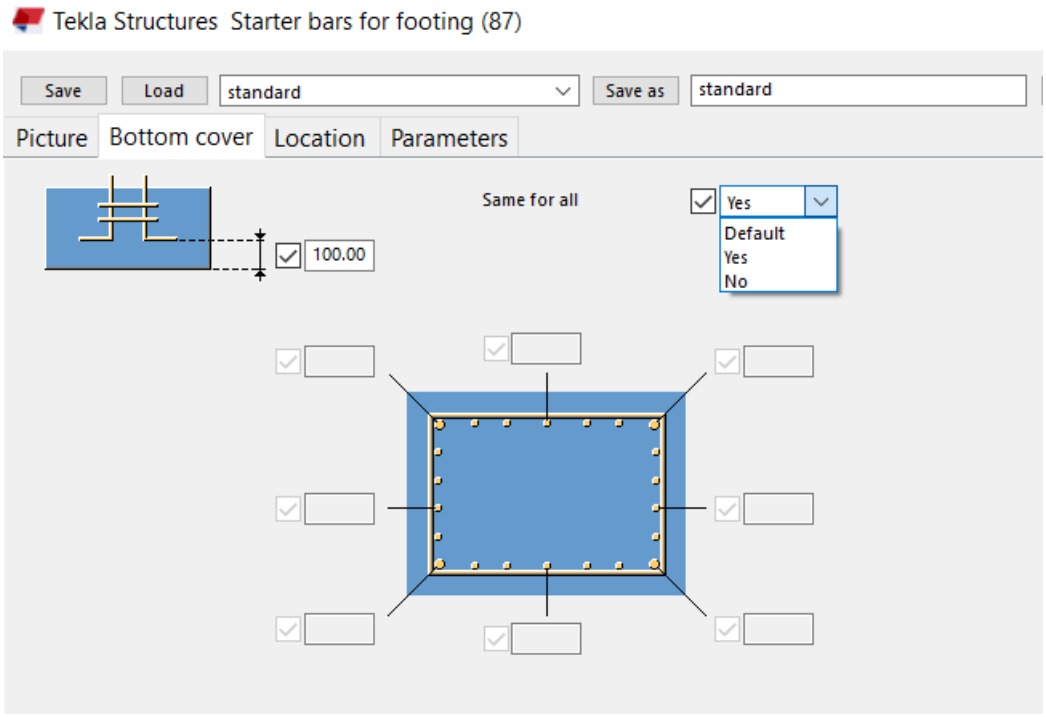
Hole reinforcement for slabs and walls (84)

- You can now reinforce an already existing hole and apply position offset for a hole that you are creating.



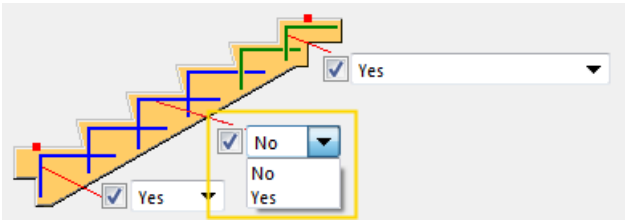
Started bars for footing (87)

With the new **Bottom cover** tab, you can now set a separate unique bottom cover thickness for each bar group. The other option is to set a common bottom cover thickess for all corner bars and side bars.

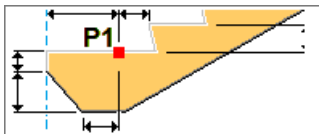


Reinforced concrete stair (95)

- You can now select whether to create finished floor level on the **Parts** tab. The finished floor level is defined by a polygon created from an offset stairs polygon and it is used for drawings. Define the profile, properties and offset of the dummy part that is created at each polygon vertex.
- You can now create reinforcement in stringers on the new **Stringer bars** tab.
- On the **Bar C** tab, there is an option for a new rebar landing shape and a setting for adapting the nose shape.
- On the **Bar E** tab, you can now select to create stirrups and pins parallel with the sloped edge of the step.
- On the **Bar K** tab, there is an option for a new rebar shape and its appropriate I bars.
- On the **Bar L** tab, you can now define whether reinforcing bars are created between the top and bottom step.



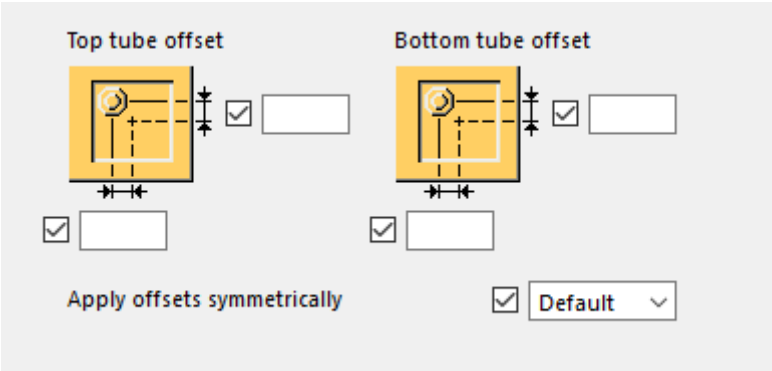
- On the **Parameters** tab, there is a new shape for the bottom landing.



- You can now define the name, prefix and start number for each type of rebar and mesh on the **Mesh bars**, **Bottom anchor bars**, **Top anchor bars**, and **Z anchor bars** tabs.

Concrete console (110)

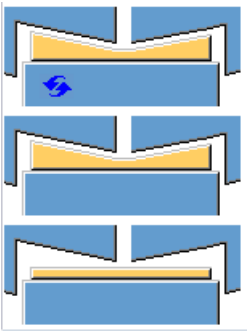
- You can now define the offsets for the tube profiles in both the X and Y directions on the **Anchor rods** tab.



- You can now use the **Legs symmetrically** setting on the **Socket** tab to select whether custom part sockets are created symmetrically.
- On **Parameters** tab, you can now find and cut extra secondary parts using classes or name search. You can also define the maximum width of the secondary part and cut it to this width.

Concrete beam-beam (112)

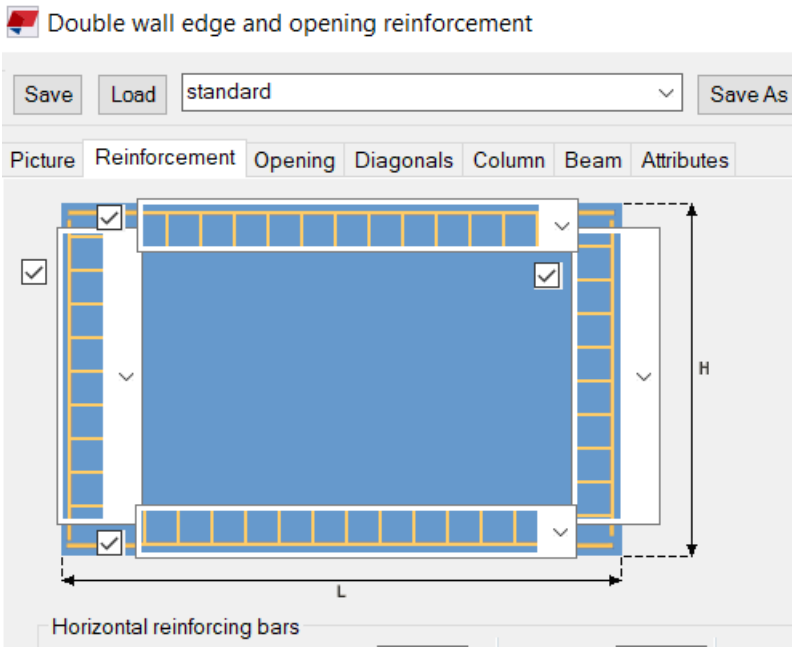
- When defining the neoprene, you can now select on the **Parts** tab whether the neoprene is fitted to fill the cut space between the main part and the secondary part, or whether it is created in a rectangular shape.



- You can now select on the **Anchors** tab whether the tubes are aligned with the main part, or with the top or bottom of the secondary part.

Double wall edge and opening reinforcement

There is a new cover thickness offset C3 on the **Picture** tab. New options have been added for edge and opening reinforcement (not reinforcement and create just stirrups) on the **Reinforcement** and **Opening** tabs.



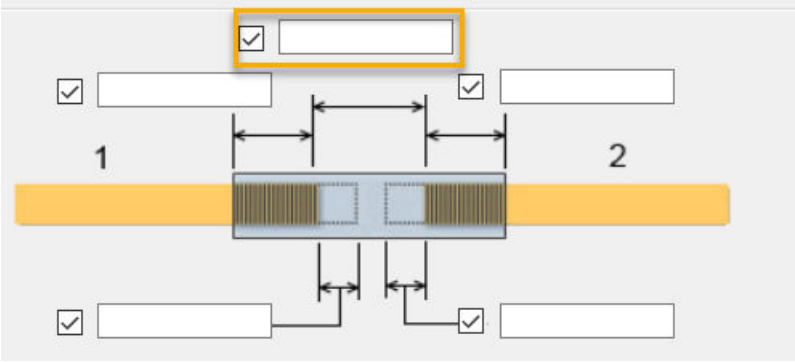
Mesh bars

You can now control the minimum length of primary and secondary bars separately.

Rebar coupler, Rebar end anchor

- **Rebar coupler** and **Rebar end anchor** components have been changed so that when used with rebar sets, the end-specific UDA values are set with end modifiers. For rebar sets, the end modifier properties thread length, extra fabrication length, and threading type values of the end modifier are set (instead of custom UDA values).

  Note that to get the threading type controlled by coupler / end anchor components, this value must be added to the `RebarCoupler.Udas.dat` file.
- **Rebar coupler** has been changed so that the free space between two rebars can be controlled with a new dimension attribute on **Attributes** tab. You can set this value manually or with the auto attribute file.



Rebar end anchor has been changed so that when it is used with rebar sets, the rebar is shortened with the given offset so that the anchor will have the same cover distance as the original bar end. The concrete cover can be automatic or overridden with the (input) end detail modifier.

Wall layout

- When customizing the content of the **UDA** tab, you can now define in the `WallLayout.Udas.dat` file that layer UDA values are not swapped when the **Wall layout layer swapper** tool is used. You can do this by adding `NoSwap` at the end of the line (fourth field): `string comment j_comment NoSwap`.
- **Wall layout** has been modified so that the **Geometry detailing strip** at the top/bottom is extended by default by the extreme of the part edges.

Wall layout T connector

The **Add seam** setting now has a new option **First layer only**. With this option, only the first layer is split into two parts. Previously, the **No** option has this functionality. The **No** option now does not split the first layer part, instead a cut that breaks the part into two solid objects is created.

Wall groove seam

You can now use the new **Create fitting** option on the **Edge shape** tab to control whether the part end fitting is created.

Wall groove seam, Wall to wall connection

- You can now control the location of the last rebar/embed in the wall top edge on the **Connectors** tab.
- There is a new edge shape option on the **Edge shape** tab. With this option you can create a groove where one of the noses can be shortened by a given distance.
- You can now control the offset of the loose bars at the bottom of the connection/start of the seam on the **Connectors** tab.
- There is a new **Thickening** tab where you can create extra thickening to walls.

- You can now select to create part cuts or only extra part cuts, and define the name of the cut. In **Wall to wall connection**, you can set this separately for both walls. For part properties of extra part cuts, select a saved settings file.

Steel components

Joining plates (14), Stiffened end plate (27), Partial stiff end plate (65), Two sided end plate (142), End plate (144)

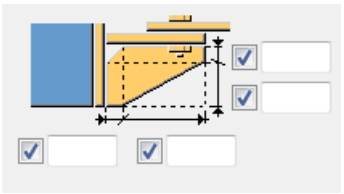
You can now define a bolt comment on the **Bolts** tab.

Triangles generation (19)

You can now define chamfers for the created triangular plates on the new **Chamfers** tab.

Tube gusset (20)

You can now create connection plate stiffeners and define the stiffener chamfers on the **Brace conn** tab.



Welded tee (32)

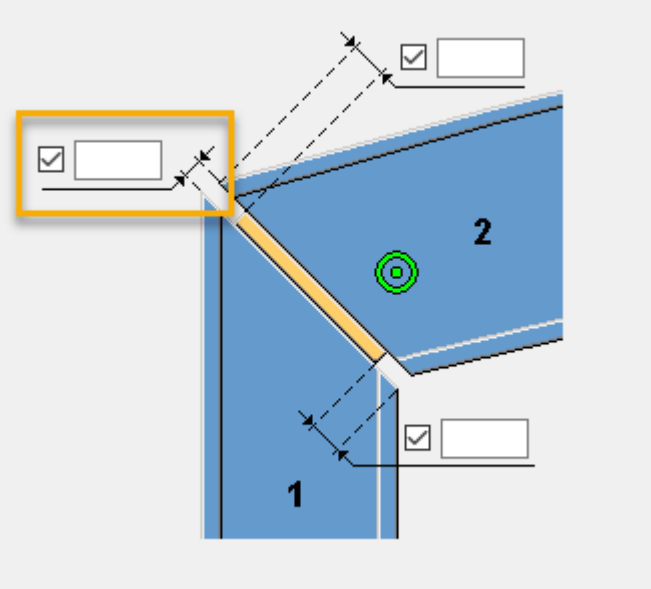
You can now define the assembly position number and the **Finish** property on the **Parts** tab.

Haunch (40)

You can now define the bolt type on the **Holes** tab.

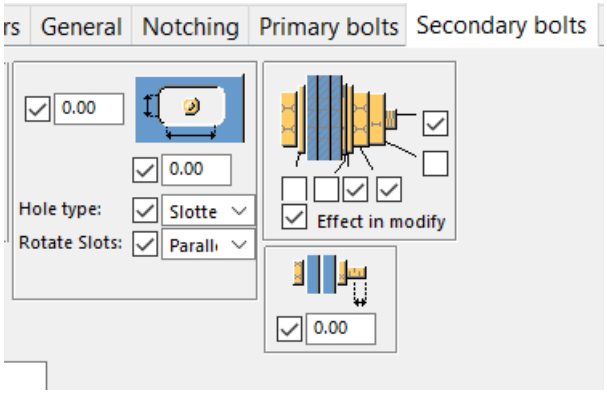
Cranked beam (41)

You can now define a gap between the parts on the **Picture** tab.



Seat conn type 1 (52)

You can now define all the basic bolt properties, and the properties for slotted holes, bolt assembly and bolt length increase on the **Secondary bolts** tab.

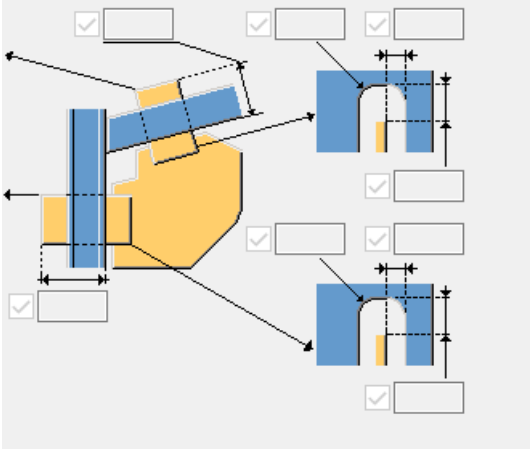


Hollow brace wraparound gusset (59)

You can now define the width of the tongue plate on the **Brace conn** tab.

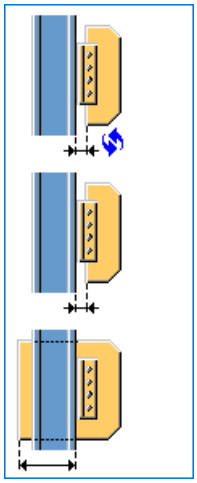
Wraparound gusset (58), Hollow brace wraparound gusset (59), Wraparound gusset cross (60)

You can now create the fastener plates extended through the connection main and secondary part on the **Gusset** tab. You can also define the sizes of the respective cuts around the fastener plates.



Bolted gusset (11), Gusseted cross (62)

You can now select on the **Picture** tab whether to create the gusset plate through the main part.



Bolted gusset (11), Tube gusset (20), Gusseted cross (62)

You can now create welding between the gusset and the base plate.

Gusseted cross (62)

- You can now define the filler plate creation side on the **Brace conn** tab when creating both connection plates.
- You can now create the gusset plate parallel to the brace without using a base plate.

HSS Brace special (66)

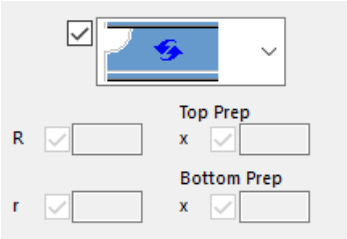
HSS Brace special (66) now has the **Design type** tab.

Rail connection (70)

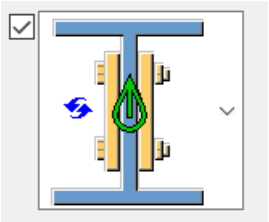
You can now define bolt assemblies on the **SBolts** tab.

Splice connection (77)

- Welds 6 and 7 have been added.
- You can now change the weld access hole shape on the **Weld prep** tab. You can now define weld types for the secondary part.



- You can now select the flange plate creation side on the **Parameters** tab. Previously, this setting was on the **Weld prep** tab.

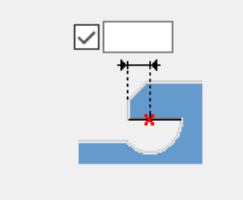


Clip angle (116)

You can now define the cut length of bolts on the **Bolts** tab.

Welded beam to beam (123)

You can now define the weld access hole offset on the **Chamfers** tab.

