

# Appendix 4

## CIC BIM User Guide for Preparation of Statutory Plan Submissions

# Tekla



December 2020

### **Disclaimer**

*Whilst reasonable efforts have been made to ensure the accuracy of the information contained in this publication (Reference Materials), the CIC nevertheless encourages readers to seek appropriate independent advice from their professional advisers where possible. Readers should not treat or rely on this publication (Reference Materials) as a substitute for such professional advice.*

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## **Preface**

The Construction Industry Council (CIC) is committed to seeking continuous improvement in all aspects of the construction industry in Hong Kong. To achieve this aim, the CIC forms Committees, Task Forces and other forums to review specific areas of work with the intention of producing Alerts, Reference Materials, Guidelines and Codes of Conduct to assist participants in the industry to strive for excellence.

The CIC appreciates that some improvements and practices can be implemented immediately whilst others may take more time for implementation. It is for this reason that four separate categories of publication have been adopted, the purposes of which are as follows:

Alerts	The Alerts are reminders in the form of brief leaflets produced quickly to draw the immediate attention of relevant stakeholders to the need to follow some good practices or to implement some preventive measures in relation to the construction industry.
Reference Materials	The Reference Materials are standards or methodologies generally adopted and regarded by the industry as good practices. The CIC recommends the adoption of the Reference Materials by industry stakeholders where appropriate.
Guidelines	The Guidelines provide information and guidance on particular topics relevant to the construction industry. The CIC expects all industry stakeholders to adopt the recommendations set out in the Guidelines where applicable.
Codes of Conduct	The Codes of Conduct set out the principles that all relevant industry participants should follow. Under the Construction Industry Council (Cap 587), the CIC is tasked to formulate codes of conduct and enforce such codes. The CIC may take necessary actions to ensure compliance with the codes.

If you have read this publication, we encourage you to share your feedback with us. Please take a moment to fill out the Feedback Form attached to this publication in order that we can further enhance it for the benefit of all concerned. With our joint efforts, we believe our construction industry will develop further and will continue to prosper for years to come.

# Foreword

I am glad to see the release of **CIC BIM User Guide for Preparation of Statutory Plan Submissions Tekla (December 2020)**. This software specific user guide shall be read in conjunction with the **CIC BIM Standards for Preparation of Statutory Plan Submissions (December 2020)**.

This software specific user guide is only provided to demonstrate the feasibility of drawings generation with the Standards.

With the software specific user guides which contains step by step procedures of modelling, BIM users can easily apply the templates for the generation of statutory plan submission drawings.

Feedback on the CIC BIM User Guide for Preparation of Statutory Plan Submissions Tekla (December 2020) from practitioners subsequent to the issuance of this publication will be considered in future revisions.

On behalf of the CIC, I would like to thank everyone who has contributed to producing this CIC BIM User Guide for Preparation of Statutory Plan Submissions Tekla (December 2020), in particular to the members of the Task Force on BIM Standards.

Ar. Ada FUNG, BBS

Chairperson

Committee on Building Information Modelling

Construction Industry Council

December 2020

# **1 Hardware / System Requirements**

## **1.1 General**

Hardware / system requirement for modellings, coordination and visualisation on desktop/notebook computers and mobile devices should be determined by the BIM managers for different projects on a case by case basis. The minimum requirement varies for different applications, project sizes and operating systems.

<https://teklastructures.support.tekla.com/support-articles/tekla-structures-2019-hardware-recommendations>

## 2 Tekla Basics

This guideline only provides the necessary information to produce 2D statutory submission drawings. Please refer to the official website linked below for a complete understanding of Tekla.  
<https://teklastructures.support.tekla.com/tekla-structures-2019-pdf-documentation>

### 2.1 User Interface

Information of user interface could be found in the official website here:

[https://teklastructures.support.tekla.com/2019/en/gen\\_interface\\_overview](https://teklastructures.support.tekla.com/2019/en/gen_interface_overview)

### 2.2 Project base point, Grid, Levels and Work Planes

Project base point defines the origin (0,0,0) of the project coordinate system initially Location of point can be determined by the project team or BIM manager as a reference point. Steps to set up project base points in Tekla could be found from the official website here :

[https://teklastructures.support.tekla.com/2019/en/int\\_base\\_point](https://teklastructures.support.tekla.com/2019/en/int_base_point)

Grids and Levels are essential for users to model and identify objects in Tekla effectively, Steps to set up grids and levels in Tekla could be found from the official website here :

[https://teklastructures.support.tekla.com/2019/en/mod\\_grids](https://teklastructures.support.tekla.com/2019/en/mod_grids)

[https://teklastructures.support.tekla.com/2019/en/mod\\_creating\\_a\\_grid](https://teklastructures.support.tekla.com/2019/en/mod_creating_a_grid)

Work Plane is a vital concept for users to model objects in Tekla, this official link is useful for users to understand work planes in Tekla :

[https://teklastructures.support.tekla.com/190/en/mod\\_work\\_plane](https://teklastructures.support.tekla.com/190/en/mod_work_plane)

### 2.3 Parts and Components

Tekla objects could be classified into parts, components, assemblies, cast units etc. In this user guide, users mainly need to use parts (for example; concrete parts such as beam, column, slabs and panels) and components (for example; rebar components). These official web pages provide good guidance for creating parts in Tekla:

[https://teklastructures.support.tekla.com/190/en/mod\\_creating\\_and\\_modifying\\_structures](https://teklastructures.support.tekla.com/190/en/mod_creating_and_modifying_structures)

[https://teklastructures.support.tekla.com/190/en/mod\\_creating\\_concrete\\_slab?da=](https://teklastructures.support.tekla.com/190/en/mod_creating_concrete_slab?da=)

Components in Tekla could greatly increase the efficiency of modelling works, information about components could be found in this official web site:



[https://teklastructures.support.tekla.com/2017/en/det\\_getting\\_started\\_overview](https://teklastructures.support.tekla.com/2017/en/det_getting_started_overview)

## 2.4 Catalogs and Define Profiles

Tekla allow users to define customised profiles for members sections; users may refer to the link below for more information

[https://teklastructures.support.tekla.com/2019/en/mod\\_profiles](https://teklastructures.support.tekla.com/2019/en/mod_profiles).

## 2.5 Phases, View Filter and Organiser

Phases are usually used by Tekla users to classify different object-groups (such as ELS, foundations or superstructures) in Tekla, differ from Revit, phase not necessarily be used to record sequential data of objects in Tekla. Users may use “Pour Phase” in Tekla to record chronological information of Tekla concrete parts. For steel parts and assemblies, part or assembly numbers are commonly used to achieve the same goal.

[https://teklastructures.support.tekla.com/2019/en/mod\\_dividing\\_the\\_model\\_into\\_phases](https://teklastructures.support.tekla.com/2019/en/mod_dividing_the_model_into_phases)

In order to do 3d-modelling and produce drawings efficiently, phases are often used together with the view filter. View filter could also be used to control the visibility of different Tekla elements. More information about view filters could be found from the official website below :

[https://teklastructures.support.tekla.com/190/en/mod\\_creating\\_a\\_view\\_filter](https://teklastructures.support.tekla.com/190/en/mod_creating_a_view_filter)

[https://teklastructures.support.tekla.com/190/en/mod\\_filtering\\_parts\\_in\\_specific\\_phases](https://teklastructures.support.tekla.com/190/en/mod_filtering_parts_in_specific_phases)

Organisers are used mainly for quantity take off purpose in Tekla, this web page provides more information about organiser in Tekla, in this document, organiser would not be discussed as it is not related to statutory drawing submissions.

[https://teklastructures.support.tekla.com/2019/en/mod\\_organizer](https://teklastructures.support.tekla.com/2019/en/mod_organizer)

## 2.6 Suggested Model Nesting Method, Reference Models and Model Sharing

Tekla is not designed to link-up with other Tekla models. For users who want to link two Tekla models together, they need to export one Tekla model as ifc and add that ifc model to another model via the “Reference Model” function in Tekla.

Information about the reference model could be found in this official web page ; files such as ifc, dwg, dgn, skp, xml, etc. could all be linked to Tekla by using this method.

[https://teklastructures.support.tekla.com/2019/en/int\\_inserting\\_a\\_reference\\_model](https://teklastructures.support.tekla.com/2019/en/int_inserting_a_reference_model)

2D reference information, such as 2D dwg/dgn maps bought from the Lands Department website shall also be linked to Tekla file by using a reference model.

Tekla allow multi-user-editing, please refer this web page for “Model Sharing” in Tekla

[https://teklastructures.support.tekla.com/2019/en/ms\\_what\\_is\\_model\\_sharing](https://teklastructures.support.tekla.com/2019/en/ms_what_is_model_sharing)

## 2.7 Views and Drawings

Views in Tekla are used to facilitate both 3D-modeling works and 2D drawing production. This web page summarises information about views in Tekla.

[https://teklastructures.support.tekla.com/2019/en/mod\\_views](https://teklastructures.support.tekla.com/2019/en/mod_views)

Users could produce 2D drawings after creating different views in Tekla. There are five different drawing types in Tekla, namely (1) general arrangement drawings, (2) single-part drawings, (3) assembly drawings, (4) Cast-unit drawings and (5) Multidrawings.

For the production of statutory-submission, only general arrangement drawings will be discussed in this user guide. Please refer to the link below for more information about creating general drawings by Tekla. Tekla will be switched from modelling mode to drawing mode for drawing production.

[https://teklastructures.support.tekla.com/2019/en/dra\\_creating\\_ga\\_drawings\\_using\\_menu\\_toolbar\\_or\\_popup](https://teklastructures.support.tekla.com/2019/en/dra_creating_ga_drawings_using_menu_toolbar_or_popup)

## 2.8 Annotation and Dimensioning

Users can create annotation and dimensions on drawings in drawing mode. Below are some web page links for more information.

[https://teklastructures.support.tekla.com/2019/en/dra\\_arranging\\_drawing\\_objects](https://teklastructures.support.tekla.com/2019/en/dra_arranging_drawing_objects)

[https://teklastructures.support.tekla.com/2019/en/dra\\_manual\\_dimensions](https://teklastructures.support.tekla.com/2019/en/dra_manual_dimensions)

## 2.9 Template Editor, Tables and Drawing Layout

Drawing frames, or so we call title block, were produced by template editor in Tekla. Template editor could also be used to produce schedules or tables in 2D drawings. This video provides a brief introduction about template editor in Tekla.

[https://teklastructures.support.tekla.com/video-tutorials/en/layout\\_editor](https://teklastructures.support.tekla.com/video-tutorials/en/layout_editor)

[https://teklastructures.support.tekla.com/system/files/document\\_attachments/TE\\_USG\\_380\\_en\\_Template\\_editor\\_user\\_guide.pdf](https://teklastructures.support.tekla.com/system/files/document_attachments/TE_USG_380_en_Template_editor_user_guide.pdf)

This video shows how the template editor could be used to produce schedules in 2D drawings.

[https://teklastructures.support.tekla.com/video-tutorials/en/introduction\\_to\\_template\\_editor](https://teklastructures.support.tekla.com/video-tutorials/en/introduction_to_template_editor)

## 2.10 2D Library and Symbol Editor

Tekla has some features to enable users to manage 2D drawing pieces and 2D symbols. They are namely the 2D Library and symbol editor. Please refer to the links below for more information.

[https://teklastructures.support.tekla.com/video-tutorials/en/2d\\_library](https://teklastructures.support.tekla.com/video-tutorials/en/2d_library)

[https://teklastructures.support.tekla.com/video-tutorials/en/add\\_symbols](https://teklastructures.support.tekla.com/video-tutorials/en/add_symbols)

[https://teklastructures.support.tekla.com/system/files/document\\_attachments/SE\\_USG\\_300\\_en\\_Symbol\\_editor\\_user\\_guide.pdf](https://teklastructures.support.tekla.com/system/files/document_attachments/SE_USG_300_en_Symbol_editor_user_guide.pdf)

## 2.11 User Define Attributes

Tekla enables users to introduce user-defined-attributes (UDA) to manage information about Tekla objects. An example of applying UDA to Tekla objects is provided as bored piles in the sample models. This requests users to acquire advanced Tekla skills, including some basic coding skills. For those who are interested, please refer to the link below, this user guide would not discuss this in detail.

[https://teklastructures.support.tekla.com/cs/191/en/sys\\_example\\_creating\\_and Updating\\_uda](https://teklastructures.support.tekla.com/cs/191/en/sys_example_creating_and Updating_uda)

To manage UDA efficiently, Users may also search UDA in Tekla Warehouse and install more extensions:

<https://warehouse.tekla.com/#!/search/?searchTerm=uda>

Information stored in Tekla as UDA could also be exported to IFC as IFC property set, please refer to the link below for more information ;

[https://teklastructures.support.tekla.com/2019/en/int\\_defining\\_property\\_sets\\_using\\_property\\_set\\_definitions](https://teklastructures.support.tekla.com/2019/en/int_defining_property_sets_using_property_set_definitions)

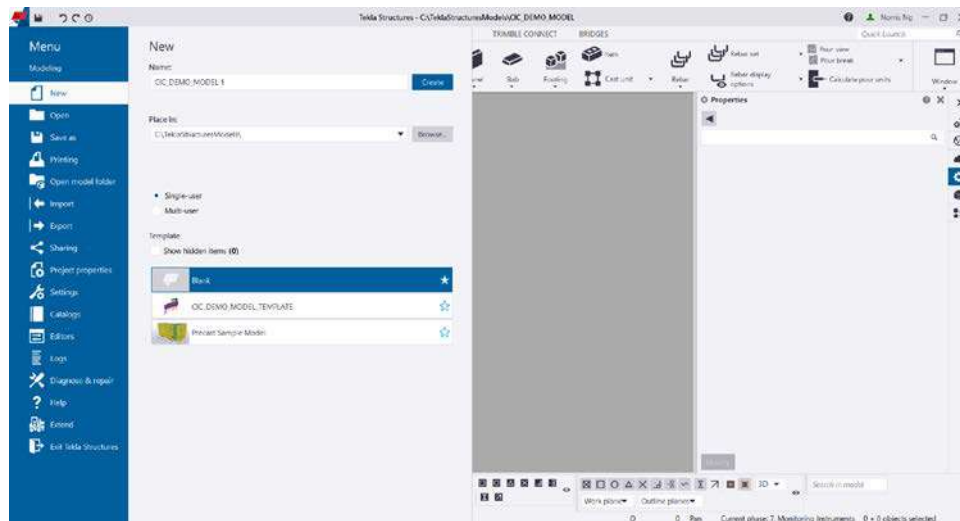
## 3 Getting Start

Users are expected to install Tekla 2019i before followings the steps stated in this section.

### 3.1 Opening Project Template

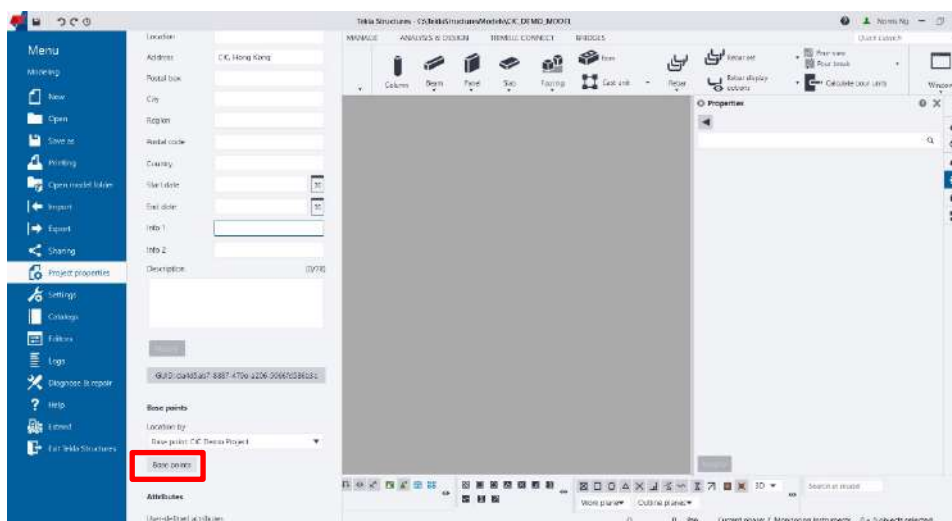
Download template file from CIC website. Run the Env\_SE\_Asia\_2019.exe to install Asian Tekla tool set. Put the folder set ""CIC\_TEMPLATE\_STR\_2019"" to C:\ProgramData\Trimble\Tekla Structures\2019.0\Environments\SE\_Asia\Precast\model\_templates.

Open Tekla 2019, open new file with template "CIC\_DEMO\_MODEL\_TEMPLATE" being chosen.



### 3.2 Set-up of Project Base Points

Chose a reference point in the target project. Enter the Easting and Northing coordinates to Tekla by clicking the "base point" button in the project property menu as shown in the pictures below



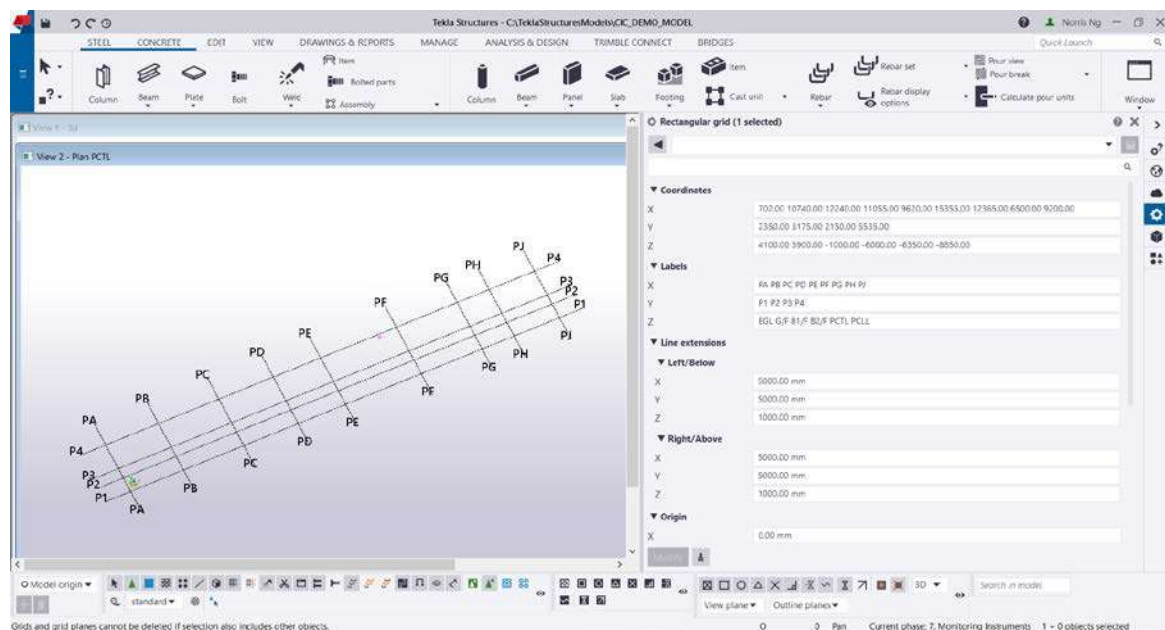


### 3.3 Creating Grids

On the Edit tab, click Grid > Create rectangular grids as shown in the picture below; click “create rectangular grids” again to create another grid system if needed. The user could also create radial grids by choosing “Create radial grid”. Unlike Revit, Tekla uses grids in the Z dimension to define building levels. For details about grids in Tekla, please refer to the reference links in section 2.2 in this user guide.

