

# TEKLA BASECAMP

AUG. 27 - 29

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Recent Developments for Cast-In-Place, Rebar  
and Precast - 2019i



## Overview: Tekla Structures 2109i

### Agenda

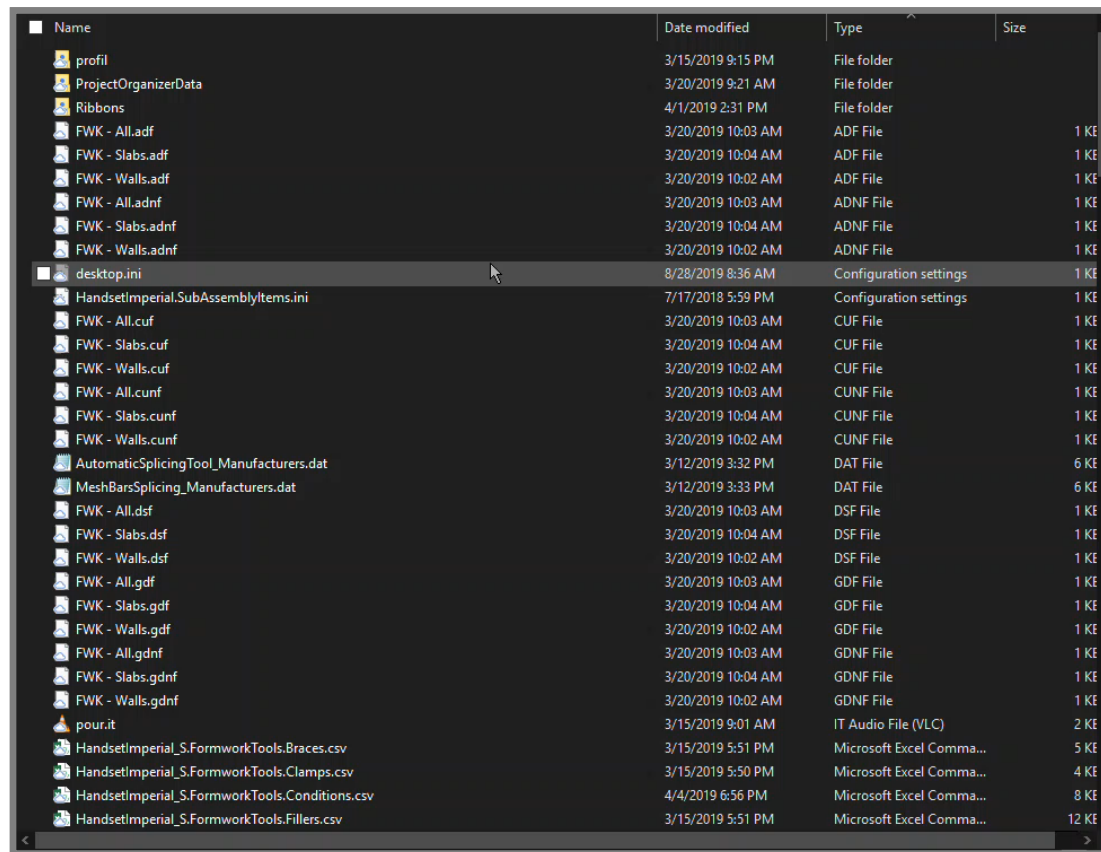
- Updates to Firm & Project Folders
- Improvements to User Interface
- New Parts: Lofted Slabs and Plates
- Improvements in Reinforcement
- Improvements in Components
- What's Coming to Drawings
- Exportation and Interoperability

Tekla Structures 2019i

# UPDATES TO FRIM & PROJECT FOLDERS



## Updates to Frim & Project Folders



Name	Date modified	Type	Size
profil	3/15/2019 9:15 PM	File folder	
ProjectOrganizerData	3/20/2019 9:21 AM	File folder	
Ribbons	4/1/2019 2:31 PM	File folder	
FWK - All.adf	3/20/2019 10:03 AM	ADF File	1 KE
FWK - Slabs.adf	3/20/2019 10:04 AM	ADF File	1 KE
FWK - Walls.adf	3/20/2019 10:02 AM	ADF File	1 KE
FWK - All.adnf	3/20/2019 10:03 AM	ADNF File	1 KE
FWK - Slabs.adnf	3/20/2019 10:04 AM	ADNF File	1 KE
FWK - Walls.adnf	3/20/2019 10:02 AM	ADNF File	1 KE
desktop.ini	8/28/2019 8:36 AM	Configuration settings	1 KE
HandsetImperial.SubAssemblyItems.ini	7/17/2018 5:59 PM	Configuration settings	1 KE
FWK - All.cuf	3/20/2019 10:03 AM	CUF File	1 KE
FWK - Slabs.cuf	3/20/2019 10:04 AM	CUF File	1 KE
FWK - Walls.cuf	3/20/2019 10:02 AM	CUF File	1 KE
FWK - All.cunf	3/20/2019 10:03 AM	CUNF File	1 KE
FWK - Slabs.cunf	3/20/2019 10:04 AM	CUNF File	1 KE
FWK - Walls.cunf	3/20/2019 10:02 AM	CUNF File	1 KE
AutomaticSplicingTool_Manufacturers.dat	3/12/2019 3:32 PM	DAT File	6 KE
MeshBarsSplicing_Manufacturers.dat	3/12/2019 3:33 PM	DAT File	6 KE
FWK - All.dsf	3/20/2019 10:03 AM	DSF File	1 KE
FWK - Slabs.dsf	3/20/2019 10:04 AM	DSF File	1 KE
FWK - Walls.dsf	3/20/2019 10:02 AM	DSF File	1 KE
FWK - All.gdf	3/20/2019 10:03 AM	GDF File	1 KE
FWK - Slabs.gdf	3/20/2019 10:04 AM	GDF File	1 KE
FWK - Walls.gdf	3/20/2019 10:02 AM	GDF File	1 KE
FWK - All.gdnf	3/20/2019 10:03 AM	GDNF File	1 KE
FWK - Slabs.gdnf	3/20/2019 10:04 AM	GDNF File	1 KE
FWK - Walls.gdnf	3/20/2019 10:02 AM	GDNF File	1 KE
pour.it	3/15/2019 9:01 AM	IT Audio File (VLC)	2 KE
HandsetImperial_S.FormworkTools.Braces.csv	3/15/2019 5:51 PM	Microsoft Excel Comma...	5 KE
HandsetImperial_S.FormworkTools.Clamps.csv	3/15/2019 5:50 PM	Microsoft Excel Comma...	4 KE
HandsetImperial_S.FormworkTools.Conditions.csv	4/4/2019 6:56 PM	Microsoft Excel Comma...	8 KE
HandsetImperial_S.FormworkTools.Fillers.csv	3/15/2019 5:51 PM	Microsoft Excel Comma...	12 KE

## Updates to Firm & Project Folders

- Can now create user-defined sub-folders under the Firm and Project folders.
  - Ability to store property files in the sub-folders.
  - Provides a more organized and logical folder structure in the project and firm folders.
  - Tekla Structures can read and copy the property files from the sub-folders when needed.
  - For example, property files are copied when you start sharing a model.

## Updates to Firm & Project Folders

### How It Works: Sub-Folder Hierarchy

1. Tekla Structures first searches for property files in the root folder:
  - ( XS\_FIRM or XS\_PROJECT ).
2. If Tekla Structures finds the first property file with a corresponding file name suffix and file name prefix, the property file is selected.

## Updates to Frim & Project Folders

3. The search continues so that each sub-folder of the root folder is searched in alphabetical order.
4. Tekla Structures ignores each attribute file with the same file name suffix and file name prefix as the previously selected file, and stores each file name in the error log.