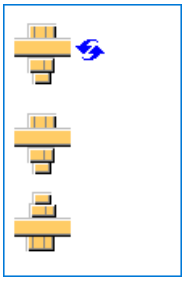


Shear plate simple (146)

You can now define the cut length of bolts on the **Bolts** tab.

Welded to top flange S (149), Full depth S (185)

You can now define the bolting direction on the **Bolts** tab.



Offshore (194)

You can now define the gap distance for haunched beam flanges.

Stiffened base plate (1014)

On the **Parts** tab, you can now define the **Class** property for plates, web plates, flange plates, and leveling plate. You can define the **Finish** property for plate, web plates, flange plates, leveling plate, fitting plates, additional beam, horizontal plates, and L profiles.

1.25 Changes in advanced options

New advanced options

- XS_ISO_LEG_LENGTH_AS_WELDSIZE
- XS_DISPLAY_DIMENSIONS_WHEN_SELECTING_REBARS
- XS_REBARSET_SHOW_LEGFACES
- XS_REBARSET_SHOW_PROPERTY_MODIFIERS
- XS_REBARSET_SHOW_END_DETAIL_MODIFIERS
- XS_REBARSET_SHOW_SPLITTERS

- XS_HATCH_PATTERN_LINE_LIMIT
- XS_AD_LOAD_COMBINATION_METHOD
- XS_APPLICATIONS_PATH
- XS_MESSAGES_PATH

Changed advanced options

- XS_DISPLAY_DIMENSIONS_WHEN_SELECTING_OBJECTS now only applies to parts, and the new advanced option XS_DISPLAY_DIMENSIONS_WHEN_SELECTING_REBARS to reinforcement.
- When XS_ENABLE_PHASE_OPTION_IN_NUMBERING is set to `TRUE` and the renamed **Assembly phase** check box is selected in the **Numbering Setup** dialog box, only the assembly phase of each assembly is now compared in numbering. The part phase or assembly phase of parts is not compared.
- The functionality of the advanced option XS_DRAWING_SNAPSHOT_CREATION has changed. When you save a drawing, you are no longer asked if you want to create a snapshot. When this advanced option is set to `TRUE` (default), the snapshot is always taken when you save a drawing, and never taken if set to `FALSE`.

Deleted advanced options

- `XS_DEFAULT_FONT_SIZE_GRID`

  You can now control the grid font size in the grid properties in the property pane instead of using the advanced option.

- `XS_GRID_COLOR`

  You can now control the grid color in the grid properties in the property pane instead of using the advanced option.

- `XS_CONSTRUCTION_LINE_LINE_TYPE`, `XS_CONSTRUCTION_CIRCLE_LINE_TYPE`

  You can now control the line type of construction lines and construction circles in the property pane instead of using the advanced options.

1.26 Changes in template attributes

New template attributes

- ADDED_TO_POUR_UNIT
- IS_REBARSET_BAR
- SUB_ID_LAST
- CRANK_SIDE_START, CRANK_SIDE_END
- CRANK_ROTATE_START, CRANK_ROTATE_END
- CRANK_STRLEN_START, CRANK_STRLEN_END
- CRANK_LENTYPE_START, CRANK_LENTYPE_END
- CRANK_RATIO_START, CRANK_RATIO_END
- CRANK_DIST_START, CRANK_DIST_END
- CRANK_OFFSET_START, CRANK_OFFSET_END
- LAP_SIDE_START, LAP_SIDE_END
- LAP_PLACEMENT_START, LAP_PLACEMENT_END
- LAP_LENGTH_START, LAP_LENGTH_END

2 Tekla Structures 2019 administrator's release notes

Upgrade guide from Tekla Structures 2018i to Tekla Structures 2019

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.

Administrator's release notes: General settings (page 111)
Administrator's release notes: Steel settings (page 126)
Administrator's release notes: Concrete settings (page 138)

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.

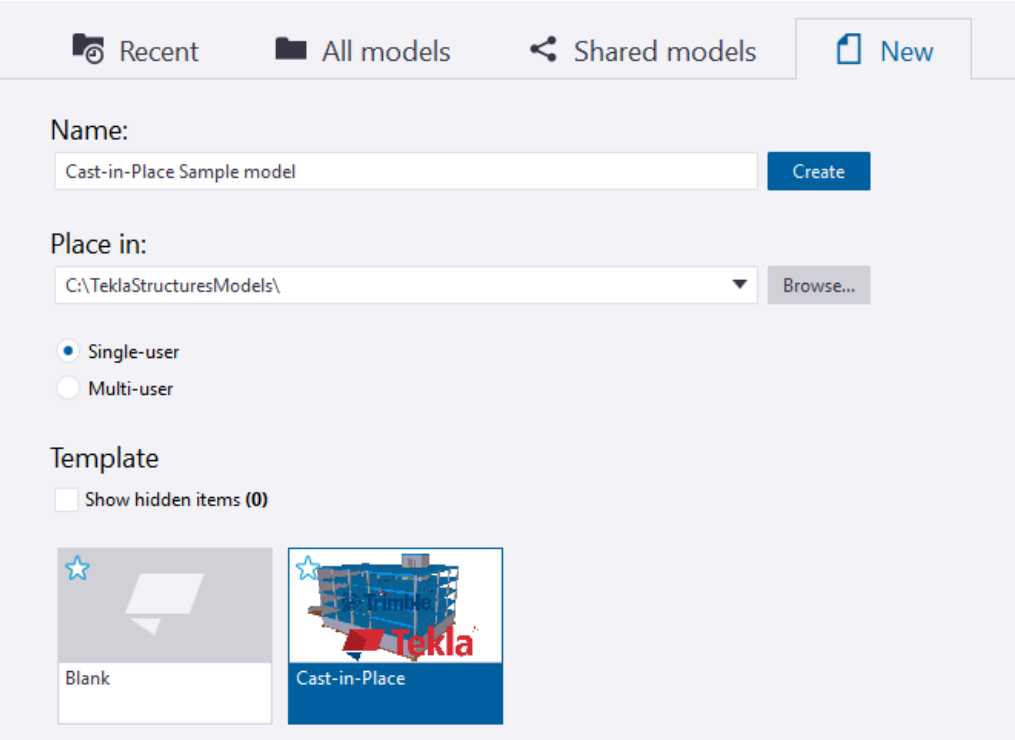
Administrator's release notes: Model templates in version update (page 112)
Administrator's release notes: Applications & components catalog maintenance (page 115)
Administrator's release notes: Radial grids (page 116)
Administrator's release notes: New construction objects (page 117)
Administrator's release notes: User-defined columns in Drawing content manager (page 118)
Administrator's release notes: Document manager manual categories (page 119)
Administrator's release notes: Improvements in drawings (page 121)

Administrator's release notes: New template attributes for pour units and surfaces (page 123)

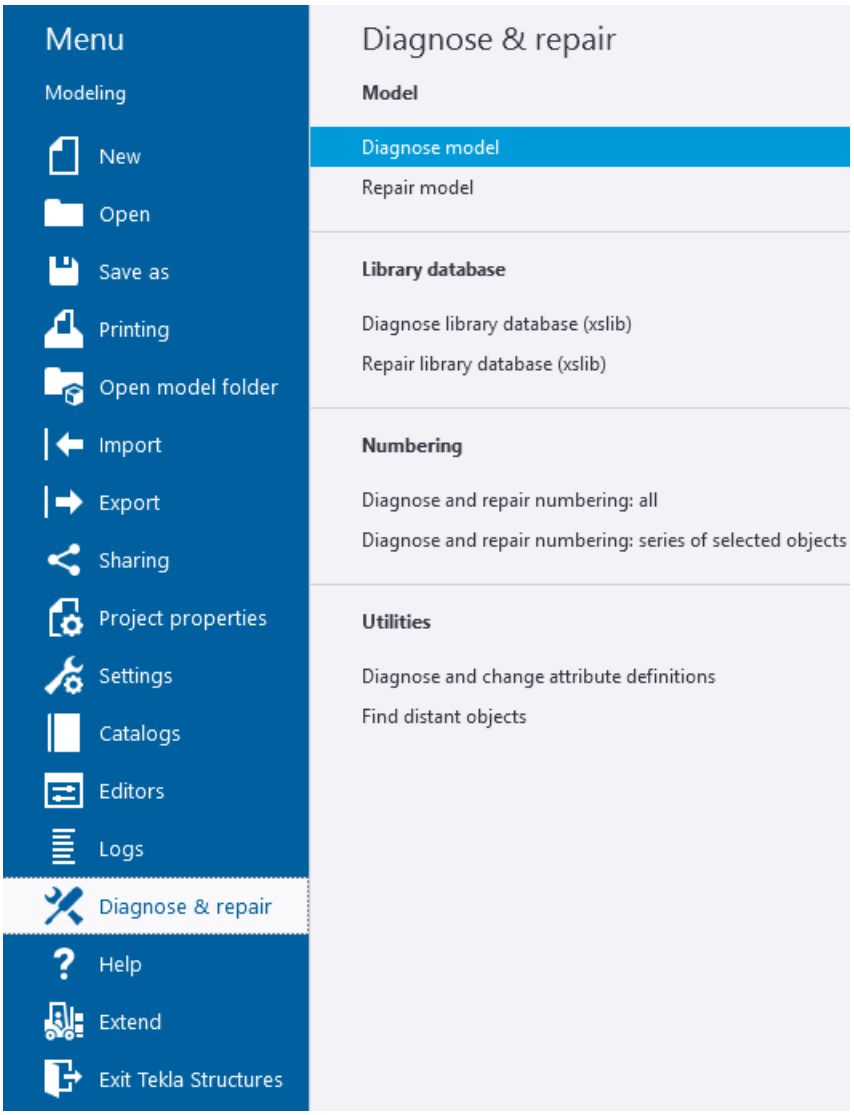
Administrator's release notes: Small general items (page 124)

Administrator's release notes: Model templates in version update

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

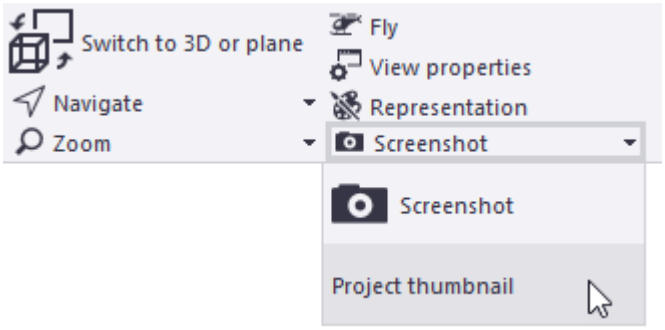


4. Open a 3D view.
5. Diagnose and repair the model.



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

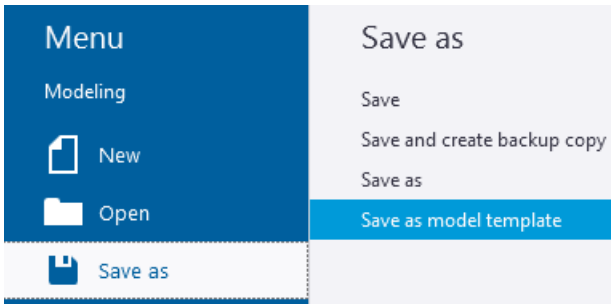
   The preferred size of the image is `120 x 74` pixels.



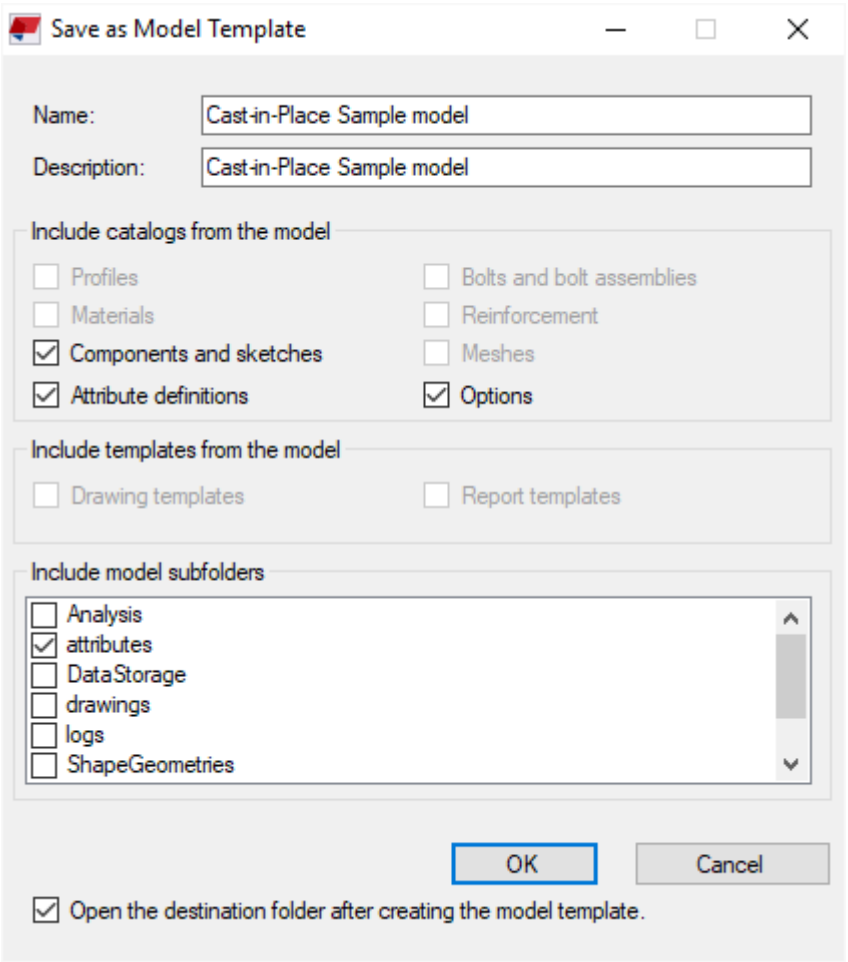
7. Save the model.

   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**.



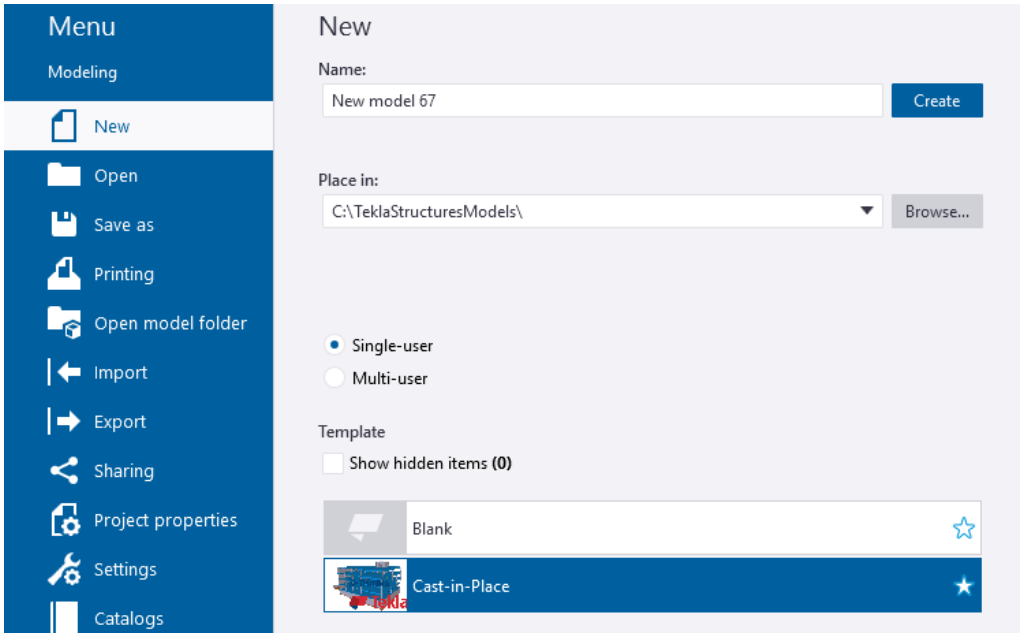
10. Remove manually all `*.db` files (environment database, options databases) from the model folder.

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.

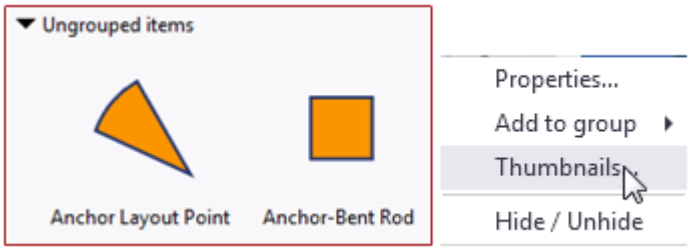
As in the example above, there may be errors for:

- `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: Radial grids

Overview

Until now you have been able to create only rectangular grids with straight grid lines in Tekla Structures. However, there are use cases where radial / polar grids are needed. For this purpose, there have been workarounds (Radial Grid extension, for example) to create radial grid systems in Tekla Structures models.

However, it was not possible to create any curved grid lines even when using the Radial Grid extension. This lead to radial grids that did not have a very finished look. To fix these issues you can now create radial grids in Tekla Structures

The old grid properties dialog box has been replaced by the property pane window for both rectangular and radial grids.

You can now select grid (view plane) color, label font color and label font size for each grid in the model separately. This also means that the `XS_GRID_COLOR` and `XS_DEFAULT_FONT_SIZE_GRID` advanced options are not in use anymore.