Grids are useful to control 3D objects in Tekla. Users could switch on or switch off the magnetic function of grids. The magnetic function is also available in construction lines and planes in Tekla. Users could use construction lines and construction planes as a temporary 3D reference during 3D modelling. Please refer to the link below for more information:

[https://teklastructures.support.tekla.com/video-tutorials/en/magnetic\\_construction\\_objects](https://teklastructures.support.tekla.com/video-tutorials/en/magnetic_construction_objects)



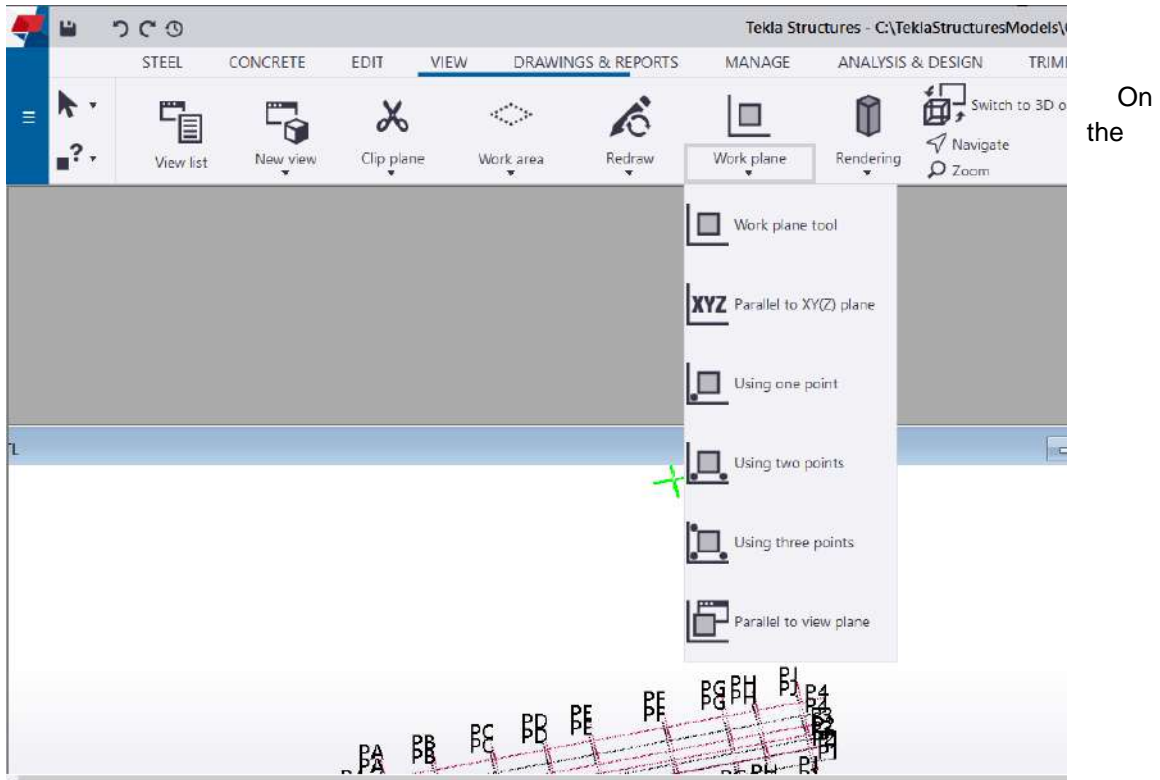
## 4      **Creating Model Objects**

The following objects will be modelled in Tekla:

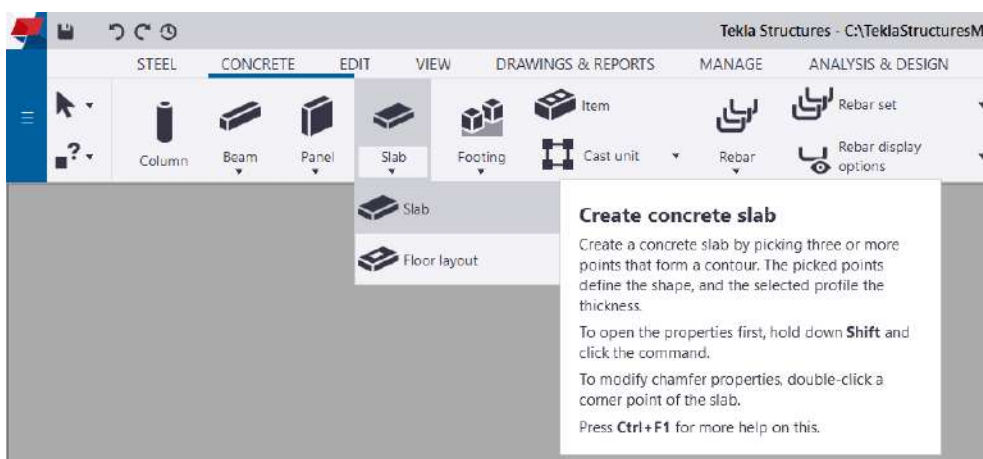
- Slab
- Column
- Wall
- Beam
- Lift Shaft
- Staircase
- Piles
- Pile Caps
- Tie Beams
- Reinforcement
- Steel members for ELS
- Hoarding
- Geotechnical Monitoring instruments

## 4.1 Creating Slabs

On the View tab, click View tab > new view > along gridline to create views for specific floor levels, click Work Plane > Parallel to view plane to create work plane parallel to the view. For the snap settings which could be adjusted at the right bottom corner choose a plan, work plan and grid plane in the three put down the menu. Press ctrl+P to get a top view in Tekla modelling space,

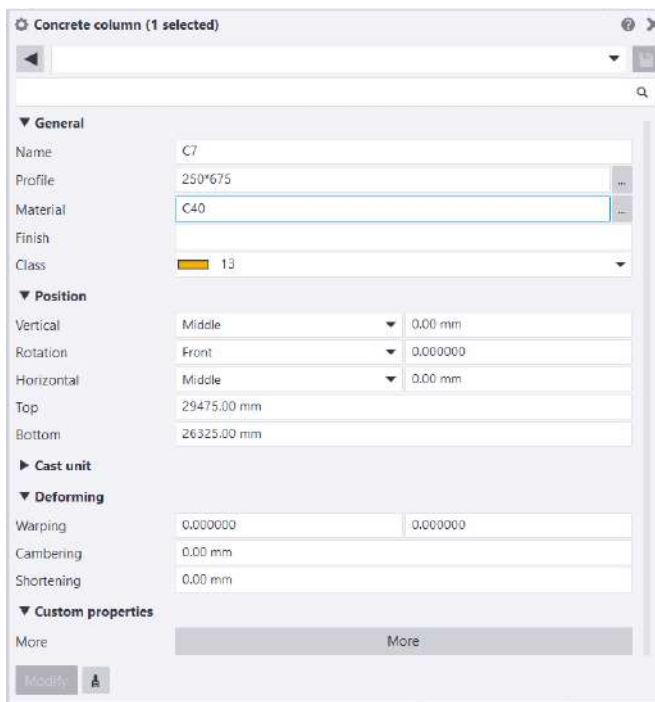
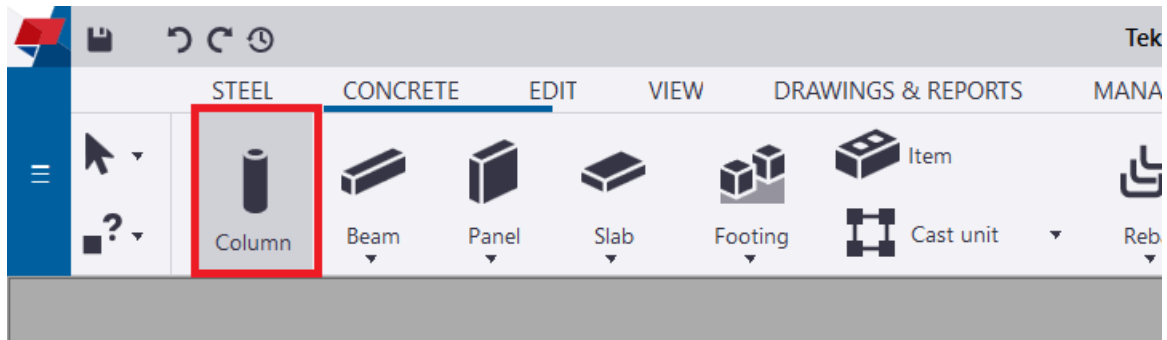


Concrete tab, click Slab > Slab as shown in the picture below, left-click to define corner points of the slab, press middle mouse button to finish. Slab thickness can be adjusted in the property menu on the right.



## 4.2 Creating Columns

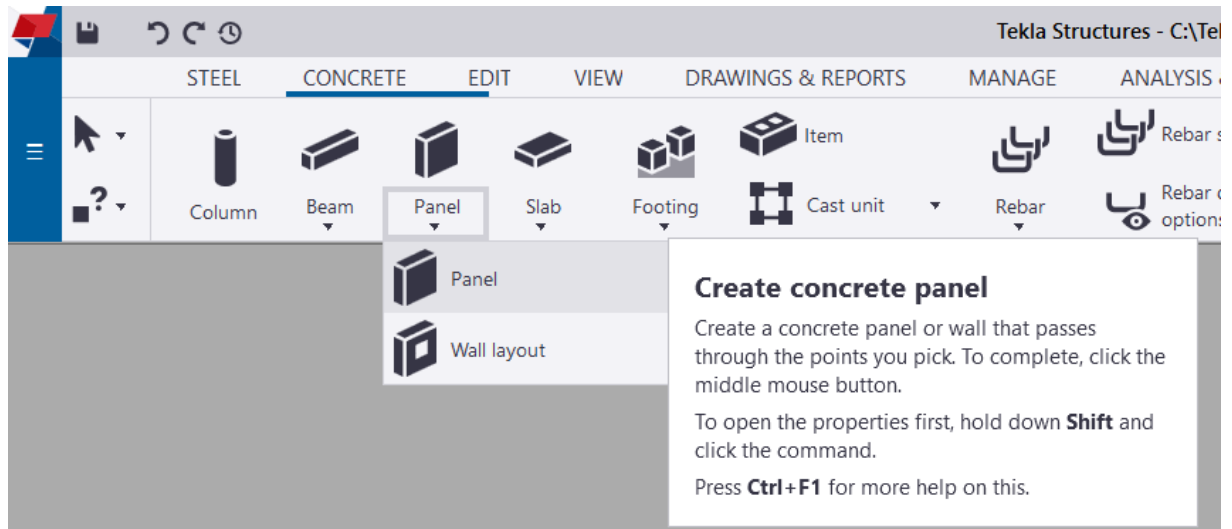
On the Concrete tab, click Column to create a column. Left-click in 3D model space to create a column. In the property menu, assign a name for the column; simply change the numbers in the profile entry in property menu (such as 250\*675 or 400\*600) to adjust column size; type D- diameter length (such as D1800) to change it to a circular column. Press three dots at the right for specific section profile. Change values in Top and Bottom to adjust column elevation. Right-click the column and choose move special > linear to fine adjust the position of the column in 3D space.





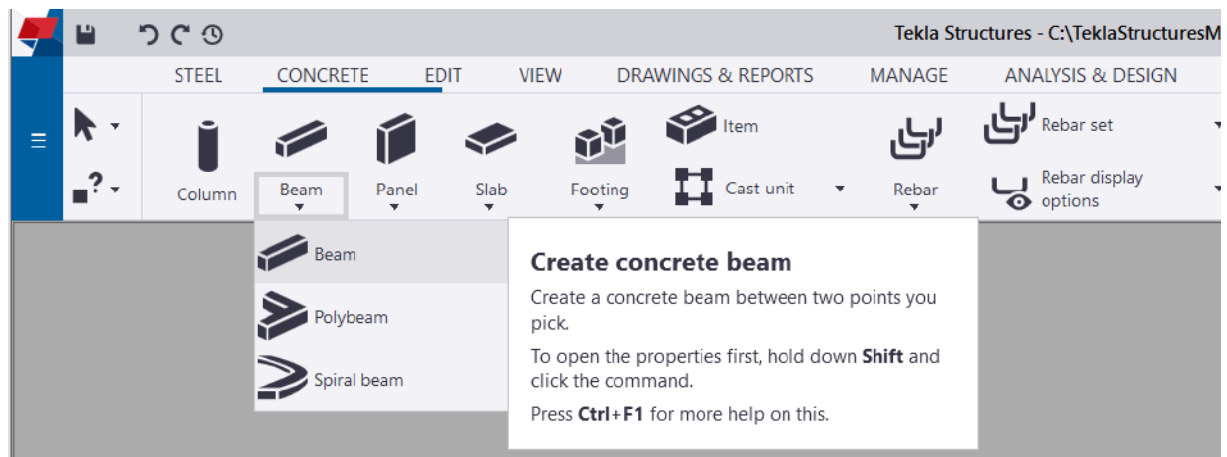
### 4.3 Creating Panels ( Walls )

On the concrete tab, click Panel > Panel to create walls. Left-click to define wall alignment on the plan view, press middle mouse button to finish. In the property menu, assign a name for the wall, Wall height and wall thickness can be adjusted in the profile entry in the property menu.

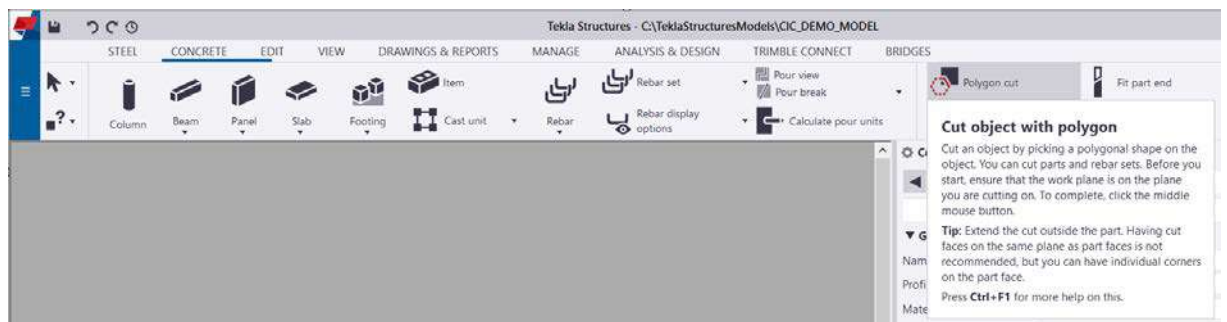


## 4.4 Creating Beams

On the Concrete tab, click Beam > beam to create beams. Left-click in 3D model space to define endpoints of the beam. In the property menu, assign a name for the beams; like columns, simply change the numbers in the profile entry in property menu (such as 400\*600 or 200\*300) to adjust beam size; press three dots at the right for specific section profile. Right-click the beams and choose move special > linear to fine adjust the position of the beams in 3D space.



For specially shaped beams such as haunch beam, stepped beams and cranked beams, it is suggested to use polygon cut to remove unwanted portion of the beam.

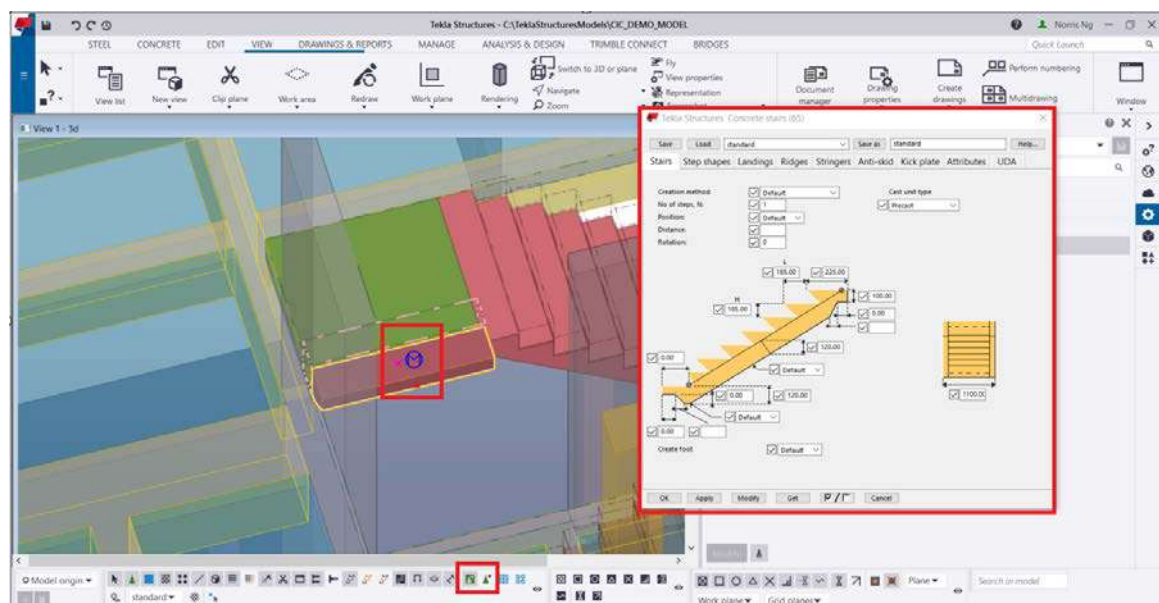
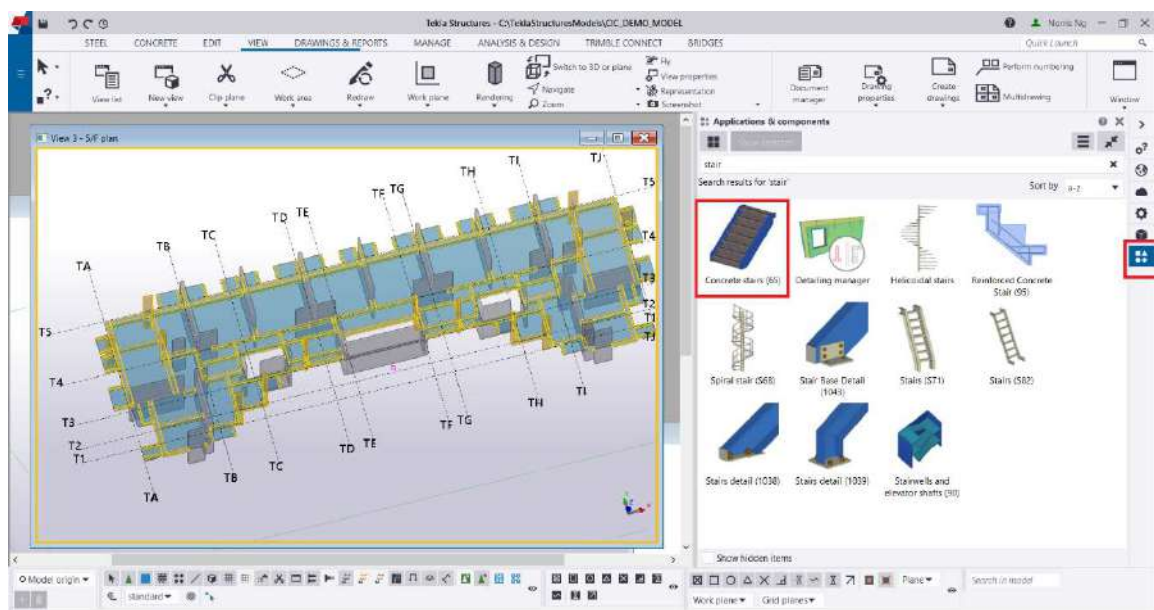


## 4.5 Creating Slab Openings

Left-click the slab which needs to create slab opening, on the concrete tab, Press “ctrl+P” to get a top view in Tekla modelling space, choose polygon cut on the concrete tab to create slab opening.