## Updates to Firm & Project Folders

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

- ProjectOrganizerData
  - ProjectOrganizerData\DefaultCategoryTrees
  - ProjectOrganizerData\PropertyTemplates
  - ProjectOrganizerData\ExcelTemplates
- AdditionalIPSets
- macros
  - macros\drawings
  - macros\modeling



## Updates to Firm & Project Folders

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

- Drawing Details
- extensions
  - extensions\drawings
  - extensions\model
- CustomInquiry
- PropertyRepository\Templates
- symbols
- template
  - template\mark
  - template\settings
  - template\tooltips
- profil
  - profil\ShapeGeometries
  - profil\Shapes
- Environment folders

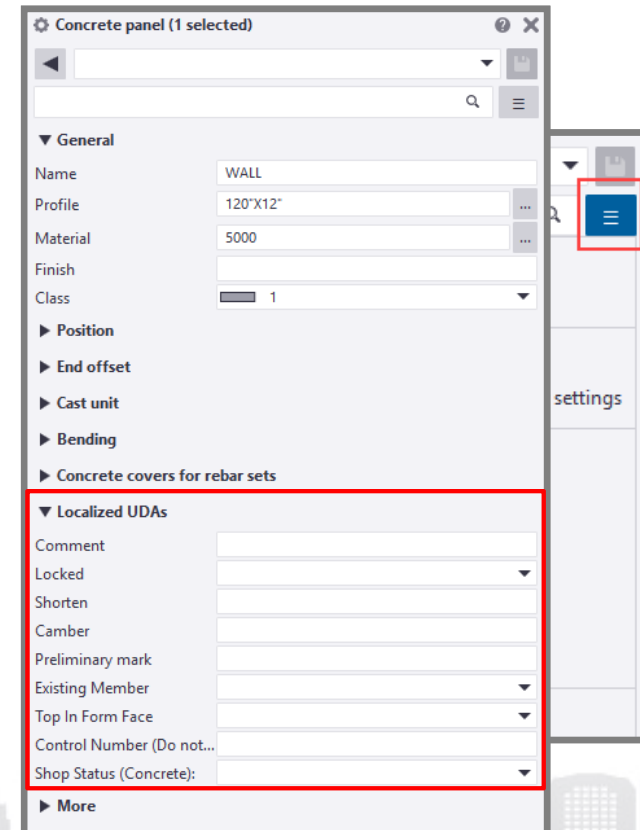
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# USER INTERFACE IMPROVEMENTS



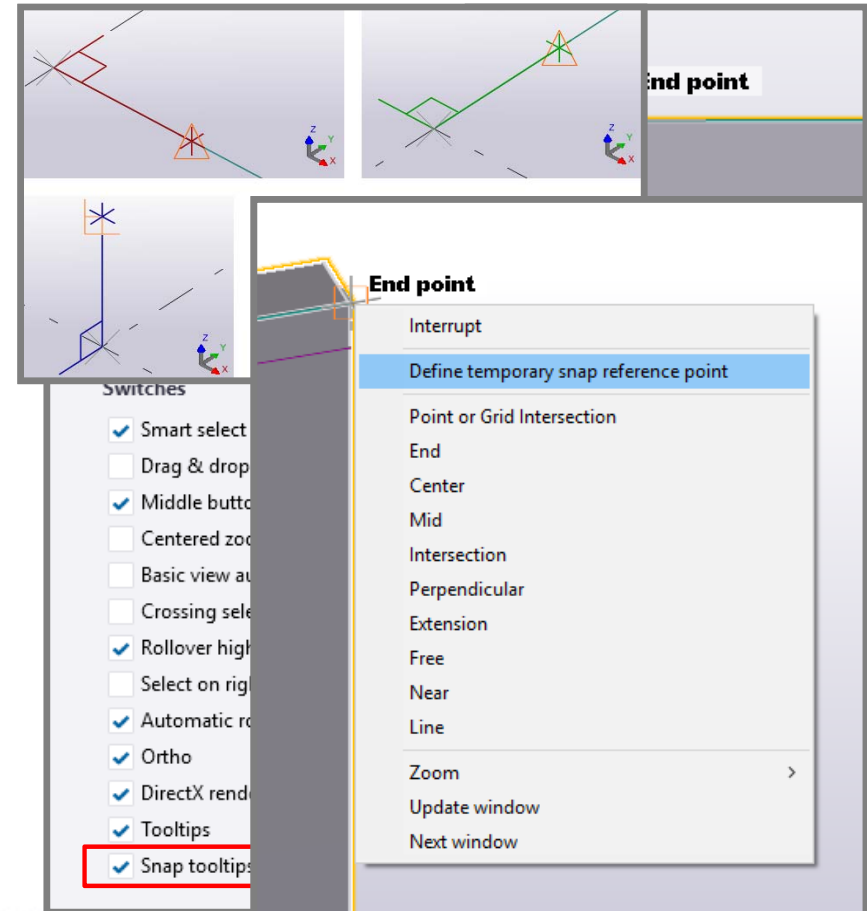
## User Interface: Update to the Properties Pane

- New options to control property visibility in the property pane.
- Expand and Collapse all property categories.
- Show Properties based on values or visibility.
- **NEW:** Localized UDA's.



## User Interface: Updates to Snapping

- Orthogonal Snapping: Reduced Priority.
- Tooltips for Snap Points
  - Can be toggled from the settings menu.
- Snapping Color Changes
  - Corresponds to Axis for easy identification.
- Define a temporary reference point by right-click.



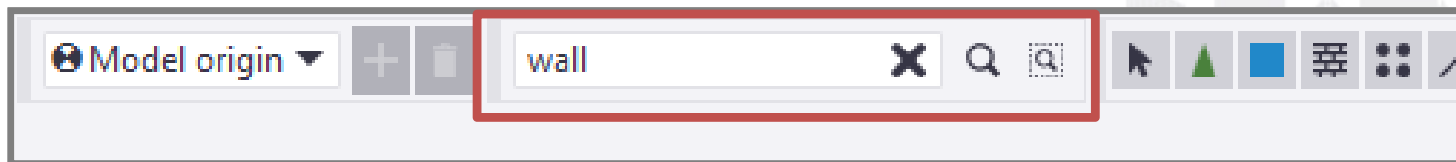
## User Interface: Selected View Angles

- View Angles now available to Model Views, Assemblies and Components.
  - Previously only worked with Parts.
- Executed via the Contextual Toolbar.
- View Angles are applied within the same model view.
- View Angles for assemblies are based on the main part's coordinate system.



## User Interface: Search Model

- Model Search Toolbar
  - Search the entire model.
  - Searches for objects who's property values contain the search term.
  - Highlights and selects results.
  - Located at the left of the selection tool bar.



## User Interface: Search Model

- Model Search Toolbar: Available Criteria
  - **Parts and items** : name, profile or shape, material, part/position/cast unit position number, GUID
  - **Reinforcement** : name, grade, position/cast unit number, GUID
  - **Surfaces** : name, GUID
  - **Components** : name, running number (shown in the **Inquire object** dialog box), GUID
  - **Assemblies** : name, assembly position number, GUID
  - **Cast units** : name, cast unit position number, GUID
  - **All other objects** : GUID

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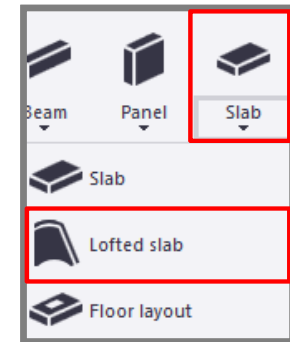
# NEW PART TYPE: LOFTED SLABS AND PLATES





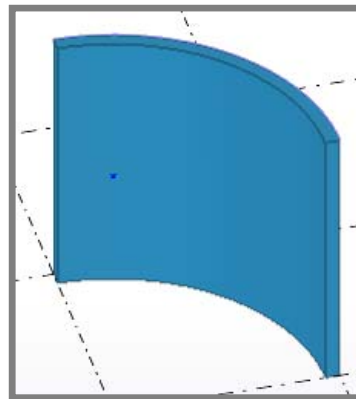
## Lofted Slabs and Plates

- Can be used to create curved and double-curved slabs, walls or plates.
- Two methods of creation:
  - Using two construction objects.
  - Using one construction object and picking a point.
- Lofted Slabs work with Pour View and Pour Breaks.
- Can be modified with Direct Modification and the Properties Pane.
- Can be split vertically using the Split tool.

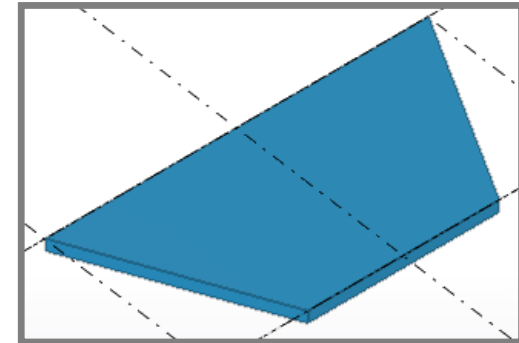


## Lofted Slabs and Plates: Examples

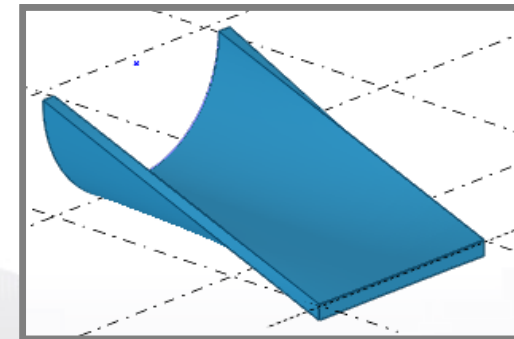
- Sloped or tapered walls and slabs using two construction lines.
- Rolled walls and slabs using a construction line and arc.
- Curved walls or slabs using two construction arcs.