You can use this feature, for example, when modeling round or curved structures, such as round columns and towers, tanks and containers, circular platforms, stadiums, and so on, whenever either radial grids or curved grid lines are needed. You can snap to the radial and curved grid lines, which makes modeling parts very easy.

To do

Create the needed radial grids as examples and save them to the wanted folders in `XS_SYSTEM`, `XS_FIRM`, or `XS_PROJECT` path.

Administrator's release notes: New construction objects

To Do

Remove the obsolete advanced options and update their values in the standard files.

Create the needed standard files with the new settings (**Color** and **Line type**).

New construction objects

Arc and polycurve are new construction objects. The **Circle** command replaces the **Circle using three points** and **Circle using center point and radius** commands.

Advanced options

Construction object line type properties have been moved from advanced options to object properties. The `XS_CONSTRUCTION_CIRCLE_LINE_TYPE` and `XS_CONSTRUCTION_LINE_LINE_TYPE` advanced options have been removed.

Administrator's release notes: User-defined columns in Drawing content manager

Overview

Drawing content manager in the drawing mode side pane is an interactive tool for viewing and editing model objects and drawing content in the current drawing. With this functionality, missing, duplicate or false information can be checked without having to manually go through all drawing objects separately. The functionality is also intended to aid new or inexperienced users to add annotations to drawing content without drawing properties set up.

Previously, the **Drawing content manager** functionality was restricted to a limited number of property columns for each category type. You can now edit the existing column property type and add new property columns.

From now it is possible to define the column property types and the preferable number of columns for each category. You can also add, edit, and remove columns and change the column order in **Drawing content manager**.

Notes:

- It is not possible to add the same property twice in the same category with the exception of **Custom text**.
- Mark quantity and quantity ("NUMBER") properties cannot have other properties in the column they are put.
- The available properties are those defined for the Template Editor.

Settings work in two levels. First, a user-specific setting file `DrawingContentManagerCategories_<username>.xml` is searched for, and if it is found, it will be used. If this file cannot not be found, then `DrawingContentManagerCategories.xml` will be looked for and used if found. To convert the user-specific file to a generic one, just to remove the "`_username`" part from the file name.

Settings are searched for in the `\attributes` folder under the model folder, then `XS_PROJECT`, `XS_FIRM`, `XS_SYSTEM`, and `XS_USER_SETTINGS_DIRECTORY`.

To do

Create the needed categories. They are in `<model>\attributes \DrawingContentManagerCategories_<username>.xml` .

Remove the "`_username`" part from the file name and copy it to any folder in `XS_PROJECT`, `XS_FIRM`, or `XS_SYSTEM` path in the environment.

See also

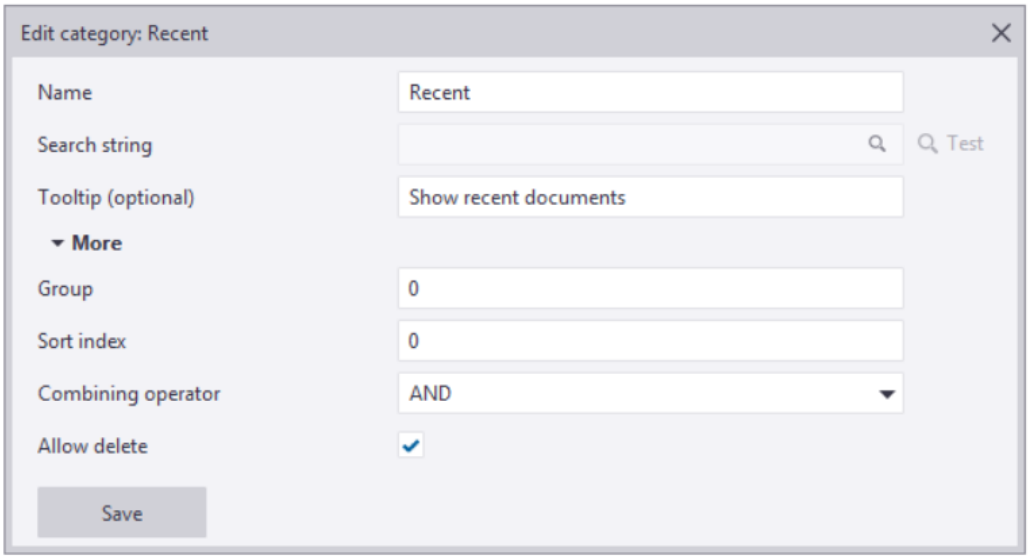
Improvements in Drawing content manager, marks and notes (page 53)

Administrator's release notes: Document manager manual categories

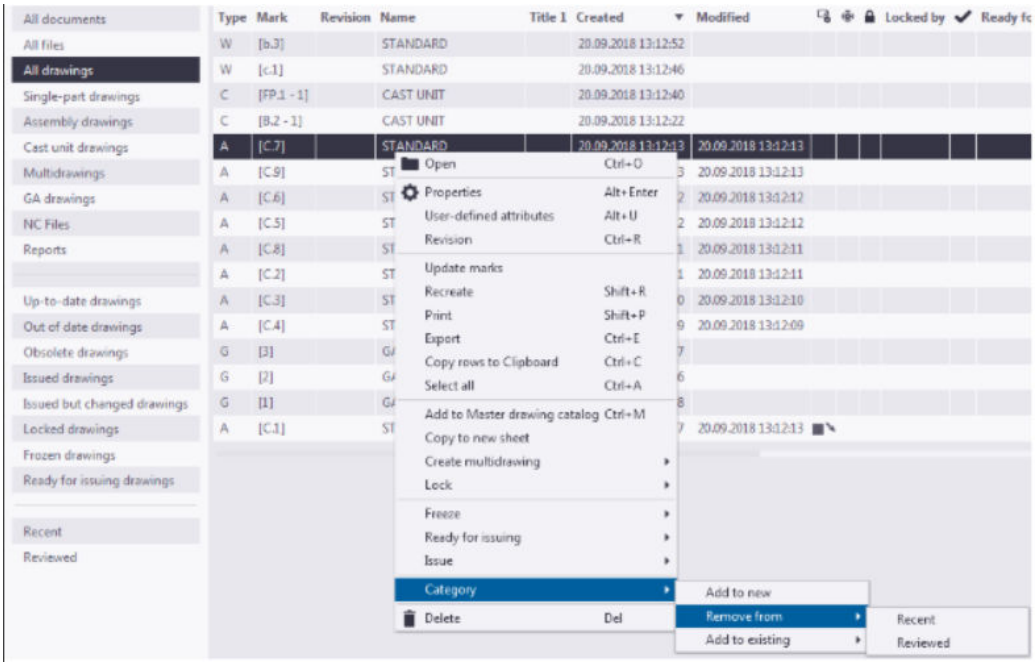
Sometimes you may need to have a document category in **Document manager** for documents that would be difficult to categorize using the search. Now you can simply select documents, create a manual category and add your documents there. You can also add documents to and remove documents from existing manually created categories, and combine categories, both search-based and manual ones. A manual category may contain both drawings and file documents.

Creating a manual category may be useful, for example, when you have enabled the **Show changes from the checkpoint set when the button is activated** feature in **Document manager**, and then when some documents have changed and are listed, you can add the changed documents in the manual category.

- To create a new category manually, and add documents there, select the documents from the list, right-click and select **Manual category** --> **Add to new** . Type a name for the category, type an optional tooltip, and define other necessary settings. The options are the same as in the search-based categories. Then click **Save**.
- The newly created or modified manual categories are saved to the `DocumentManagerCategories_<username>.xml` file under the current model folder.



- To add a document to an existing manual category, select the documents from the list, right-click and select **Manual category** --> **Add to existing** and then select the desired category. All compatible manual categories are listed. You can add one document to several categories.
- To edit a manual category, right-click the category in the category list and select **Edit**.
- To remove a document from a category, right-click the document, select **Manual category** --> **Remove from** and then select the category from which to remove the document.
- To delete a manual category, right-click the category in the category list, and select **Delete**.



Settings work in two levels. First a user-specific setting file `DocumentManagerCategories_<username>.xml` is tried to be found. If it is found, it will be used. If not, then `DocumentManagerCategories.xml` will be looked for and used if found.

To convert the user-specific file to a generic one, just remove the "`_username`" part from the file name.

Settings are scanned first from the model folder, then from `XS_PROJECT`, `XS_FIRM`, `XS_SYSTEM`, and `XS_USER_SETTINGS_DIRECTORY`.

To do

Create the needed categories. They are in `<model>\DocumentManagerCategories_<user>.xml`.

Remove the "`_username`" part from the file name and copy it to any folder in `XS_PROJECT`, `XS_FIRM`, or `XS_SYSTEM` path in the environment.

See also

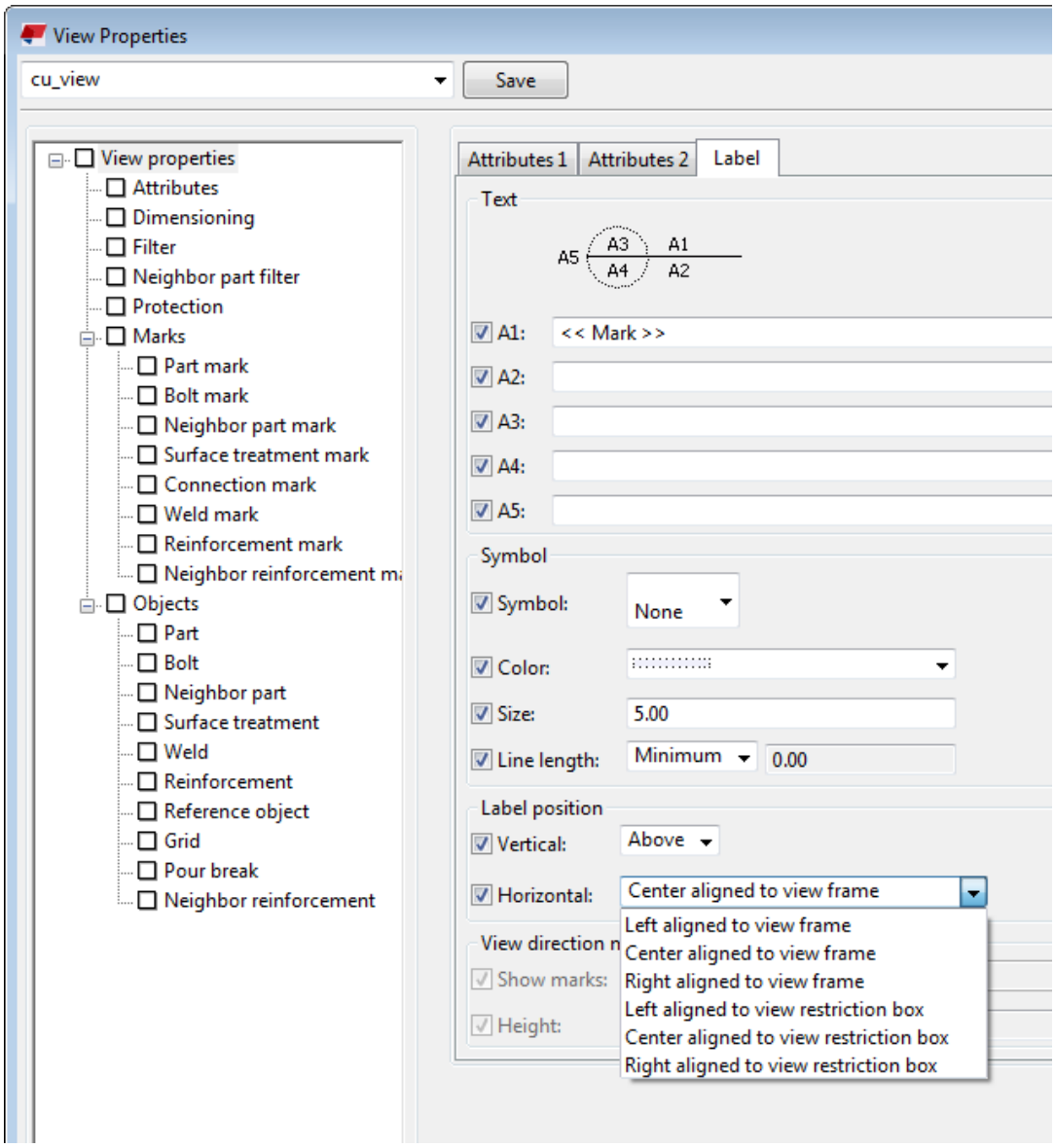
Other drawing improvements (page 67)

Administrator's release notes: Improvements in drawings

Option to set the view label orientation

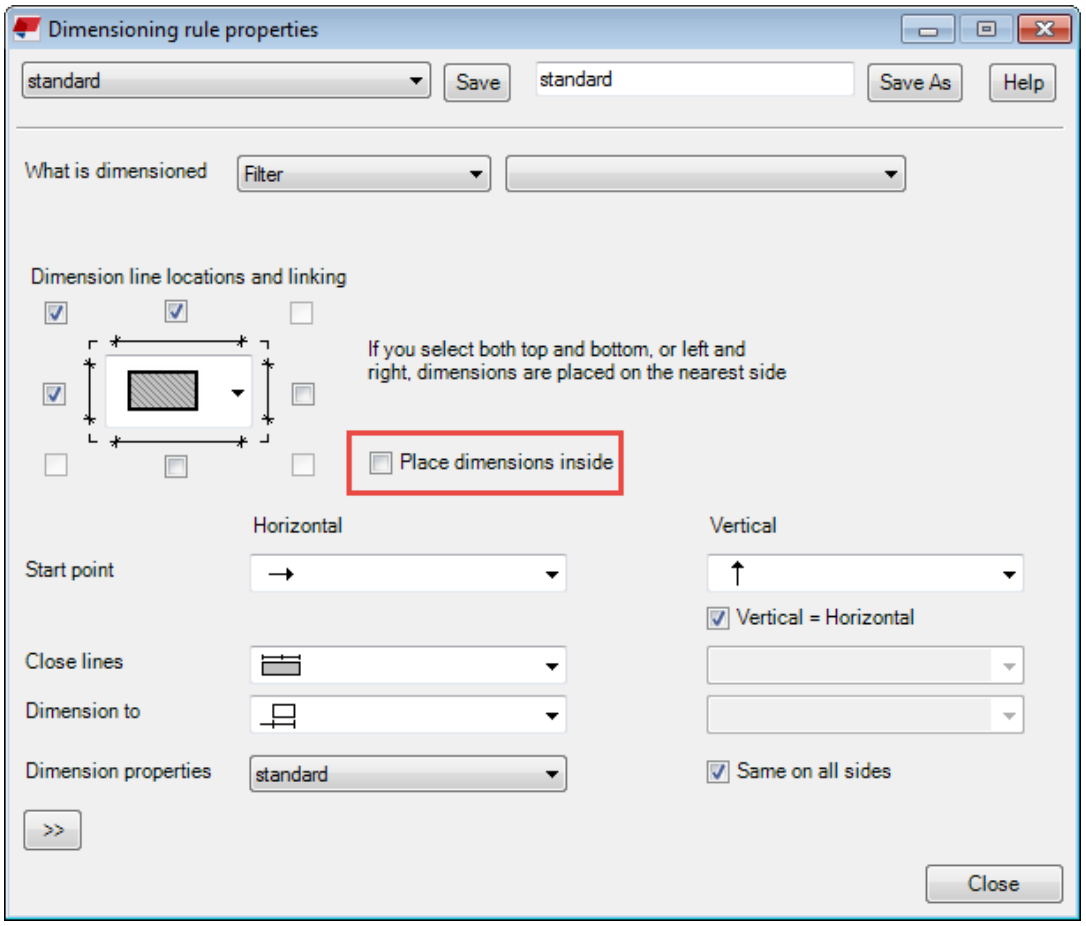
Previously, you could only center view labels horizontally by view frame or by view restriction box in drawing view label properties. Now you have more options available:

- **Left aligned to view frame**
- **Center aligned to view frame**
- **Right aligned to view frame**
- **Left aligned to view restriction box**
- **Center aligned to view restriction box**
- **Right aligned to view restriction box**



Dimensioning: dimension lines inside concrete contour

In view-based dimensioning, in the **Dimensioning rule properties** dialog box, there is now a new setting **Place dimensions inside** for the dimensioning type **Filter dimensions**. When you select this setting, the dimensions can be placed inside a cast unit, assembly or part.



Detailed instructions on how to use dimensioning rule properties can be found in .

Administrator's release notes: New template attributes for pour units and surfaces

There are new template attributes for surfaces and pour units. Start using them in filters, templates, and reports. Also check the inquiry report.

Surfaces

There is now a template attribute `ATTACHED_TO` for checking if the surface is attached to a part or a pour.

The possible values are:

- `0` (part)
- `1` (pour)

Pour units

There is now a template attribute `ADDED_TO_POUR_UNIT` for checking how the object is added to a pour unit (automatically or manually).

The possible values are:

- `0` (unassigned, or modified after the pour units were calculated the last time)
- `1` (manually assigned)
- `2` (automatically assigned)

This attribute is added to the template category in filters and to template attributes for the following object types:

- `ASSEMBLY`
- `BOLT`
- `CAST_UNIT` (only precast, not for cast in place)
- `MESH`
- `REBAR`
- `SINGLE_REBAR`
- `SINGLE_STRAND`
- `STRAND`
- `STUD`

Administrator's release notes: Small general items

More fields in project properties

The following additional project fields have been added to project properties from the IFC4 standard:

- ASSEMBLY = PROJECT.LOCATION
- ASSEMBLY = PROJECT.POSTAL_BOX
- ASSEMBLY = PROJECT.TOWN
- ASSEMBLY = PROJECT.REGION
- ASSEMBLY = PROJECT.POSTAL_CODE
- ASSEMBLY = PROJECT.COUNTRY

You can use these new properties in reports and templates.

