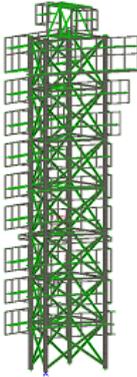
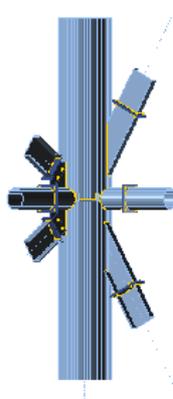


IDEA StatiCa tutorial – BIM link AxisVM

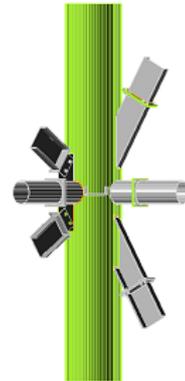
This tutorial will show how to activate and use the link between AxisVM and IDEA StatiCa Connection.



Activate the link



Use the link



Update the project

1 How to activate the link

- Install the latest version of IDEA StatiCa, get it in the [Downloads](#)
- Make sure you are using a supported version of AxisVM – updates are published in the [BIM section](#)

After installation of both programs, run IDEA StatiCa and start with the item **BIM**.

In the BIM wizard continue with the item **Activate your Bim Link...** During the process notification *"Run as administrator"* appears. Please confirm with the button **Yes**.

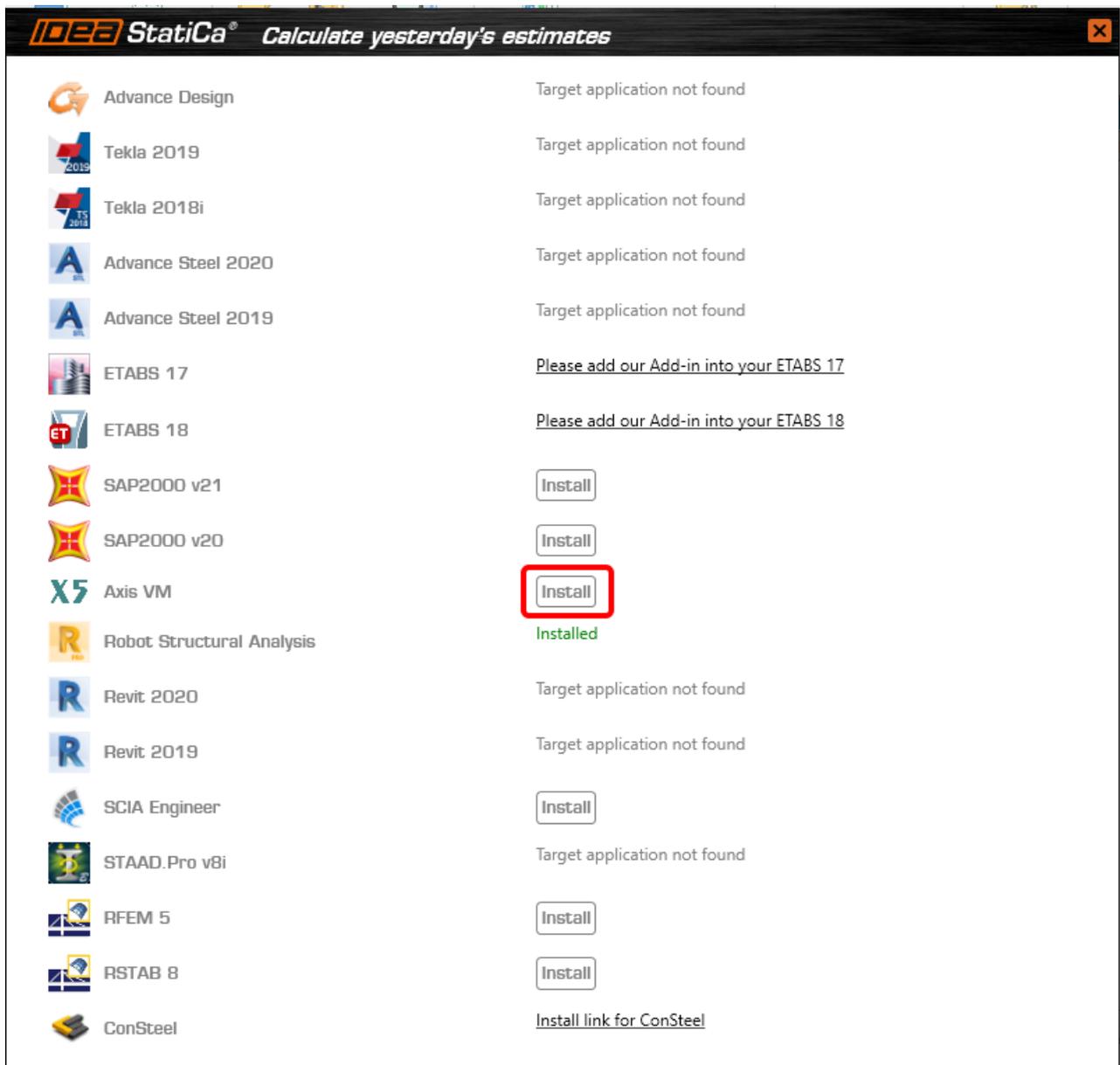
The screenshot shows the IDEA StatiCa website interface. At the top, the logo "IDEA StatiCa®" is displayed with the tagline "Calculate yesterday's estimates". Below the logo, there are navigation tabs for "STEEL", "CONCRETE", and "BIM", with "BIM" highlighted in a red box. To the right of the tabs are links for "Online resources" and "Online calculation".

Under the "BIM" tab, there is a section titled "Activate your BIM link..." with a red border. Below this, there are logos for "Midas Civil", "Scia Engineer", "Dlubal", and "AxisVM". To the right of these logos, there is a text block that reads: "IDEA StatiCa is a part of your workflow. Speed up your analysis and design process by importing data model from the most widespread FEA and CAD programs."

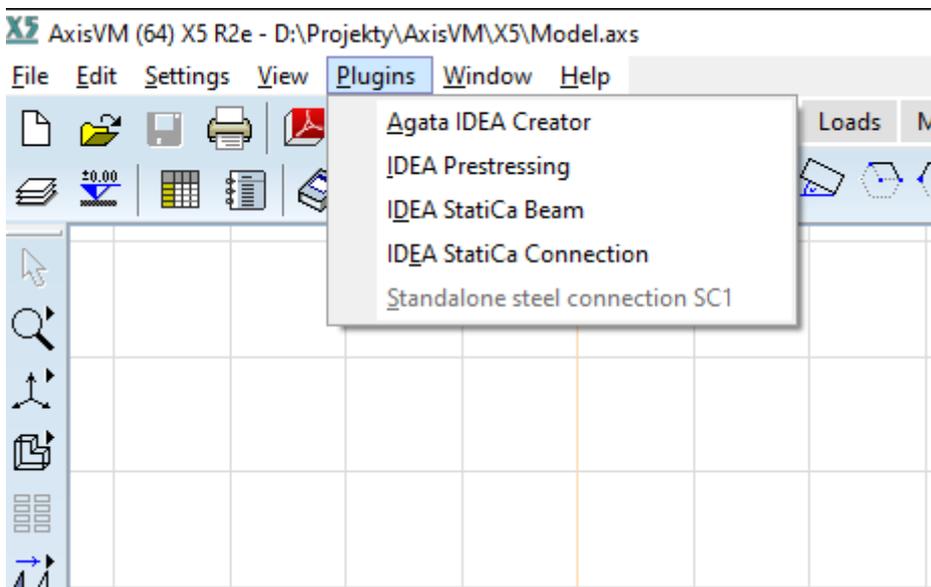
Below the text block, there are three panels illustrating the workflow: "Node Selection", "Design of Connection", and "Check EC / AISC". Each panel shows a 3D model of a steel connection. Below the panels, there is a button labeled "Open existing project Import from other program".

At the bottom of the page, there is a footer with the text "Have a question?" and "Keep in touch at" followed by social media icons for LinkedIn, Facebook, and YouTube.

Select your version of AxisVM and click the button **Install**. The process of integration will start.

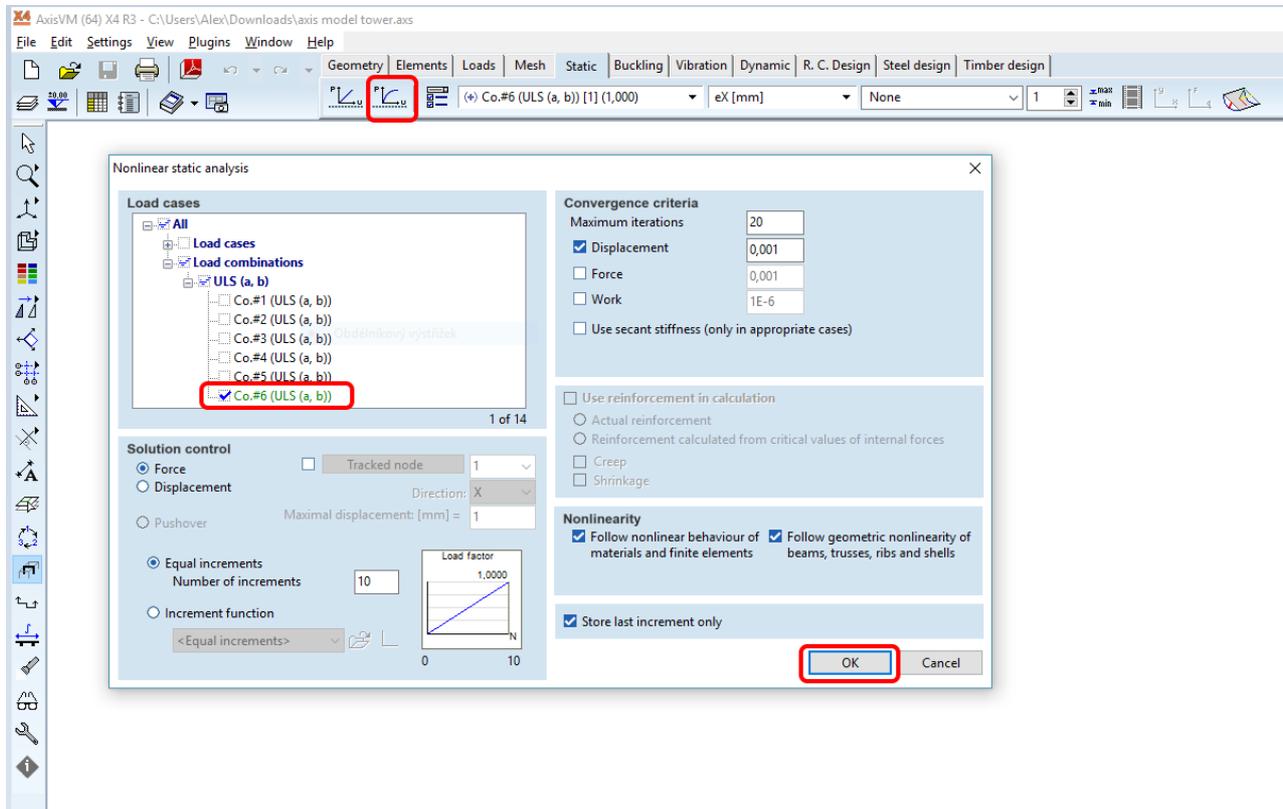


Start **AxisVM**. In the menu Plugins are now installed all 3 Plugins of IDEA StatiCa.