Const. Arc to Const. Arc



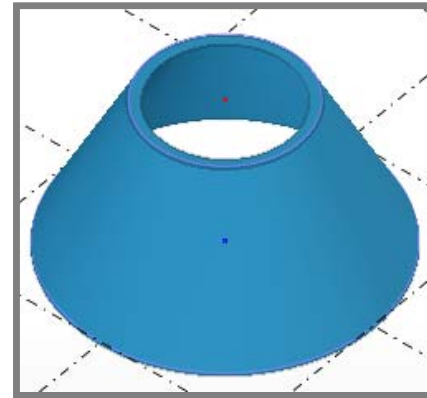
Line to a Line



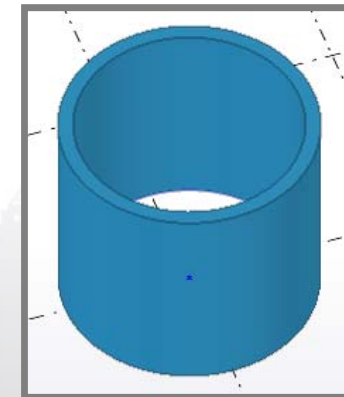
Const. Line to Const. Arc

## Lofted Slabs and Plates: Examples

- Tapered cylindrical shapes using construction circles.
- Uniformed cylindrical shapes using a circle and choosing a point.
- Let's take a closer look...

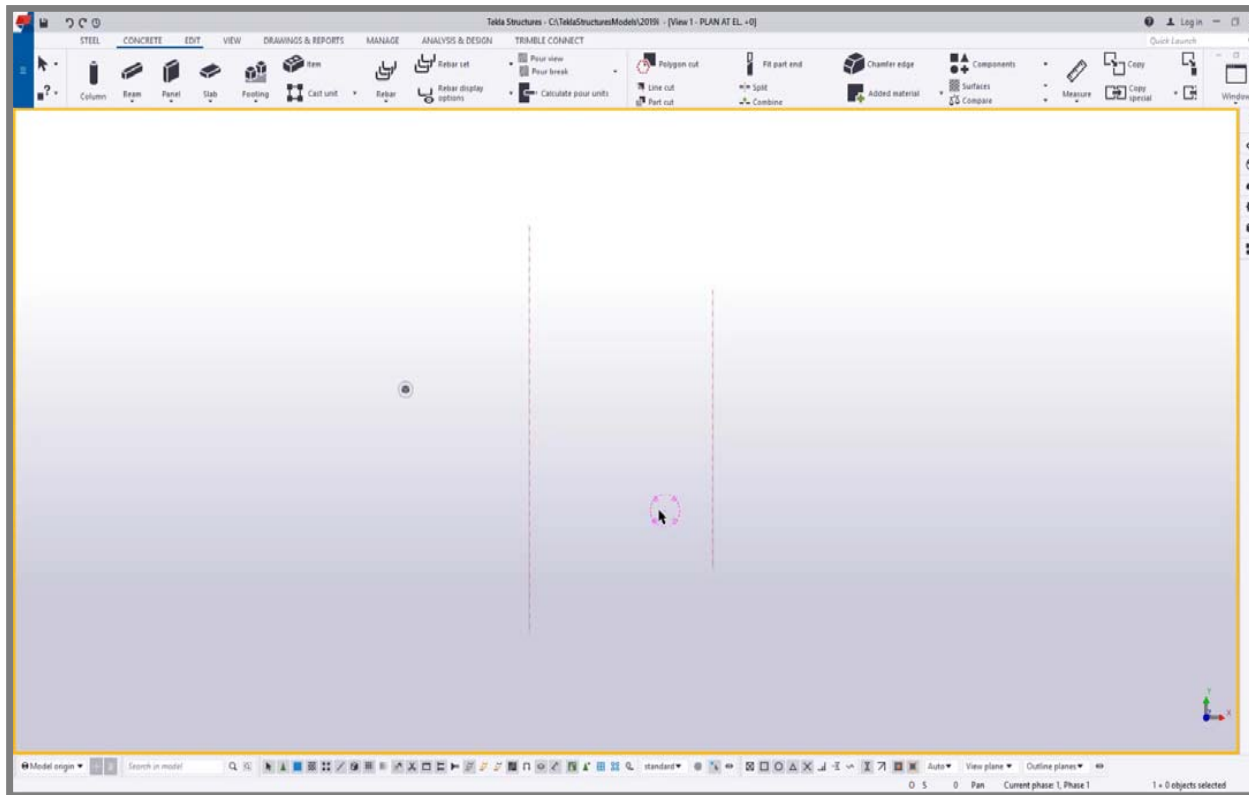


Const. Circle to Const. Circle



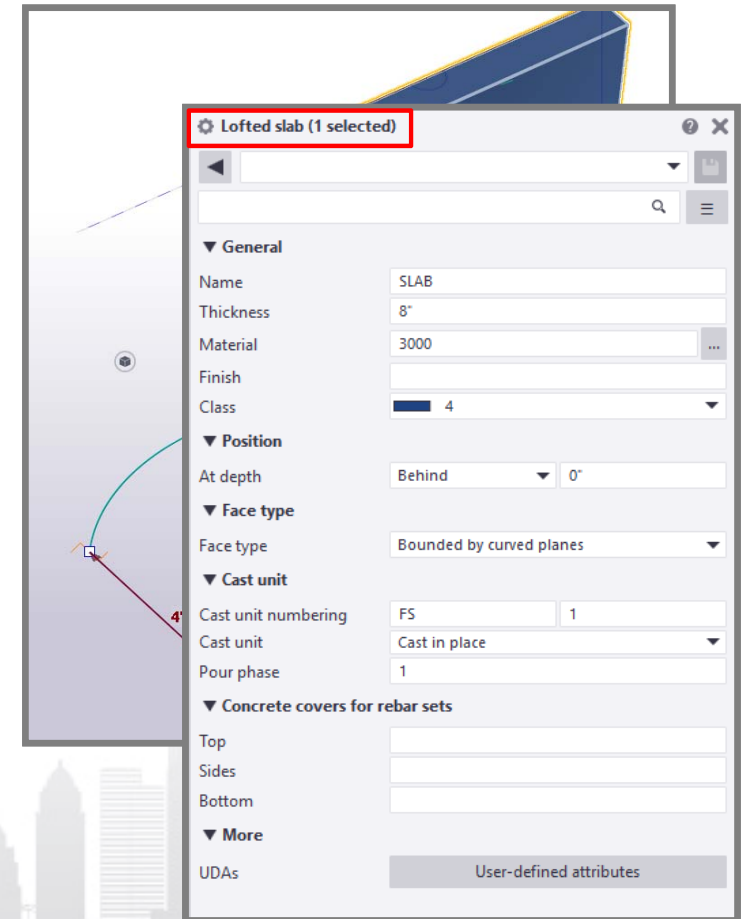
Const. Object to Point

# Lofted Slabs and Plates: Process



## Lofted Slabs and Plates: Modification

- Use direct modification to change the height or radius of a lofted slab or plate.
- Standard properties such as thickness, material or pour phase can be modified via the Properties Pane.
- The Split tool can be used on non-closed cylindrical lofted shapes.