## 4.6 Creating a Staircase

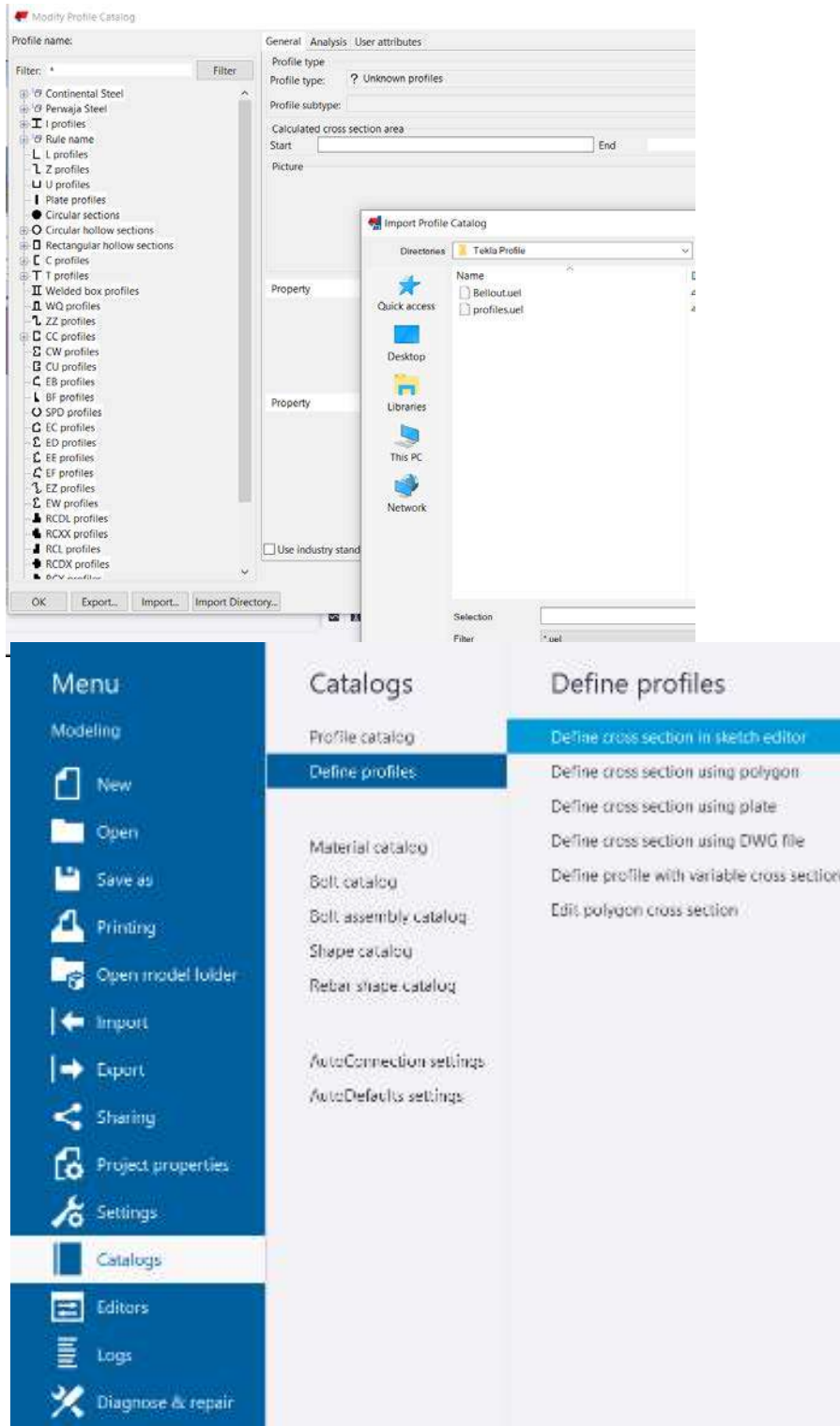
Click the application & components tab the right, search stair and chose concrete stair (component number 65) to create stair. Double-click the blue “M” symbol to adjust the properties of a component, click Modify > Apply > Okay to finish. Click the green buttons at the selection switches at the bottom to enable/disable user’s ability to choose parts inside components. Delete unwanted components if necessary. Deleted parts in the component will be regenerated whenever users click Apply > Okay in the component property menu.



## 4.7 Creating Piles

Concrete piles are created in Tekla by using concrete columns while steel piles are created by using steel columns, please refer to section 4.2 in this user guide for detail.

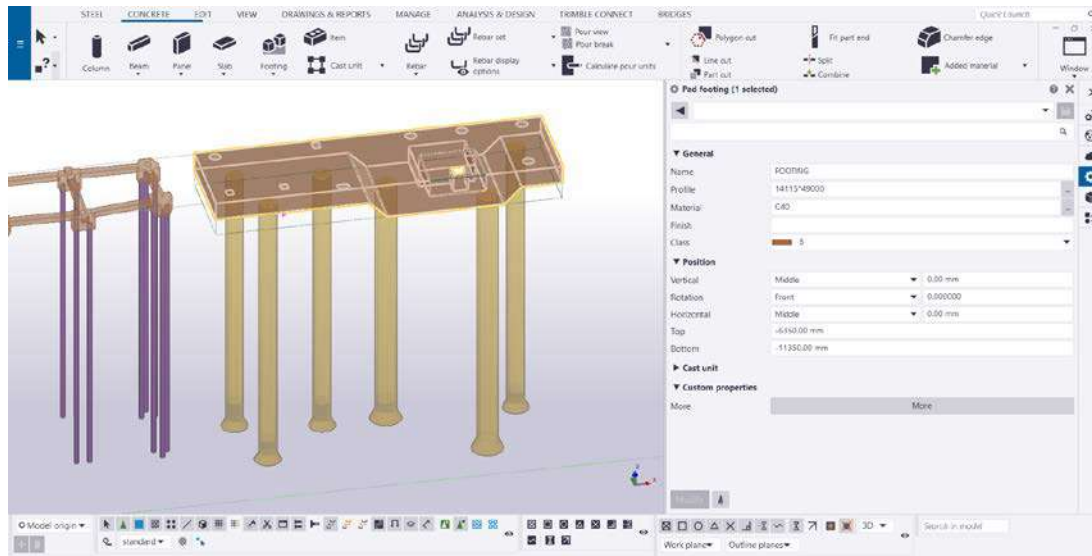
Users may download the Bellout.uel profile file from the CIC website if they want to model bored piles with bellout. Import the uel file from “Profile Catalog” which could be found in the file menu at the top right corner (see the user interface at “General” in this user guide). “Profile Catalog” is under the catalogues tag.





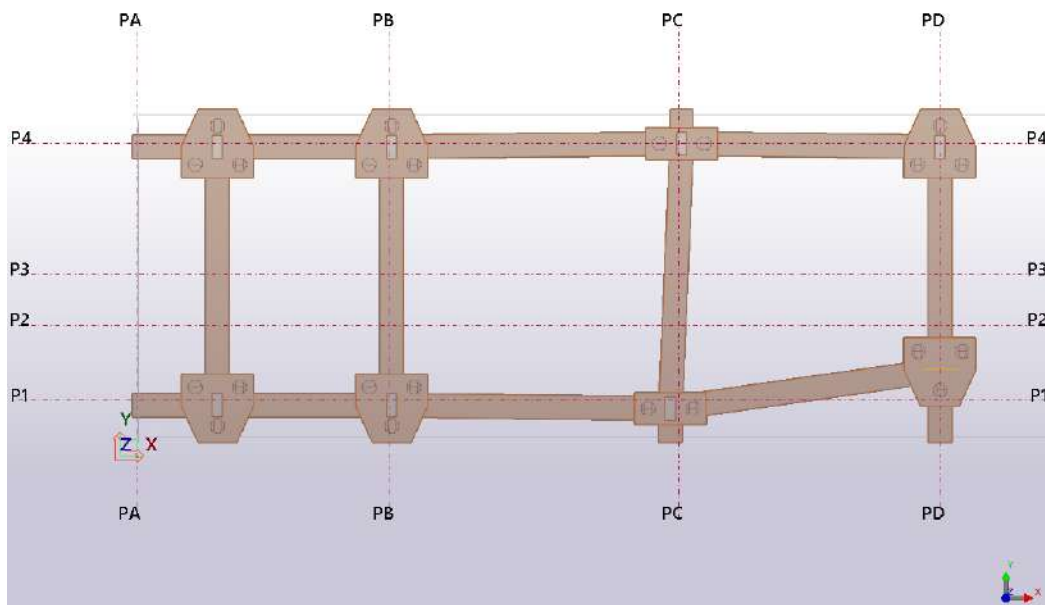
## 4.8 Creating Pile Caps and Tie Beams

Pad footing is used to create a pile cap in Tekla. It is suggested to create a one big rectangular box model by using pad footing and then trim it by using polygon cut. It is not suggested to use more than one pad footing to model one pile cap as this would cause problems during 2D drawing production.



To minimise the use of polygon cuts, it is suggested to use custom profiles to create footing with a shape which can be created by simple extrusions, such as the triangular pile cap as shown below. Users may use “define cross-section in sketch editor” to create custom profiles.

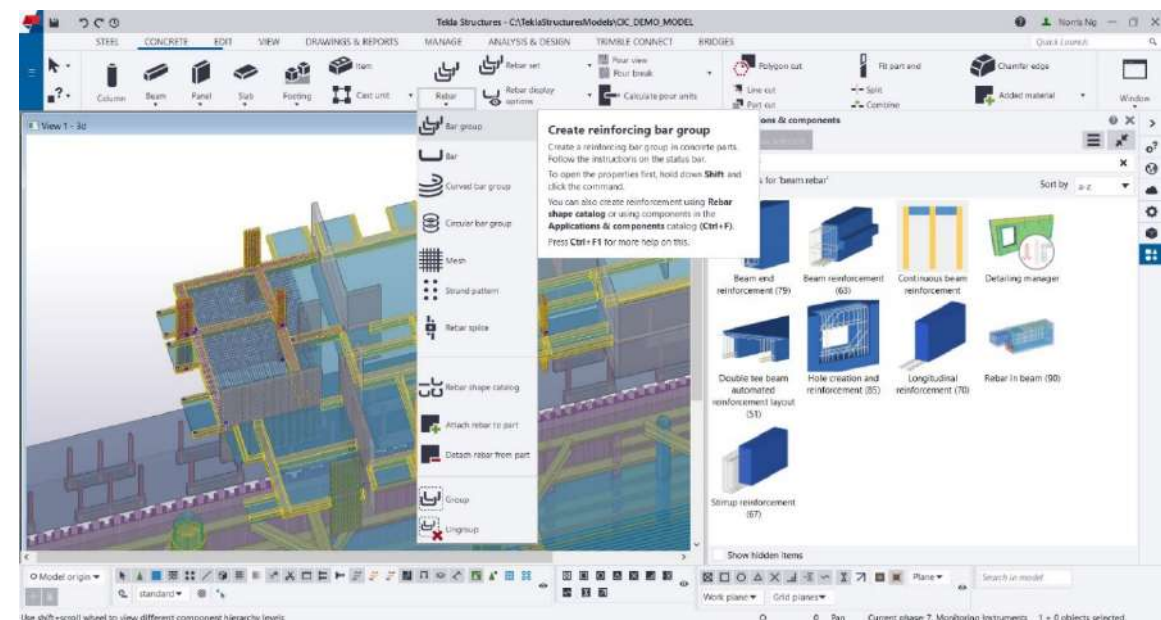
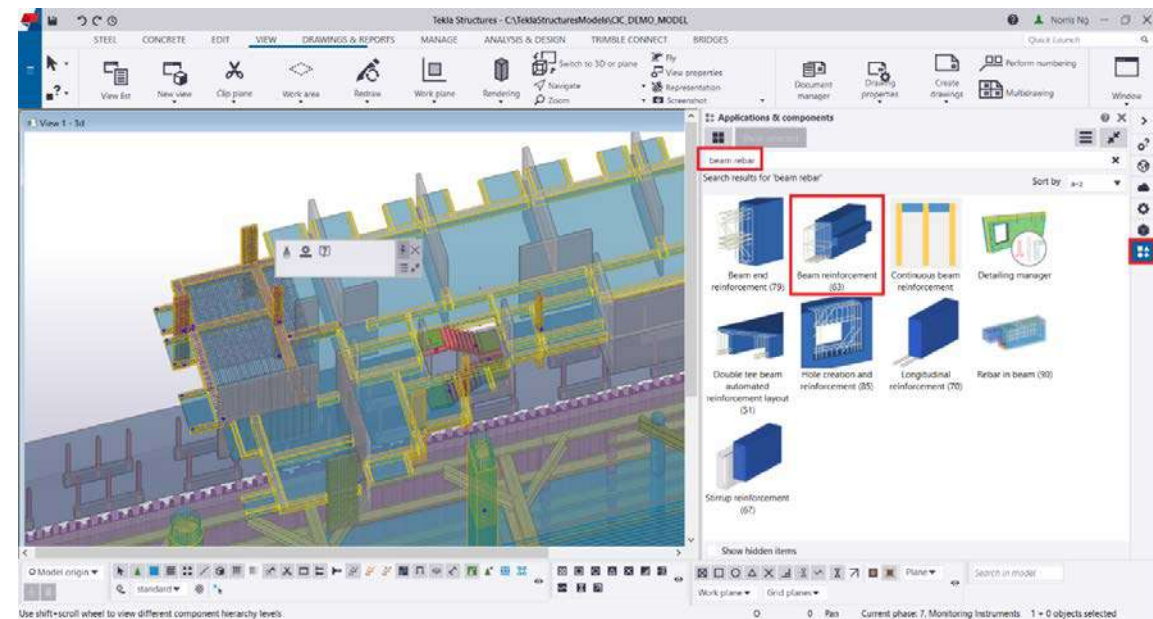
Tie beams should be modelled by using strip footing under the Concrete > Footing tab.



## 4.9 Creating Reinforcement by Rebar Components and Rebar Groups.

Click the application & components tab the right, search beam / column / wall / slab rebars to create rebars. Click the concrete parts such as beams and columns in modelling space to assign rebar. If necessary, users could right-click and select explode component after selecting specific rebar components, such that rebar components will be broken down to different rebar groups. This will not affect 2D drawing production.

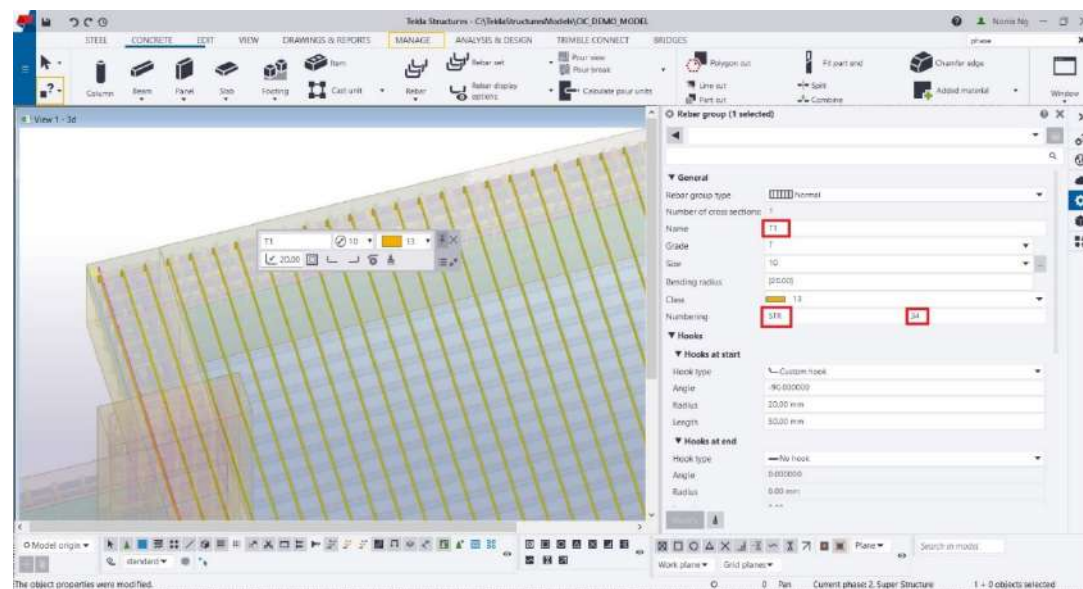
Users may also create rebar groups by clicking Rebar > Rebar group on the concrete tab. Properties of the rebars could be adjusted in the rebar group property menu on the right.



in the rebar group property menu, it is suggested to assign rebar layer name (such as T1, T2, B1, B2) in the Name entry. “Prefix” in the “Numbering entry” to specify zone information (such as STR for superstructure or FND for foundation) and the “Start number” in the “Numbering Entry” to specify the bar marks.

The purpose of specifying zone information is to control the visibility of rebars in 3d models and 2D drawings. This setting could be used together with phase manager in 3d modelling mode and view filter function in both 3d modelling mode and 2d drawing mode to control the visibility of objects in complex Tekla models.