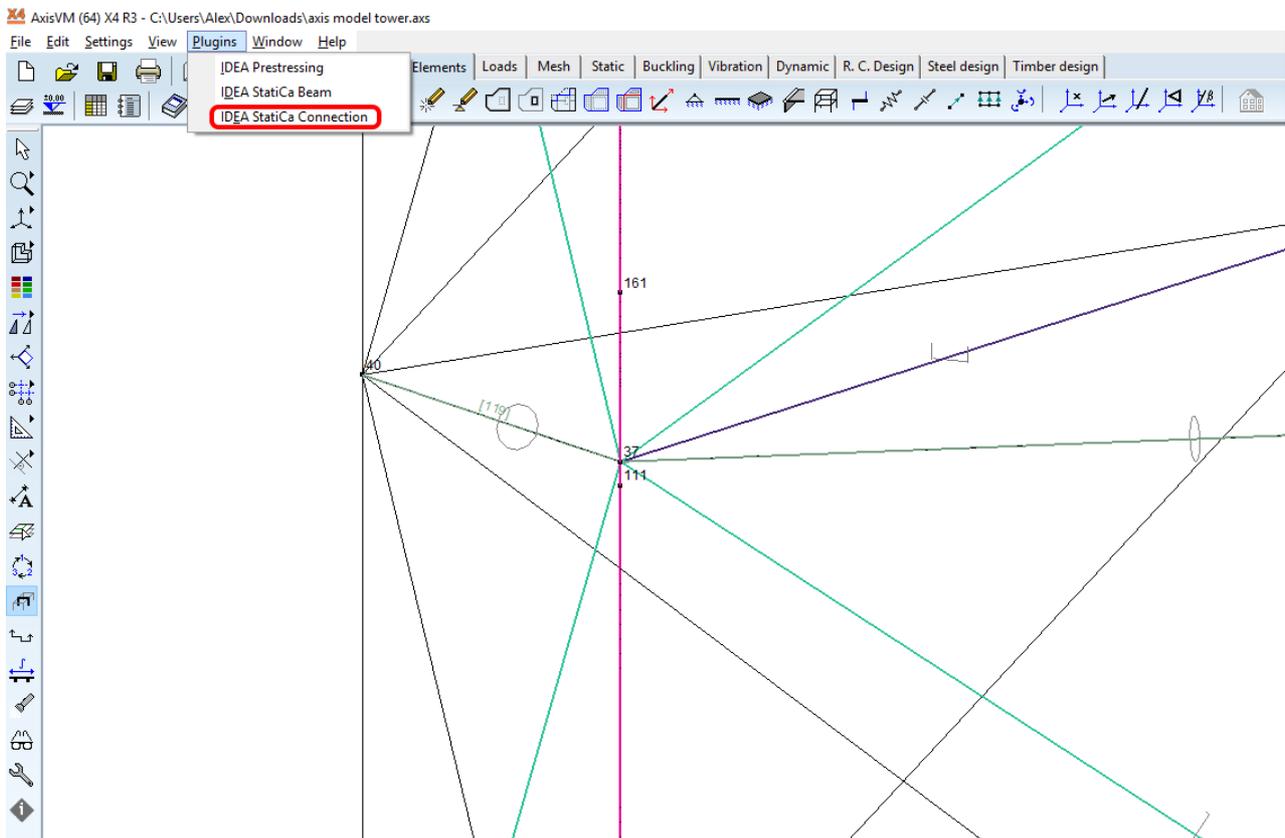


2 How to use the link

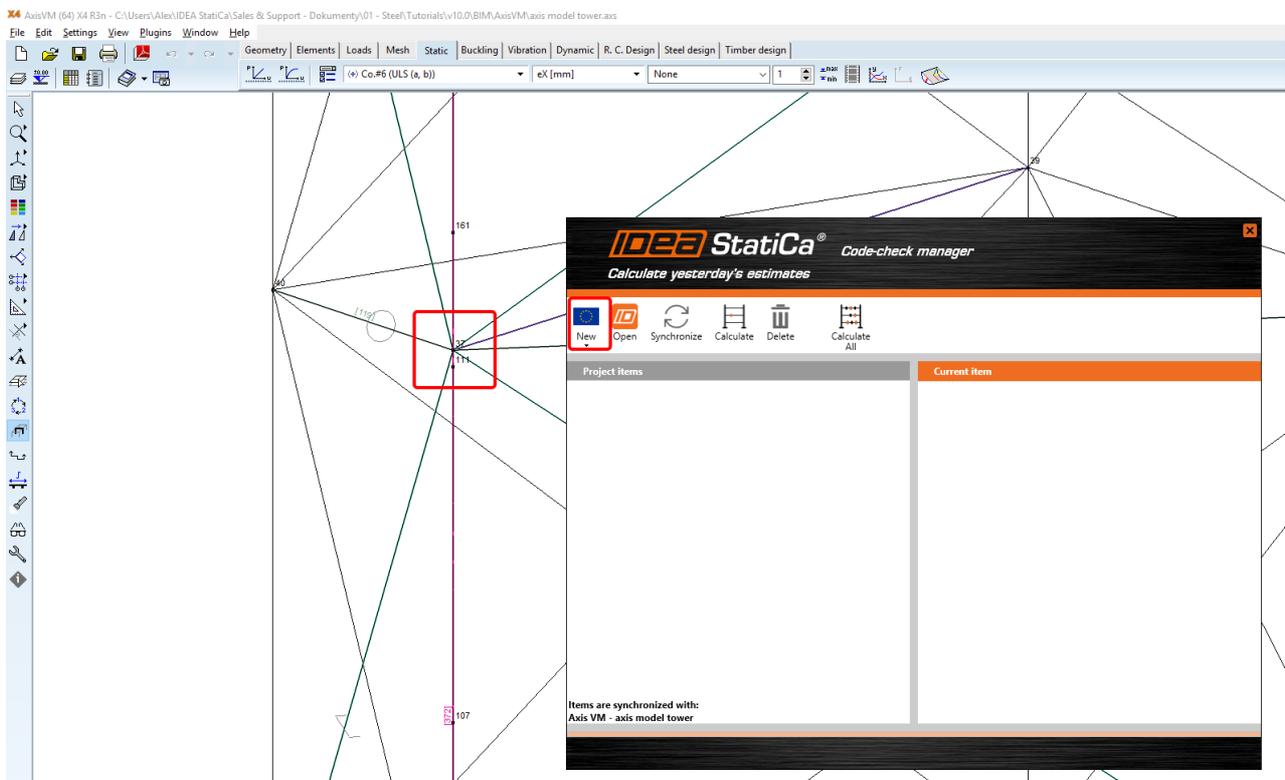
Open attached [project](#) in AxisVM, run the linear and then non-linear analysis. This rule is valid only for the projects, where non-linear analysis is required. In our case, we will choose only the combination **Co#6** to speed up the analysis.



Go to menu item **Plugins** and choose **IDEA StatiCa Connection**.



A wizard window opens, select the joint you want to transfer to IDEA StatiCa Connection and click on **New project**.



In the Wizard continue with the button **Next**.



We assign the vertical member as a **Bearing** and **Continuous** and then click **Next**.

IDEA StatiCa® CONNECTION
Calculate yesterday's estimates

Connection design needs more data to be able to provide a proper design according to national codes. You can use default settings or define them in this wizard.

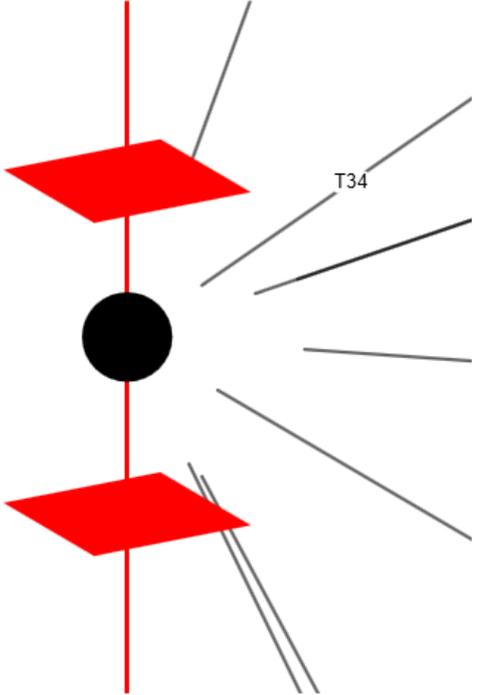
Design code: EN

Type of structure: General structure

Default setting:
All load combinations are used for the design.
Load combinations are sorted into classes ULS, SLS etc.

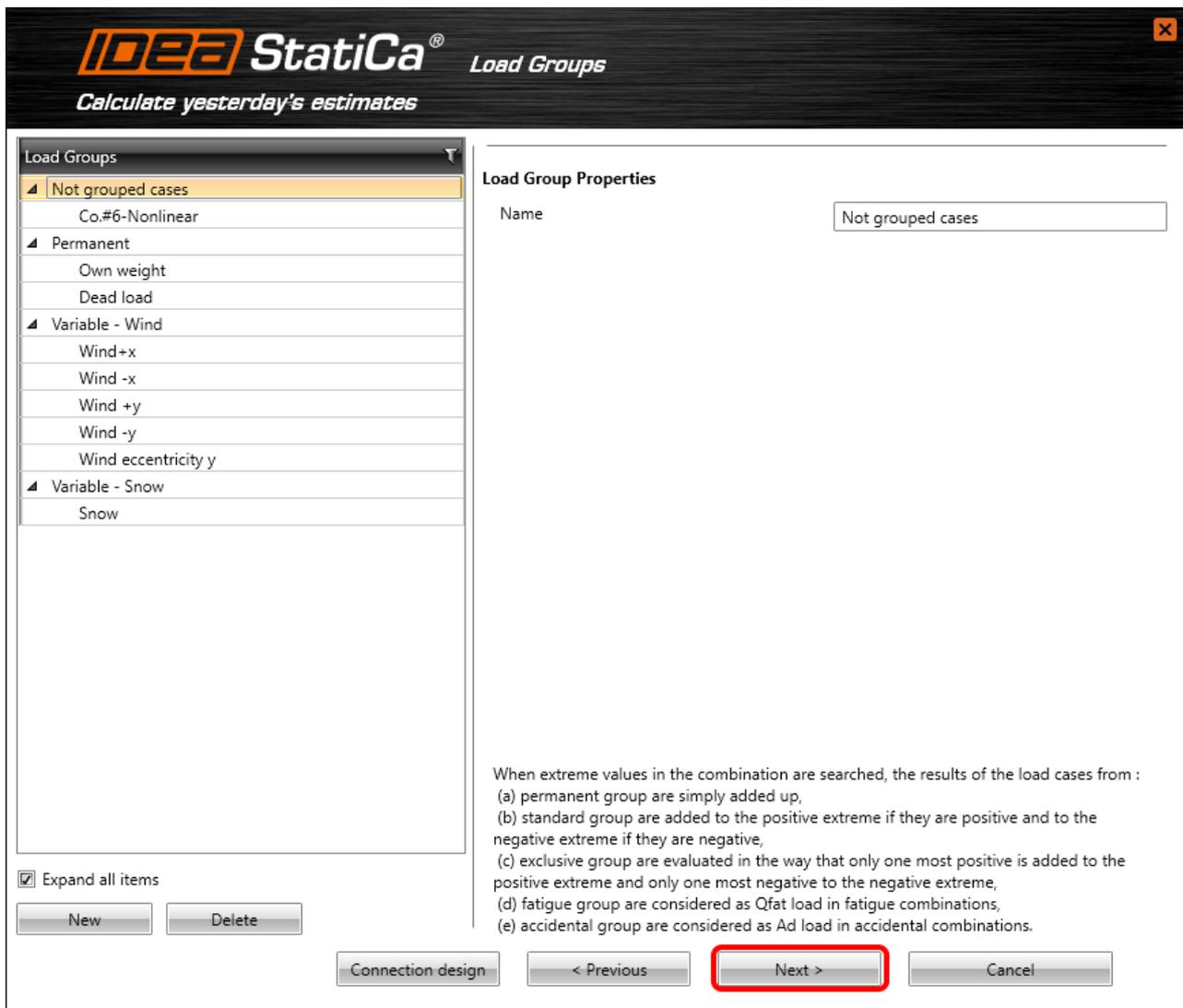
Node 62-Node N62
Connected members:

Cross-section	Role	Type
T34 (Diagonal U 240)		Ended
T31 (Diagonal U 240)		Ended
M116 (O 219.0 x 6.0 SV)		Ended
M119 (O 219.0 x 6.0 SV)		Ended
T16 (Hor U 200)		Ended
T50 (Diagonal U 240)		Ended
T51 (Diagonal U 240)		Ended
> M372 (O 521.0 x 10.0 SV)	Bearing	Continuous

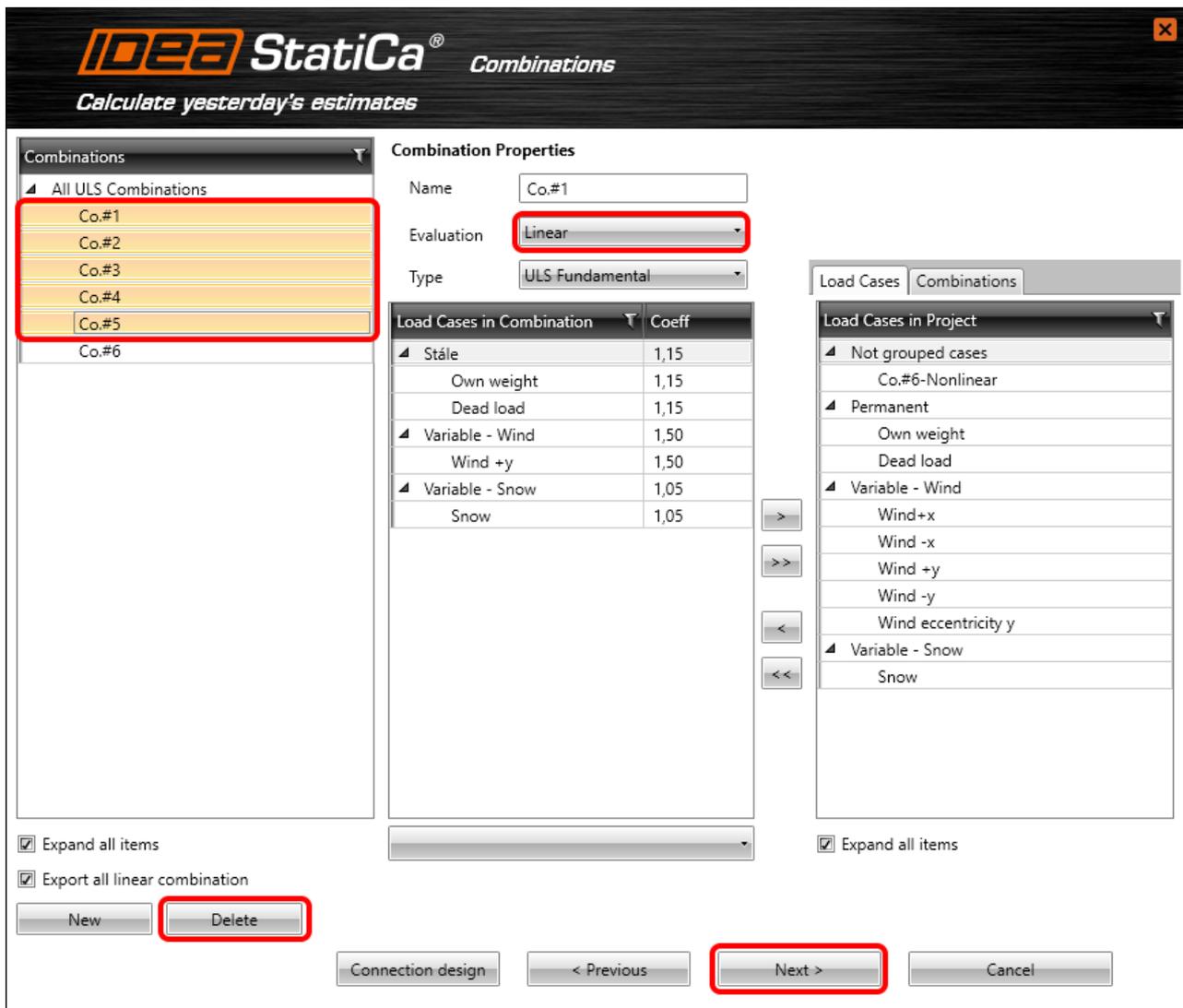


Connection design < Previous **Next >** Cancel

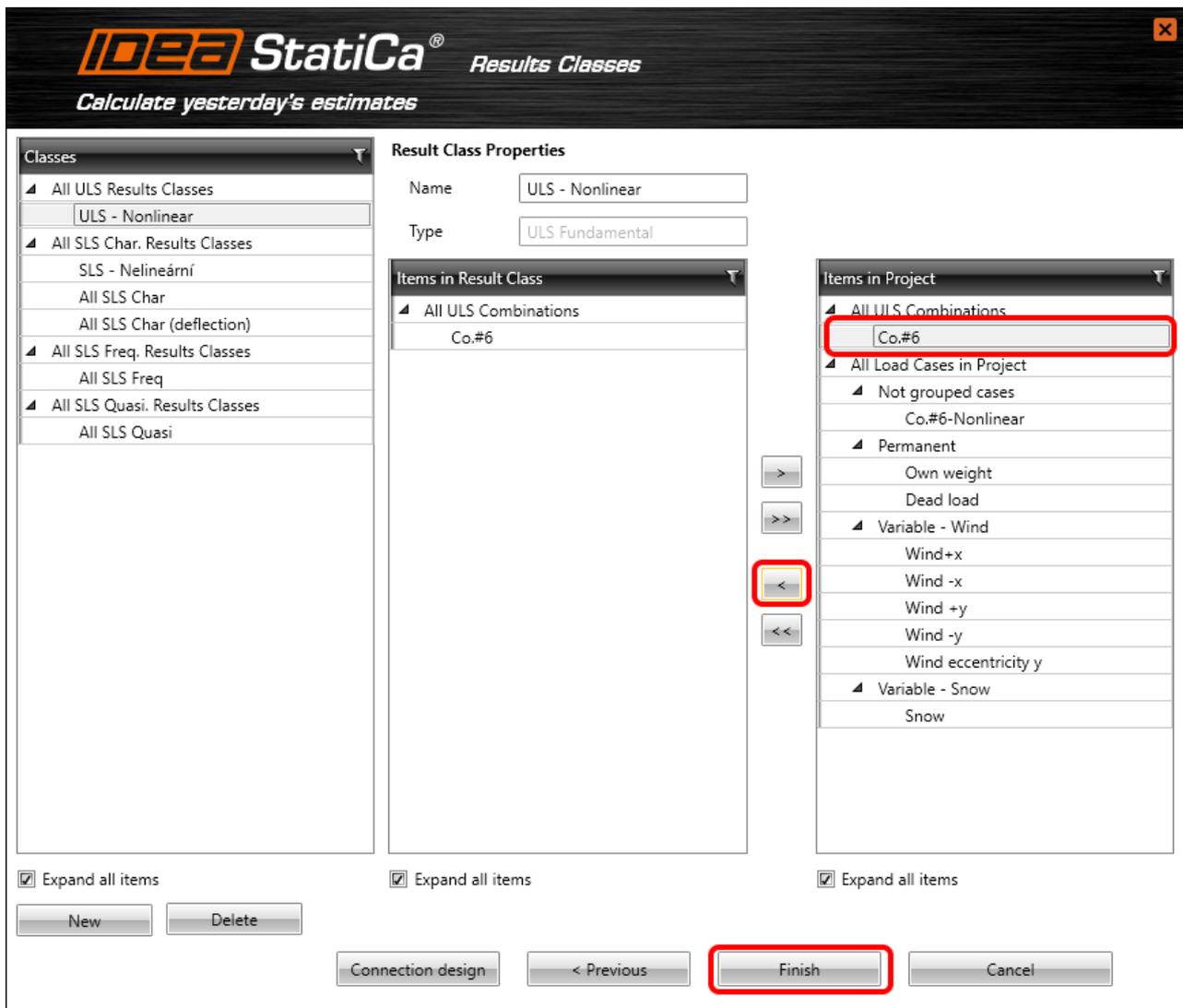
In the Wizard window "Load Groups" we continue with the button **Next**.



In the Wizard window "Combinations" delete all five combination except the combination CO6, set the evaluation to **Linear** and continue with button **Next**.



We add the combination **Co#6** to column **Result Class Properties** and click **Finish** to end the process.