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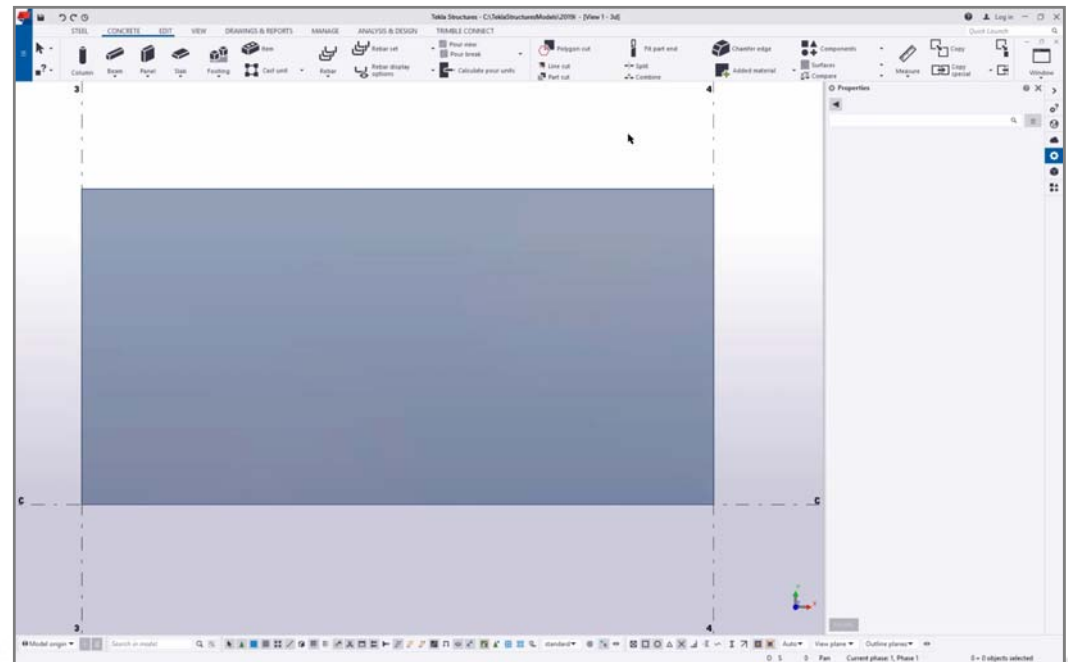
# IMPROVEMENTS IN REINFORCEMENT



## Rebar Sets: Grouping Rebar Sets

### NEW: Manually group Rebar Sets

- Create a rebar set.
- Select the rebar set bars that you want to group.
- Create a property modifier for the bars within the set to be grouped.
- In the Properties pane, **General** section, select **Manual** in the **Grouping** list.



## Rebar Sets: Face Specific Concrete Cover

### NEW: Face Specific Concrete Cover

- Surfaces can now be used to define face specific concrete cover thickness for rebar sets.
- Useful for varying clear cover requirements on a specific concrete parts or pour objects within a project.
- Has more efficient control than selecting the rebar set leg face using direct modification.



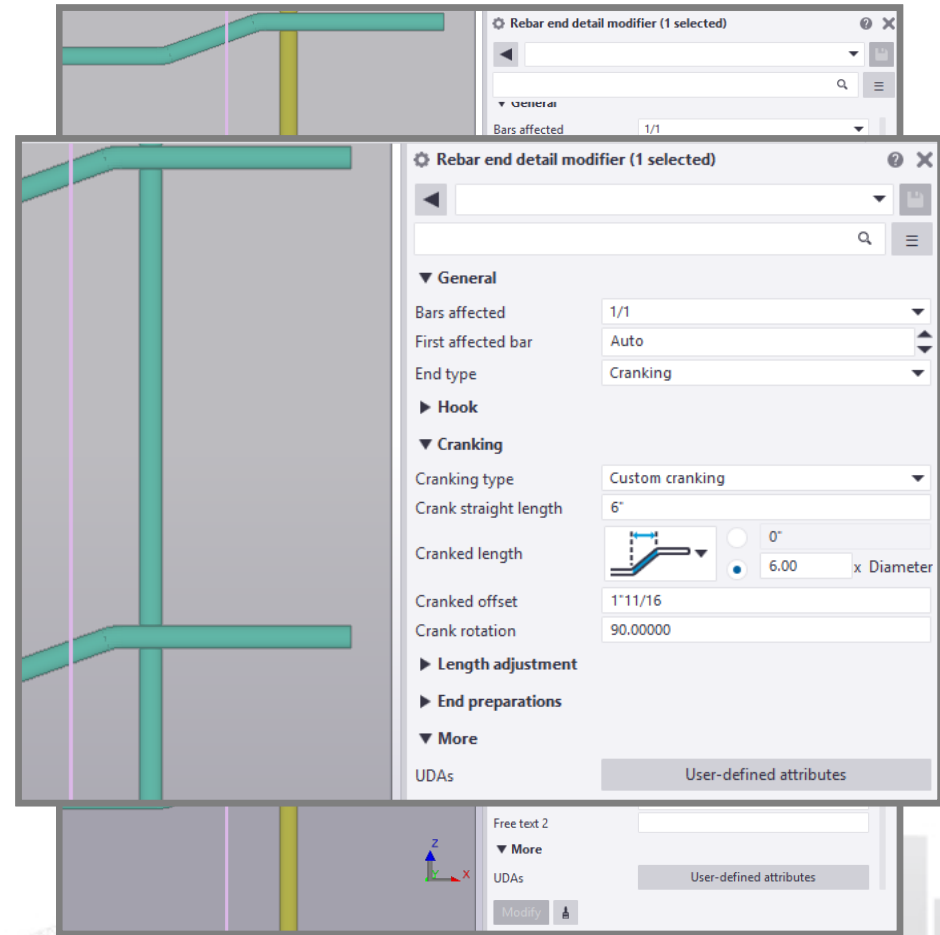
## Rebar Sets: Face Specific Concrete Cover

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



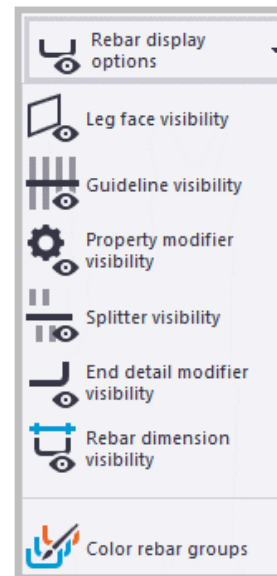
## Rebar Sets: Cranking in End Details

- Cranking has been added as a new **End Detail Type**.
  - Found in the end detail modifier properties.
  - Useful in reinforcing splice walls or columns of different sizes in successive floors.



## Rebar Sets: New Hot Keys

- Shortcuts to visibility of set guidelines.
  - Guidelines are shown by default.
- Shortcuts for Selection Switches.
- Provides more efficient visibility control while using rebar sets.



### Rebar Display Hot Keys

- **Alt+1**: Leg face visibility
- **Alt+2**: Guideline visibility
- **Alt+3**: Property modifier visibility
- **Alt+4**: Splitter visibility
- **Alt+5**: End detail modifier visibility
- **Alt+6**: Rebar dimension visibility
- **Alt+7**: Color rebar groups

### Rebar Selection Hot Keys

- **Alt+Q**: Select Rebar Sets
- **Alt+W**: Select Rebar Groups
- **Alt+E**: Select Single Rebar

## Rebar: Other Improvements

### New .inp file for Rebar Sets

- **objects\_rebar\_set.inp**
- Contains all the User-Defined Attributes for Rebar Sets.
- Easier to manage than the several separate files from previous versions.

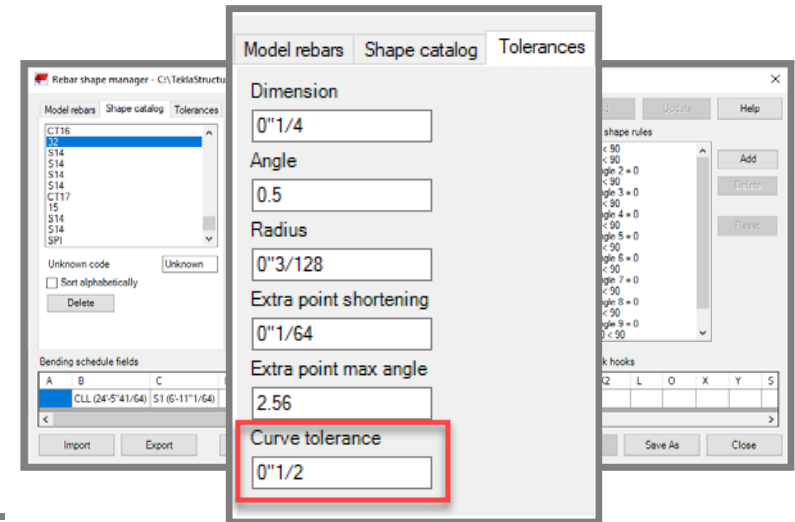
### Rebar Shape Manager

- Updated to recognize multiple sequential bar bends that form an arc.