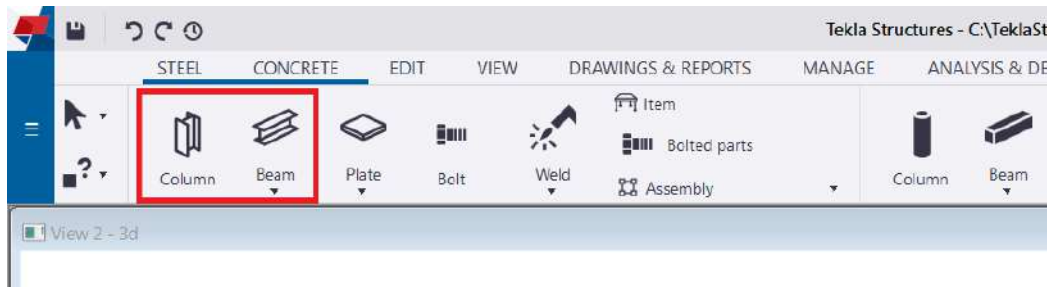
Users may also control end conditions of the rebar group by adjusting values in the “Hooks” entries in the rebar group property menu.



Users could also create rebars by using rebar sets. Rebar set is a powerful tool to enable users to create 3D rebars effectively. More settings are needed in advance for users to create rebars by using rebar set. For simplicity, only rebar component and rebar group are discussed in this user guide. No matter rebars are modelled by rebar components, rebar groups or group sets, detailed reinforcement drawings could also be produced by Tekla in 2D drawing mode. As both rebar groups and rebar sets contain information of name, numbering prefix and numbering start number. Tagging of rebar would not be affected during 2D drawing production.

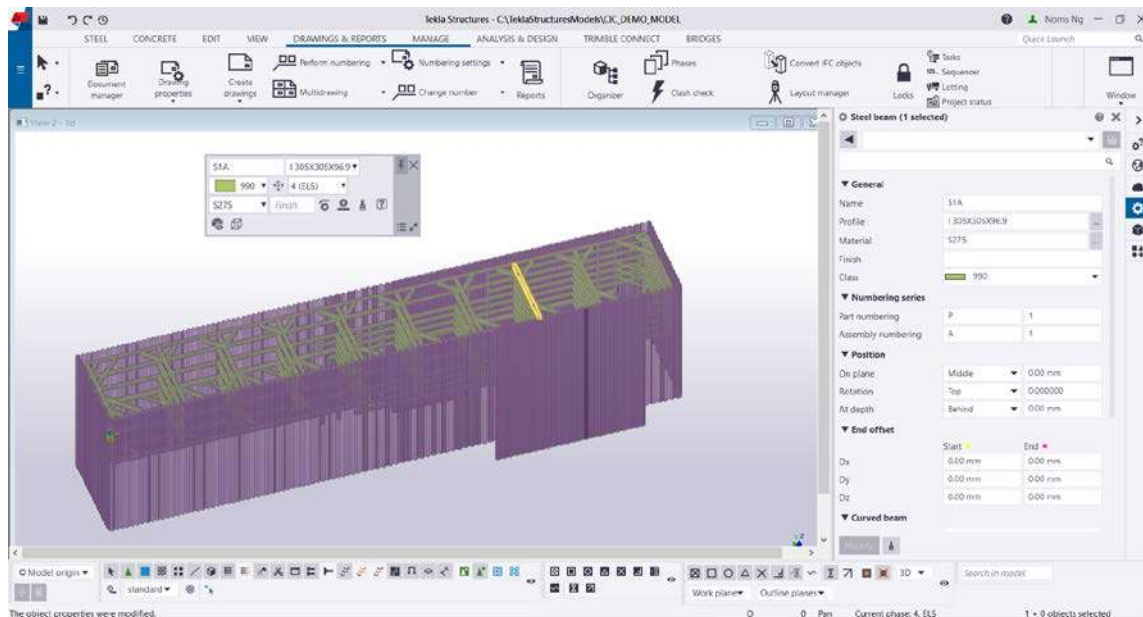
## 4.10 Creating Steel Members for ELS

Steel members in excavation lateral support system could be modelled by using column and beam under Steel tab. Method of modelling is just similar to concrete columns and beams as specified in section 4.2 and 4.4 in this user guide.

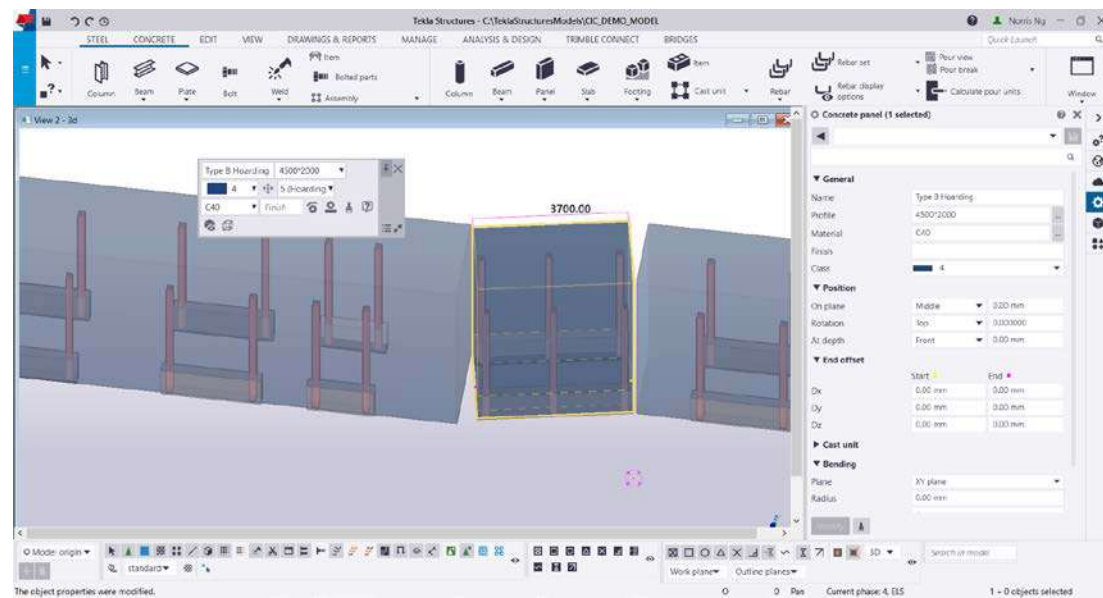
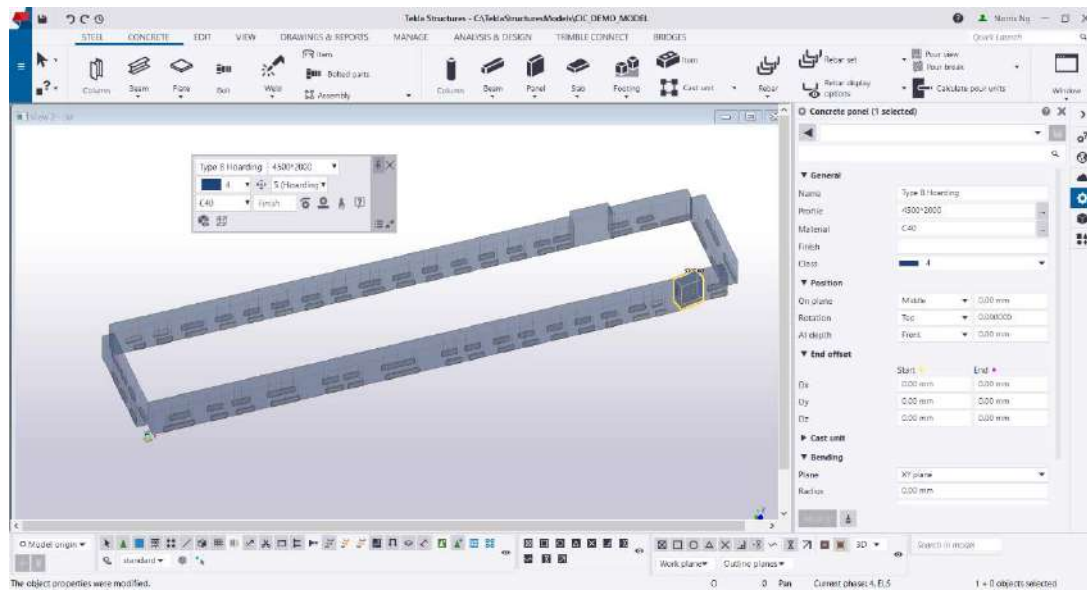


## 4.11 Creating Hoarding

Model concrete footings of the site hoarding by using the concrete panel, as mentioned in section 4.3. Model steel posts of site hoarding by using steel columns. After footings and steel posts were modelled, model a thick concrete panel to indicate the area of the covered walkway as shown in the pictures below. Specify the type of the hoarding in the name entry in property menu for tagging in 2D drawings.







## 4.12 Creating Street Furnitures

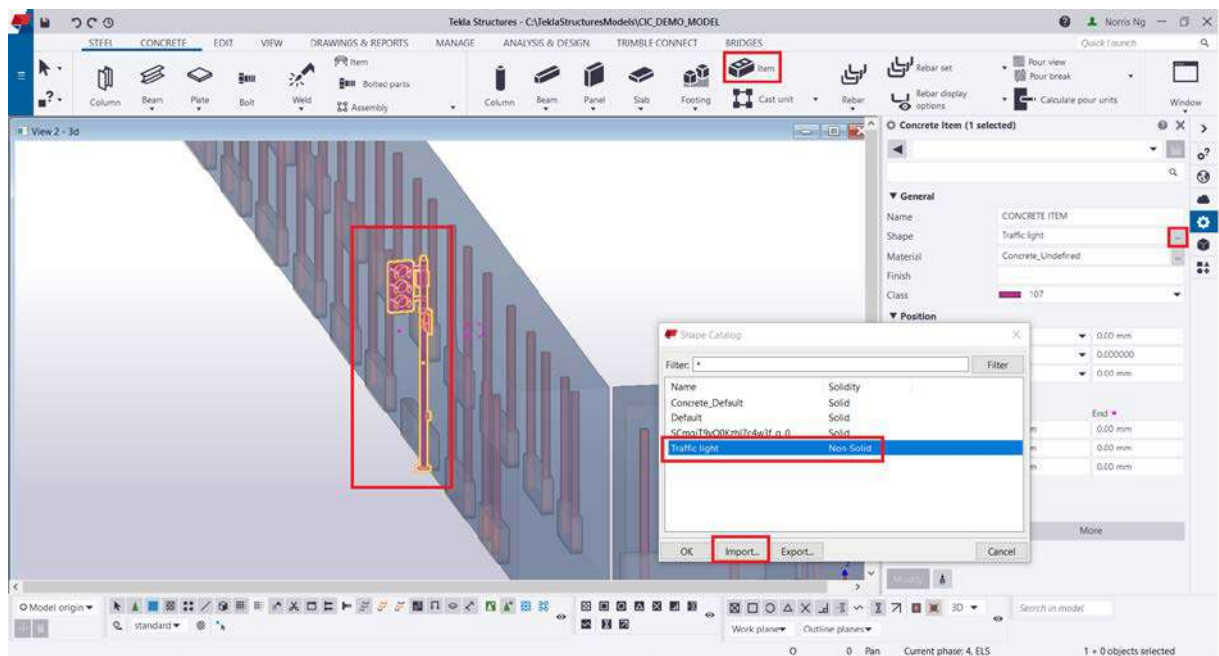
Tekla is not designed to model street furniture such as light posts, traffic lights, guard rail, manhole covers, fire hydrants etc. Users may download these 3D models from Trimble SketchUp 3D warehouse and turn those skp files to Tekla objects.

On the concrete tab, choose item, under the property menu pick the three dots at the right of the shape entry. 3D models in .tsc / .skp / .dxf / .dwg / .ifc / .ifczip / .ifcXML / .igs / .iges / .dgn / .stp or .step format could be imported into Tekla by this method.

Users may also buy 2D maps in dwg or dgn format from Lands Department website and import those files to Tekla by using the Reference model function, as mentioned in section 2.6 in this user guide.

Sketchup 3D warehouse:

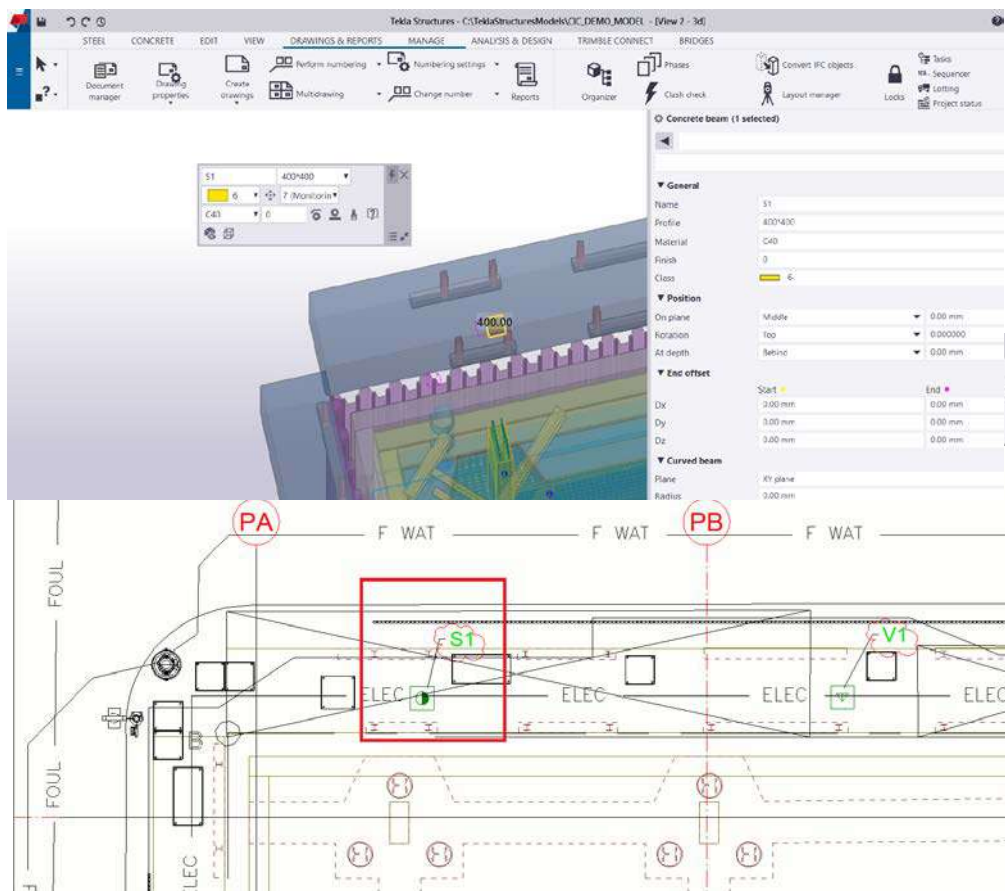
<https://3dwarehouse.sketchup.com/>



## 4.13 Creating Monitoring Instruments

It is suggested to create a simple box model in Tekla to represent geotechnical monitoring instruments such that objects could be scheduled if needed. Users could choose whether to insert 3D instrument model by using “shape” in “concrete items” as mentioned in section 4.12 in this user guide or simply use native concrete parts to create a box model such that the space consumed by the instrument could be adjusted inside Tekla. Name the instrument in the name entry in property menu such that the name could be shown by using associative note in the drawing.

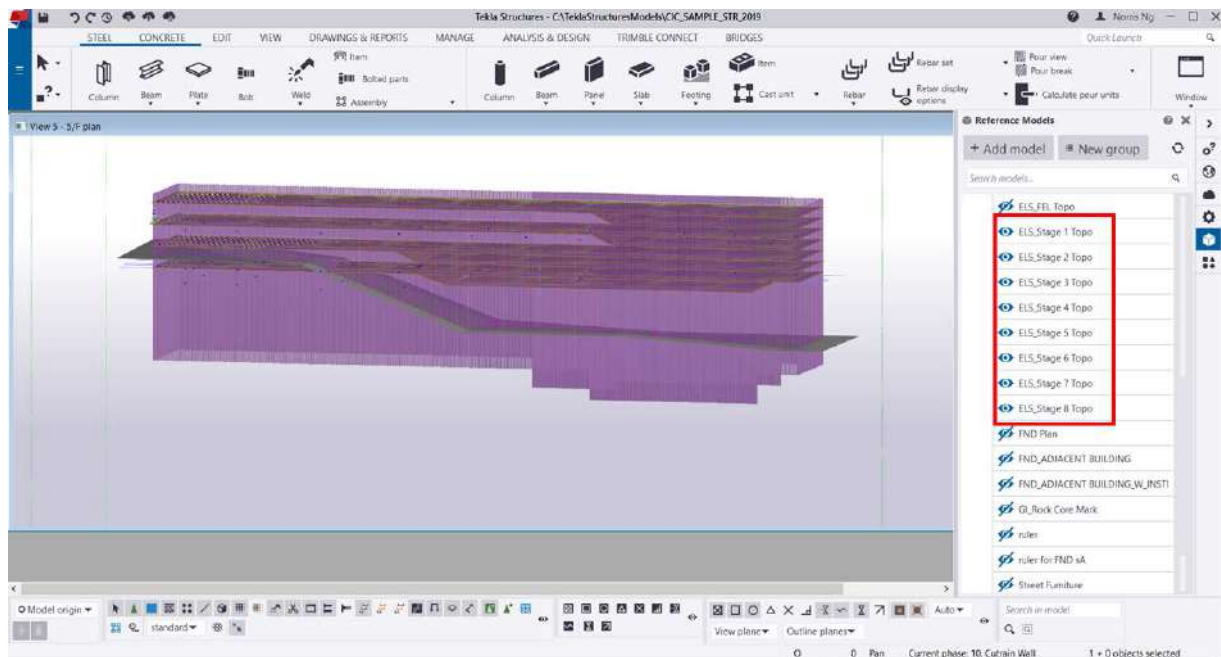
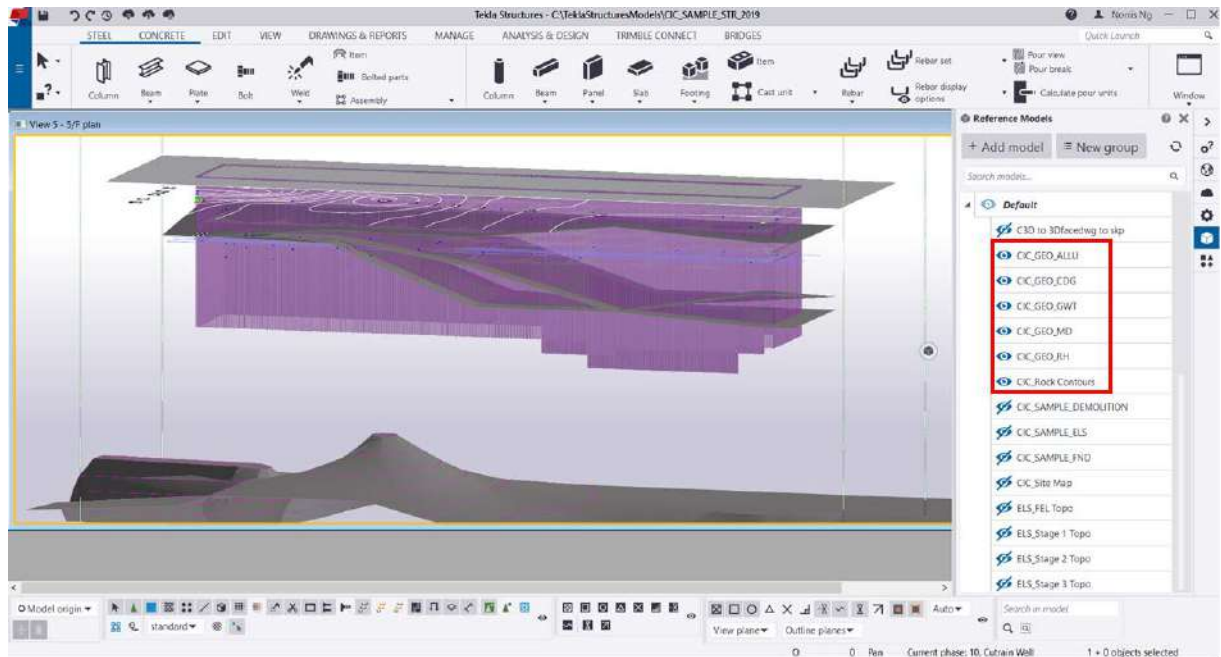
It is suggested to use a symbol in part mark to denote the location and type of the instrument and use an associative note to denote the name. Such that information could be shown clearly on 2D drawings, even some instruments are put very close to each other.