3 Design

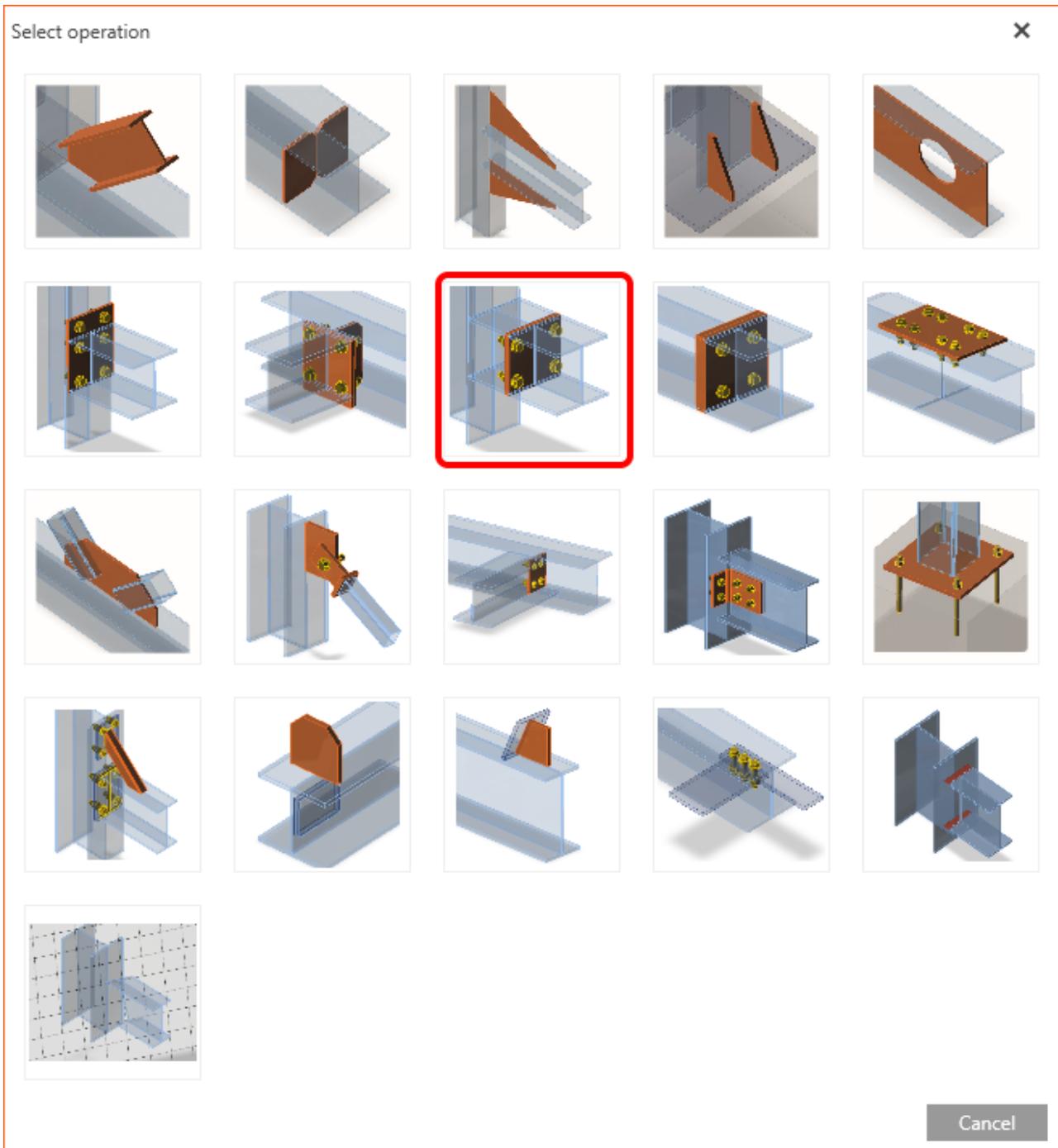
In the upon ribbon we select **Design** and right-click on **Operation** to add a New operation **Stub – Plate to plate**.

The screenshot displays the IDEA StatiCa CONNECTION software interface. The main window shows a 3D model of a tower joint with a large cylindrical member and several smaller members. The 'Design' tab is active in the top menu. On the right, the properties panel for member M372 is shown, with the 'Operations' tab selected. The properties include:

- Properties:** Cross-section: 54 - O S21.0 x 10.0 SV; Geometrical type: Continuous.
- Position:** β - Direction: 0.0; γ - Pitch: 90.0; α - Rotation: 180.0; Offset ex, ey, ez: 0.
- Model:** Model type: N-Vy-Vz-Mx-My-Mz; Forces in: Position; X [mm]: 0.

A note at the bottom of the properties panel states: "One member of the joint is considered as 'bearing'. The other one is 'connected'. The support in analysis model is applied on the bearing member."

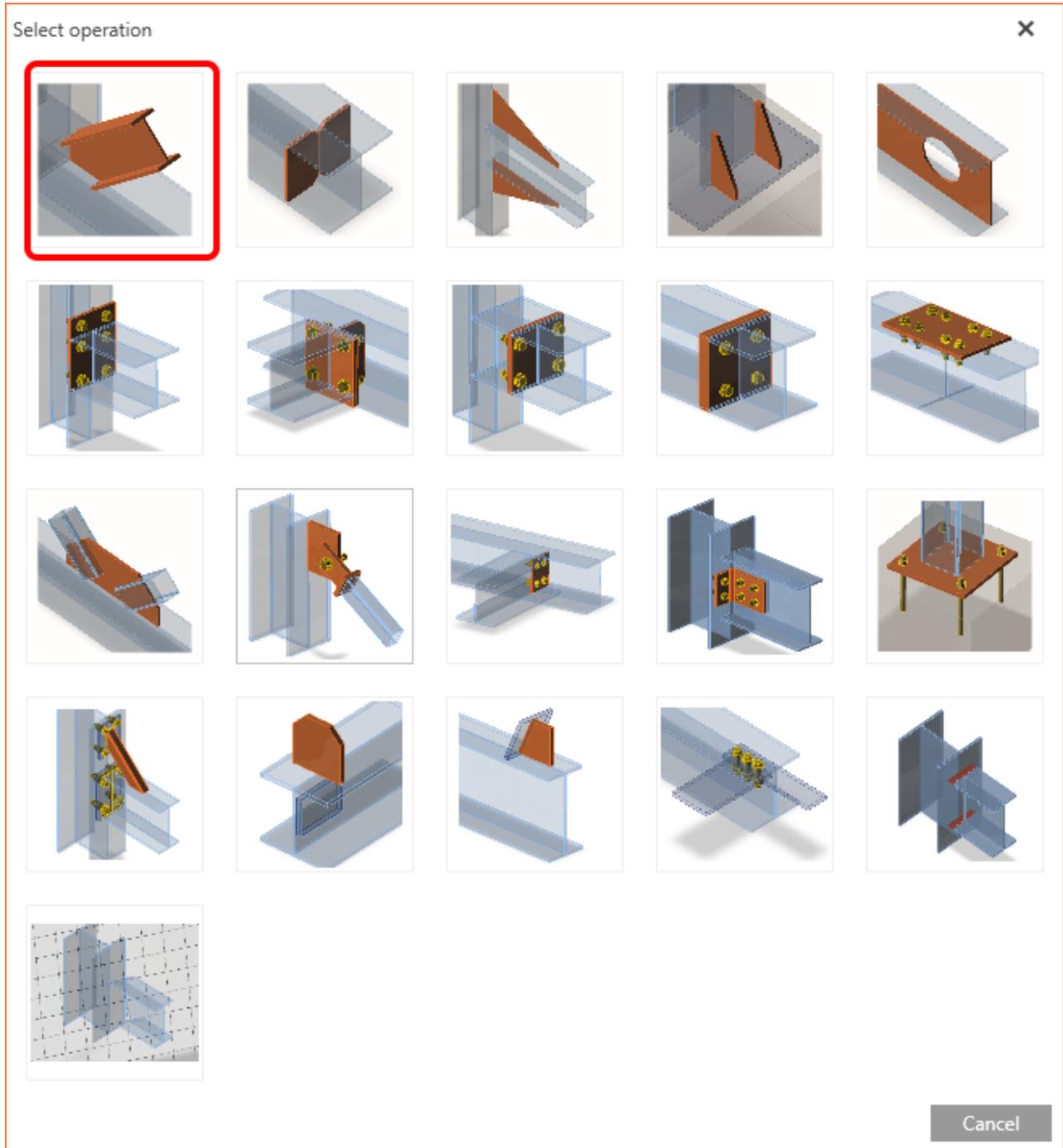
At the bottom of the software window, the status bar indicates: Design code: EN; Analysis: Stress, strain; Load effects: In equilibrium; Units: mm.