## Rebar: Other Improvements

### Rebar Shape Manager (cont.)

- Now combined into one or more bend with an arc radius.
  - Creates bends 90 degrees or less.
- `XS_REBAR_COMBINE_BENDINGS_IN_EVALUATOR`
  - Needs to be set to TRUE.
- Used with New Tolerance Setting: **Curved Tolerance**

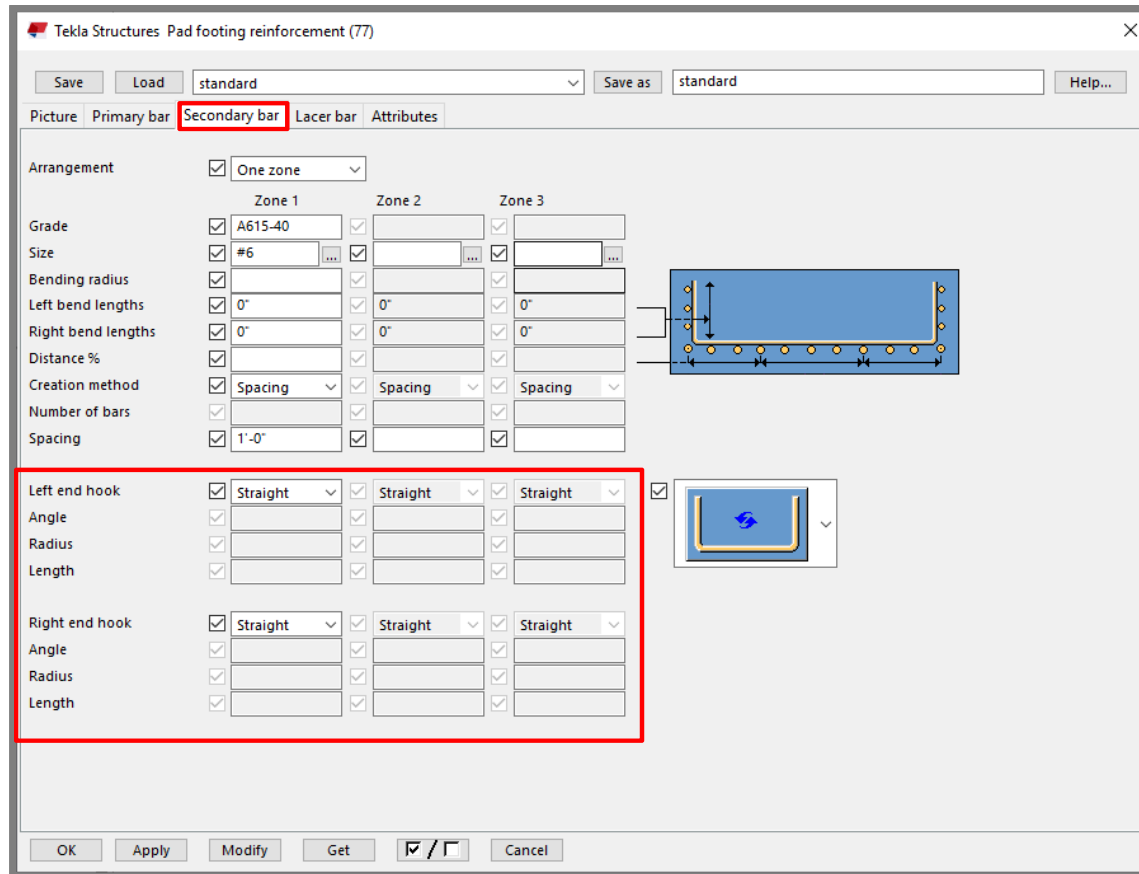


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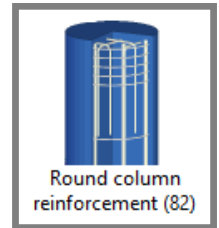
# IMPROVEMENTS IN COMPONENTS



# Pad Footing Reinforcement (77)



# Round Column Reinforcement (82)



Tekla Structures Round column reinforcement (82)

Save Load standard Save as standard Help...

Main bars Stirrups Stirrup attributes Top Bottom Advanced (main bars)

0°  1'-8"  1'-8"  0°

Number of bars:  6  
Rotation:  0.00000  
Grade:  A615-60  
Size:  #8  
Bending radius:   
Class:  214  
Name:  REBAR  
Prefix:  R  
Start number:  1

OK Apply Modify Get  /  Cancel



# Rebar in Beam (90)

Tekla Structures Rebar in beam (90)

Save Load standard Save as standard Help...

Primary bottom bars Primary top bars Side left Side right **Stirrups** Stirrup spacing Stirrups 2 Stirrup 2 spacing Stirrups 3 Stirrup 3 spacing Advanced Configuration

Grade  A615-60  
Size  #4  
End conditions left  90 degree  
End conditions right  90 degree  
Bend lengths left  4 1/2  
Bend lengths right  4 1/2

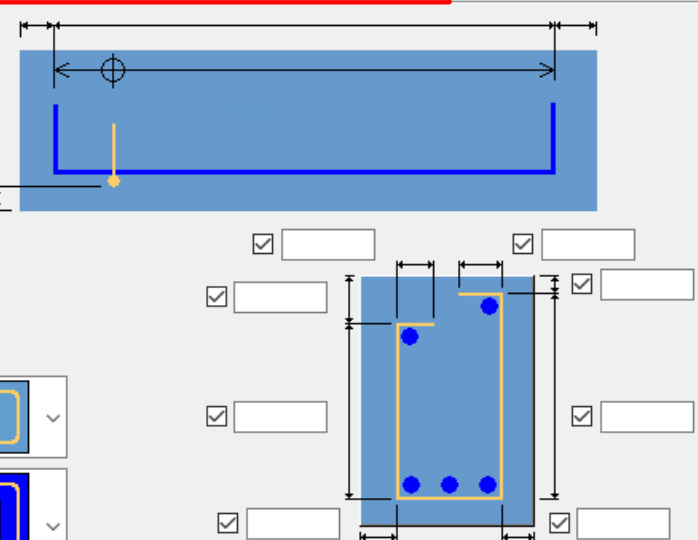
Bar no to create  [ ]

Create stirrups

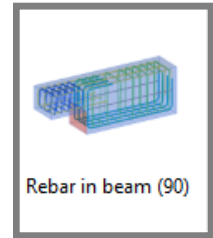
As one group  
No  
As one group  
As separate groups

Single stirrup

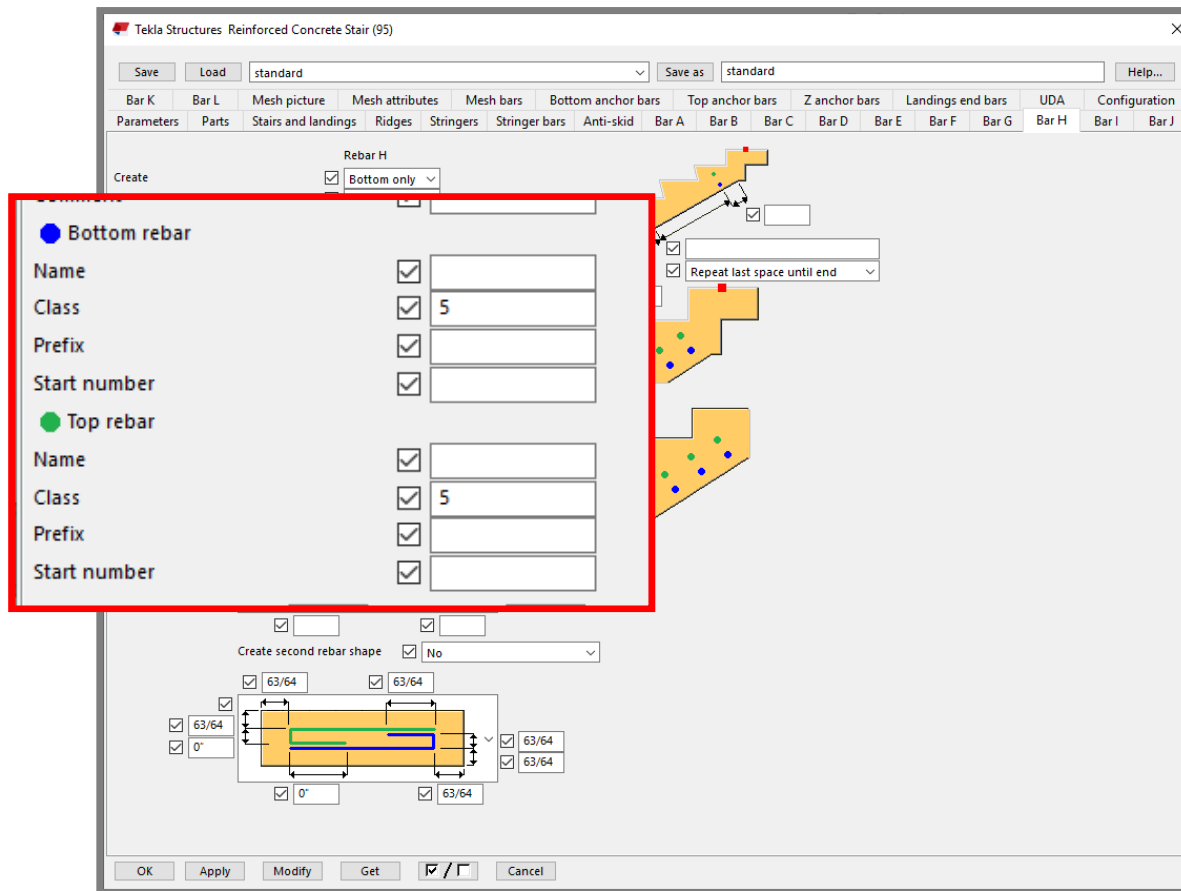
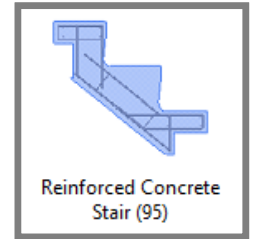
a:  [ ]  
b:  [ ]  
c:  [ ]  
d:  [ ]  
e:  [ ]