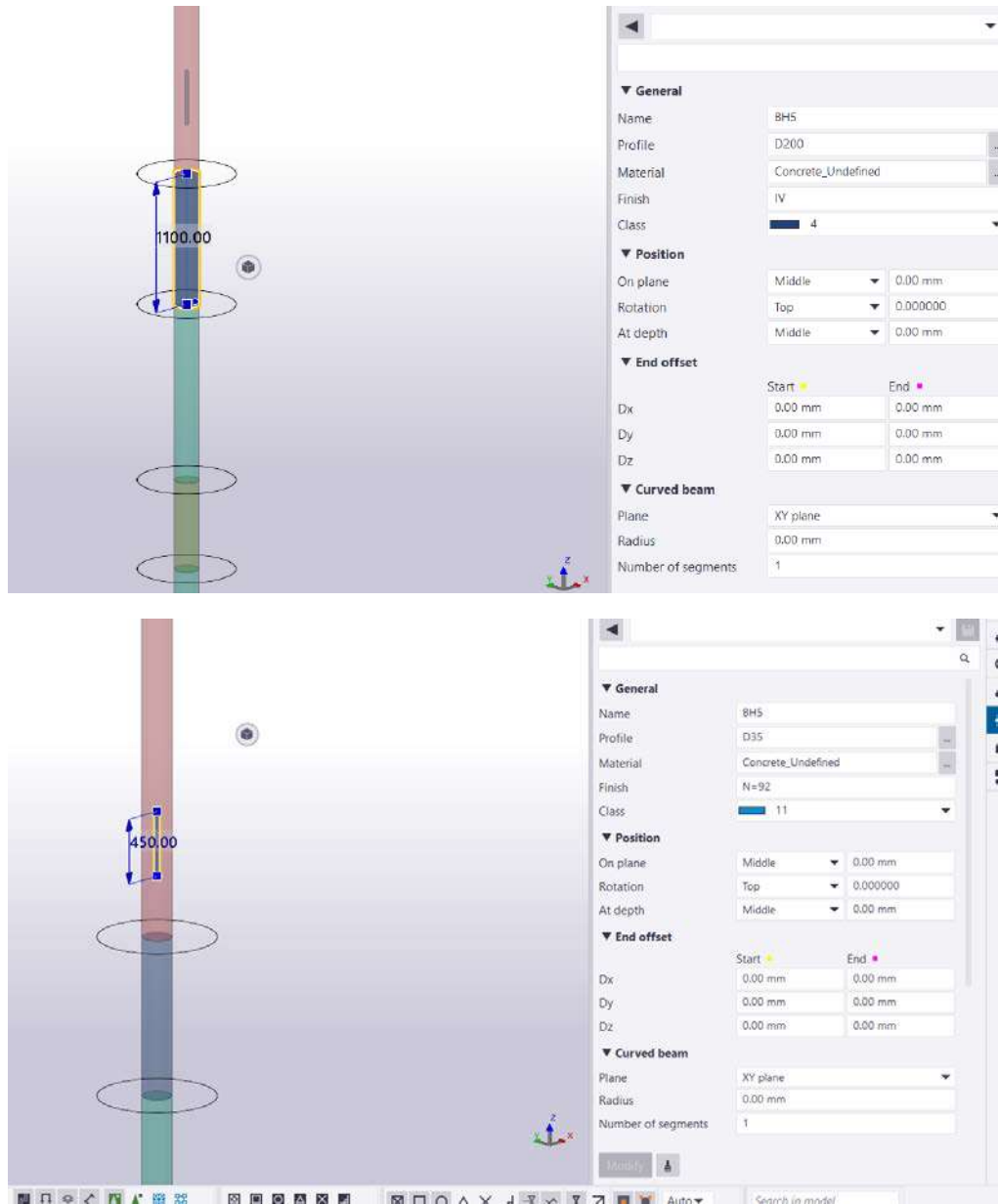
## 4.14 Attaching 3D topographic models

Tekla is not designed to model 3D topographic models, but users could attach 3D topographic models from other software to Tekla through the 'Reference Model' function. Users need to name those reference model systematically in order to manage their visibility in 2D drawings.



## 4.15 Creating Ground Investigation Data

Rock core samples from the bored hole and standard penetration tests results are needed to be modelled in 3D for drawing production. A Grasshopper script could be downloaded from the CIC website to facilitate users to model this information in 3D.



First users need to organise GI data in Excel as shown in the picturesm below for rock core samples in the bored hole and SPT results. Name

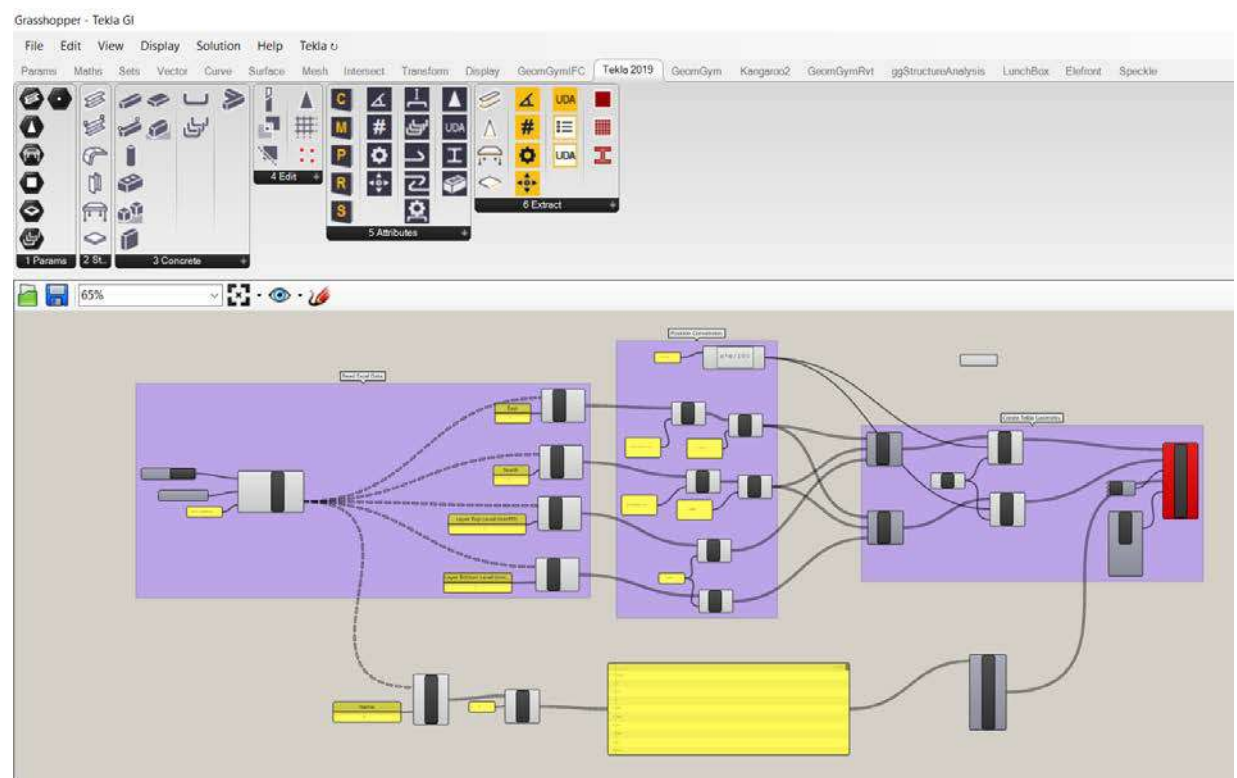
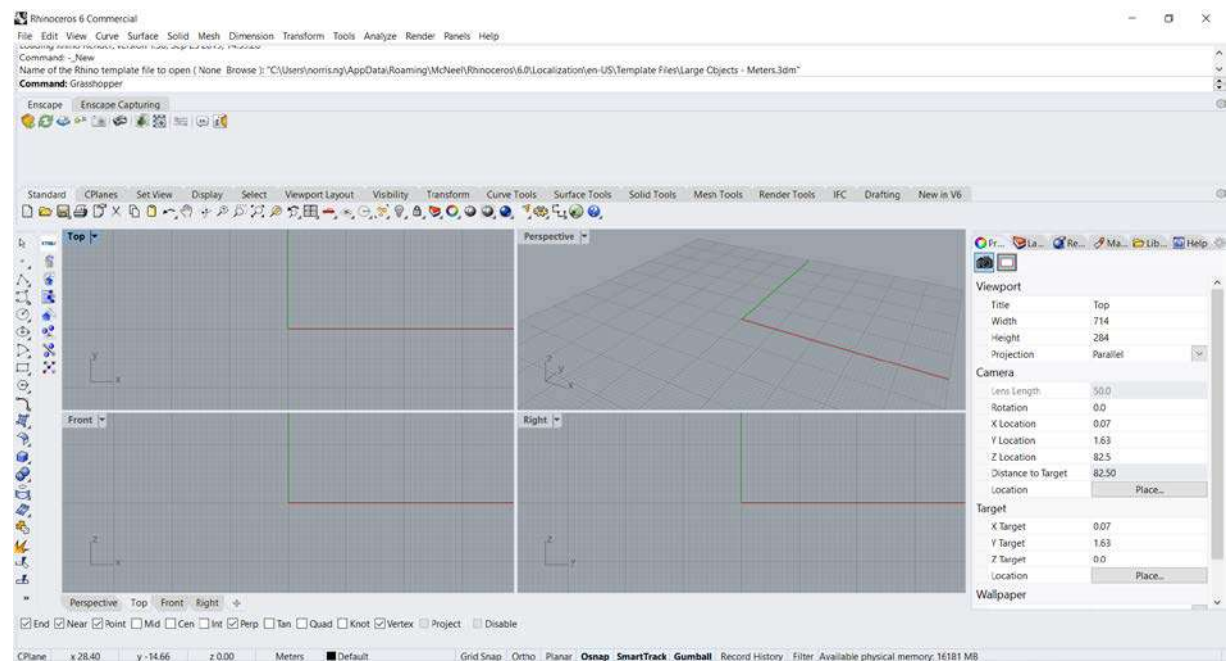
	A	B	C	D	E	F
	BH no.	Soil / Rock Layer	Easting	Northing	Layer Top Level (mPD)	Layer Bottom Level (mPD)
1	BH1	FILL	895338517	819787853.8	4019.447	-4480.553
2	BH1	V	895338517	819787853.8	-4480.553	-5980.553
3	BH1	II	895338517	819787853.8	-6080.553	-8480.553
4	BH1	V	895338517	819787853.8	-8480.553	-27480.5529
5	BH1	IV	895338517	819787853.8	-27480.5529	-30100.5529
6	BH1	III	895338517	819787853.8	-30100.5529	-33780.5529
7	BH1	IV	895338517	819787853.8	-33780.5529	-34680.5529
8	BH1	III	895338517	819787853.8	-34680.5529	-36660.5529
9	BH1	II	895338517	819787853.8	-36660.5529	-38800.5529
10	BH1	III	895338517	819787853.8	-38800.5529	-39380.5529
11	BH1	II	895338517	819787853.8	-39380.5529	-40730.5528
12	BH1	III	895338517	819787853.8	-40730.5528	-41090.5528
13	BH1	II	895338517	819787853.8	-41090.5528	-41880.5528
14	BH1	III	895338517	819787853.8	-41880.5528	-42560.5528
15	BH1	II	895338517	819787853.8	-42560.5528	-43430.5528
16	BH1	III	895338517	819787853.8	-43430.5528	-43800.5528
17	BH1	II	895338517	819787853.8	-43800.5528	-44930.5528
18	BH1	III	895338517	819787853.8	-44930.5528	-45250.5528
19	BH1	II	895338517	819787853.8	-45250.5528	-47670.5528
20	BH1	III	895338517	819787853.8	-47670.5528	
21	BH2	FILL	895350267.7	819789797.4	4000.0005	-2100.0123
22	BH2	MD	895350267.7	819789797.4	-2100.0123	-3999.9933
23	BH2	V	895350267.7	819789797.4	-3999.9933	-14099.9981
24	BH2	II	895350267.7	819789797.4	-14099.9981	-15699.9981

Text                      Number (mm)

	A	B	C	D	E
	Count	Easting	Northing	Position Z	Value
1	BH1	895338517	819787853.8	501.0366	N=9
2	BH1	895338517	819787853.8	-1498.9634	N=10
3	BH1	895338517	819787853.8	-4998.9634	N=15
4	BH1	895338517	819787853.8	-8998.9634	N=15
5	BH1	895338517	819787853.8	-10998.963	N=19
6	BH1	895338517	819787853.8	-12998.963	N=24
7	BH1	895338517	819787853.8	-14998.963	N=26
8	BH1	895338517	819787853.8	-16998.963	N=72
9	BH1	895338517	819787853.8	-18998.963	N=76
10	BH1	895338517	819787853.8	-20998.963	N=97
11	BH1	895338517	819787853.8	-22998.963	N=100
12	BH1	895338517	819787853.8	-24998.963	N=97
13	BH1	895338517	819787853.8	-26998.963	N=105
14	BH1	895338517	819787853.8	-28998.963	N=200/50
15	BH1	895338517	819787853.8		
16	BH2	895350267.7	819789797.4	1496.4827	N=9
17	BH2	895350267.7	819789797.4	-503.5173	N=11
18	BH2	895350267.7	819789797.4	-3503.5173	N=11
19	BH2	895350267.7	819789797.4	-4503.5173	N=10
20	BH2	895350267.7	819789797.4	-5503.5173	N=11
21	BH2	895350267.7	819789797.4	-6503.5173	N=17
22	BH2	895350267.7	819789797.4	-10503.517	N=22

Text                      Number (mm)                      Text

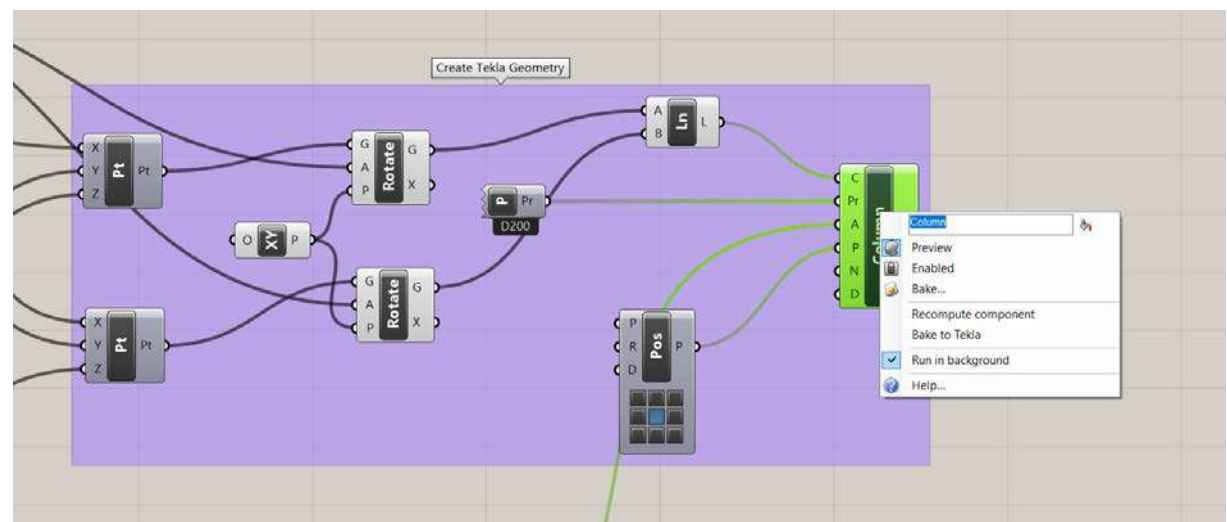
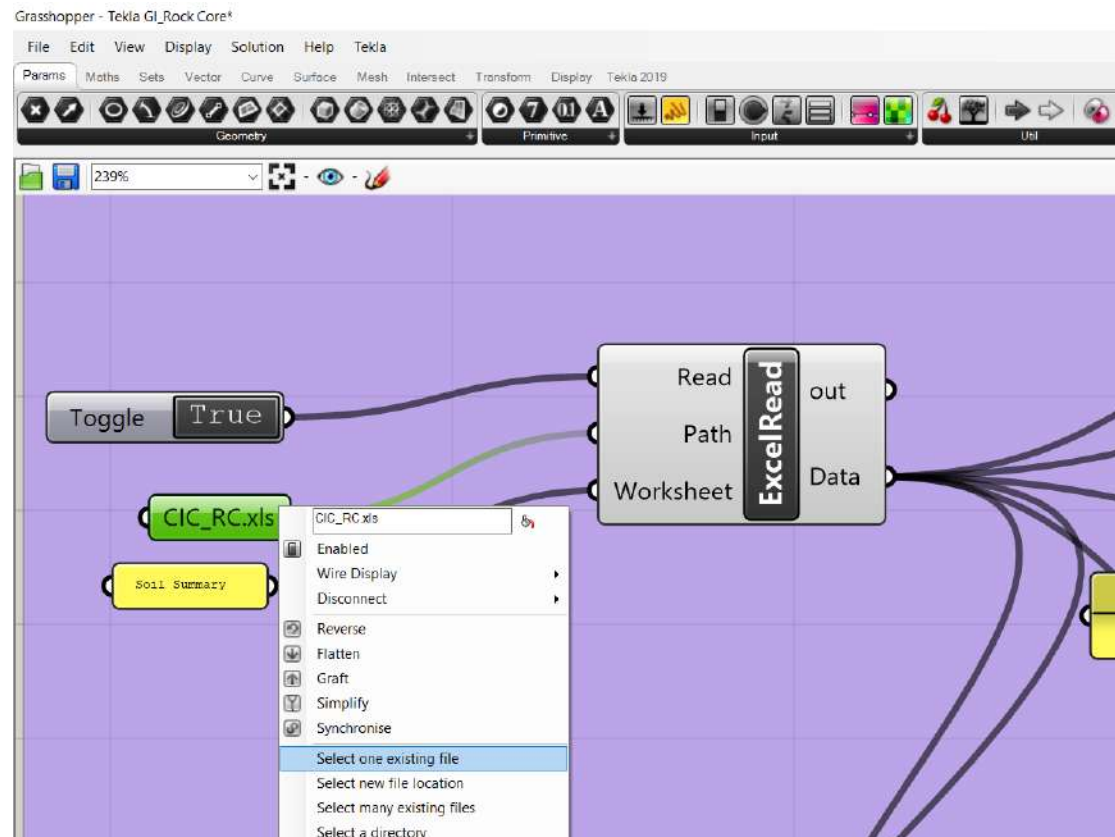
Second, after installing Rhino6 , users could type “Grasshopper” on the command bar to open Grasshopper. After Grasshopper is opened, go to “File” at the top left corner and choose “Open Document” to open the “Tekla\_GI Rock Core.gh” file to open the script.