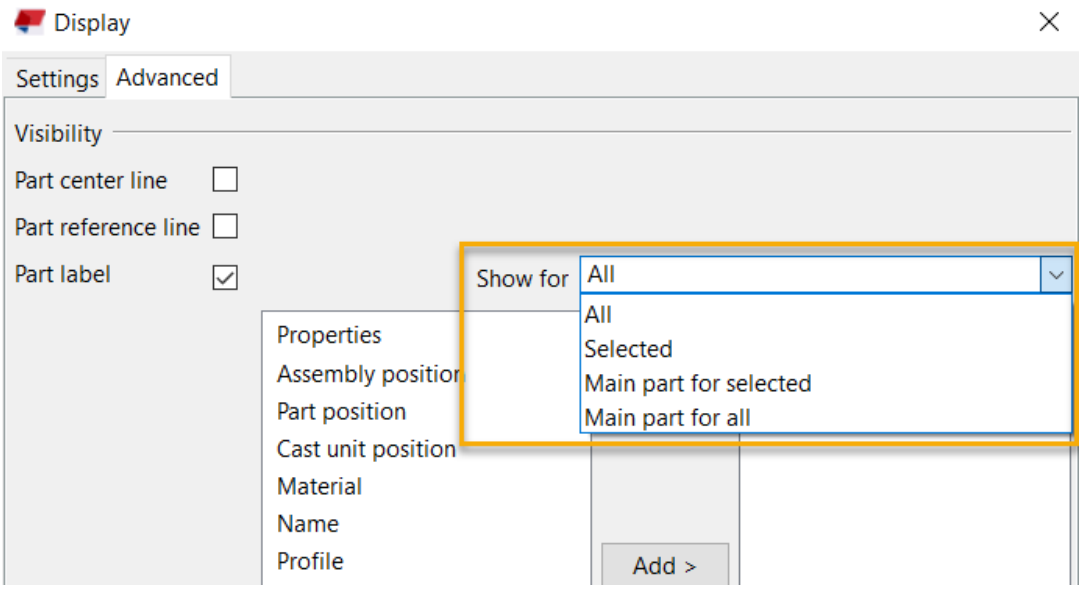
New label settings

There are new options in the **Display** dialog box to extend the functionality of showing part labels for different conditions.

There is a new setting **Show for** with the following options:

- **All**: This is the old behavior of part labels. Part labels are shown for all parts in the view.
- **Selected**: Part labels are only shown for all selected parts.
- **Main part for selected**: Part labels are only shown if the selected part is the main part of its assembly.
- **Main part for all**: Part labels are only shown for all visible parts that are the main parts of their assemblies.

For the **Selected** and **Main part for selected** options, note that you need to first apply the dialog box changes to the view when the view is selected, and then continue to select objects that you want to investigate.



Load applications and extensions from several folders

To support extensions, you can create `.tsep` installation packages and deploy them into an environment under `%commonEnvFolder%\extensions\applications`.

Company-specific applications can be now located in company-specific folders instead of the Tekla Structures installation folder. The new location should be added to `XS_APPLICATIONS_PATH`.

The new XS_APPLICATIONS_PATH advanced option allows you to add multiple paths. Tekla Structures uses the paths to load system components.

The current configuration in `teklastructures.ini` is as follows:

```
set XS_APPLICATIONS=%XS_DIR%\applications\ set
XS_APPLICATIONS_PATH=%XS_APPLICATIONS%;%XSDATADIR
%environments\common\Extensions\applications\
```

Load translations for extensions from several folders

Company-specific translations can be now located in company-specific folders instead of the Tekla Structures installation folder. The new location should be added to `XS_MESSAGES_PATH`.

The new XS_MESSAGES_PATH advanced option allows you to add multiple paths. Tekla Structures uses the paths to load the translation files.

The current configuration in `teklastructures.ini` is as follows:

```
set XS_MESSAGES=%XS_DIR%\messages\ set XS_MESSAGES_PATH=
%XS_MESSAGES%;%XSDATADIR%environments\common\Extensions
\messages\
```

2.2 Administrator's release notes: Steel settings

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

Administrator's release notes: Improvements in steel items (page 126)
Administrator's release notes: Steel components (page 127)

Administrator's release notes: Improvements in steel items

Stand-alone bent plate

Stand-alone bent plate has been implemented as a part of the complex geometry solutions in Tekla Structures. It can also be seen as further development to conical bent plate feature implemented in Tekla Structures 2018i. Stand-alone bent plate does not require any input parts like the cylindrical or the conical bent plate. Stand-alone bent plate can be used to model both cylindrical and conical parts. It can be used, for example, to create hoods, hoppers, cones, and so on.

To do

Create the needed standard files.

Project level setting for fillet weld size control

When modeling fillet or compound welds, users now can control how the fillet weld size is interpreted. This is done by using the new advanced option

XS_ISO_LEG_LENGTH_AS_WELDSIZE. It has impact only if XS_AISC_WELD_MARK is set to FALSE.

When XS_ISO_LEG_LENGTH_AS_WELDSIZE is set to FALSE, the fillet weld size is treated as throat thickness. When XS_ISO_LEG_LENGTH_AS_WELDSIZE is set to TRUE, the fillet weld size is treated as leg length. If the user sets a prefix that influences the weld size, the prefix overrides the advanced option value.

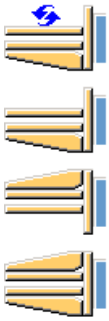
To do

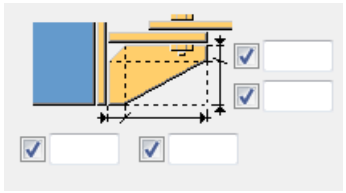
Start using the new advanced option if needed.

Administrator's release notes: Steel components

Tube gusset (20)

It is now possible to create a connection plate stiffener and define its chamfers on the **Brace conn** tab. There is now welding available for the stiffener plates.



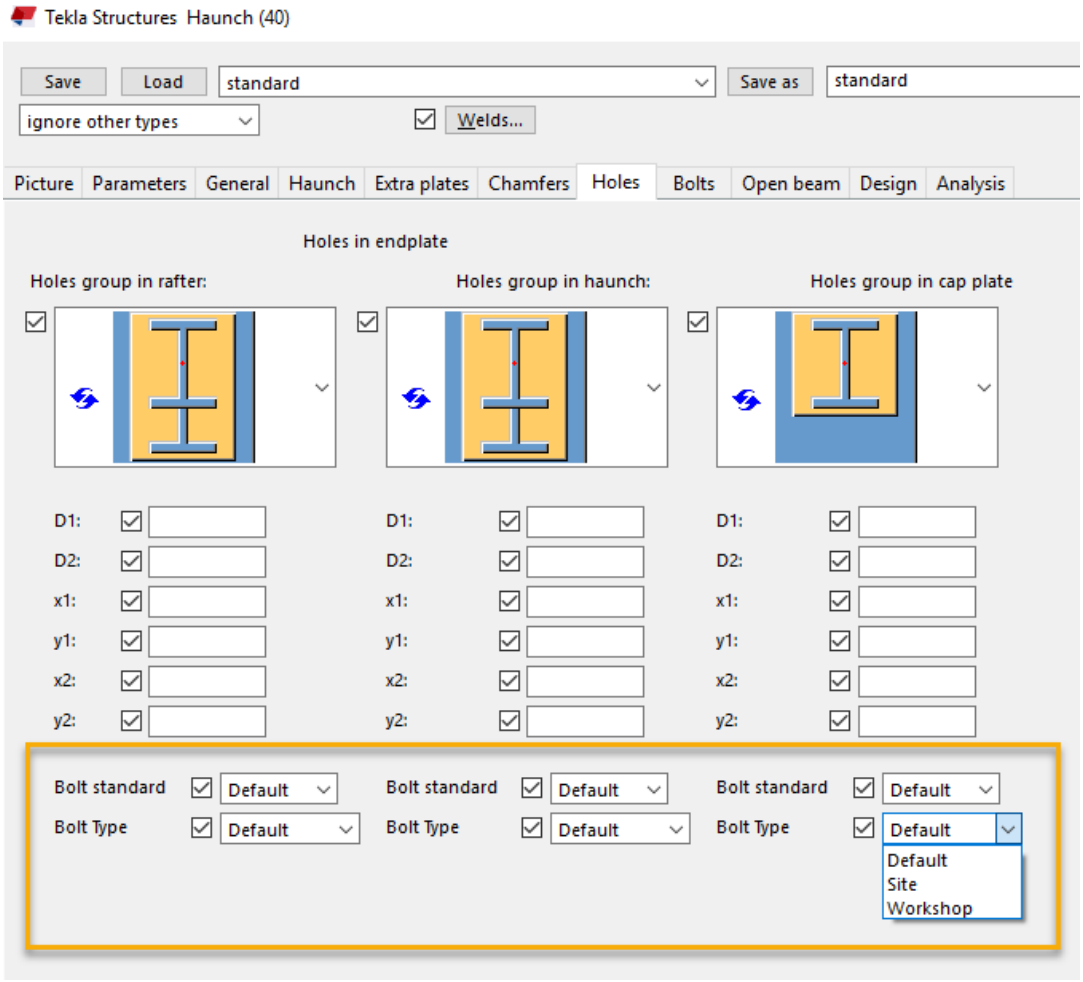


Welded tee (32)

You can now define the assembly position number and the **Finish** property on the **Parts** tab.

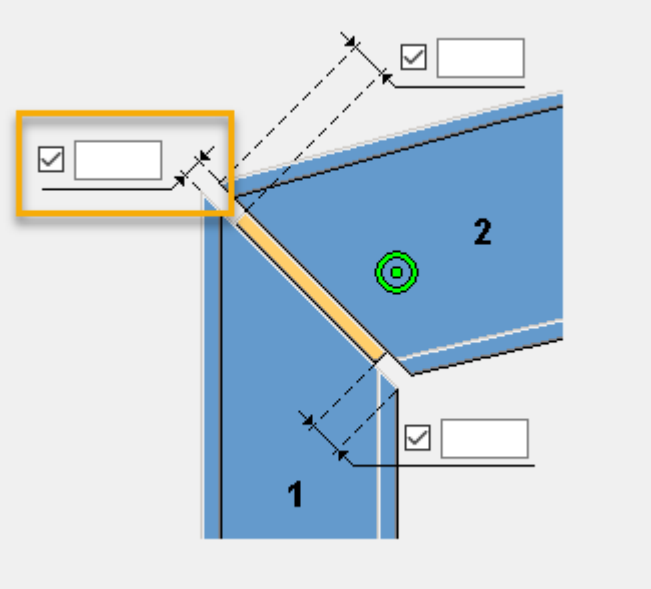
Haunch (40)

You can now define the bolt type on the **Holes** tab.



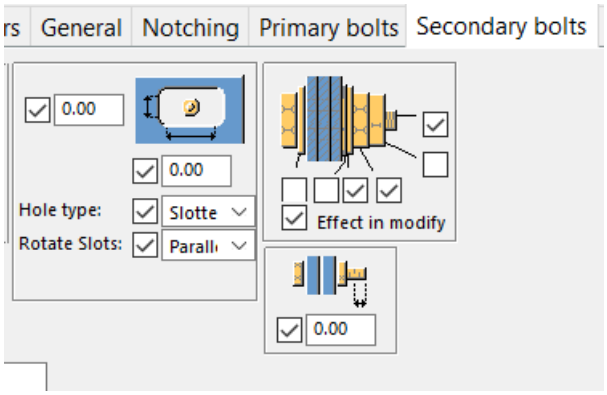
Cranked beam (41)

You can now define a gap between the parts on the **Picture** tab.



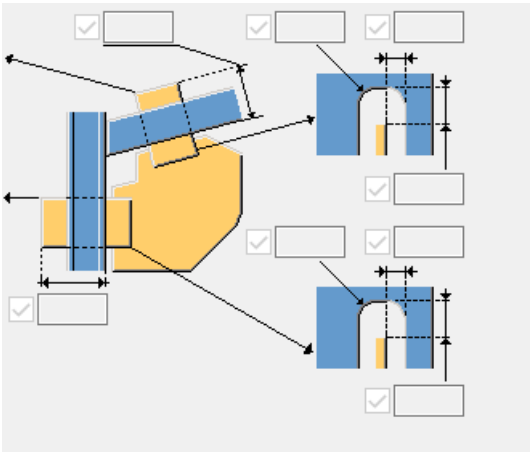
Seat conn type 1 (52)

You can now define all the basic bolt properties, and the properties for slotted holes, bolt assembly and bolt length increase on the **Secondary bolts** tab. Some bolt properties have been moved so that they are on the appropriate tabs.



Wraparound gusset (58), Hollow brace wraparound gusset (59), Wraparound gusset cross (60)

- You can now define the fastener plate cut through the connection profile on the **Gusset** tab.



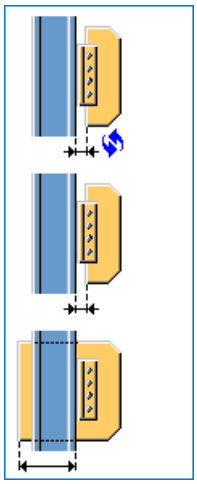
- You can now define erection clearances for different sides of the secondary part on the **Gusset** tab.
- Common **Gusset** tabs have been removed and recreated with modified layout. In **Hollow brace wraparound gusset (59)** there is now a feature to move fastener plates for non-L profiles.

Hollow brace wraparound gusset (59)

You can now define the width of the tongue plate on the **Brace conn** tab.

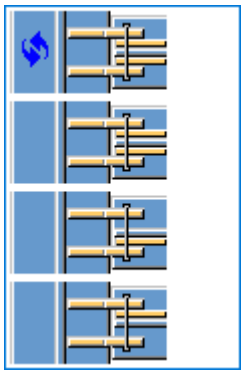
Bolted gusset (11), Gusseted cross (62)

You can now select on the **Picture** tab whether to create the gusset plate through the main part.



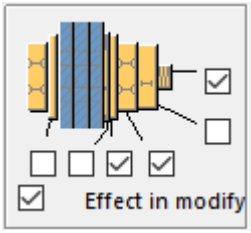
Gusseted cross (62)

You can now define the filler plate creation side on the **Brace conn** tab when creating both connection plates.



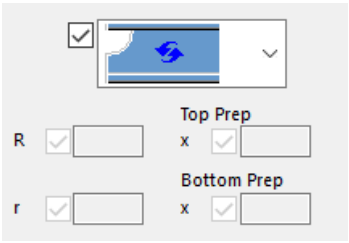
Rail connection (70)

You can now define bolt assemblies on the **SBolts** tab.

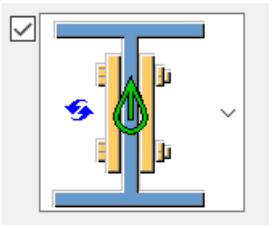


Splice connection (77)

- Welds 6 and 7 have been added.
- You can now change the weld access hole shape on the **Weld prep** tab. You can now define weld types for the secondary part.

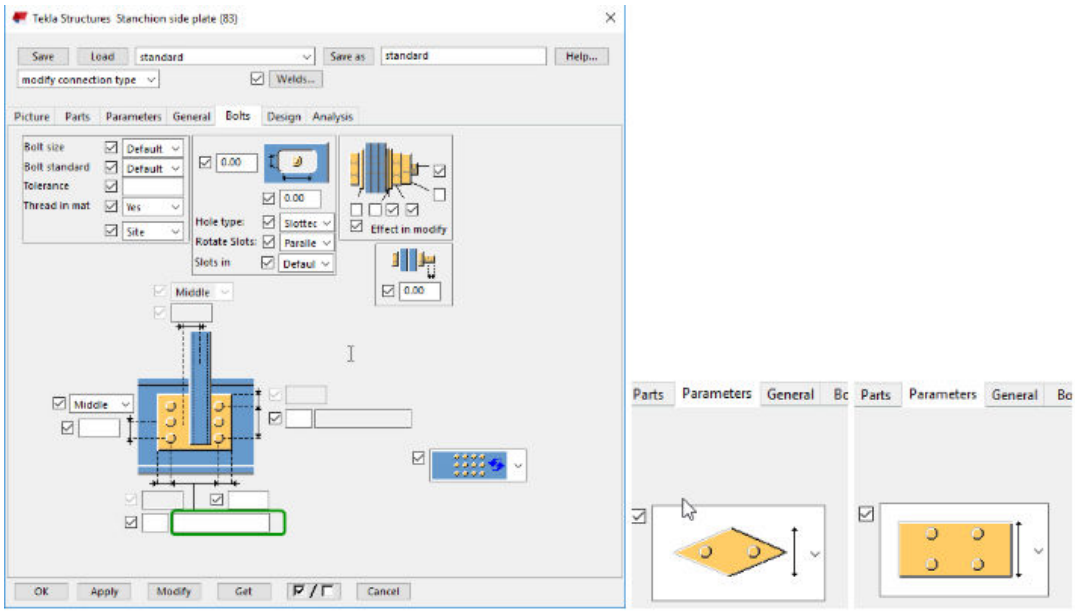


- You can now select the flange plate creation side on the **Parameters** tab. Previously, this setting was on the **Weld prep** tab.



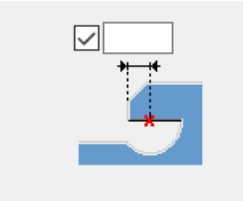
Stanchion side plate (83)

You can now set the bolt spacing when creating a rectangular or a diamond plate. Also, the component now works correctly when the up direction if set to **auto**.