OK Apply Modify Get  /  Cancel



# Reinforced Concrete Stair (95)



Rebar H

Create

Bottom only

Repeat last space until end

Bottom rebar

Name

Class  5

Prefix

Start number

Top rebar

Name

Class  5

Prefix

Start number

Create second rebar shape  No

63/64  63/64

63/64  63/64

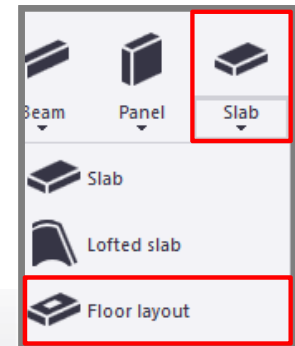
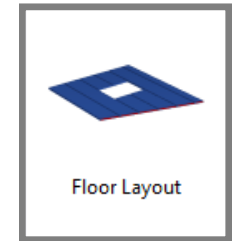
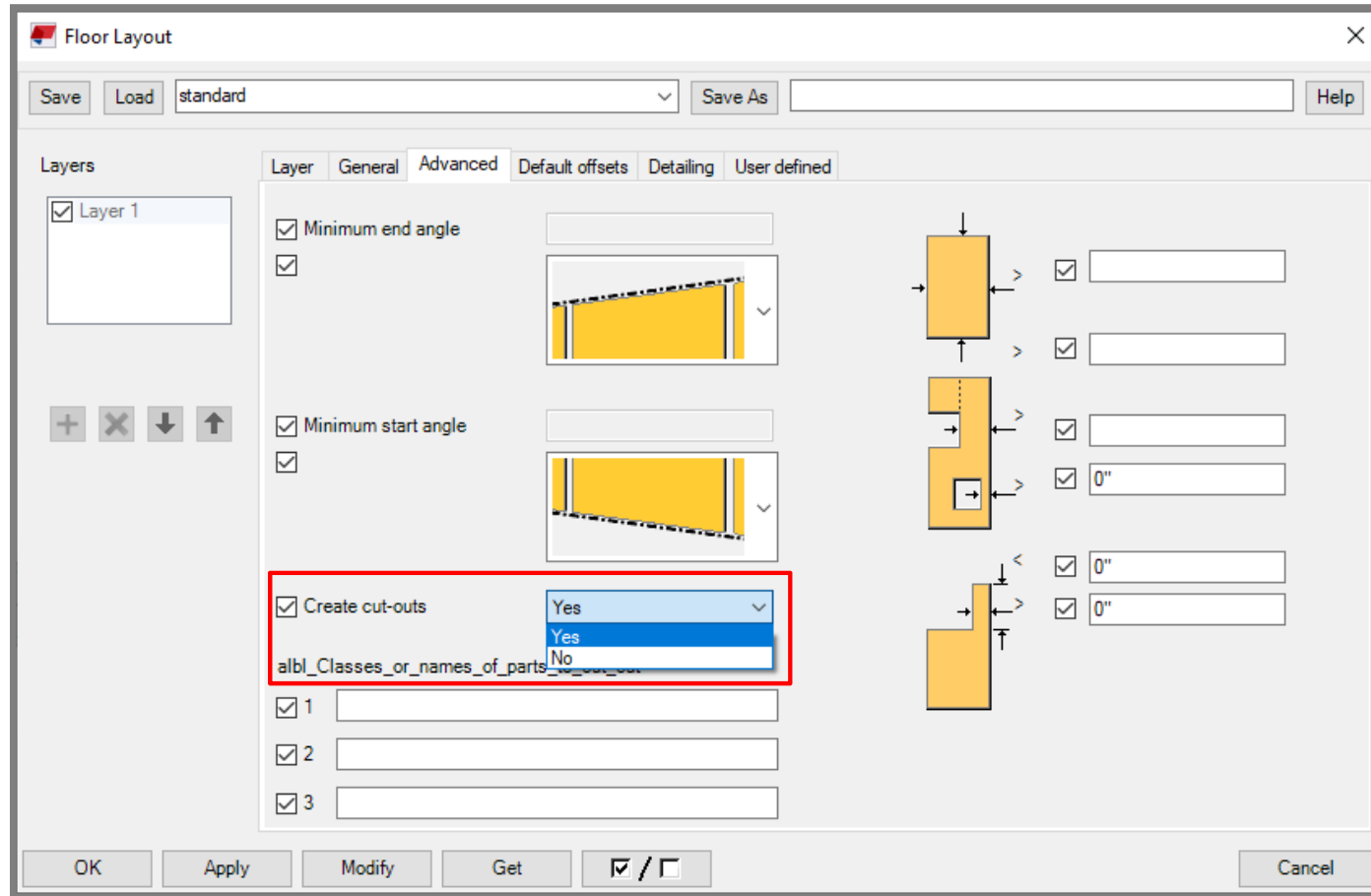
0°  63/64

0°  63/64

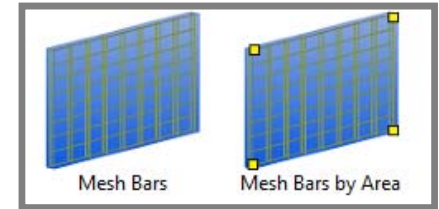
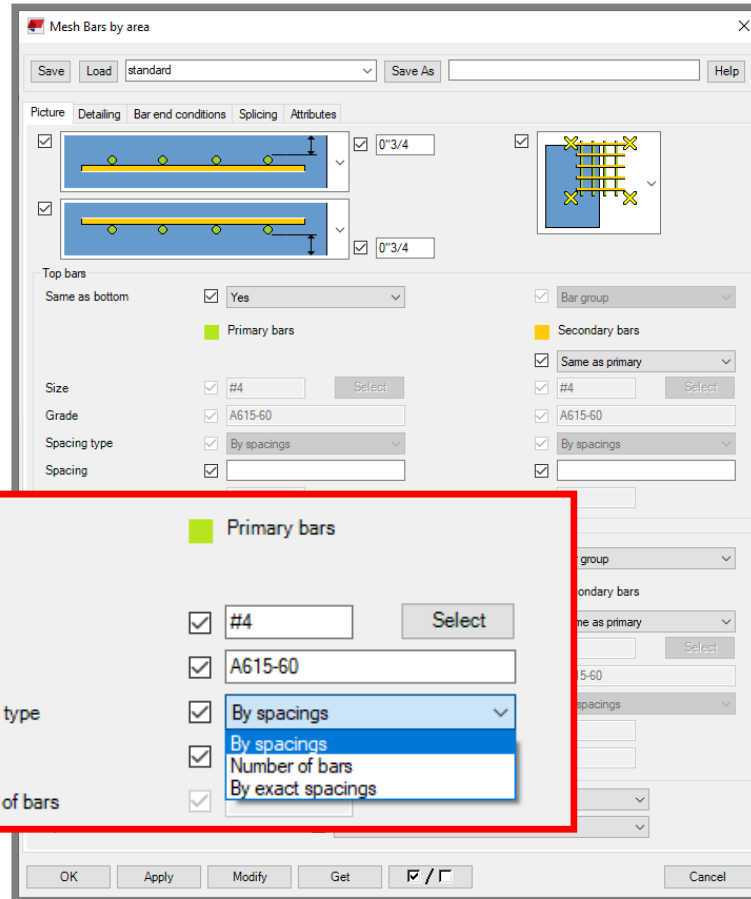
63/64  63/64