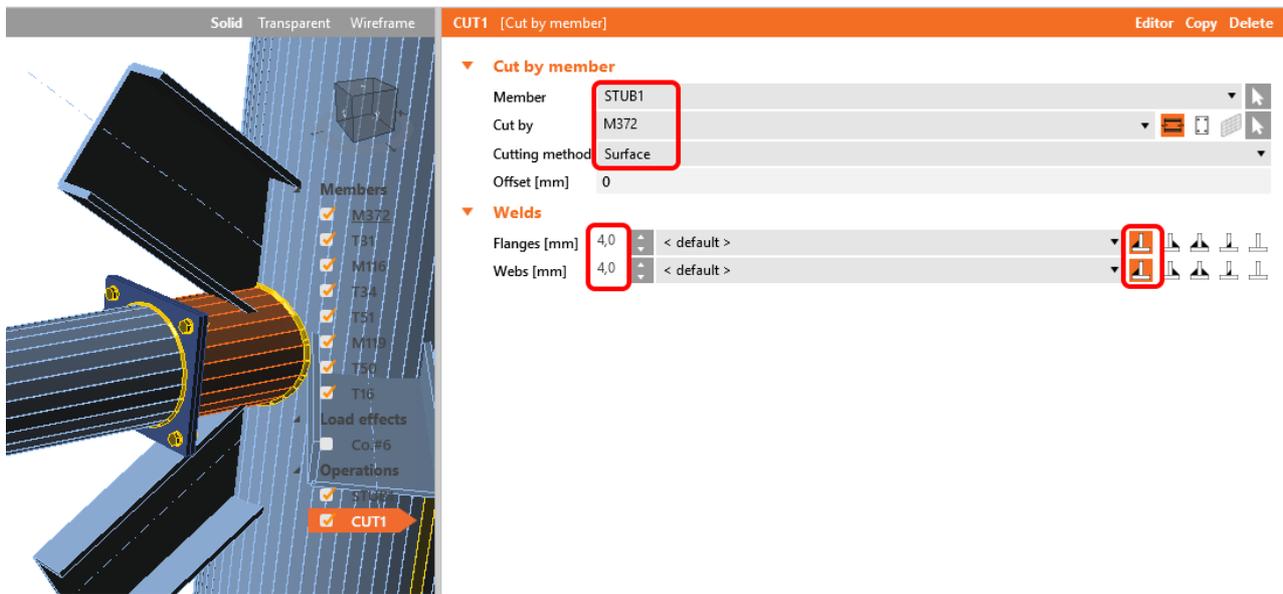


Solid Transparent Wireframe
STUB1 [Plate to plate] Editor Copy Delete

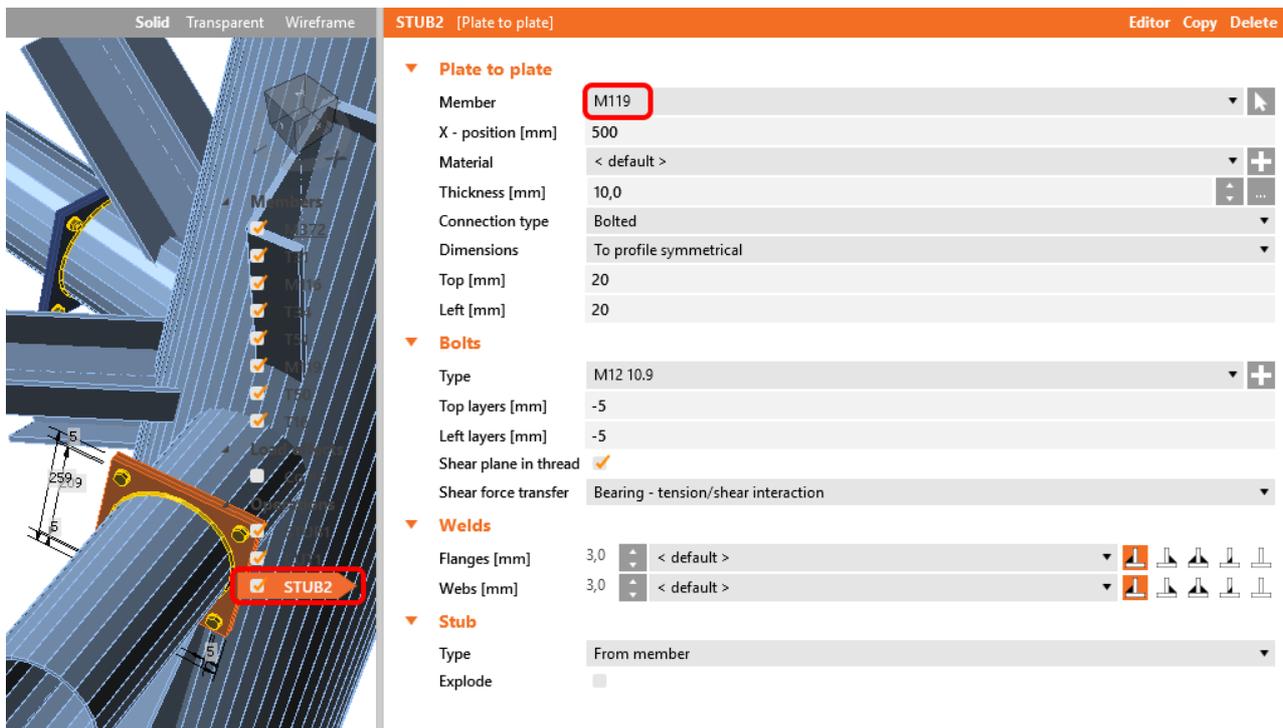
- ▼ Plate to plate**
- Member M116
- X - position [mm] 500
- Material < default >
- Thickness [mm] 10,0
- Connection type Bolted
- Dimensions To profile symmetrical
- Top [mm] 20
- Left [mm] 20
- ▼ Bolts**
- Type M12 10.9
- Top layers [mm] -5
- Left layers [mm] -5
- Shear plane in thread
- Shear force transfer Bearing - tension/shear interaction
- ▼ Welds**
- Flanges [mm] 3,0 < default >
- Webs [mm] 3,0 < default >
- ▼ Stub**
- Type From member
- Explode -

In the next step we use again right-click on **Operation** and add the manufacturing operation **Cut** and fill in the values below.

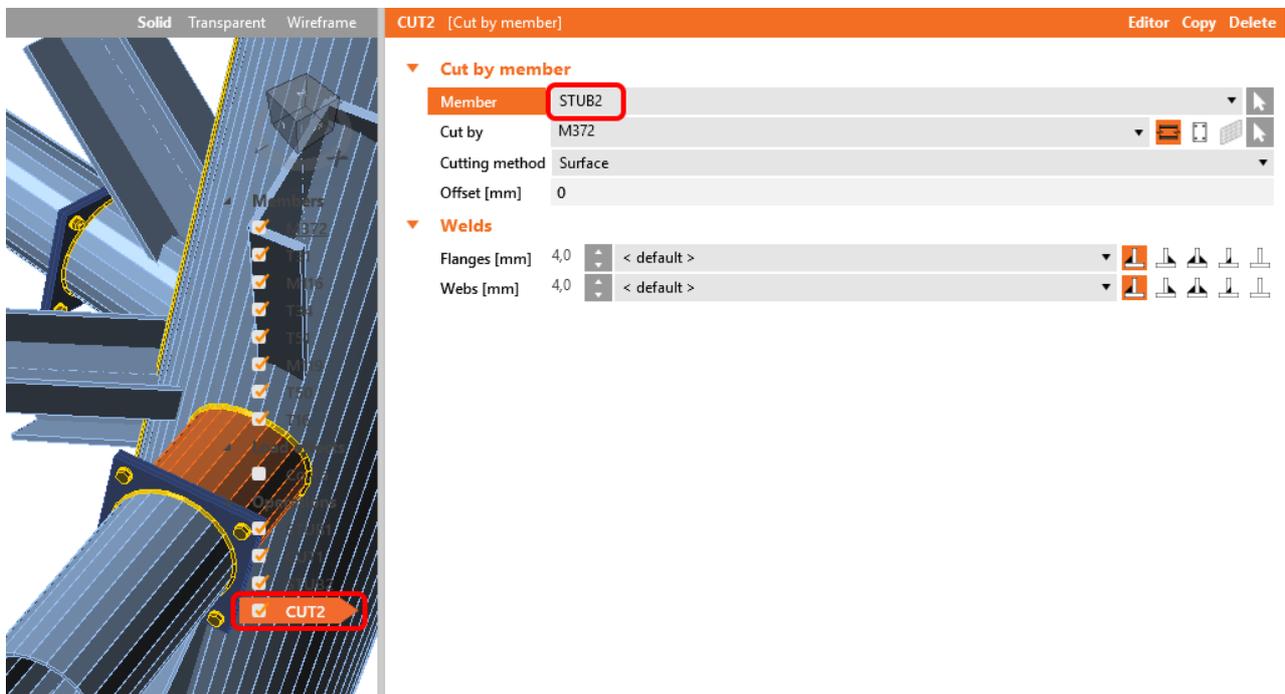




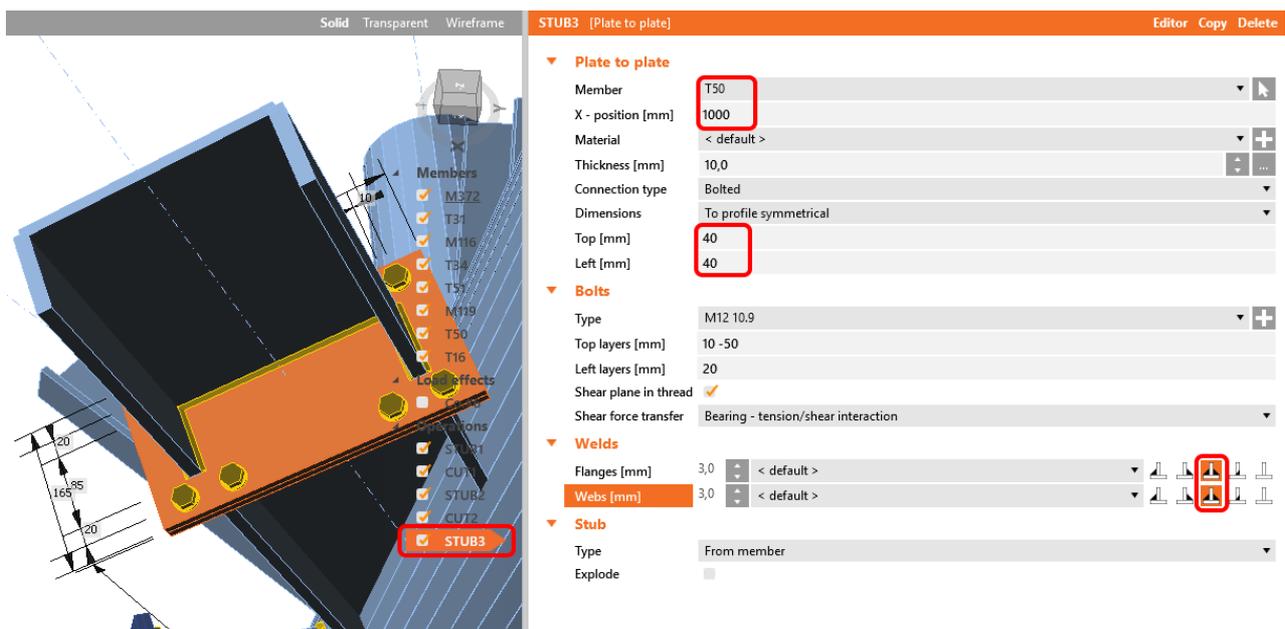
In the next step, right-click on Operation **STUB1** and select **Copy**. Then change the value for Member to **M119**.



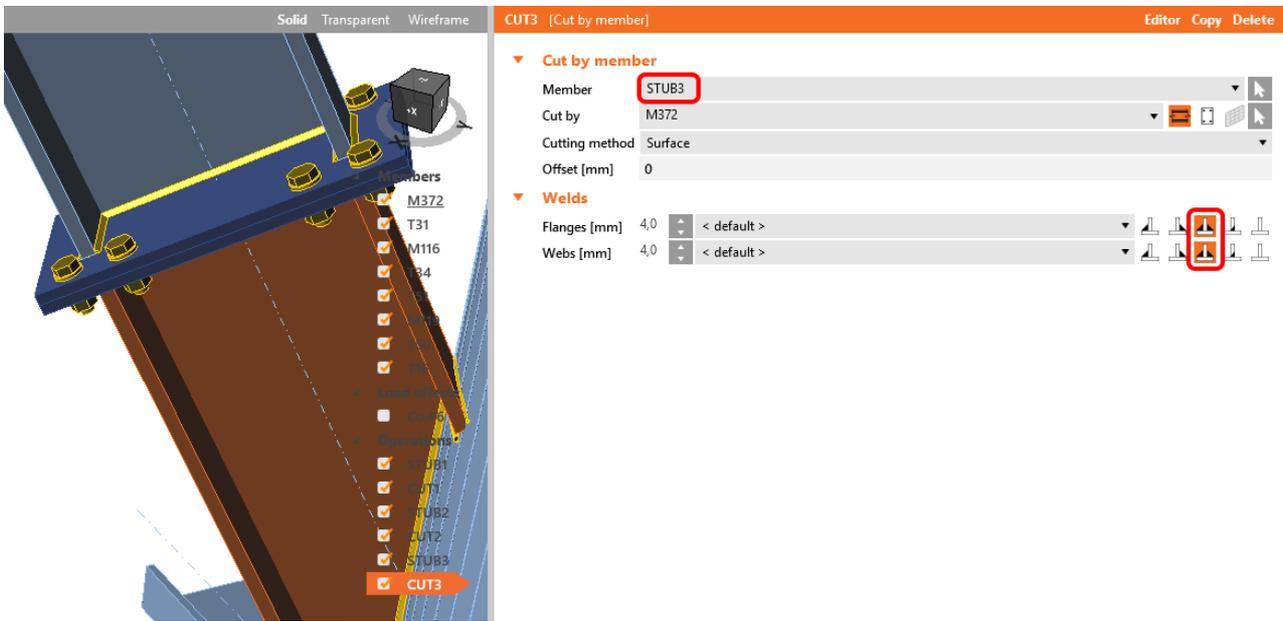
In the next step, right-click on Operation **CUT1** and again select **Copy**. Then change the value for Member to **STUB2**.