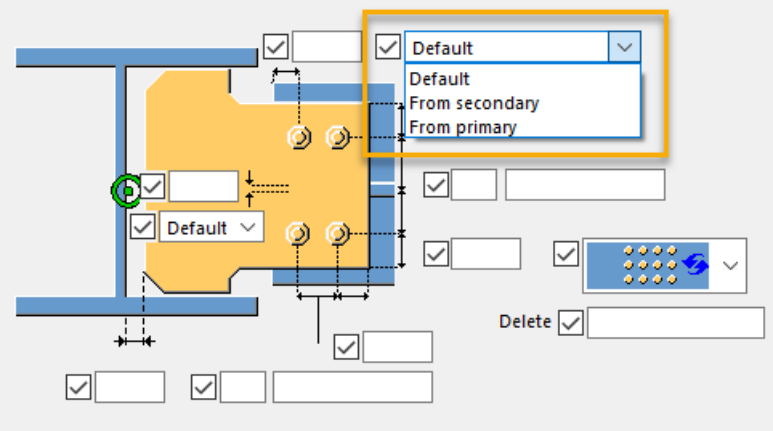
Welded beam to beam (123)

You can now define the weld access hole offset on the **Chamfers** tab.



Bolted moment connection (134)

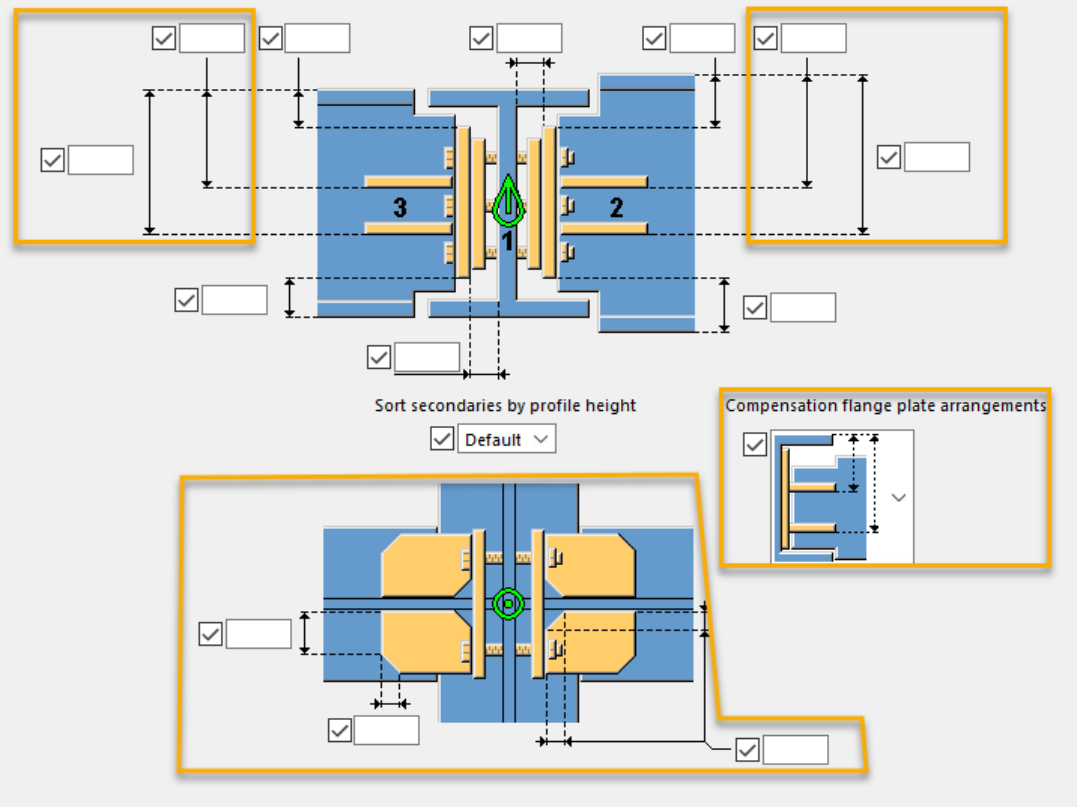
You can now select the bolt offset from the main part or the secondary part on the **Flange Blt** tab.



Two sided end plate (142)

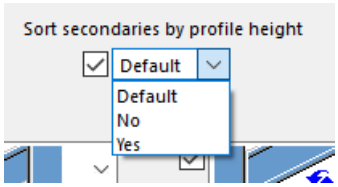
You can now create compensation flange plates (available on **Plates 1** and **Plates 2** tabs).

Welds 9 and 10 have been added for flange plates.



Two sided clip angle (143)

You can now sort the secondary parts by their profile height on the **Picture** tab. When set to **Yes**, the highest secondary part is always regarded as the first secondary part, regardless of the selection order. The selection order of secondary parts no longer affects the copying of secondary parts.

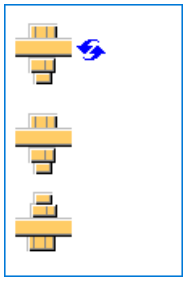


Welded to top flange (147)

Welds 8 and 9 for shear plates have been added.

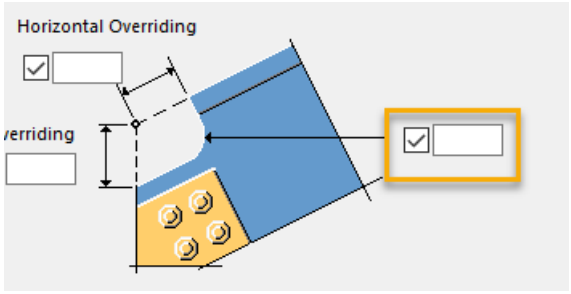
Welded to top flange S (149), Full depth S (185)

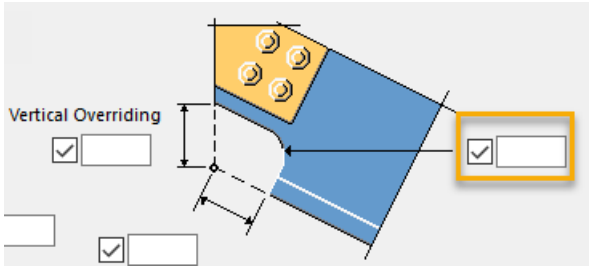
You can now define the bolting direction on the **Bolts** tab.



Bent plate (151)

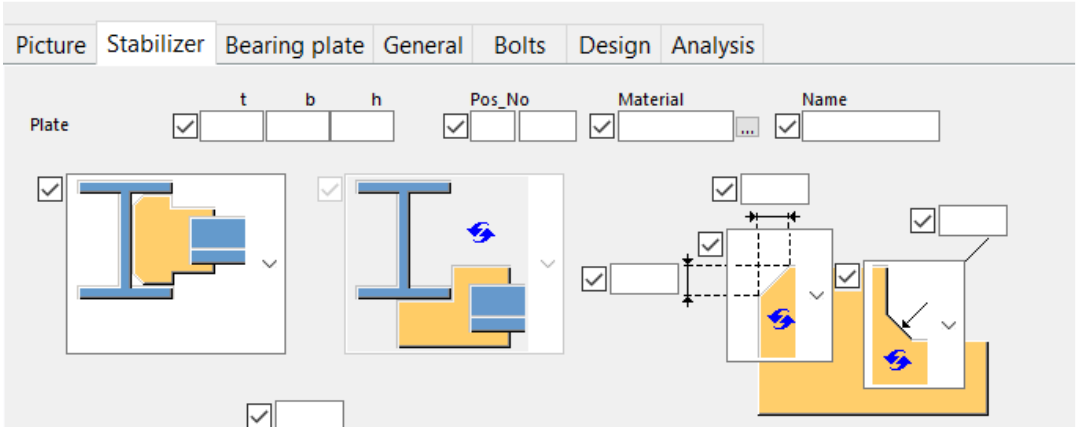
You can now define the notch cut radius on the **Top notch** and **Btm notch** tabs.





Joist to beam, type 1 (160)

You can now define a full depth stiffener and define the chamfers for it on the **Stabilizer** tab.

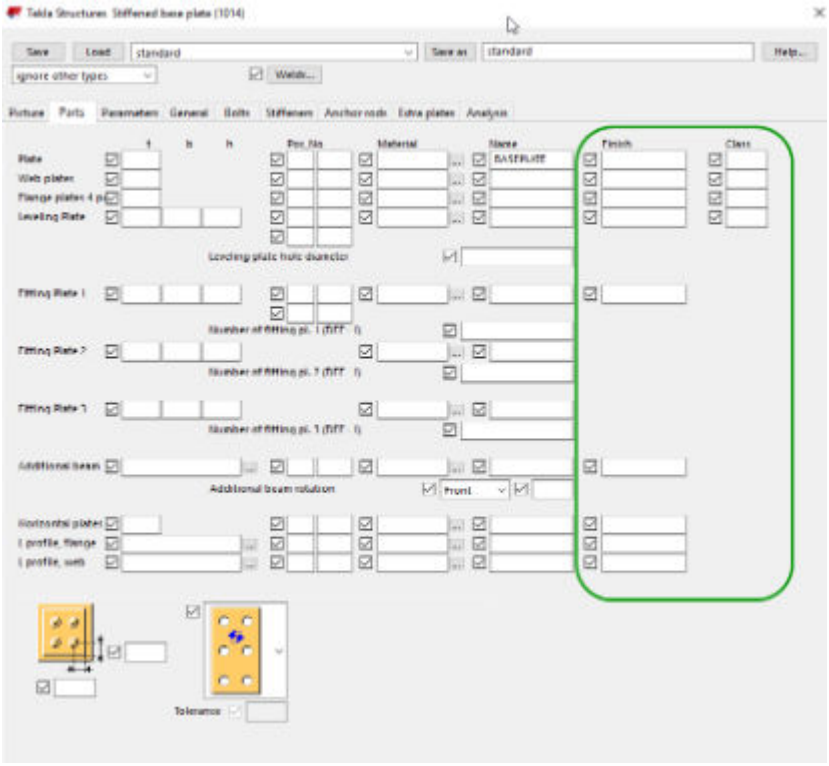


Joist to column, type 2 (163)

You can now define welds for the stabilizer plate and the top/bottom weld for the seat connection. The second side weld for seat connection has been removed.

Stiffened base plate (1014)

On the **Parts** tab, you can now define the **Class** property for plates, web plates, flange plates, and leveling plate. You can define the **Finish** property for plate, web plates, flange plates, leveling plate, fitting plates, additional beam, horizontal plates, and L profiles.

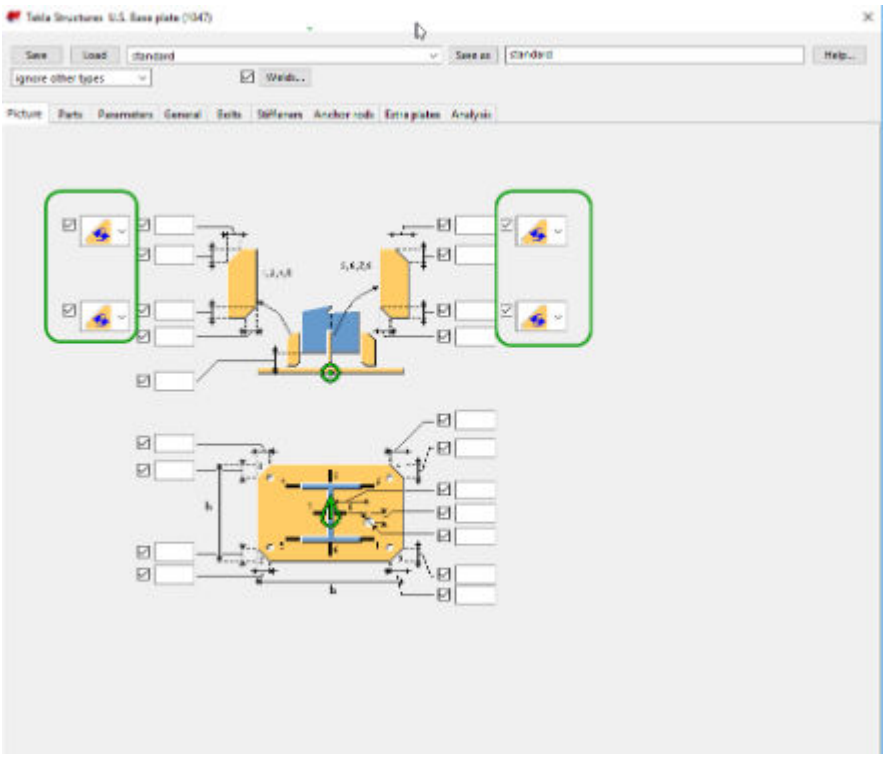


Seat det type 1 (1033)

You can now define horizontal welds (weld 3) for the seat profile.

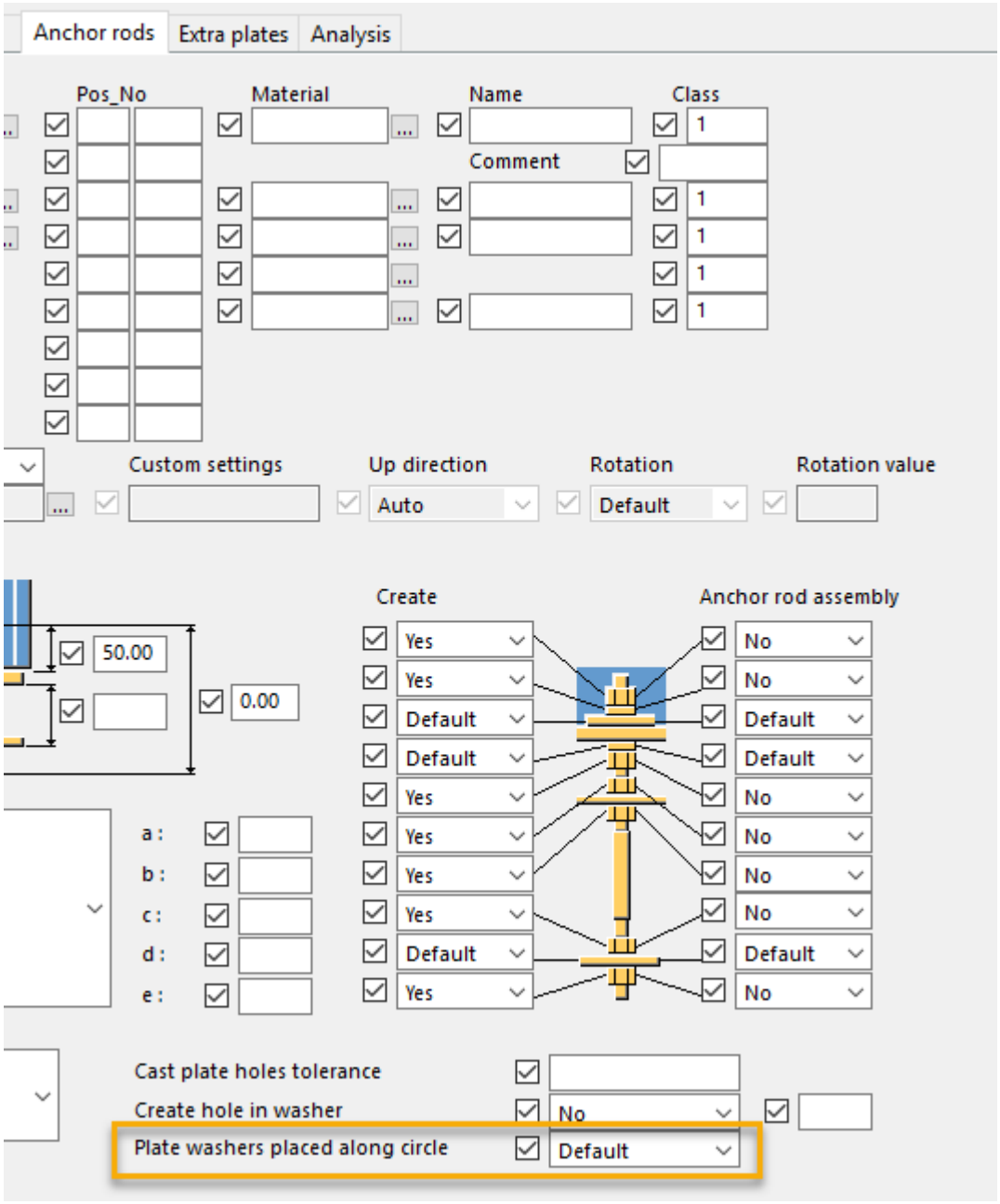
U.S. Base plate (1047)

You can now select the chamfer type for stiffeners on the **Picture** tab.



Circular base plates (1052)

You can now select to create plate washers along a circle on the **Anchor rods** tab.



2.3 Administrator's release notes: Concrete settings

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

Administrator's release notes: Rebar set improvements (page 139)
Administrator's release notes: Reinforcement drawing tools (page 143)

Administrator's release notes: Updates in tools for concrete fabrication (page 144)

Adminstrator's release notes: Concrete components (page 144)

Administrator's release notes: Rebar set improvements

End detail modifier

To do

Update the end detail modifier standard files (`standard.rst_edm` and `standard.rst_edm.more`) in your environment:

1. Create a rebar set > Interrupt > Select the rebar set.
2. Create an end detail modifier > Interrupt > Select the end detail modifier > The property pane opens.
3. Enter appropriate standard values and save them as standard.
4. Upload the newly created standard files again to your environment.