OK Apply Modify Get  /  Cancel

# Floor Layout



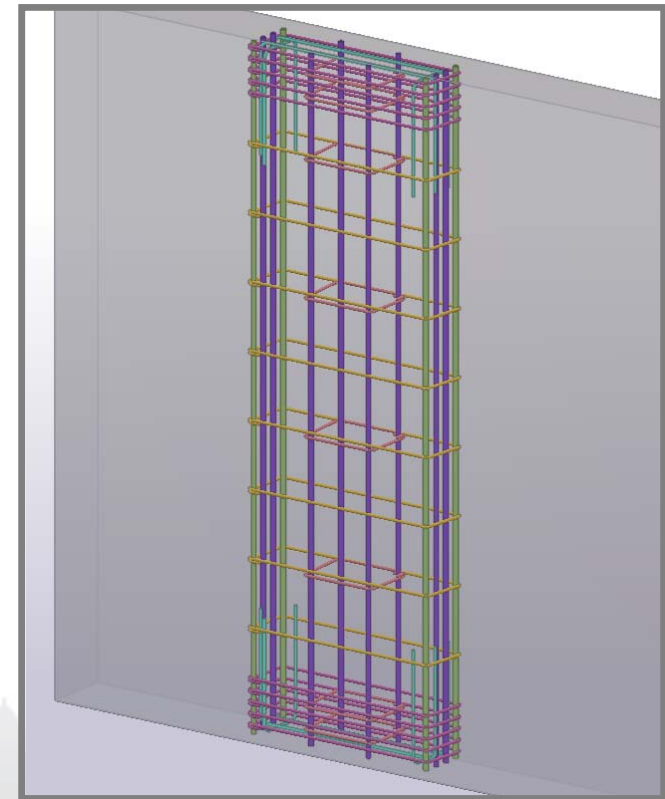
# Mesh Bars / Mesh Bars by Area



## Components: Rectangular Area Reinforcement (94)

### NEW: Rectangular Area Reinforcement

- Defines a rectangular rebar cage within a wall or slab.
- Objects created:
  1. Corner bars
  2. Side bars
  3. Stirrups
  4. Intermediate links
  5. Top and bottom bars



## Components: Rectangular Area Reinforcement (94)



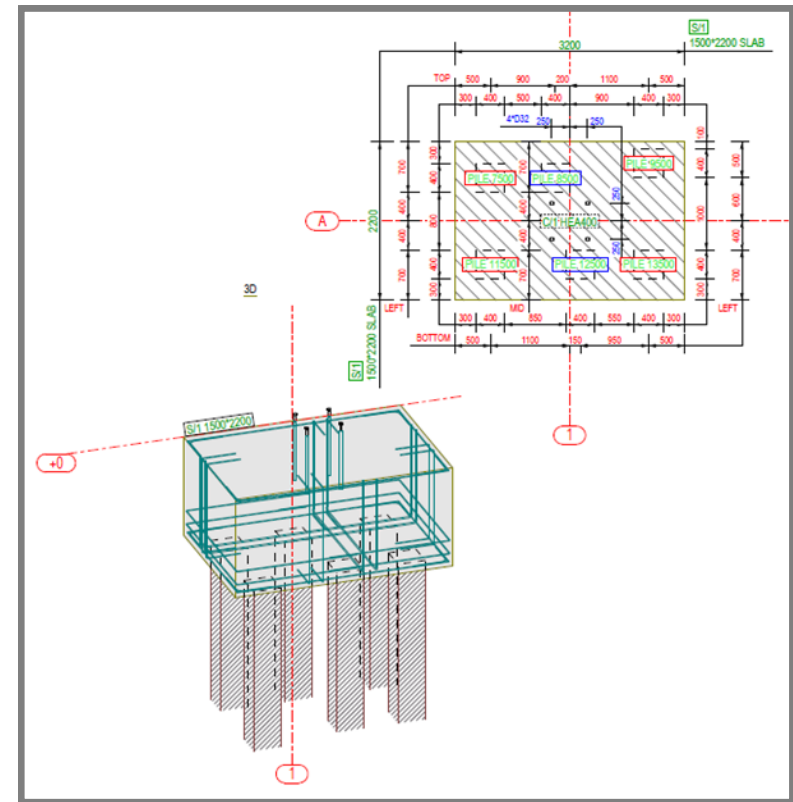
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# WHAT'S COMING TO DRAWINGS



## Drawings: General Improvements

- View Frames
  - Previously frames around views were always present.
  - Cluttered visibility when editing drawings.
- Drawing Frames are now Hidden
  - Become visible when you move the cursor over the view.
  - If you select a view, the drawing view frame stays visible.

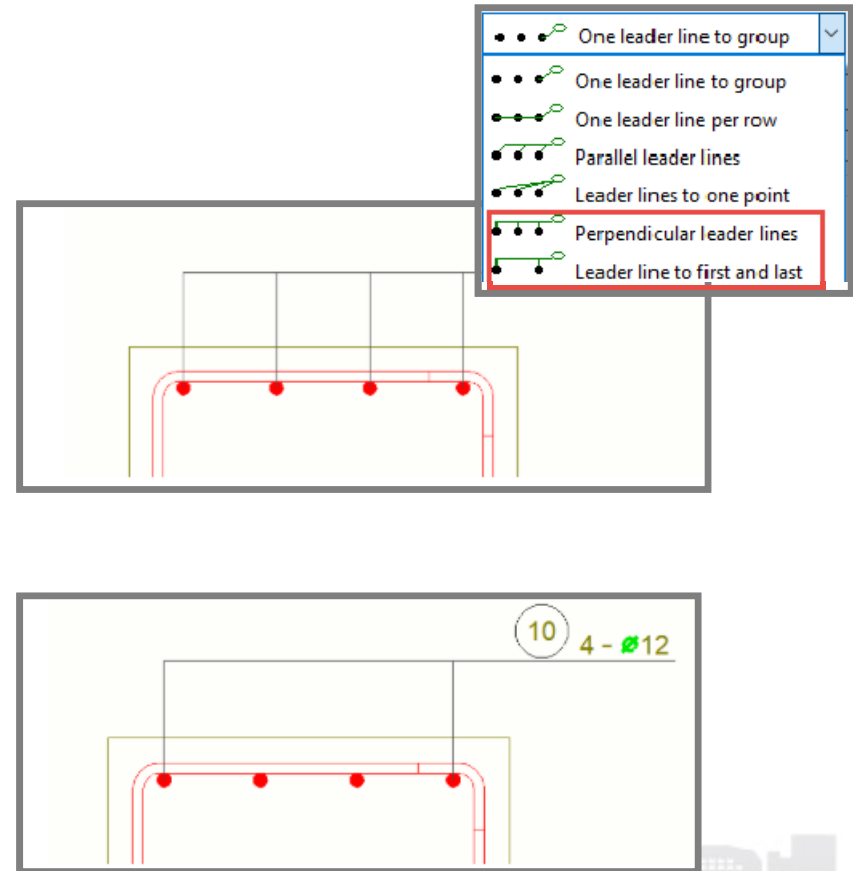




## Drawings: General Improvements

### Reinforcing Group Marks

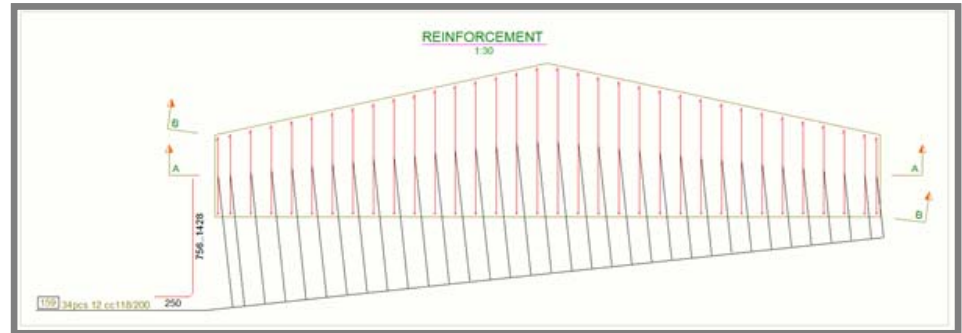
- Two New Types:
  - Perpendicular Leader Lines
  - Leader Line to First and Last
- Provides options for cleaner drawing layout for reinforcement drawings.
- Available in Cast Unit and General Arrangement Drawings.