After the “Tekla\_GI Rock Core.gh” file is opened, right-click at the “File Path Component” and choose the Excel file the user had prepared for rock core samples. Then right-click at the “Tekla Column Component” at the right and choose “Bake to Tekla” to create 3D geometries in Tekla. Those 3D geometries created should be assigned to the “GI” Tekla phase and could be used for 2D drawing production.

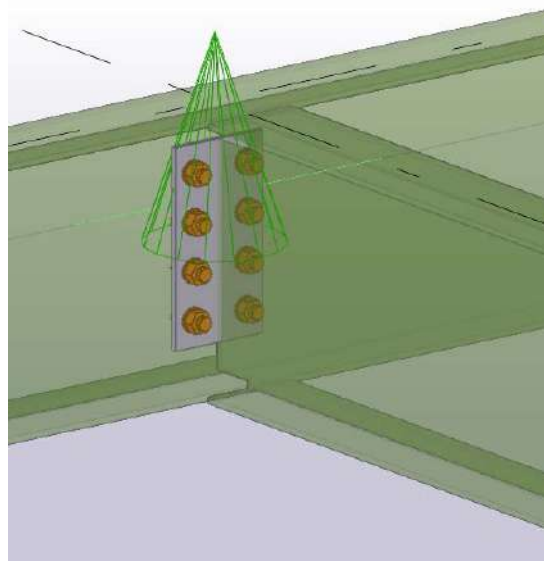
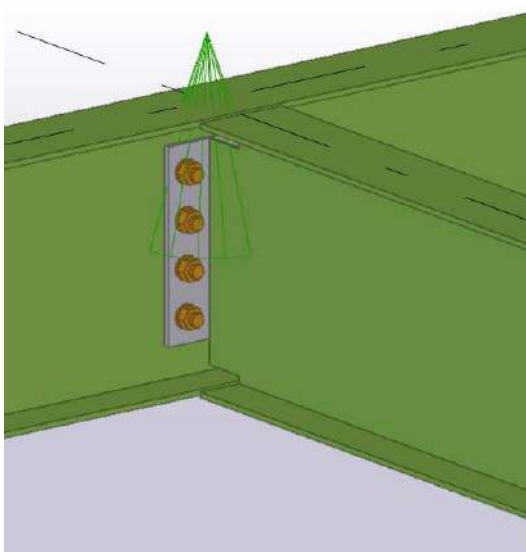
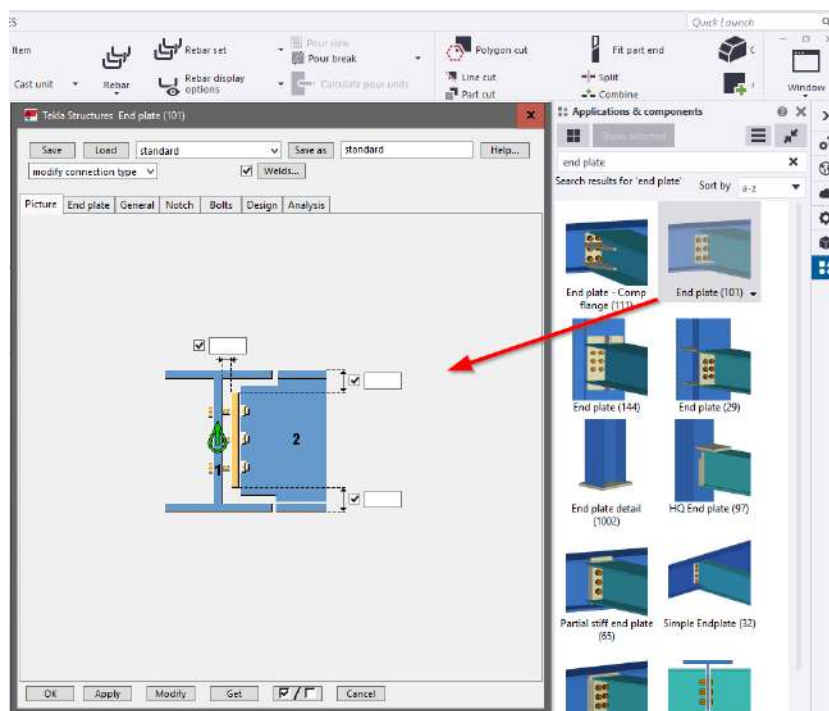
For SPT information, open the “Tekla GI\_SPT.gh” file, right-click at the “File Path Component” and choose the Excel file the user had prepared for SPT information and then bake those 3D object to Tekla by using the same method as mentioned above.



## 4.16 Creating Steel Connections

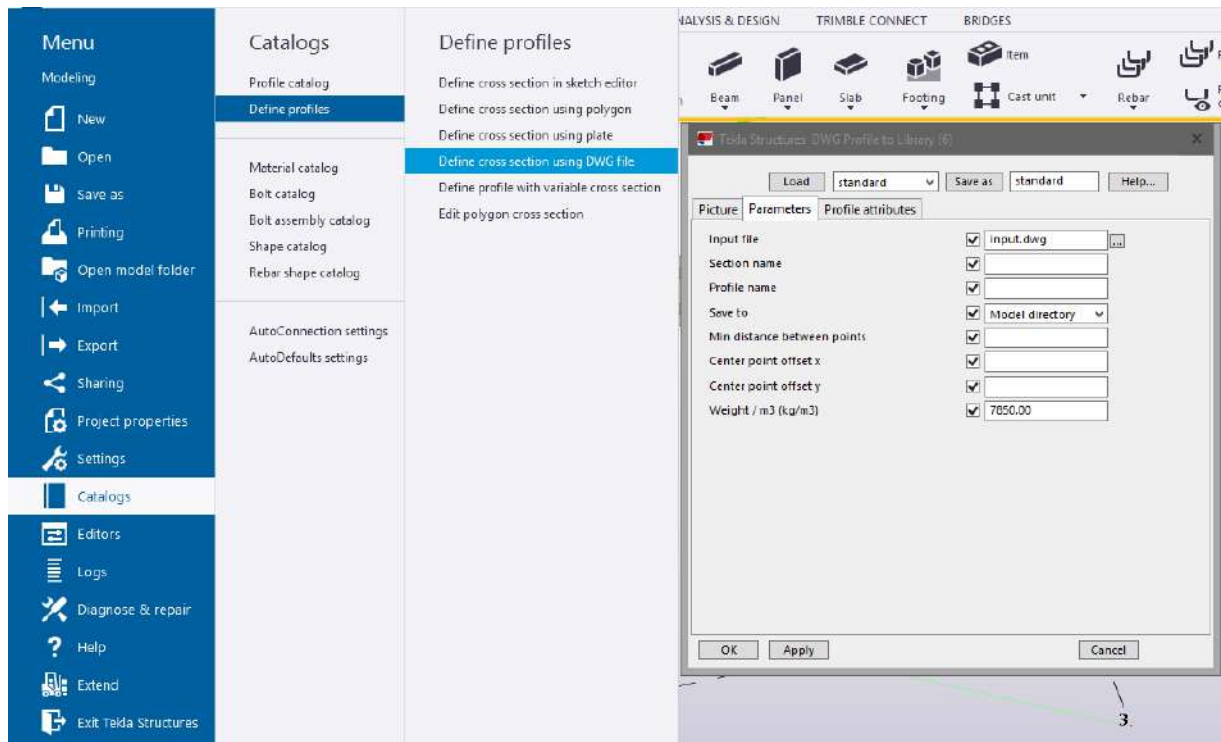
One of the main advantages of using Tekla lies in its capability to efficiently model all kinds of steel connections. Many connection types have an existing parametric component that the users can quickly edit to create the desired connections. Components are found in the “Applications & components” pane where users can search for the desired connection type (e.g. “end plate”, “brace connection” or “shear plate”).

Below are the search results for end plate connections. Double-clicking a component opens up its dialogue box where users can see how the component works and what parameters are available. In case of the component “End plate (101)”, the user must select two pre-existing beams in the model to apply the connection at their intersection. After placing the connection, users can double-click the connection in the model to modify the parameters (e.g. set bolt spacing, size of plate etc.).



## 4.17 Creating Curtain Wall Elements

Curtain wall elements such as transoms and mullions can be either modelled by simple rectangular sections (e.g. RHS) or the actual profiles can be imported to Tekla. For the latter, users can create user-defined sections by sketching the section or importing from a DWG file.

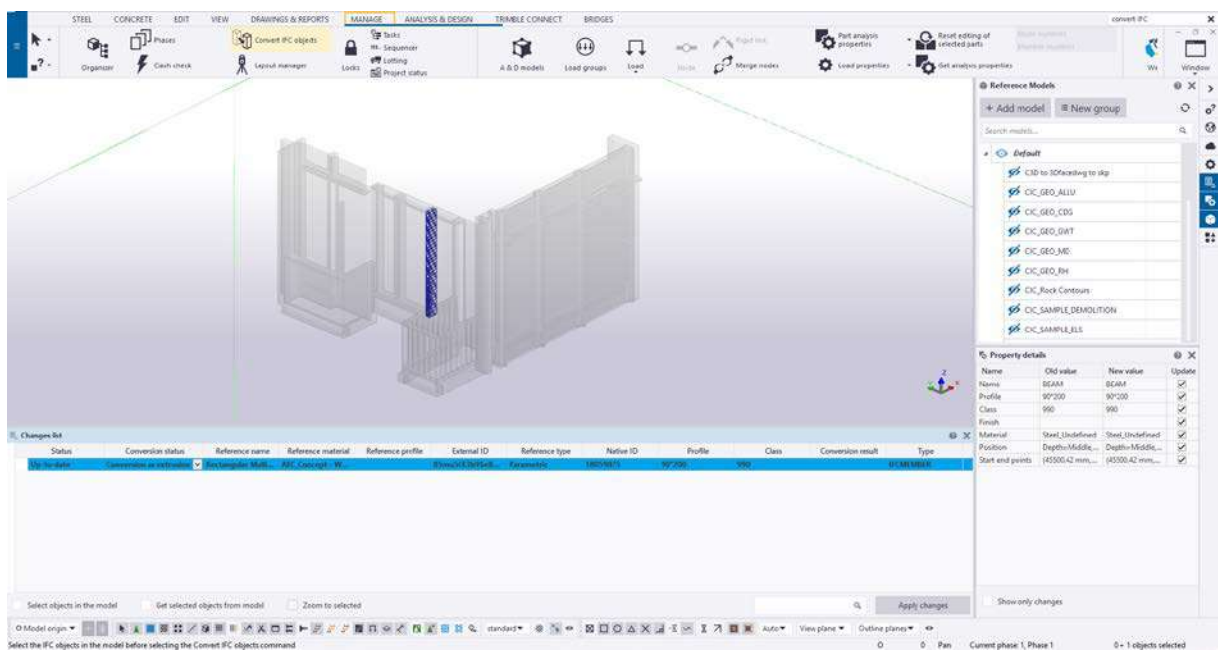
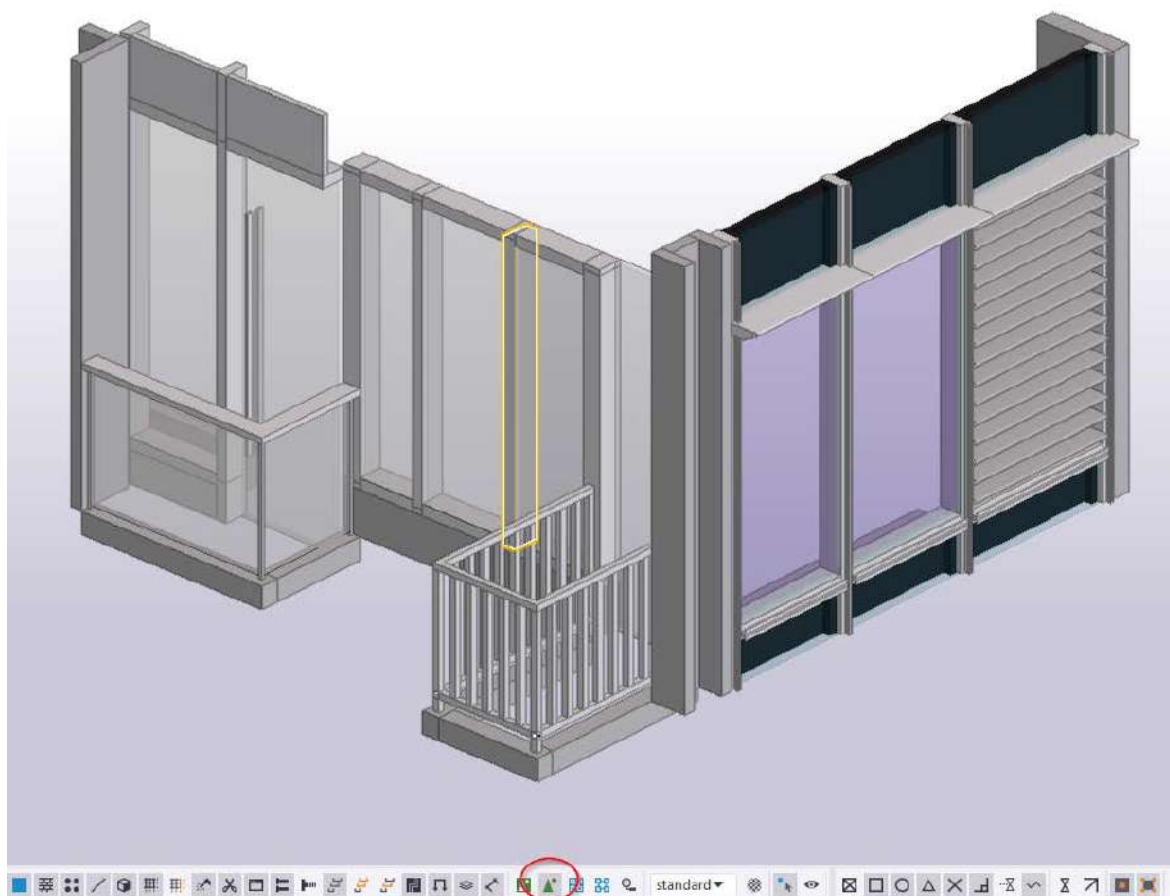


## 4.18 Creating native Tekla elements from IFC objects

It is possible to convert IFC reference model objects to native Tekla elements using the “Convert IFC objects” tool. Users can choose to convert a portion of, or the entire IFC model. Users can overview the converted properties and choose the conversion type.



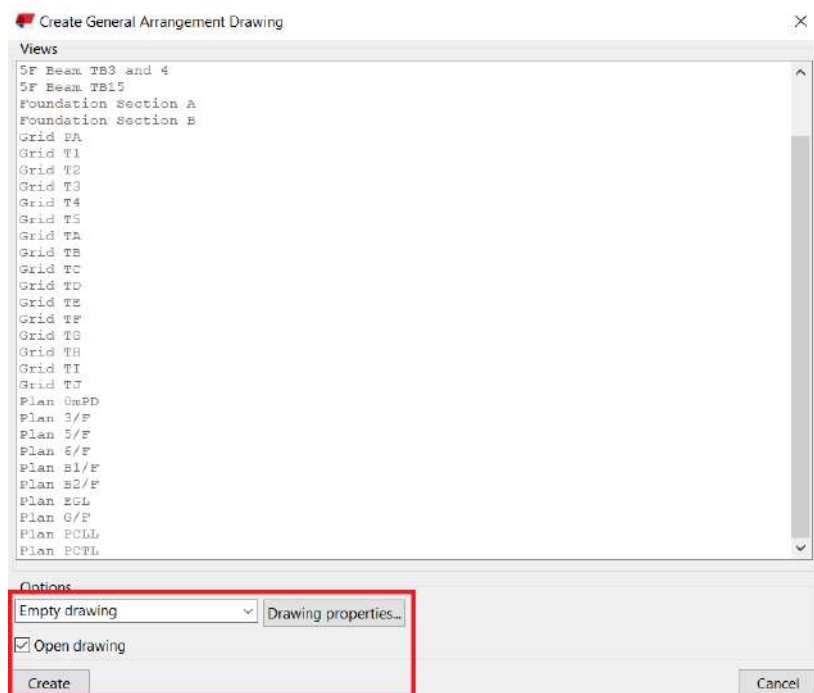
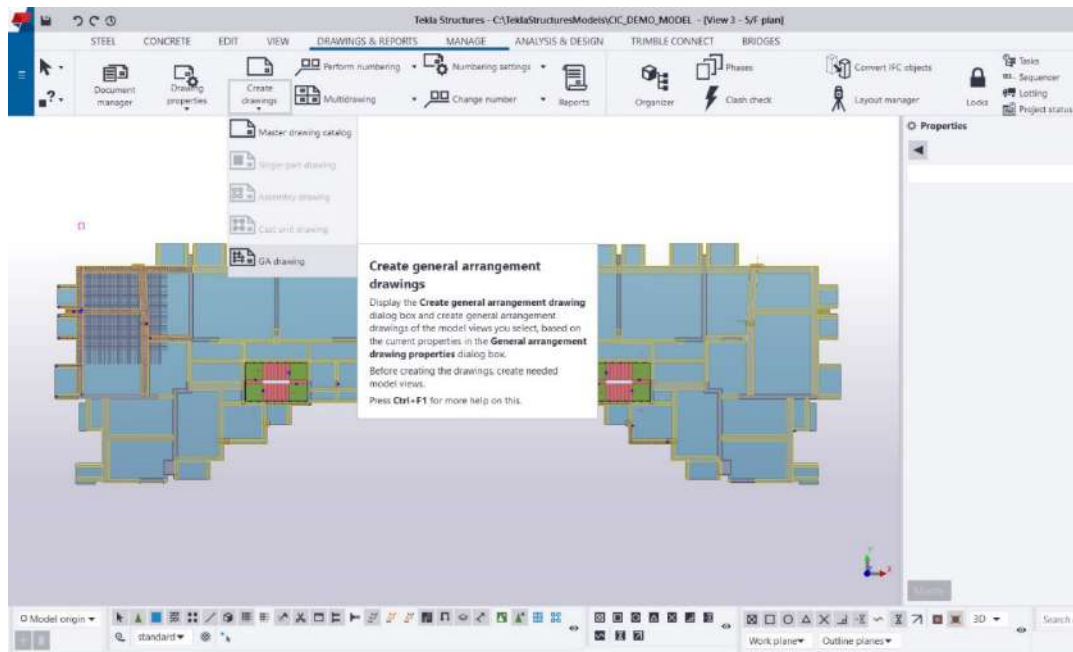