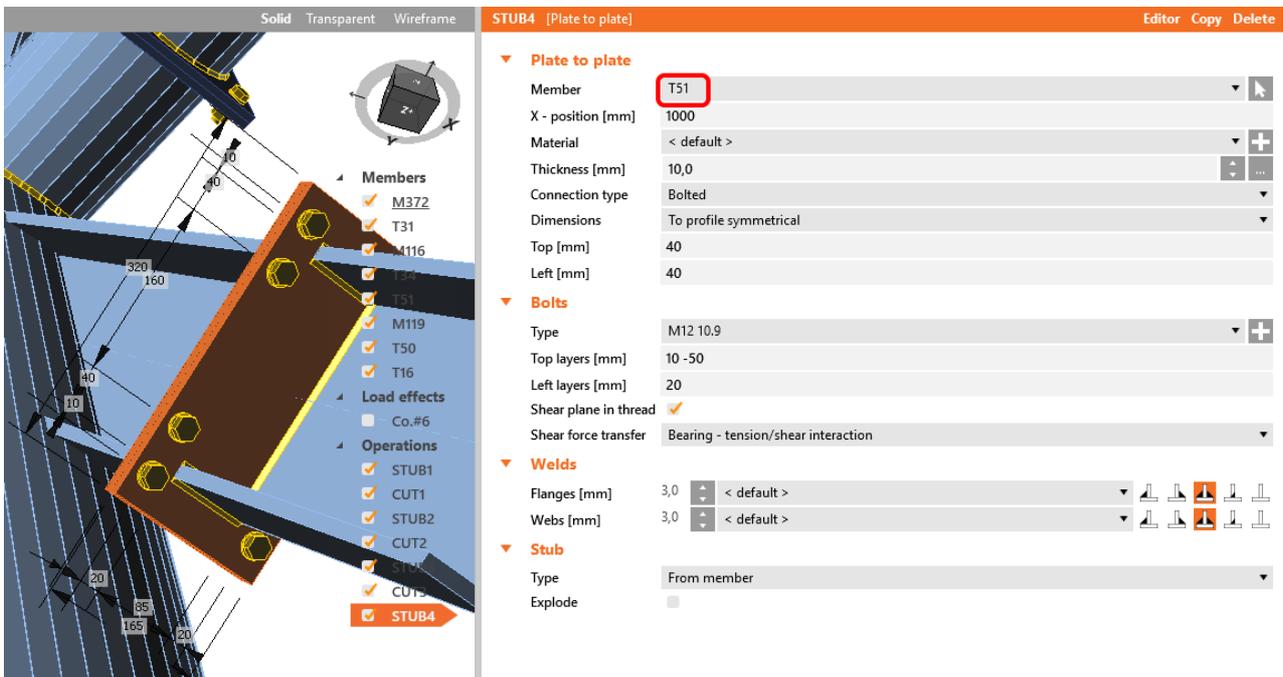
Use again the operation **Copy** to create the operation **STUB3** and fill in the values below.



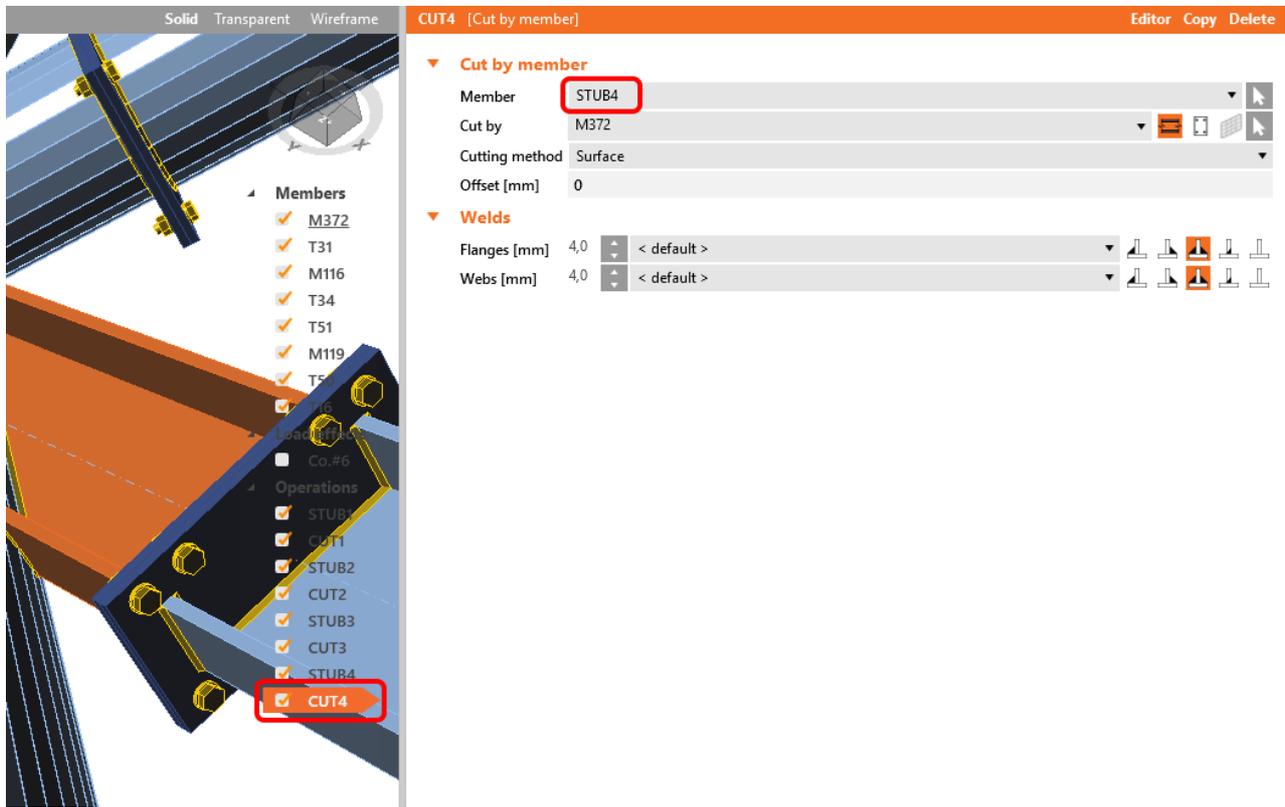
In the next step copy the manufacturing operation **CUT2**, set the value for Member to **STUB3** and change distribution of the welds to **Double fillet**.



Copy the manufacturing operation **STUB3** and set the value for Member to **T51**.

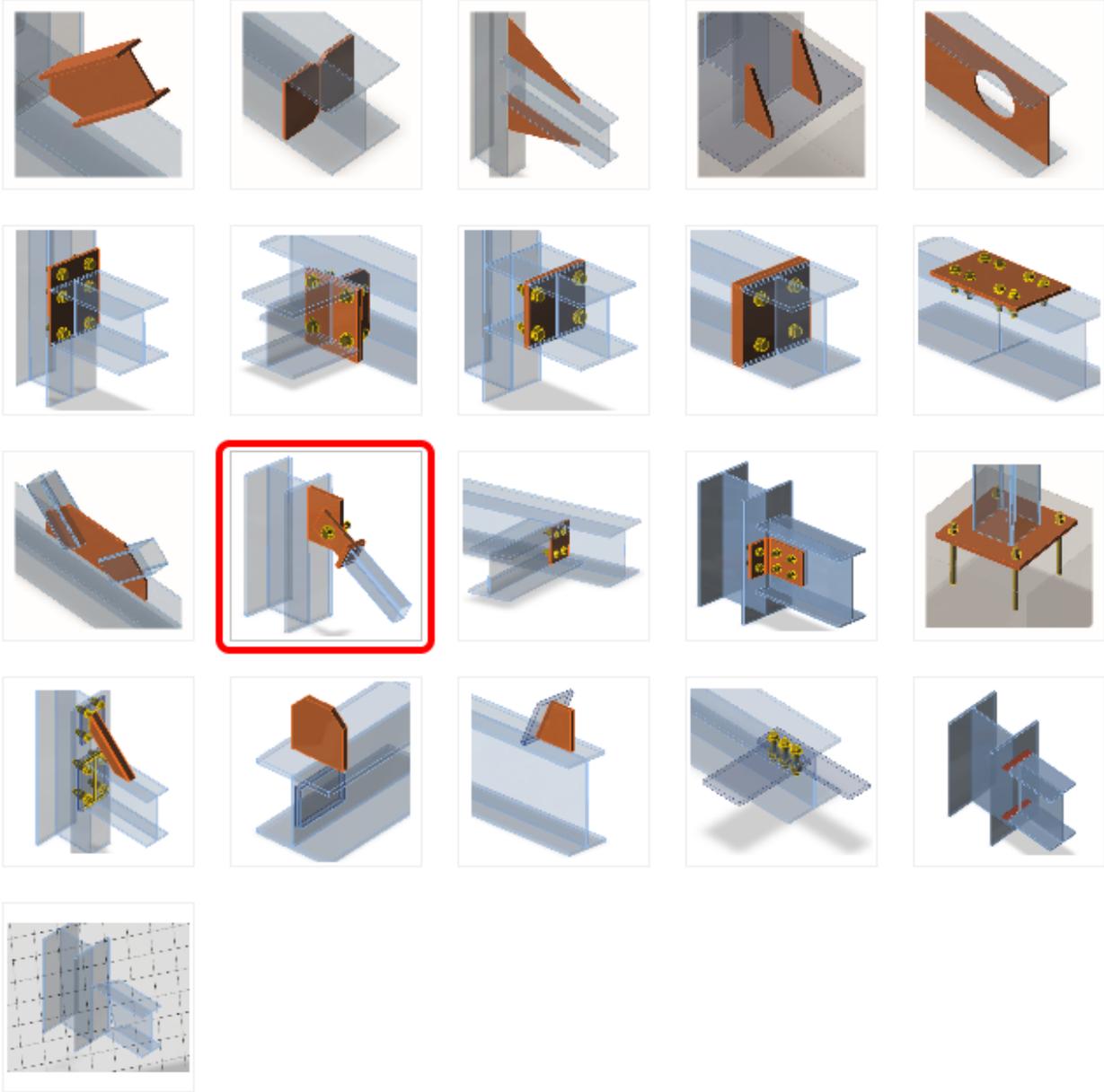


In the next step **Copy** the manufacturing operation **CUT3** and set the value for Member to **STUB4**.