## Drawings: General Improvements

- When using the two new options, leader lines always place horizontally or vertically.
- Length of the perpendicular line is controlled in Advanced Options.

BEFORE:



2019i:



## Drawings: Cast Unit Drawings

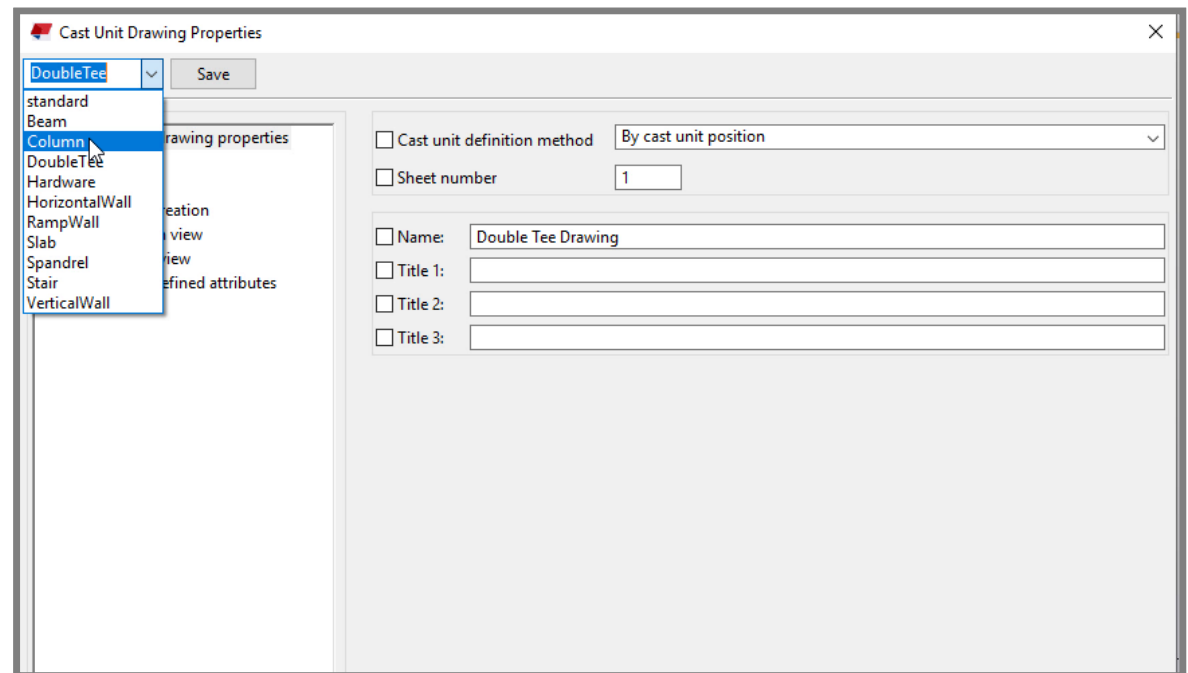
### Cast Unit Drawings

- Revised presets for common Precast elements.
- More efficient view creation and placement.
- Better results with Dimensioning in views.
- Reduction in additional work per drawing using default settings.
- Better starting point for creating company specific standards and settings.

## Drawings: Cast Unit Drawings

- Revised Settings:

- Beam
- Column
- Double Tee
- Hardware
- Horizontal Wall
- Ramp Wall
- Slab
- Spandrel
- Stair
- Vertical Wall



## Drawings: Cast Unit Drawings

2  
0  
1  
9

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# EXPORTATION AND INTEROPERABILITY



## Concrete Fabrication: Export Improvements

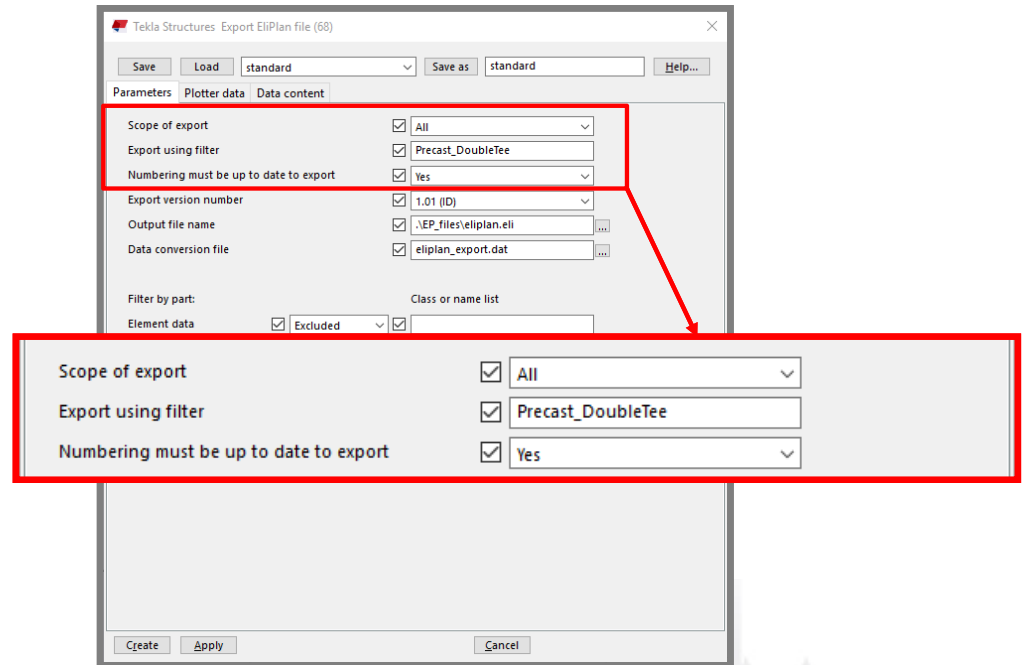
- Unitechnik
  - New options for specifying Name of Order and Drawing Number
  - New Unloading Type setting for SLABDATE block data.
  - New options to Rotate Geometry upon Export.
    - Found on the TS Configuration Tab.
- BVBS
  - Now exports with the Nominal Rebar Diameter regards of advance options.
  - New options for Rounding Lengths.



## Concrete Fabrication: ELiPLAN

- **Export EliPlan file** has been improved in the following ways:

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





## Export: IFC

# Export to IFC Improvements

- IFC2x3
  - Can now export Radial Grids
- IFC4
  - New Export Type: IFC4precast view.
    - Supports fabrication data transfer workflow of precast elements.
    - Currently supports walls and slabs and associated reinforcement and embeds.

## Export: 3D DWG & 3D DGN v8

### Updates to Exporting to 3D DWG or 3D DGN v8

- Both now can export with the base point functionality.
- 3D DGN now has the requested v8 format.
- Several new export settings available in the new 3D DNG v8 export.
  - Can now export objects relative to the model origin to the base point you define, or to the work plane.
  - Can now export in layers by name, phase or any template attribute or user-defined attribute.
  - Colors can be exported by class or by stored object representation.
  - Can export all objects or selected objects.
- The old 3D DWG/DXF or 3D DGN v7 exports will still be available in **File > Export** .

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# RECAP



## Recap:

### Updates to Firm/Project Folders

- Introduction of User-defined sub-folders.

### User Interface

- Updates to Properties Pane
- Improvements to Snapping
- Improvements to Views
- Ability to Search the Model

### New Parts

- Lofted Slabs and Plates
  - Use of Construction Objects
  - Different Types
  - Overall creation process.

## Recap:

### Reinforcement Improvements

- Manually Group Rebar Sets
- Face Specific Concrete Cover
- Create Cranking with End Detail Modifiers
- New Hot Keys for Reinforcement Selection

### Applications & Components

- **New Component:** Rectangular Area Reinforcement (94)
- Pad Footing Reinforcement (77)
- Round Column Reinforcement (82)
- Rebar in Beam (90)
- Reinforced Concrete Stair (95)
- Floor Layout
- Wall Panel Reinforcement
- Mesh Bars / Mesh Bars by Area

## Recap:

### What's Coming for Drawings

- Hidden View Frames
- Two new types of Reinforcing Group Marks.
- Update to Cast Unit Drawing settings for Precast elements.

### Exportation & Interoperability

- Updates to BVBS, ELiPlan and Unitechnik.
- Updates to IFC Export
  - Radial Grids in IFC2x3
  - IFC4precast view for IFC4
- Updates to 3D DWG and 3DGN.

**THANK YOU!**