Splitter improvements

To do

Update the splitter standard file (`standard.rst_sm`) in your environment:

1. Create a rebar set > Interrupt > Select the rebar set.
2. Create a splitter > Interrupt > Select the splitter > The property pane opens.
3. Enter appropriate standard values and save them as standard.
4. Upload the newly created standard files again to your environment.

Cranking and lapping report attibutes

If you want to create report templates for reporting these new properties, you can use these cranking and lapping report attributes:

- `CRANK_SIDE_START`
- `CRANK_ROTATE_START`
- `CRANK_STRLEN_START`
- `CRANK_LENTYPE_START`
- `CRANK_RATIO_START`
- `CRANK_DIST_START`
- `CRANK_OFFSET_START`

- LAP_SIDE_START LAP_PLACEMENT_START
- LAP_LENGTH_START
- CRANK_SIDE_END
- CRANK_ROTATE_END
- CRANK_STRLEN_END
- CRANK_LENTYPE_END
- CRANK_RATIO_END
- CRANK_DIST_END
- CRANK_OFFSET_END
- LAP_SIDE_END
- LAP_PLACEMENT_END
- LAP_LENGTH_END

These attributes are available both in the REBAR and SINGLE_REBAR rows in reports.

Rebar database file update

Localize the rebar database (rebar_database.inp) in your environment to cover the new standard lapping and standard cranking properties:

- Open your environment's rebar_database.inp and start adding the values to the file according to the needs of your area.
- Add 5 columns at the rightmost end of each row. Use tabs to differentiate the values from each other. See the example image below.

Note that the column titles (for example, CrankSL) do not matter. The values should be in the correct order.

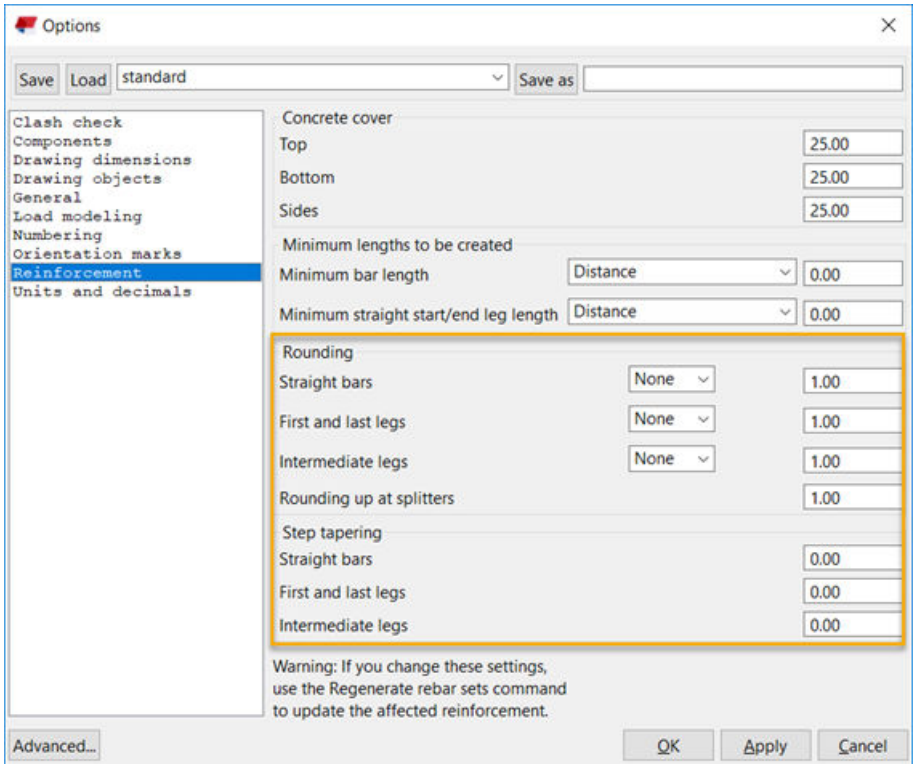
```
alpha r    L    LapLength CrankSL  CrankedLengthT   CrankedLength CrankExtraOffset */

180  72    30   300       300      DiagonalRatio    10            0
180  96    40   400       400      DiagonalRatio    10            0
180  120   50   500       500      DiagonalRatio    10            0
180  144   60   600       600      DiagonalRatio    10            0
180  168   70   700       700      DiagonalRatio    10            0
180  192   80   800       800      DiagonalRatio    13            0
180  240   100  1000      1000     DiagonalRatio    13            0
180  300   125  1300      1300     DiagonalRatio    13            0
180  384   160  1600      1600     DiagonalRatio    13            0
180  12    60   300       300      DiagonalDistance 100           0
180  16    80   400       400      DiagonalDistance 100           0
180  20    100  500       500      DiagonalDistance 100           0
180  30    120  600       600      DiagonalDistance 100           0
180  35    140  700       700      DiagonalDistance 200           0
180  40    160  800       800      DiagonalDistance 300           0
180  50    200  1000      1000     DiagonalDistance 400           0
180  88    250  1300      1300     DiagonalDistance 500           0
180  112   320  1600      1600     DiagonalDistance 700           0
```

Rounding and step tapering in model level settings

To do

Find out what would be the best values in your area for the reinforcement settings. Localize them in your environment's `standard.opt` file.



This is how the above values are defined in the file:

```
dia_option_settings.StepTaperingSingle 0.000000
dia_option_settings.StepTaperingFree 0.000000
dia_option_settings.StepTaperingIntermediate 0.000000
dia_option_settings.RoundingSingle 1.000000
dia_option_settings.RoundingFree 1.000000
dia_option_settings.RoundingIntermediate 1.000000
dia_option_settings.RoundingTypeSingle 1
dia_option_settings.RoundingTypeFree 1
dia_option_settings.RoundingTypeIntermediate 1
dia_option_settings.RoundupInSplitters 1.000000
```

You can also localize the rest of the **Reinforcement** settings in the **Options** dialog box. Modify these settings in the same file if needed:

```
dia_option_settings.ConcreteCoverTop 25.000000
dia_option_settings.ConcreteCoverBottom 25.000000
dia_option_settings.ConcreteCoverSides 25.000000
dia_option_settings.MinimumBarLength 0.000000
dia_option_settings.MinimumLegLength 0.000000
dia_option_settings.MinimumBarLengthType 0
dia_option_settings.MinimumLegLengthType 0
```

Adding rounding and step tapering controls to rebar set and property modifier level

To do

Rebar set standard file update

Update the rebar set standard files (`standard.rst`, `standard.rst.more` and `standard.rst.zones`) in your environment:

1. Create a rebar set > Interrupt > Select the rebar set > The property pane opens.
2. Enter appropriate standard values and save them as standard.
3. Upload the newly created standard files again to your environment.

Property modifier standard file update

Update the property modifier standard files (`standard.rst_pm`) in your environment:

1. Create a rebar set > Interrupt > Select the rebar set.
2. Create a property modifier > Interrupt > Select the property modifier > The property pane opens.
3. Enter appropriate standard values and save them as standard.
4. Upload the newly created standard file again to your environment.

For environments that do not follow the ..\common\inp folder

Copy the `objects_length_adjustment.inp` file from `..\common\inp` folder and place it to your environment folder. If you do not do this, the rebar set auto-apply will not work.

IS_REBARSET_BAR

If you want to differentiate old reinforcing bars from rebar set bars, there is now a report template attribute that you can use: `IS_REBARSET_BAR`. The value `1` is for rebar set bars, the value `0` is for the old bars. This attribute is available both in the `REBAR` and `SINGLE_REBAR` rows.

Administrator's release notes: Reinforcement drawing tools

Rebar group dimensioning

- The **Extra marks** tab was split into two separate extra mark tabs **Extra marks in front** and **Extra marks behind**.

  On each tab it is possible to define the content of **Mark 1** and **Mark 2**.

  The grouping and positioning the marks for extra marks in front and extra marks behind is placed only on the first extra marks tab.
- Now you can define the space between mark 1 and mark 2 using the new setting **Space between Mark1 and Mark2** on the **Advanced settings** tab. On the same tab, **Next mark spacing** was moved under the new area **Grouping** and renamed to **Group mark spacing**. **Rebar group tolerance** was also moved to the **Grouping** area and renamed to **Grouping tolerance**.
- Rebar length output method **Sum values A B C** has been renamed to **Sum of exact lengths** on the **Mark 1**–**Mark 3** tabs.

Rebar group marking

- On the **Mark 3** tab you can now define how to rotate the mark text using the new setting **Mark rotation**. You can rotate the mark text horizontally and vertically or to the mark line direction (default). Default mark line direction is conserved.
- You can now have a frame around mark elements. Note that symbols, new lines and pullout pictures cannot have a frame.
- Origin sum values A B C have been replaced by the sum of exact lengths.

Rebar pullout picture and marking

- Added new line colors (added missing color options)
- Fixed option "m/cm" in segments length

  Fixed 0.0 cm issue in drawings

  Fixed conversion to Tekla Structures value through dimensions.

See also

Other drawing improvements (page 67)

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

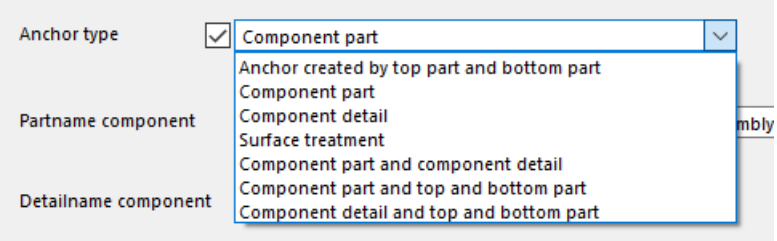
Export Unitechnik contains several new useful features, and **Export EliPlan file**, and **Export BVBS** have also been improved.

For more information about the improvements, see Updates in tools for concrete fabrication (page 89) in Tekla Structures 2019 release notes.

Adminstrator's release notes: Concrete components

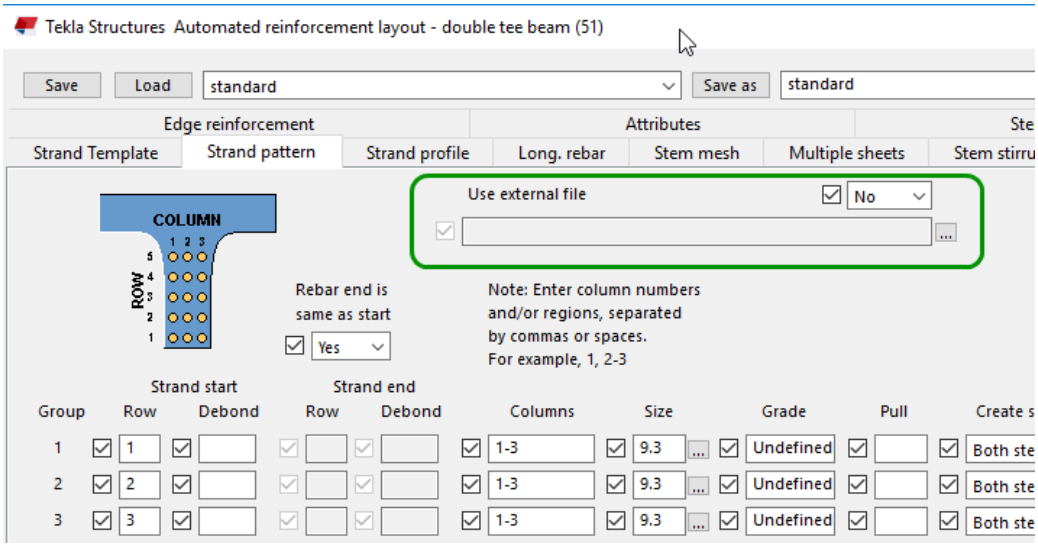
Embedded anchors (8)

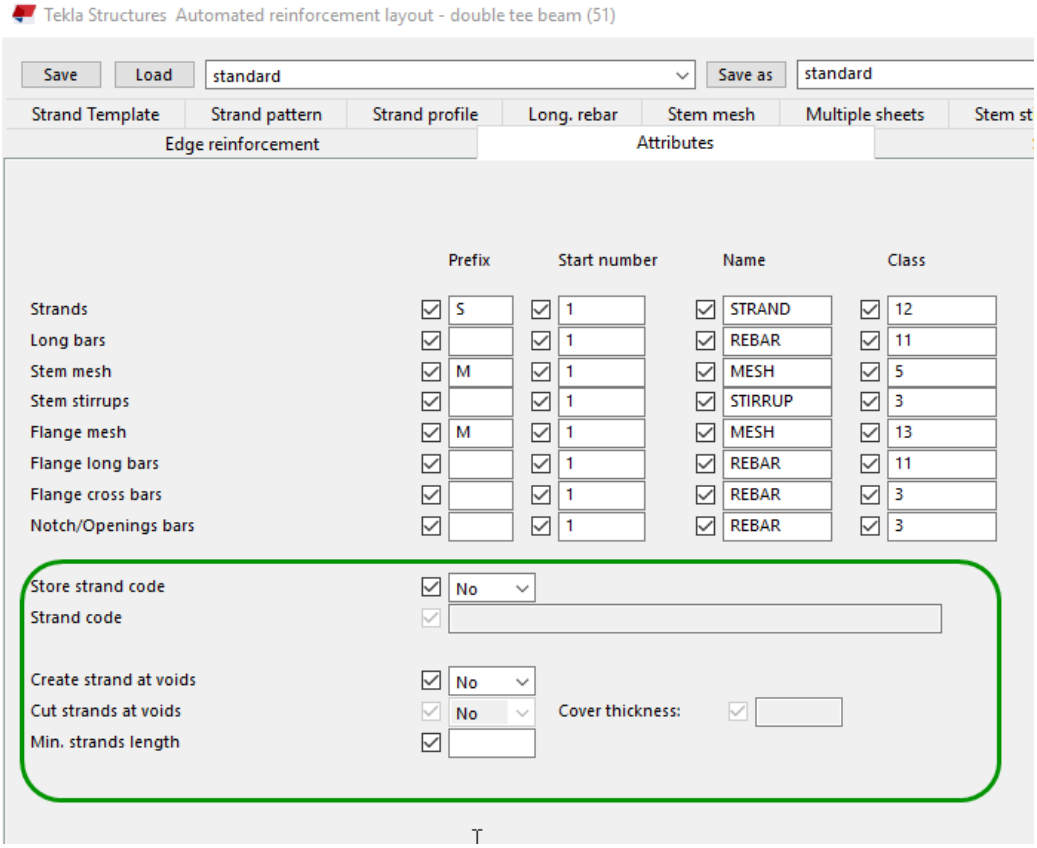
There are now combination options for the anchor rod type on the **Input** tab.



Automated reinforcement layout components (51-57) and Reinforcement strand layout (66)

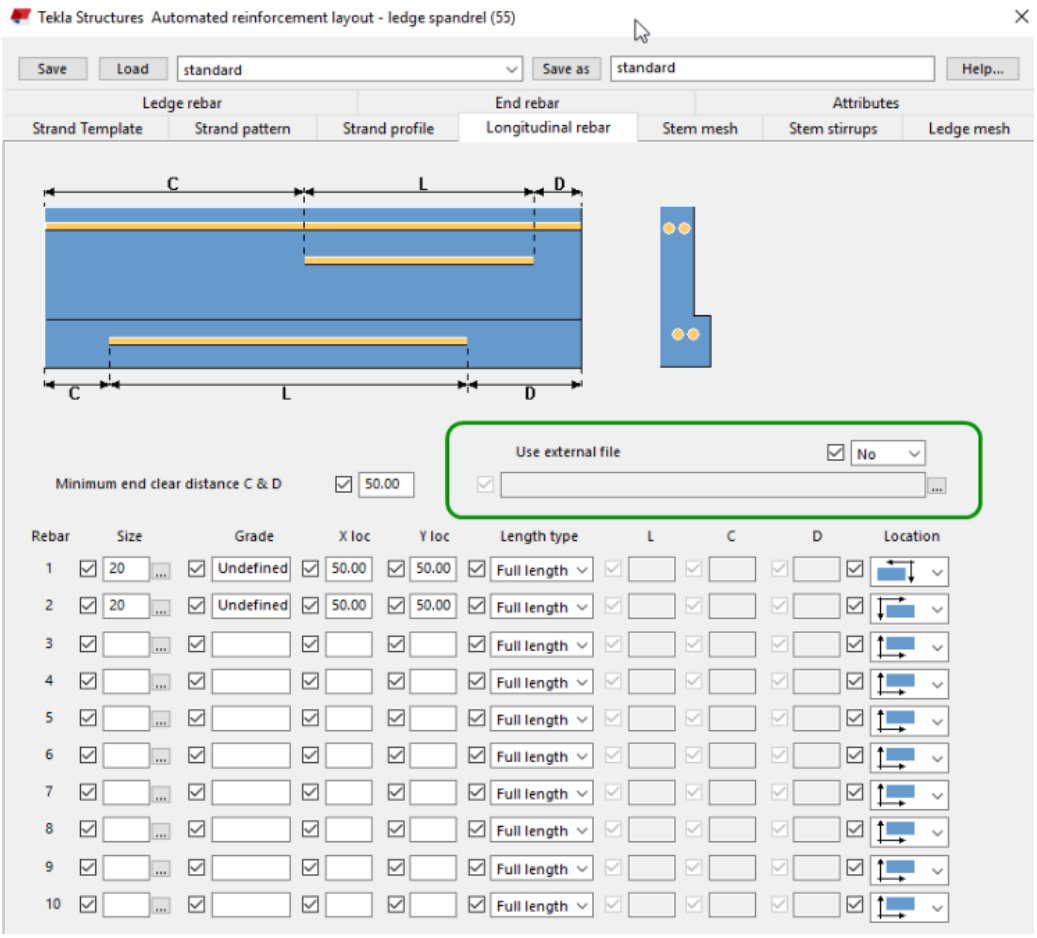
- In **Inverted tee beam - automated reinforcement layout (52)**, **Ledge beam - automated reinforcement layout (53)**, **Rectangular beam - automated reinforcement layout (54)**, **Ledge spandrel - automated reinforcement layout (55)**, **Rectangular spandrel - automated reinforcement layout (56)**, and **Reinforcement Strand Layout (66)**, you can now use an external CSV file for unlimited loading of strand rebars on the **Strand pattern** tab and define a strand code on the **Attributes** tab.