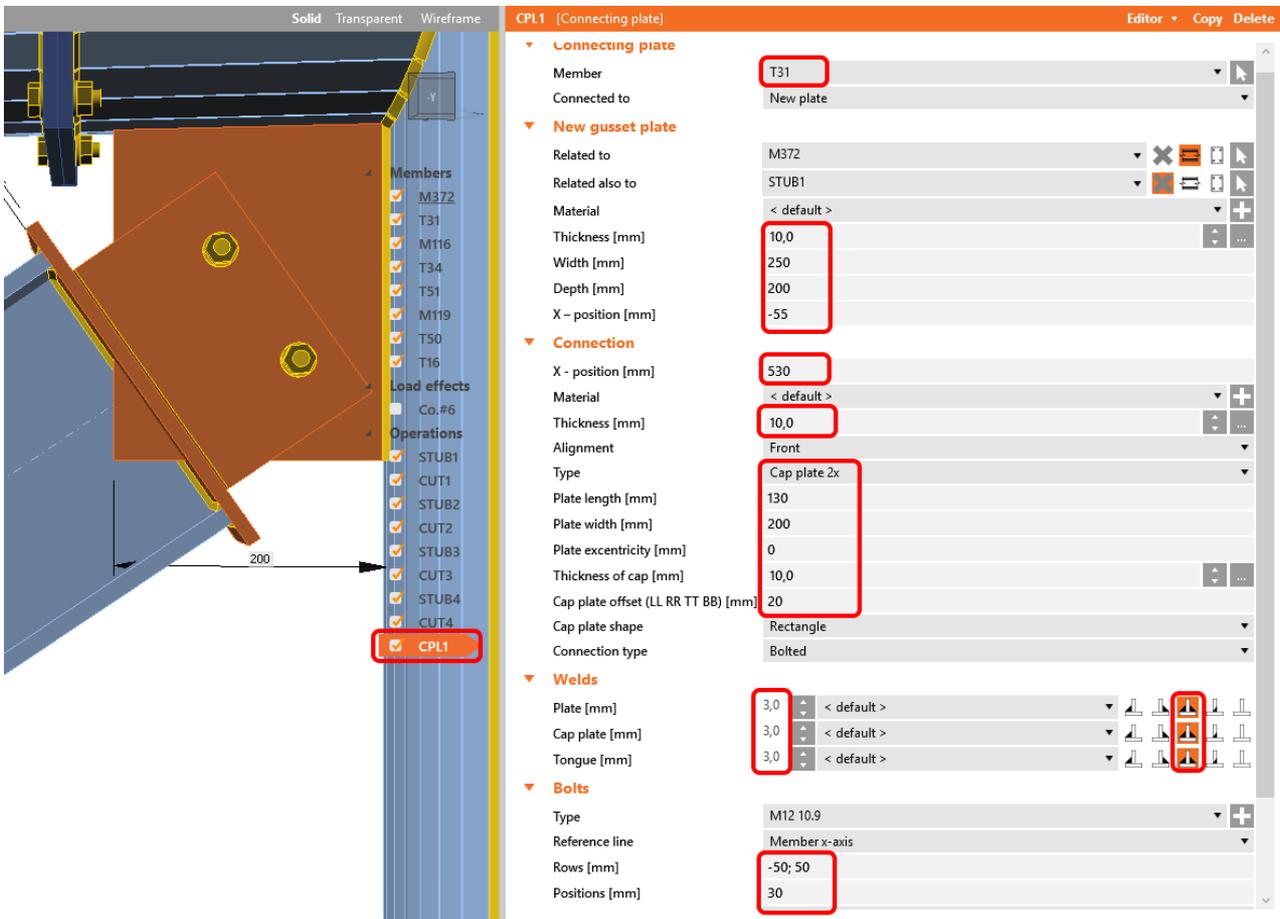


Continue with creating new manufacturing operation **Connecting plate-beam to beam or column** and fill in the values below.