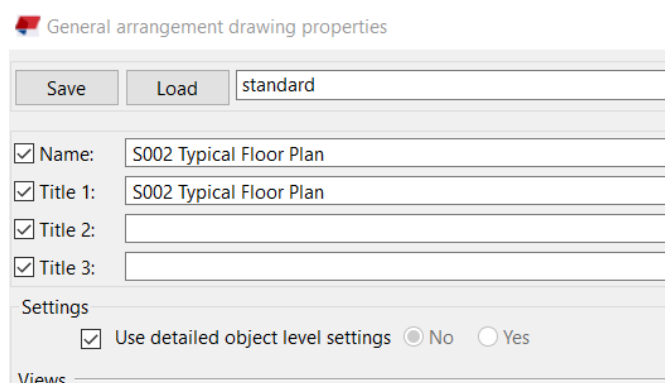
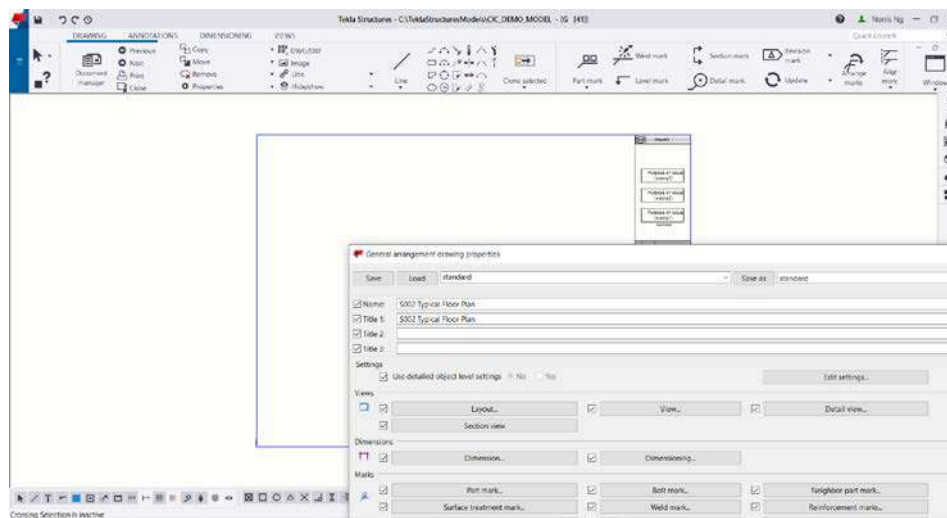
## 5 2D drawing production

### 5.1 Creating GA drawings

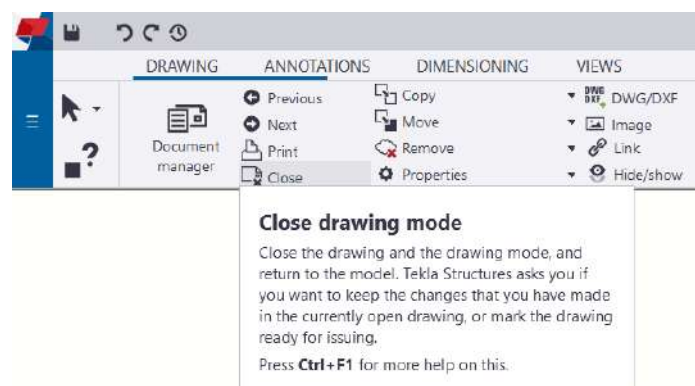
First In 3D modelling mode, choose the views needed for 2D drawing production. On the drawing tab, click create drawings > GA drawings. In the create General Arrangement Drawing pop-up window, choose empty drawings, tick the box of open drawing and then click “Create”



Now Tekla is switched from 3D modelling mode to 2D drawing mode. Double click at any blank area on the 2D drawings to open drawing property menu. Assign the name of this 2D drawing as shown below. User can also adjust drawing properties such as views, dimension, marks, objects in the drawing property menu. Click Modify > Apply > OK to finish.

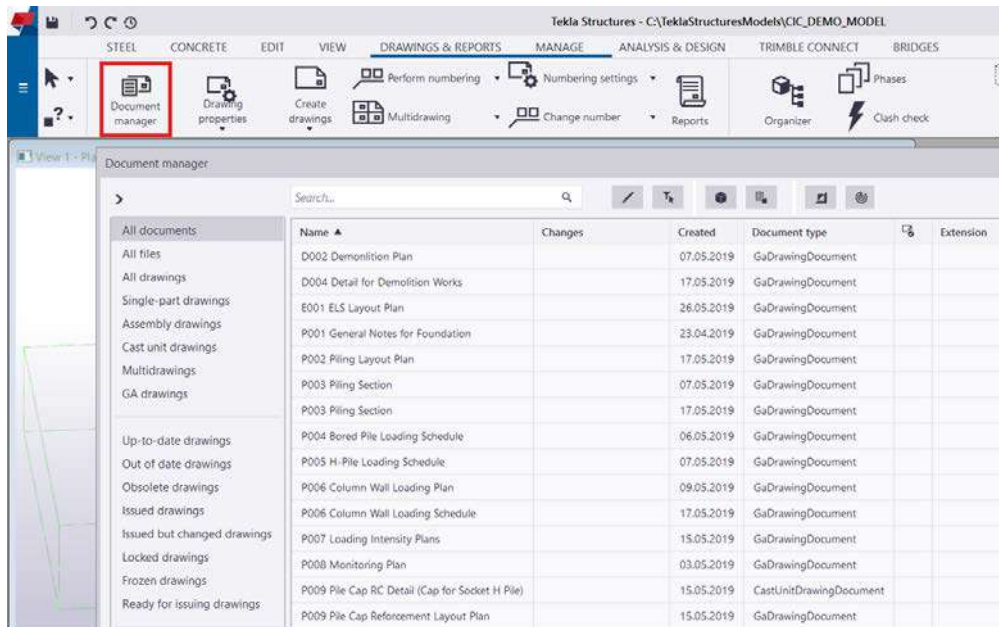


The name assigned in the drawing property menu can be found in the document manager after the user leaves this drawing close drawing mode by pressing the button as shown below. After drawing mode is close, Tekla would switch from drawing mode back to 3D modelling mode.

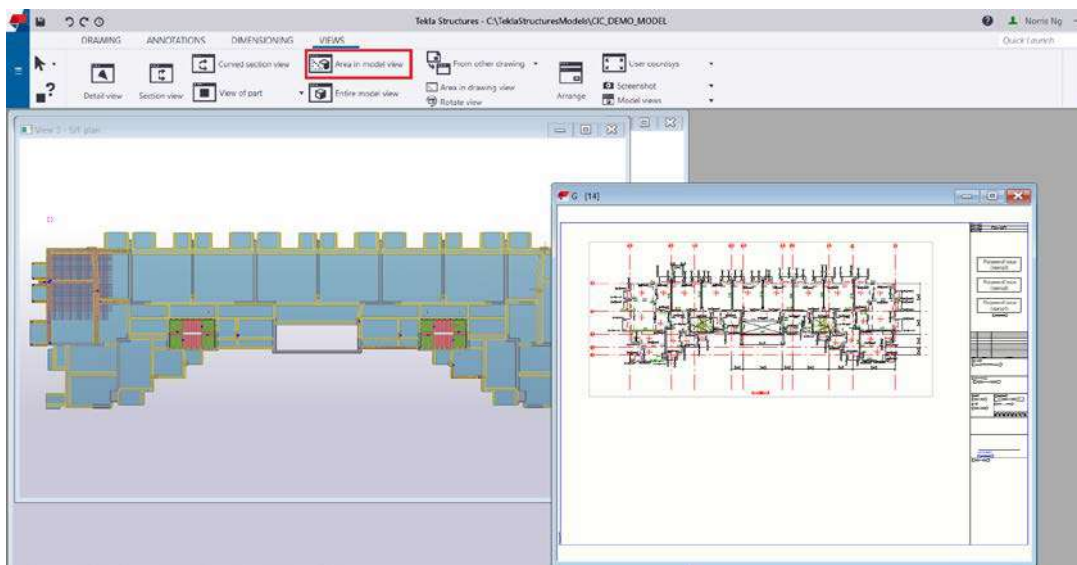


## 5.2 Inserting Views to Drawings

In 3D modelling mode, on the Drawings & Report tab, click “Document Manager” to choose the drawings which needed to be edited. Double click the name of the drawing to switch from 3d modelling mode to drawing mode. Please note users could only delete unwanted drawings in Document Manager when Tekla is in 3D modelling mode. Right-click the name of the drawing in document manager to delete unwanted drawings.

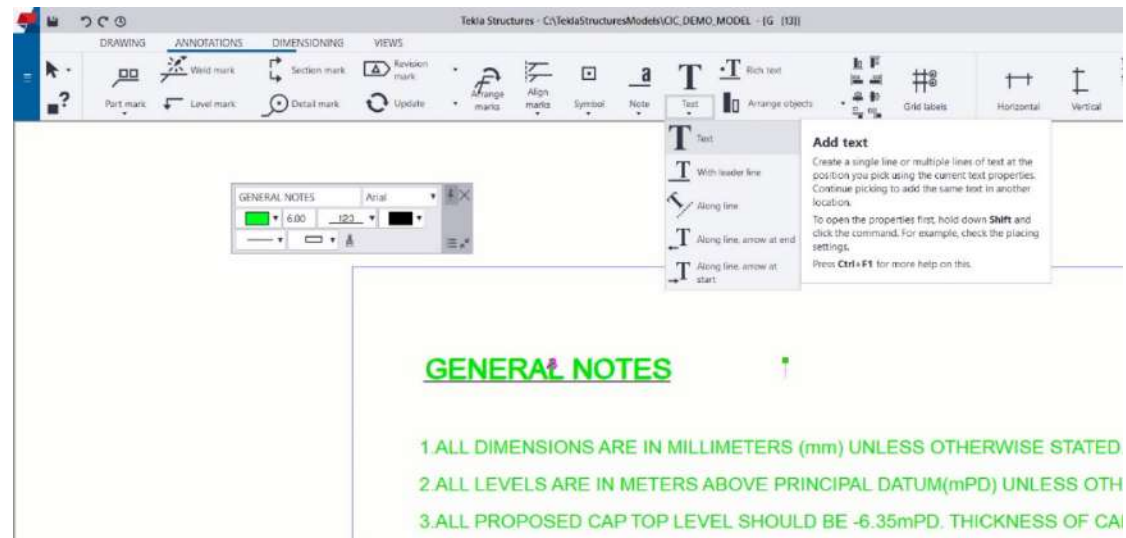


In drawing mode, on the view tab, pick Area in Model View and then choose the model view which is required to be put into the 2D drawings. Double click a blank area in drawing to adjust drawing property of the whole drawing, double click the imported view to adjust view property of the specific view. Users may use phase manager to categorise Tekla elements to a different phase and set rules in the filter in the view property menu to control whether different elements are being shown in drawings. In Tekla settings in view property will override settings in drawing property.



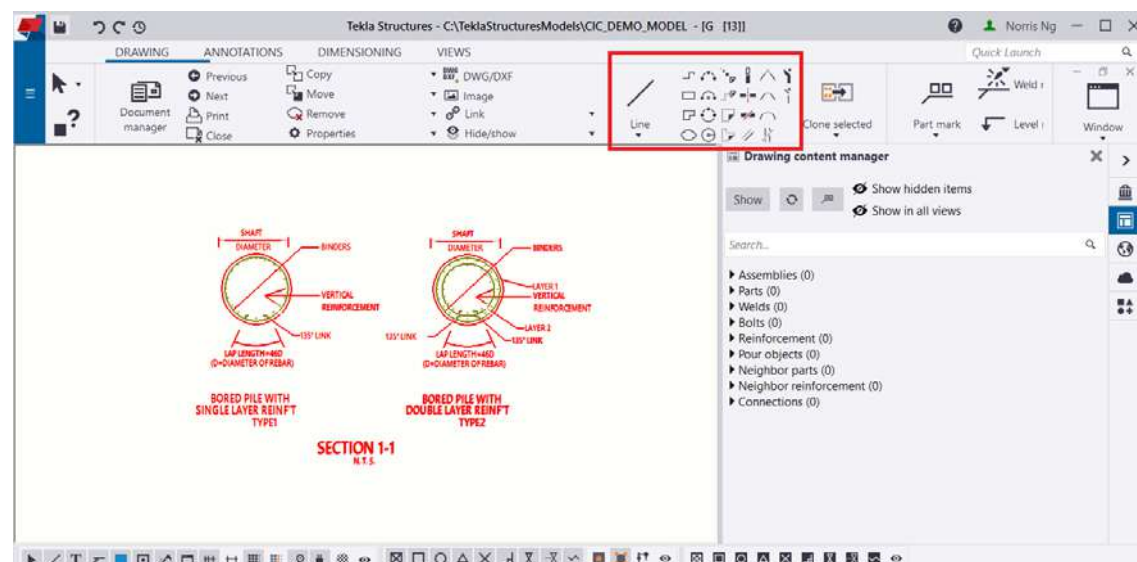
## 5.3 Creating Text and 2D Typical Details to Drawings

After putting views from 3D models to drawings, users can create text. In drawing mode, on the annotation tab, click text to inset text on drawings.



2D typical details could also be added in Tekla. Users may either create native Tekla 2d objects in drawings by using the buttons on the drawing tab as shown below or insert 2D dwg / dng files to Tekla directly. 2D drawing pieces could be stored in Tekla built-in 2D Library such that users could reuse those details in other drawings. Users can also import 2D .dwg files to the 2D library directly. The link below provides all necessary information about 2D Library in Tekla,

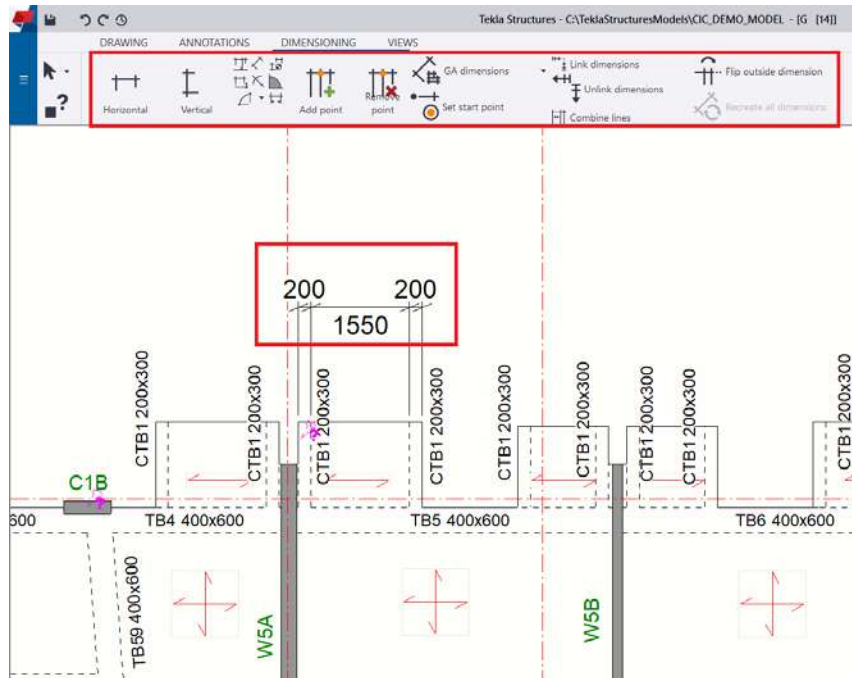
[https://teklastructures.support.tekla.com/2017/en/dra\\_details\\_in\\_drawing\\_2d\\_library](https://teklastructures.support.tekla.com/2017/en/dra_details_in_drawing_2d_library)



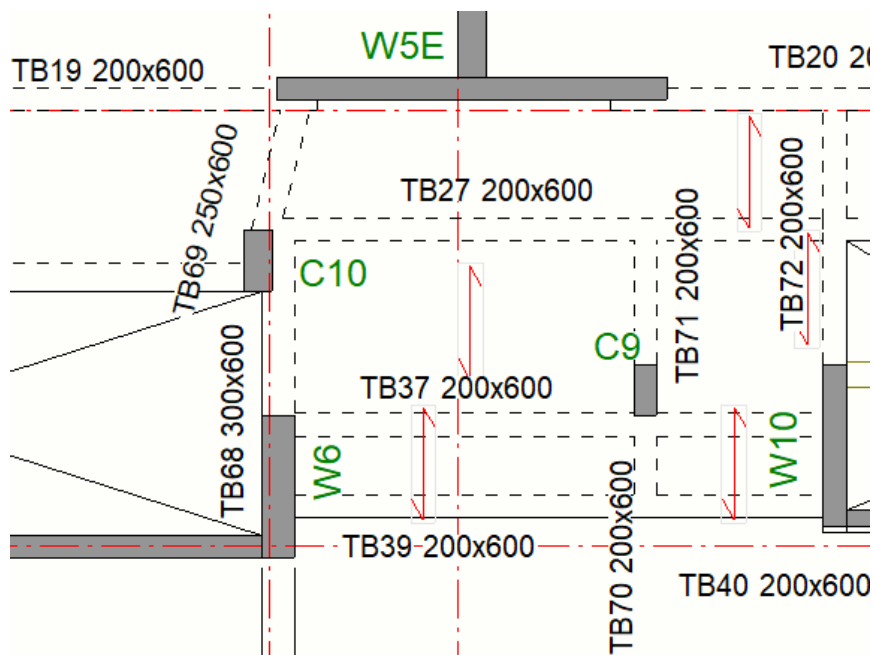


## 5.4 Adding Dimensions and Marks to Drawings

Dimensions are vital in construction drawings. After putting views from 3D models to drawings, users may specify dimensions to Tekla objects. This can be done by simply using the buttons on the dimension tab in drawing mode.