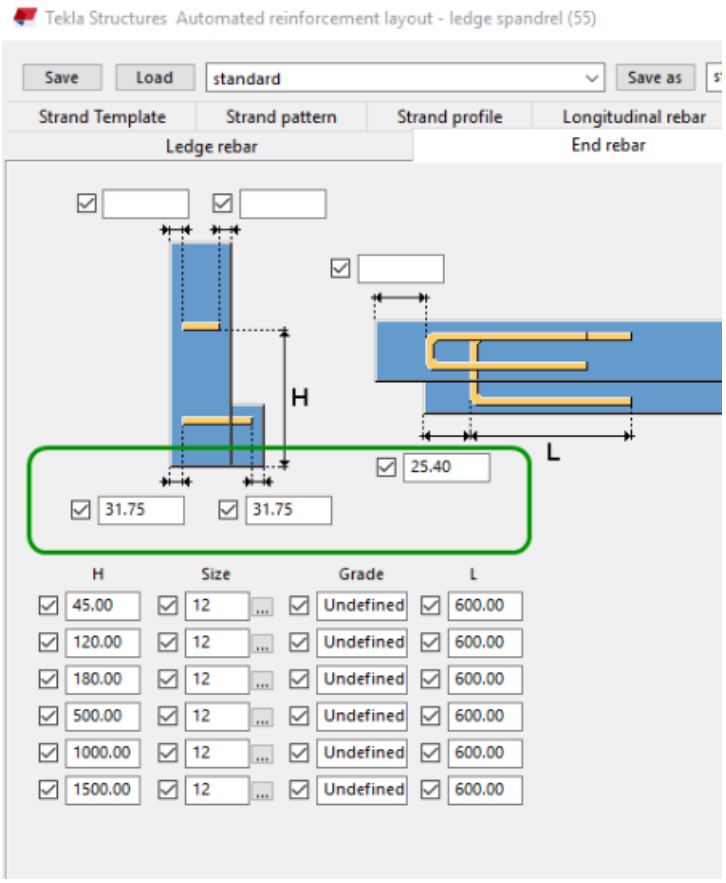


Ledge spandrel - automated reinforcement layout (55)

- You can now load an external CSV file for longitudinal rebars to define an unlimited number of rebars on the **Longitudinal rebar** tab.

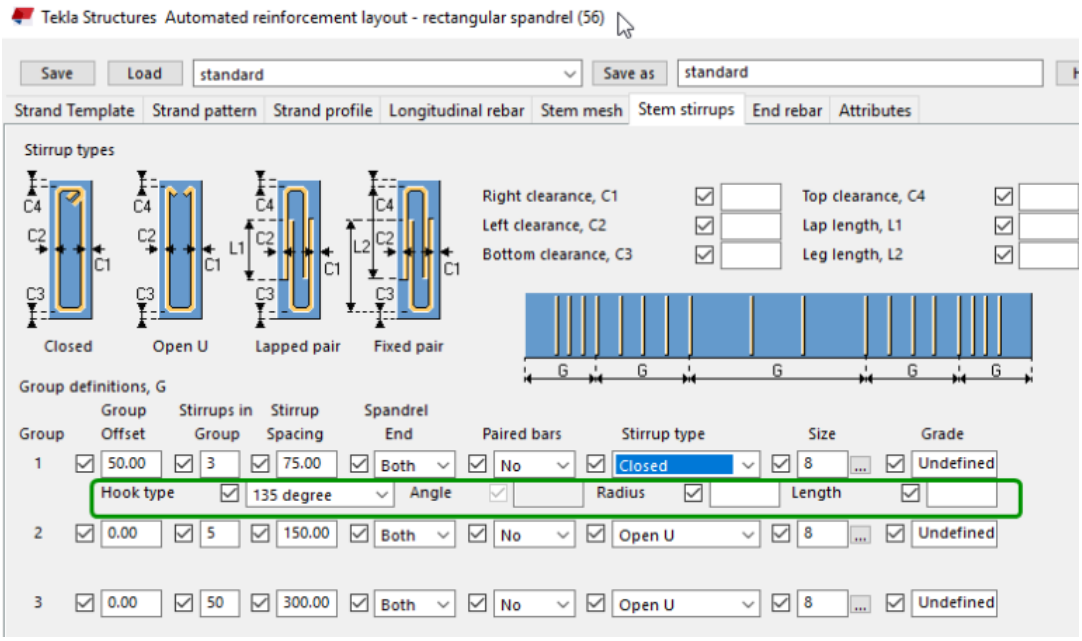


- You can now control the secondary rebar set on the **End rebar** tab.



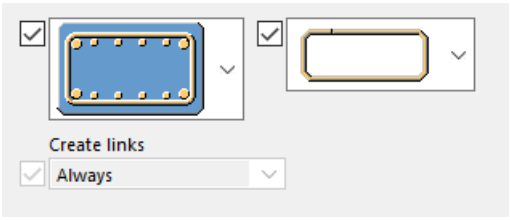
Automated reinforcement layout - ledge spandrel (55), Automated reinforcement layout - rectangular spandrel (56)

You can now define advanced hook properties for rebar groups on the **Stem stirrups** (for 55) and **Ledge rebar** tabs. The components are not fully backward compatible with older versions due to these improvements.



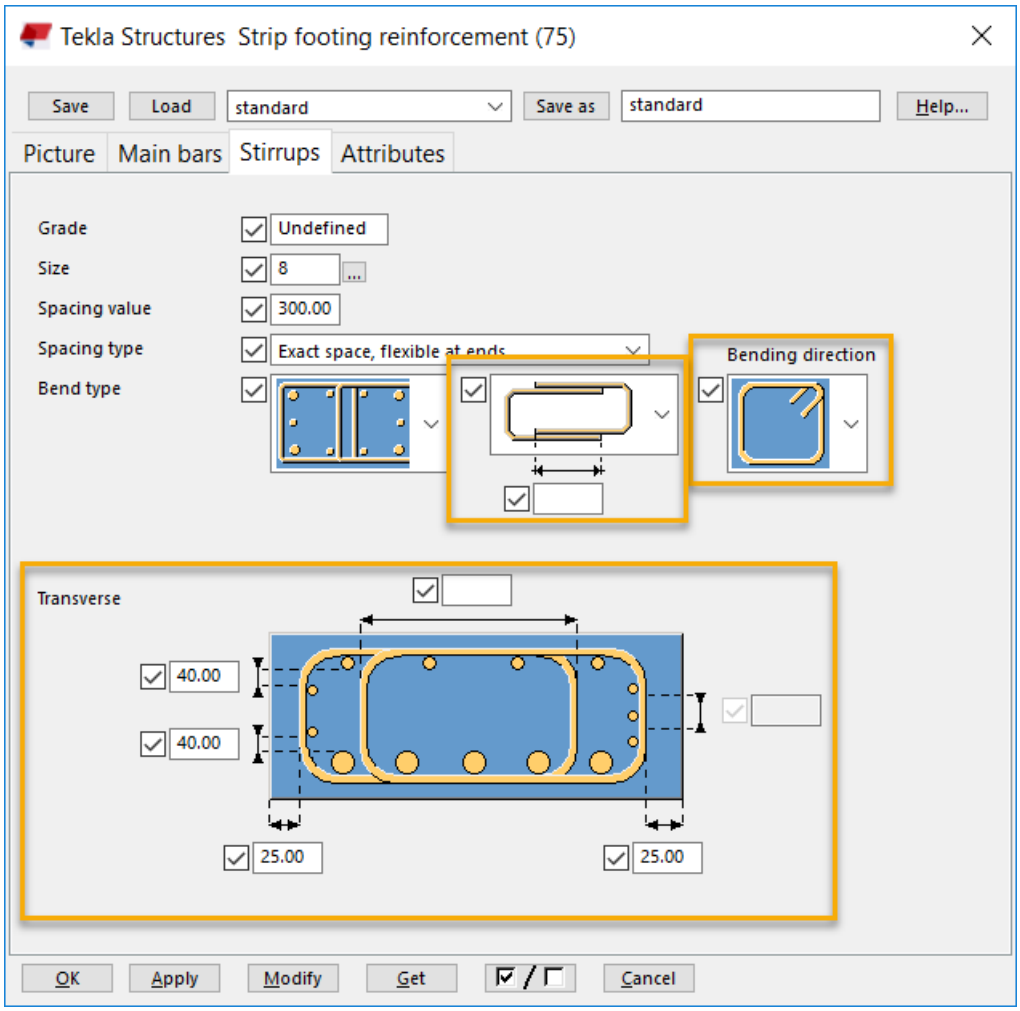
Beam reinforcement (63)

You can now select to create additional links on the **Parameters** tab and define the minimum profile length.



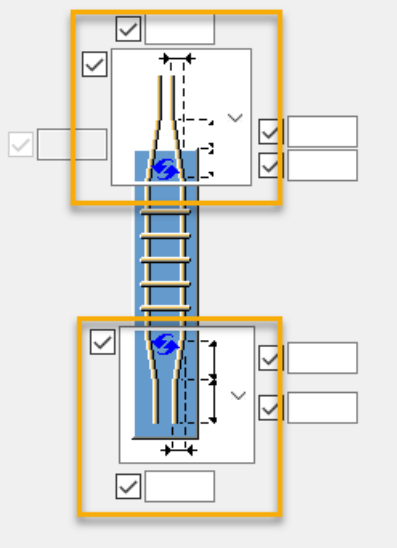
Strip footing reinforcement (75)

You can now create double stirrup bars as a new bend type on the **Stirrups** tab. You can define the end shapes of the double stirrup bars (135°, 90° or overlapped), and the overlap length. Transverse settings are now on the **Stirrups** tab and the bending direction is shown as images.



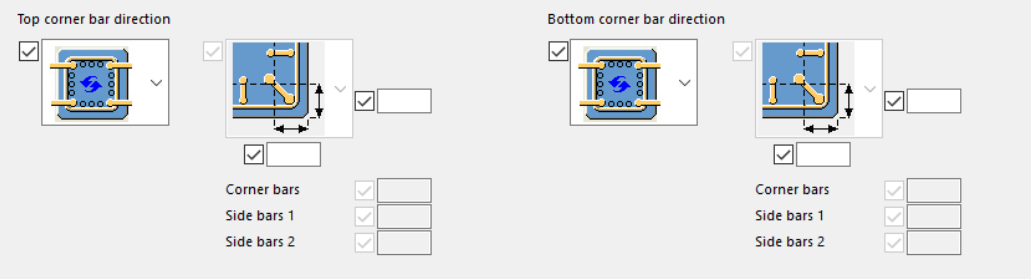
Round column reinforcement (82)

You can now create cranked reinforcing bars both at the top and at the bottom of the column. Enter the horizontal, vertical and sloped distance dimensions on the **Main bars** tab.



Rectangular column reinforcement (83)

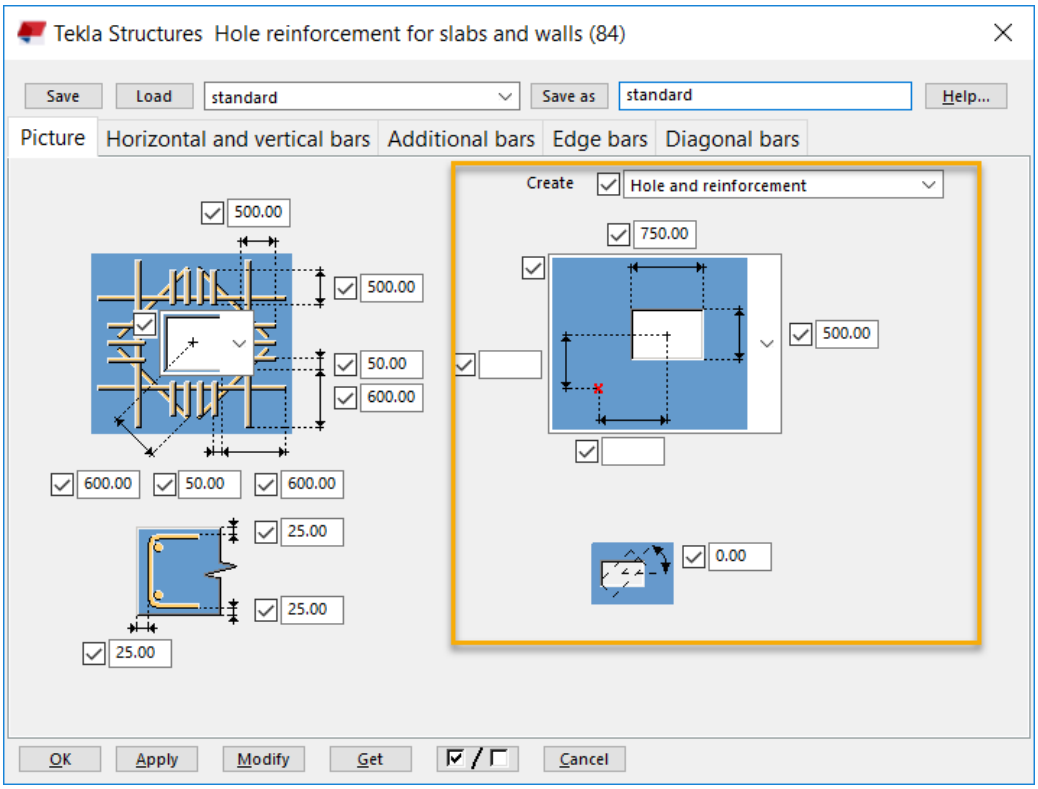
- You can now define bar cranking also at the column bottom. The length of the crank can now be defined using a sloped dimension, as an alternative to the vertical dimension.



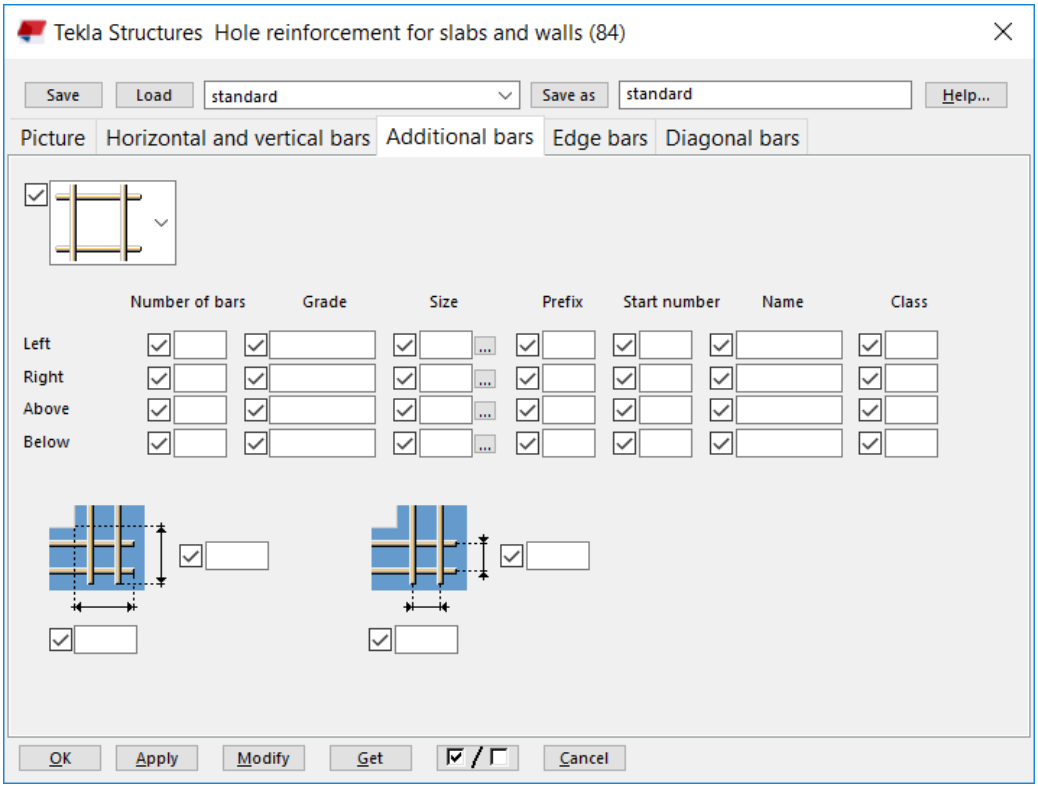
- You can now select whether all the stirrups are created as a single group on the **Intermediate links** tab.
- You can now define gaps between the stirrup groups on the **Stirrups** tab.

Hole reinforcement for slabs and walls (84)

- You can now reinforce an already existing hole and apply position offsets for a hole that you are creating.