In Tekla beam, columns, slabs and panels are called parts and users could add marks to parts in drawings. Users can create and control part marks in the drawing property menu and view the property menu. Besides, users could also control marks of individual part by right click at specifying part in drawing mode. One part could only be annotated by one mark on drawings, if users need to annotate additional information of specifying a part, users need to use associative notes by clicking the “note” button under the annotation tab in drawing mode.

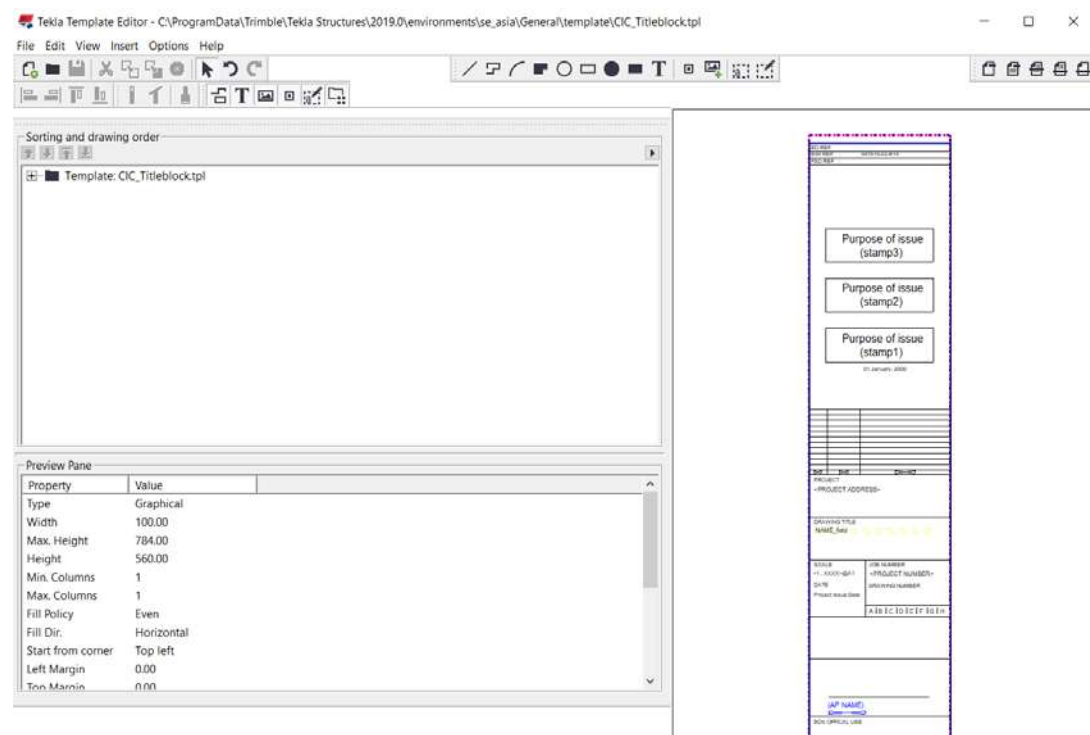


## 5.5 Creating Title Blocks and Schedules to Drawings

In Tekla, table-like objects (such as schedules, tables and title block or drawing frame) are created by using template editor to list out information.

To create Title Block in Tekla, please refer to this official step-by-step video.

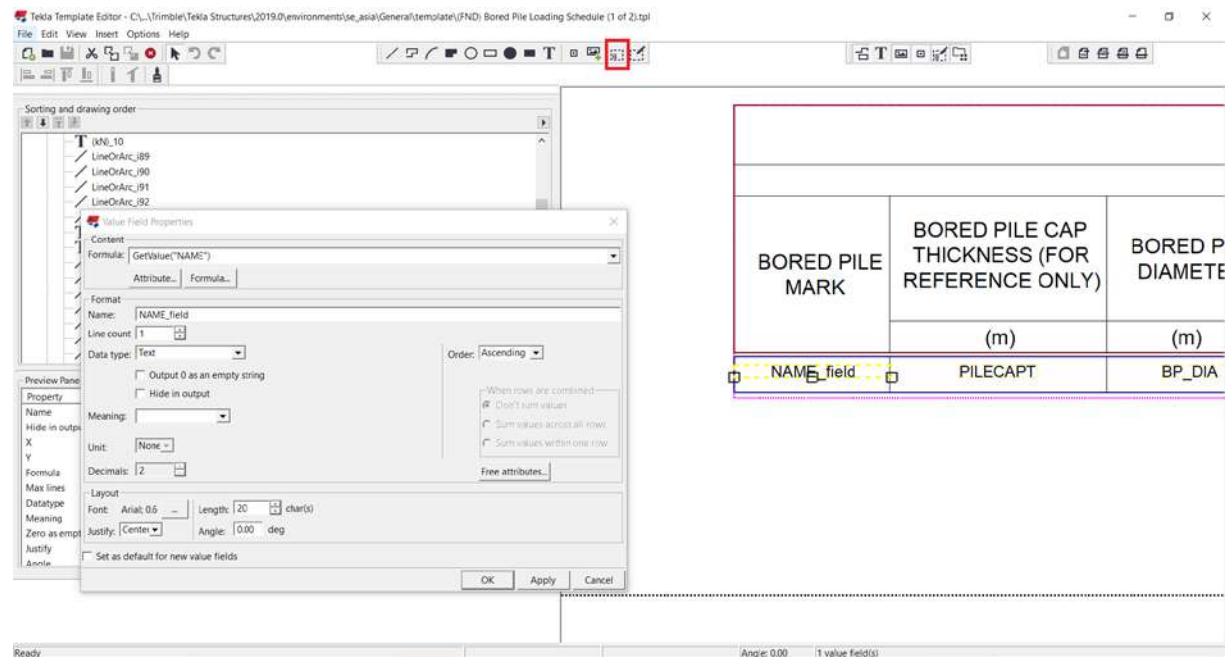
<https://teklastructures.support.tekla.com/video-tutorials/en/import-dwg-template-editor-title-blocks>



Users could also tabulate information stored in Tekla objects inside the template editor. This can be done by using the Value Field button in the templated editor as shown below.

Value Fields in Tekla could recognise objects captured inside views inside the same drawing. Value Fields are needed to be put inside “Row” (the blue box) in the template editor. Users could also use a formula to calculate information in Tekla objects and tabulate the answer in Template Editor. Please refer to the link below for more information :

[https://teklastructures.support.tekla.com/2018/en/re/ 2018\\_template\\_editor\\_improvements](https://teklastructures.support.tekla.com/2018/en/re/ 2018_template_editor_improvements)

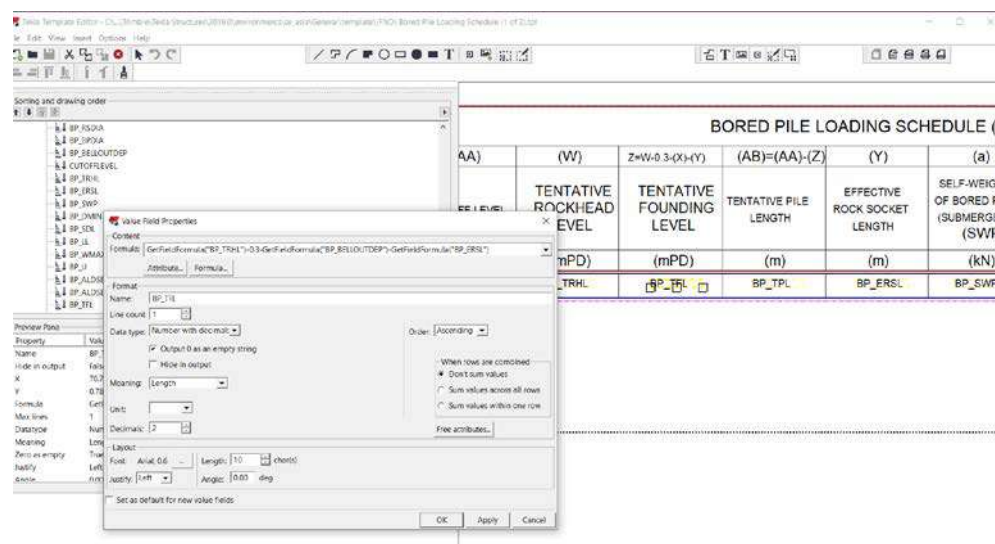
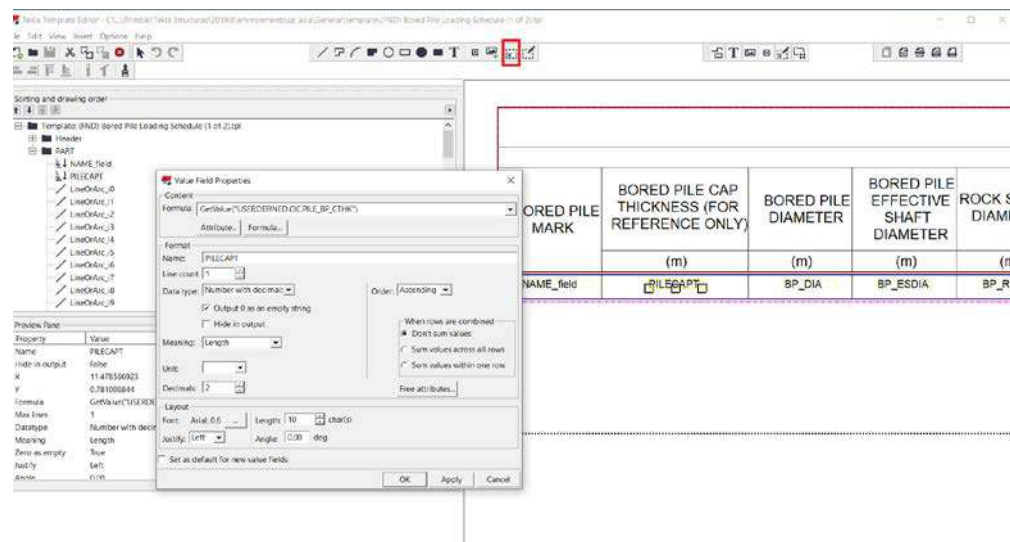




Users may refer to drawing P004 in the sample model. The Bore Pile Loading Schedule provided an example of how this could be achieved by using Tekla.

UDA was added to the template editor before value field was added to the template editor, please refer to the link below for information.

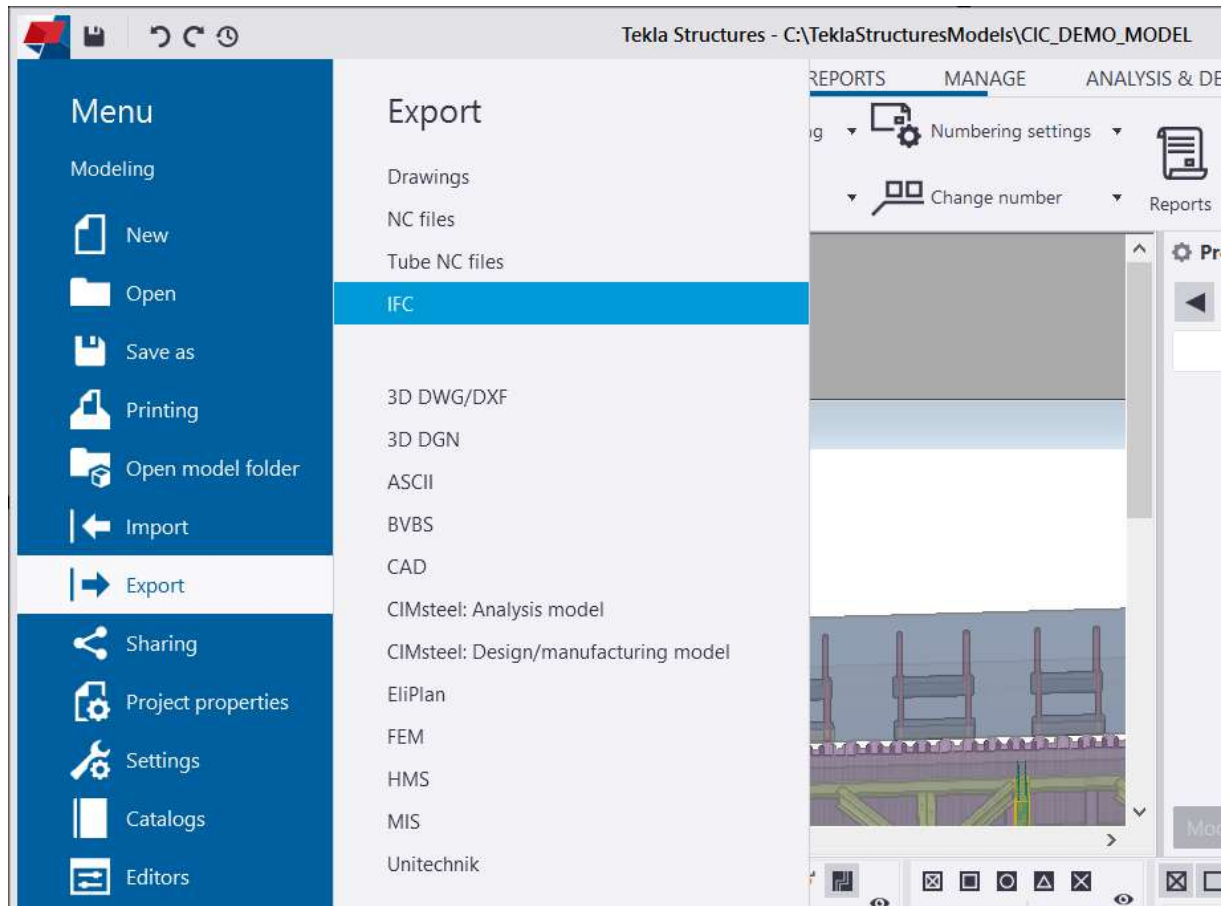
[https://teklastructures.support.tekla.com/2019/en/rep\\_adding\\_userdefined\\_attributes\\_to\\_tpl\\_ed](https://teklastructures.support.tekla.com/2019/en/rep_adding_userdefined_attributes_to_tpl_ed)



## 6 Exporting Tekla Models as Deliverables

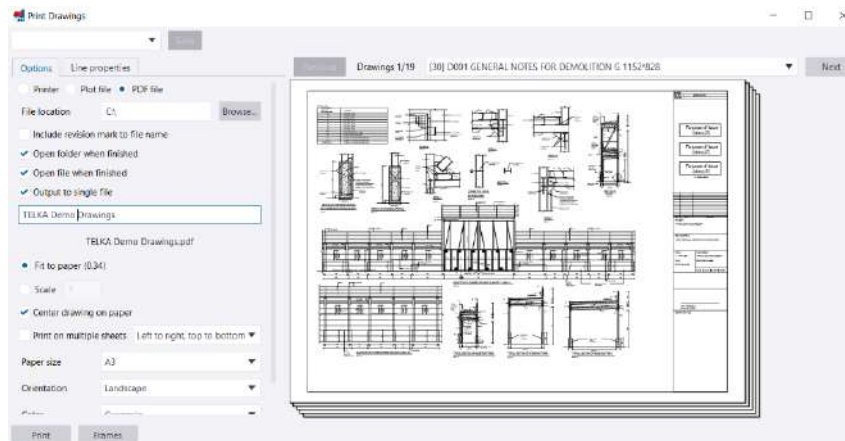
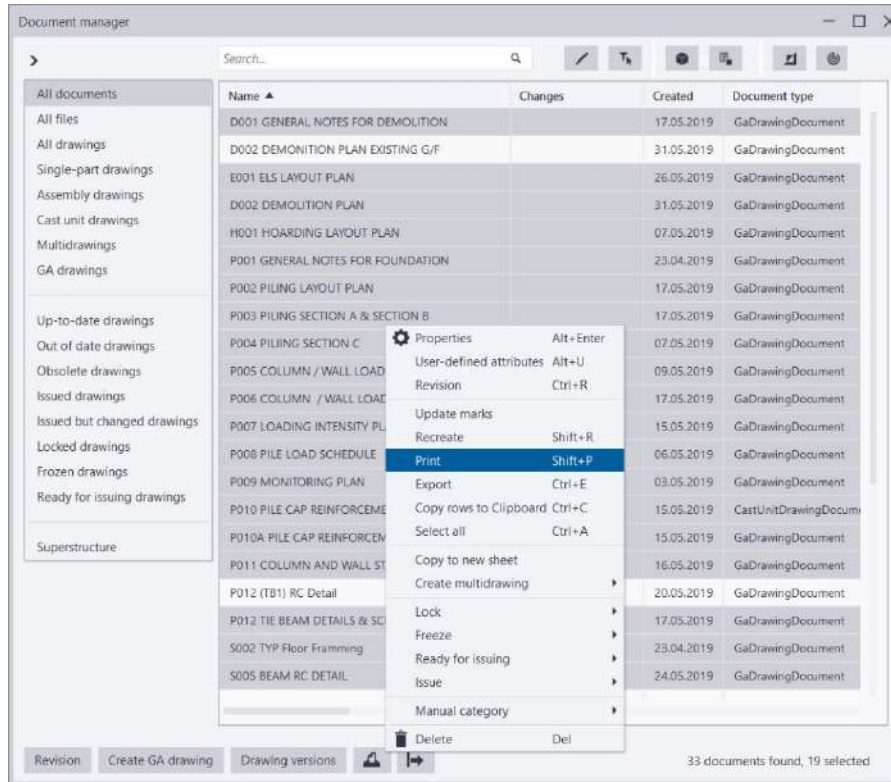
### 6.1 Exporting 3D models as ifc

IFC model could be exported by Tekla by simply clicking Export > IFC in the File menu as shown below.



## 6.2 Exporting 2D drawings as pdf or dwg

2D drawings could be exported by right click selected drawings in Document Manager in 3D modelling mode as shown below:



## Feedback Form

### CIC BIM User Guide for Preparation of Statutory Plan Submissions Tekla December 2020

To improve future editions of this publication, we would be grateful to have your comments.

(Please put a "✓" in the appropriate box.)

<b>1. As a whole, I feel that the publication is:</b>	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
<b>Informative</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comprehensive</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Useful</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Practical</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. Does the publication enable you to understand more about the subject?</b>	Yes		No		No Comment
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
<b>3. Have you made reference to the publication in your work?</b>	Quite Often		Sometimes		Never
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
<b>4. To what extent the publication benefits you?</b>	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
<b>Supply chain Information/data integrity</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Work efficiency</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Project Collaborations</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>5. Overall, how would you rate our publication?</b>	Excellent	Very Good	Satisfactory	Fair	Poor
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>6. Other comments and suggestions, please specify (use separate sheets if necessary).</b>					
<b>Personal Particulars (optional):*</b>					
Name:		Mr. / Mrs./ Ms./ Dr./ Prof./ Ar. / Ir / Sr ^			
Company:					
Tel:					
Address:					
E-mail:					

\* The personal data in this form will be used only for this survey. Your data will be kept confidential and dealt with only by the Construction Industry Council.

^ Circle as appropriate.

Please return the feedback form to:

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