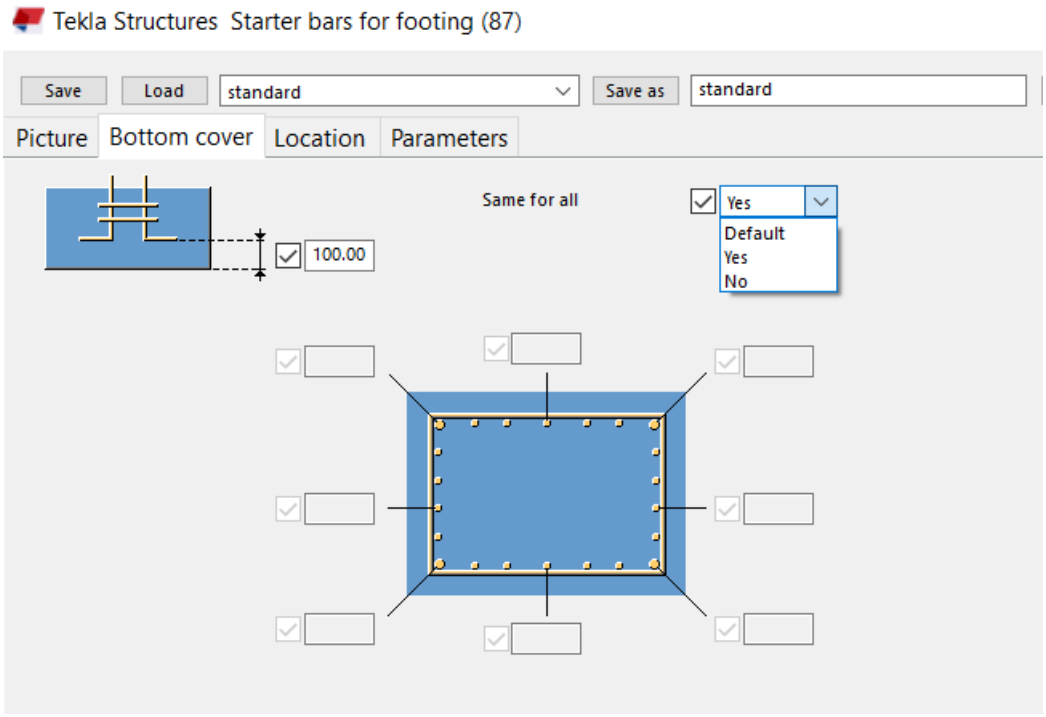


- There is a new **Additional bars** tab with full rebar control options, including their horizontal and vertical offsets.



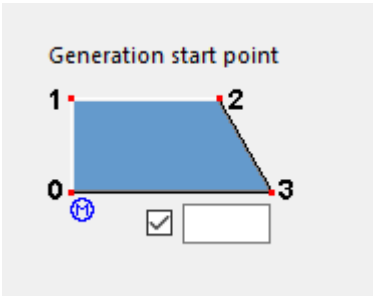
Starter bars for footing (87)

With the new **Bottom cover** tab, you can now set a separate unique bottom cover thickness for each bar group. The other option is to set a common bottom cover thickess for all corner bars and side bars.



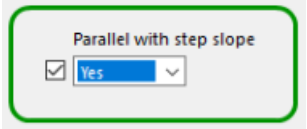
Reinforcement mesh array in area (89)

You can now define the polygon generation start point index.



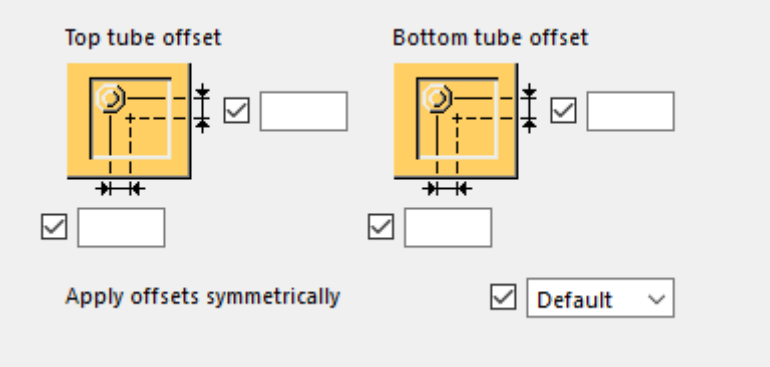
Reinforced concrete stair (95)

Stirrups and pins on the **Bar E** tab can have a rectangular shape or they can be parallel with the sloped edge of the step (if slope is allowed).

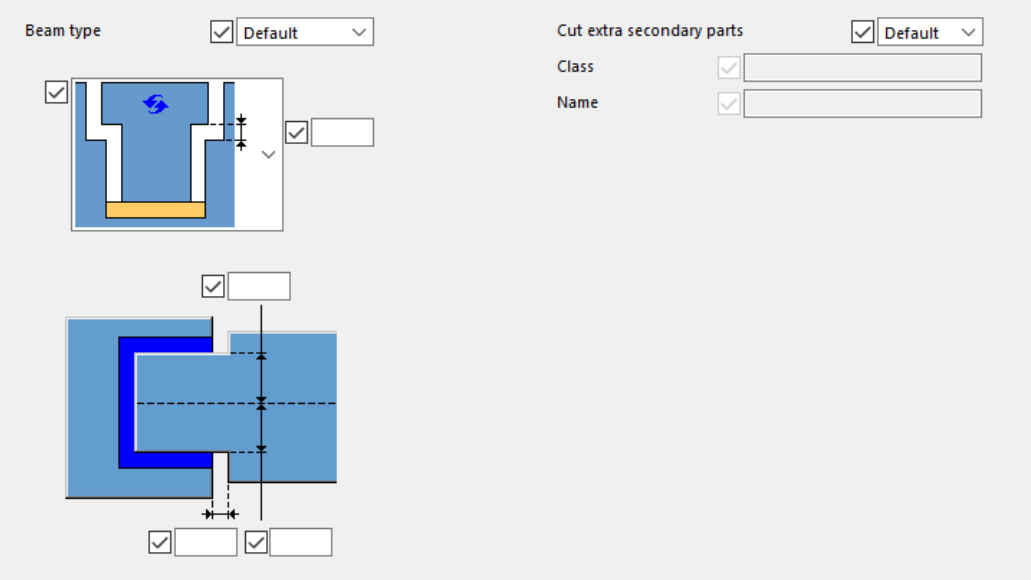


Concrete console (110)

- You can now create column cut out inclined around a T-profile.
- You can now select the default console thickness from the main part or from the secondary part.
- You can now define whether cuts are created around tubes using the **Create cuts around tubes** option. You can do this on the **Connection** tab.
- You can now define the offsets for the tube profiles in both the X and Y directions on the **Anchor rods** tab.

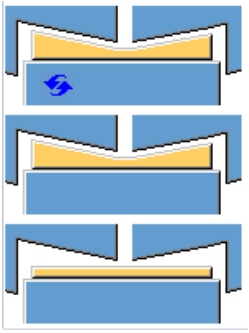


- You can now use the **Legs symmetrically** setting on the **Socket** tab to select whether custom part sockets are created symmetrically.
- On **Parameters** tab, you can now find and cut extra secondary parts using classes or name search. You can also define the maximum width of the secondary part and cut it to this width.



Concrete beam-beam (112)

- When defining the neoprene, you can now select on the **Parts** tab whether the neoprene is fitted to fill the cut space between the main part and the secondary part, or whether it is created in a rectangular shape.



- You can now select on the **Anchors** tab whether the tubes are aligned with the main part, or with the top or bottom of the secondary part.

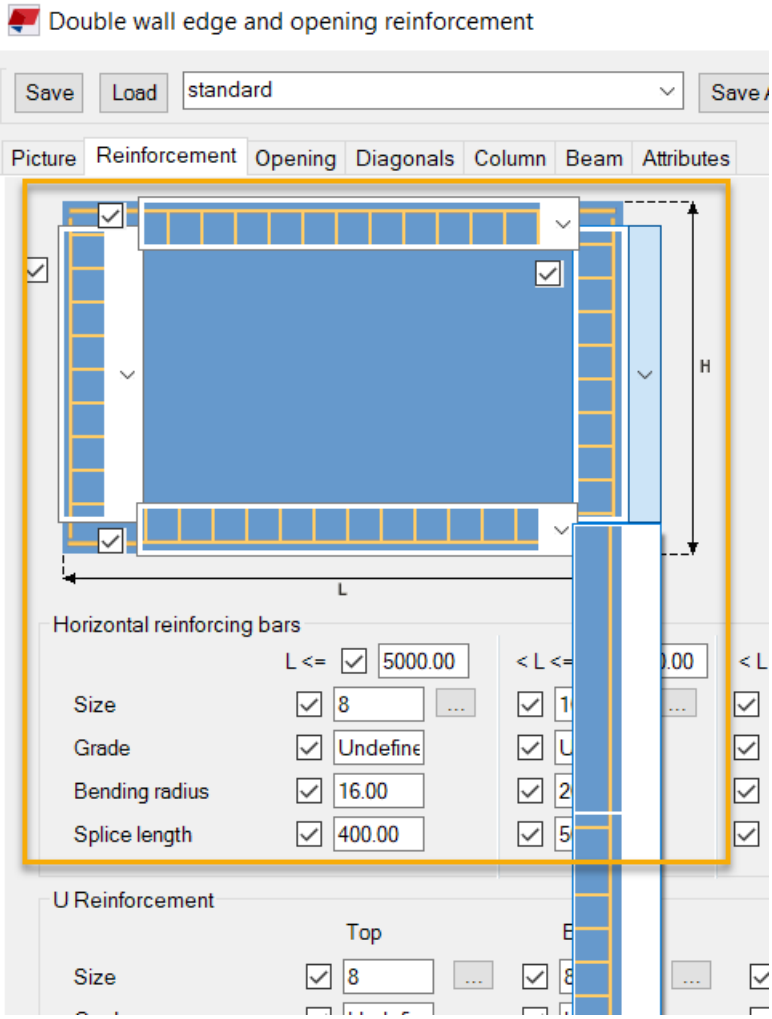
Automatic splicing tool

You can now set the lap length as an absolute value. You can now give the lap length as a measurement.

Double wall edge and opening reinforcement

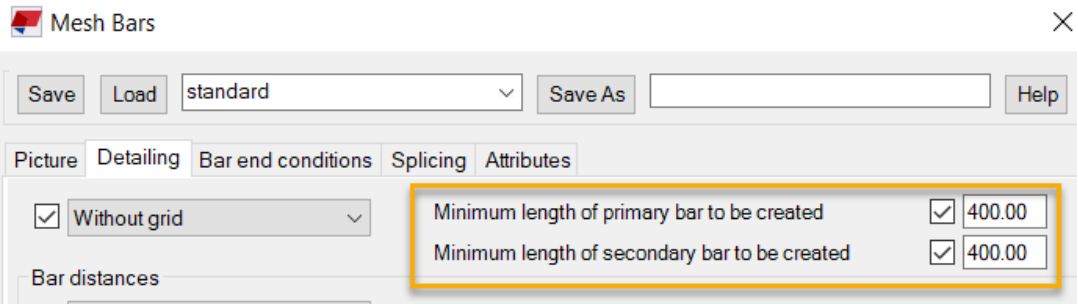
There is a new cover thickness offset C3 on the **Picture** tab.

New options have been added for edge and opening reinforcement (not reinforcement and create just stirrups) on the **Reinforcement** and **Opening** tabs.



Mesh bars

You can now control the minimum length of primary and secondary bars separately.

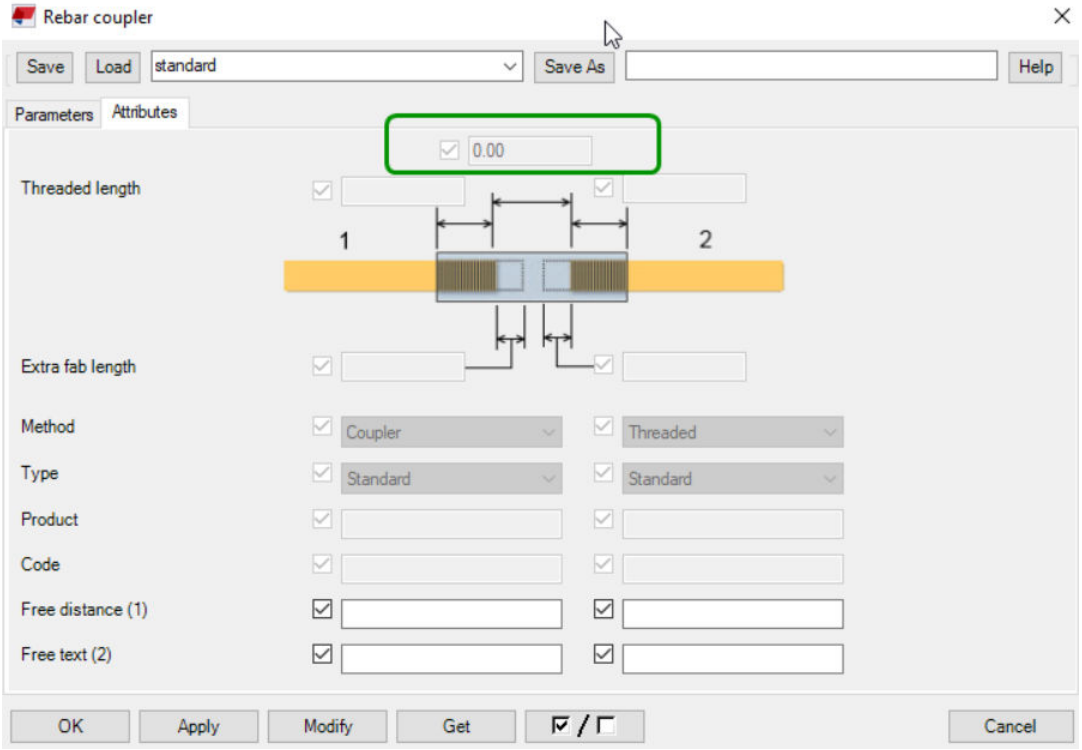


Rebar coupler and end anchor tools

Rebar coupler and **Rebar end anchor** components have been changed so that when used with rebar sets, the end-specific UDA values are set with end modifiers. For rebar sets, the end modifier properties thread length, extra

fabrication length, and threading type values of the end modifier are set (instead of custom UDA values).

Note that to get the threading type controlled by coupler / end anchor components, this value must be added to the `RebarCoupler.Udas.dat` file.



Sandwich and double wall

You can now use the **Foil** tab for controlling the vertical and/or horizontal splitting of the foil.

Wall layout

When customizing the content of the **UDA** tab, you can now define in the `WallLayout.Udas.dat` file that layer UDA values are not swapped when the **Wall layout layer swapper** tool is used. You can do this by adding `NoSwap` at the end of the line (fourth field): `string comment j_comment NoSwap`.

```
//
// Customized user defined attributes (UDA) for layer parts created by
wall layout component
//
// Each row shall contain 2 or 3 fields separated by tab(s) or semicolon.
// Please note that all uda names shall be unique
//
// Field 1: The data type of the attribute. Valid values are 'distance',
'float', 'option', 'integer' and 'string'
// compatible with the actual user defined attributes as specified in
objects.inp
// Field 2: UDA name. This is the name of the user defined attribute set
for the layer part.
// Field 3: Label. This text is shown in the attributes dialog. It can be
```

```
a translatable label (albl_) or any text.
// Field 4: 'NoSwap' if you do not want the 'Wall layout layer swapper'
to swap the values.
//
string comment j_comment NoSwap
string USER_FIELD_1 _user_field_1
string USER_FIELD_2 _user_field_2
string USER_FIELD_3 _user_field_3
string USER_FIELD_4 _user_field_4
```

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 160). The updated version replaces the existing version you have installed.
2. Renew your licenses as explained in Renew a Tekla license (page 161).

   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 162).

   You can use the Migration Wizard (page 162) 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 163).

   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.

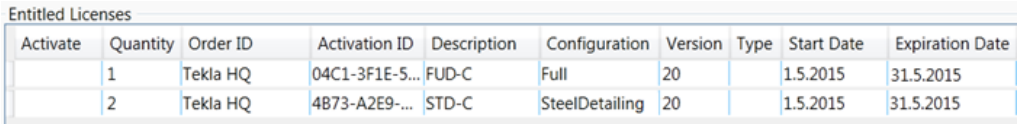
3. Go to **Tekla Licensing** --> **Tekla License Administration Tool** through the **Start** menu or **Start screen**, depending on your Windows operating system.

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.

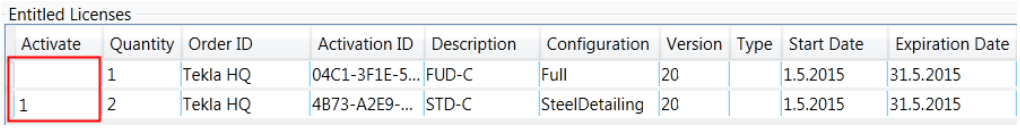
   NOTE Do not use automatic notification if you are using some other FlexNet license and license server administration tool, such as FlexNet Manager. To notify the license server about license changes manually, see Activating Tekla Structures licensing using manual server notification.

6. If not already enabled, enable the automatic license server notification functionality by clicking the **Notify Server** button.
7. Open the license entitlement certificate located in the `..\Tekla \License\Server` folder by clicking **Open**, navigating to `..\Tekla \License\Server`, selecting `EntitlementCertificate.html`, and clicking **Open** again. 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.

Do not forget to take a backup copy of the trusted storage of the activated licenses.

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 159)

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 162) tool.

See also

Upgrade Tekla Structures to a new version (page 159)

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 165)

Install an earlier Tekla Structures service pack (page 166)

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. 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 165)

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. 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 165)

6 Disclaimer

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