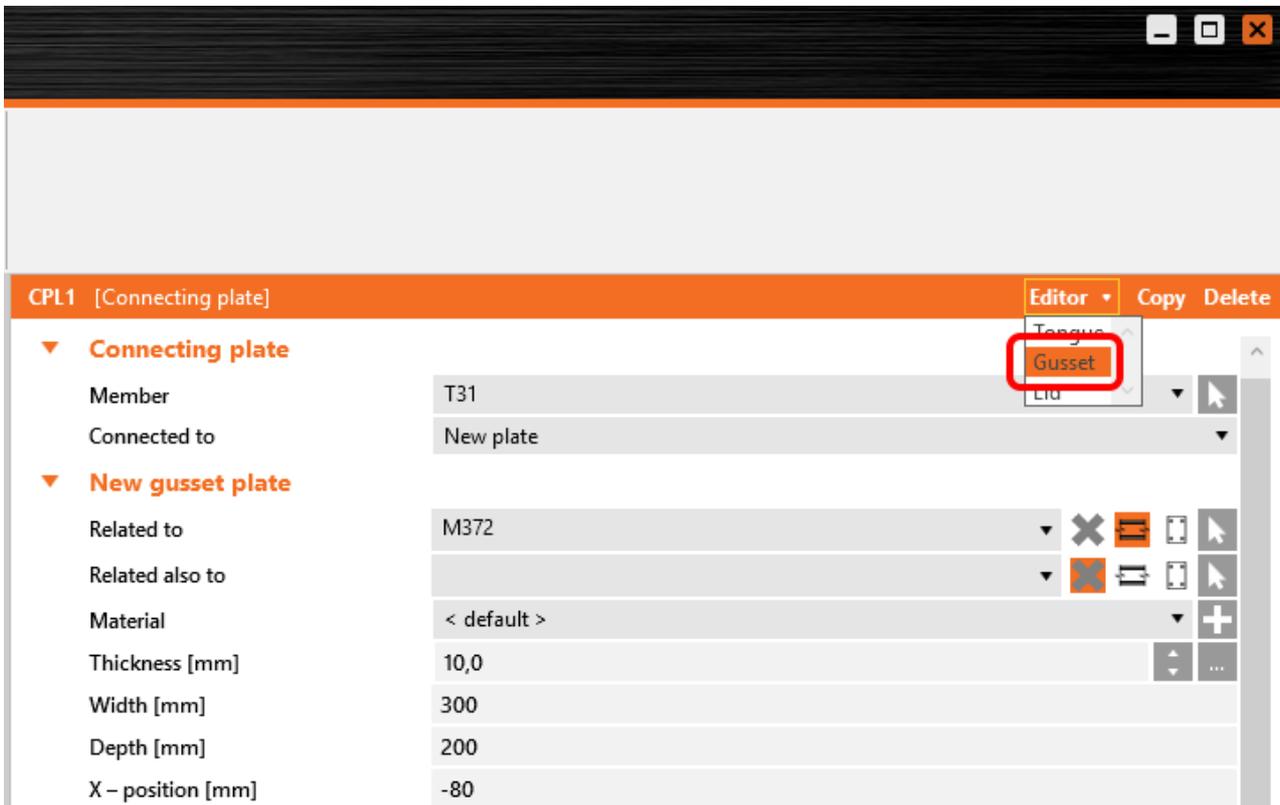
Select operation

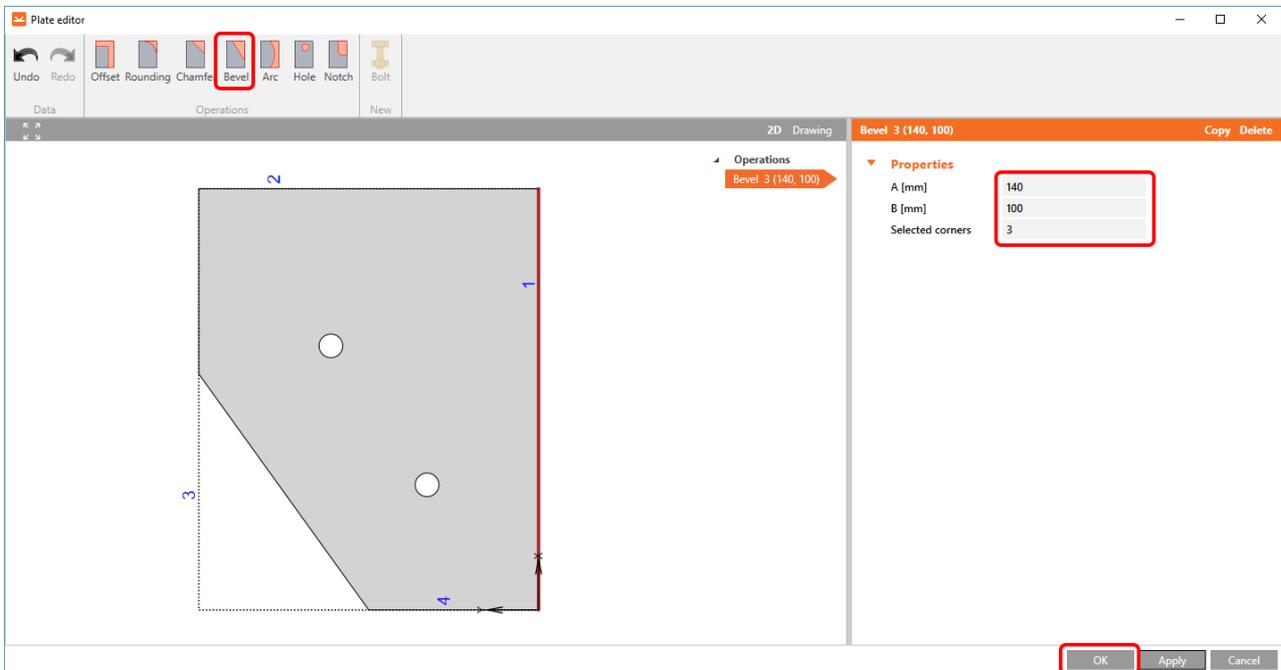


Cancel

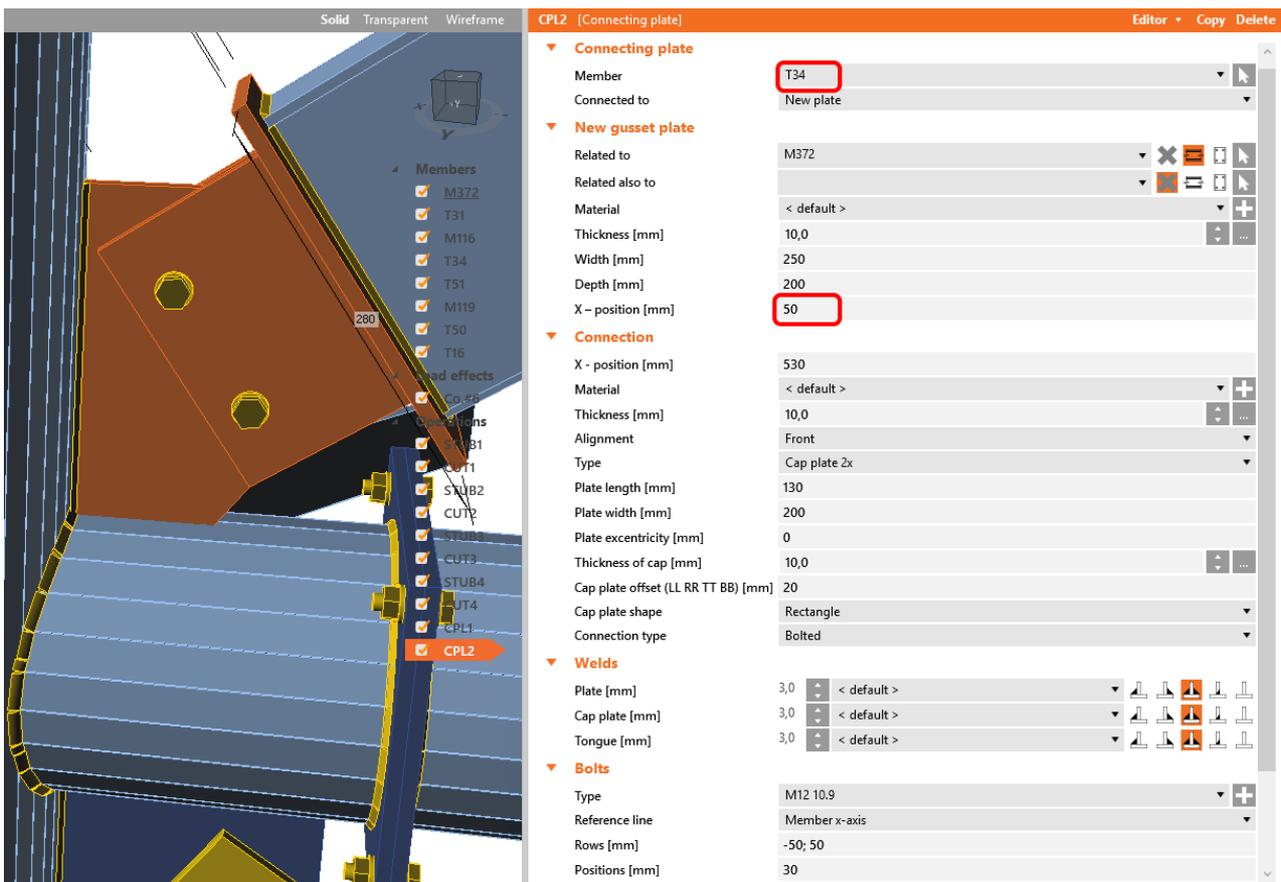


In the manufacturing operation **CPL1** continue to the **Editor**, select **Gusset** and create operation **Bevel** with values defined below.

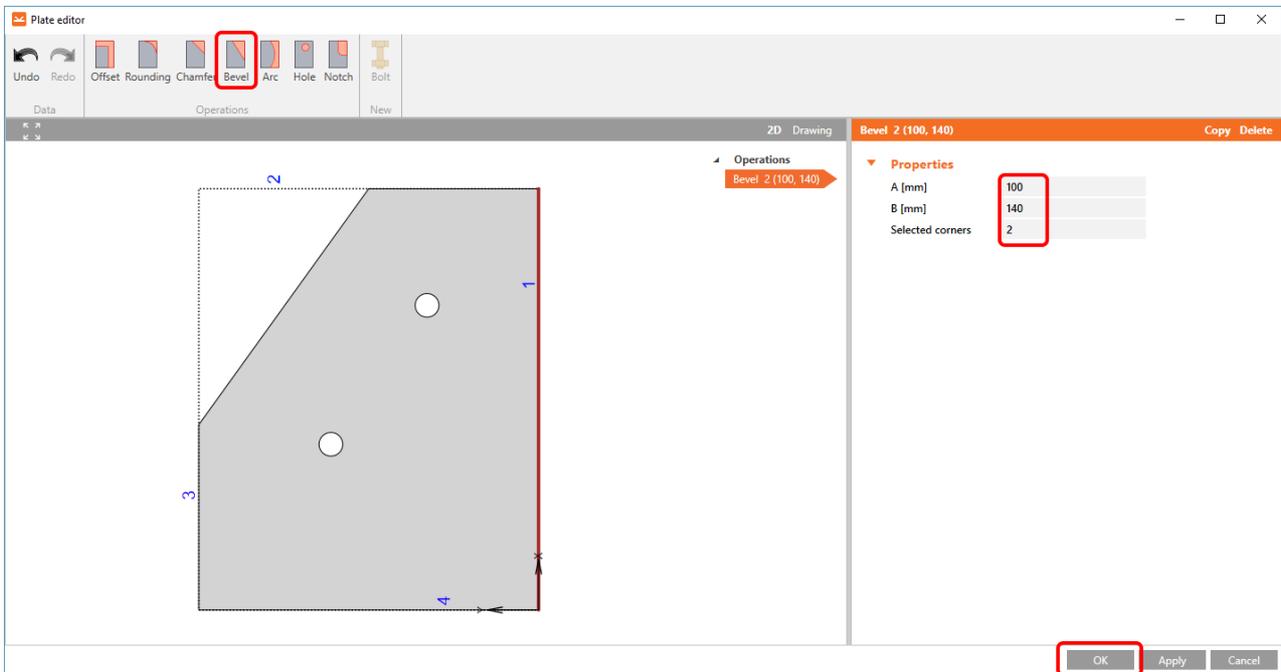




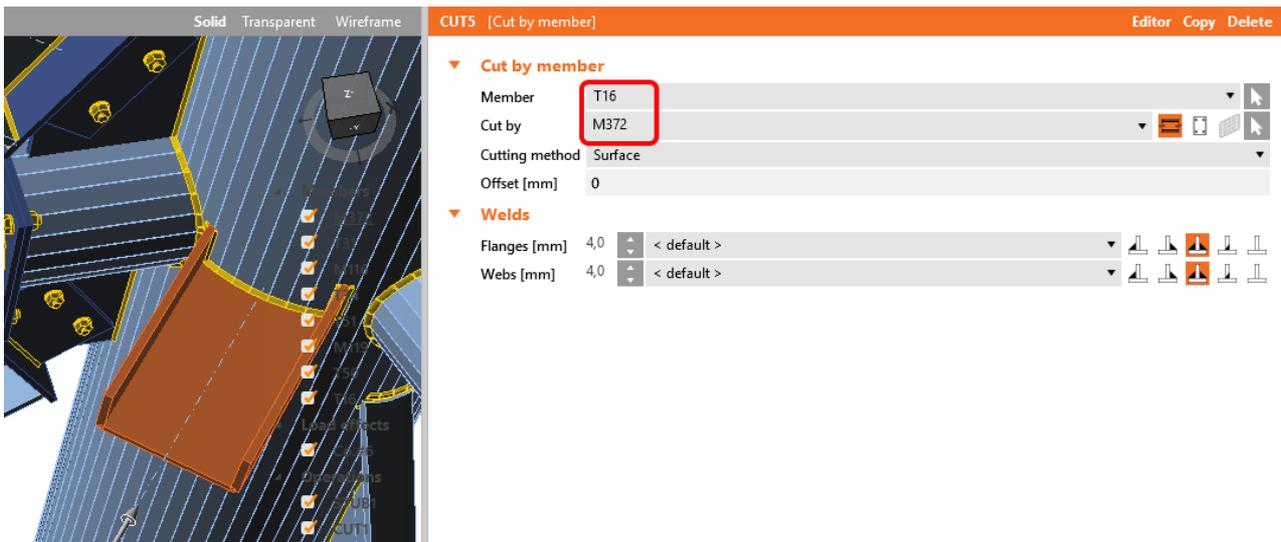
Copy the manufacturing operation **CPL1** and change the value for Member to **T34** and in New gusset plate change X-position to the value **50 mm**.



In the manufacturing operation **CPL2** continue to **Editor**, select **Gusset** and create operation **Bevel** with values defined below.

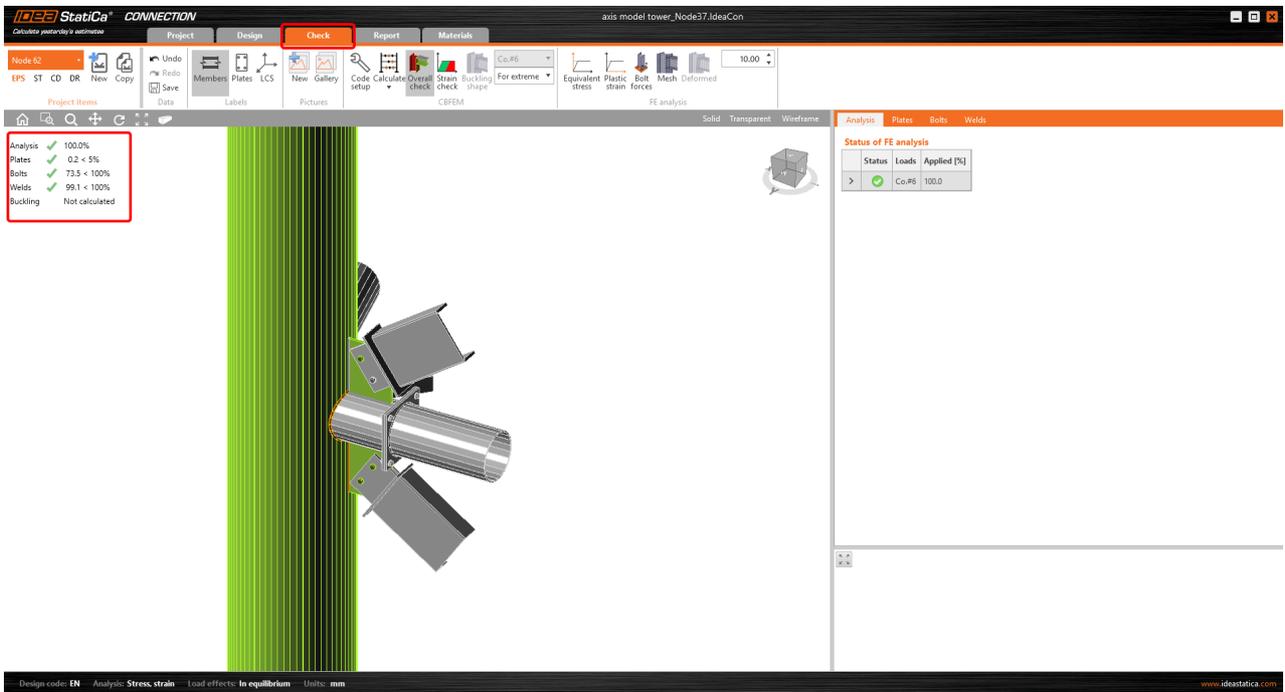


Copy the manufacturing operation **CUT4** and set the value for Member to **T16**.



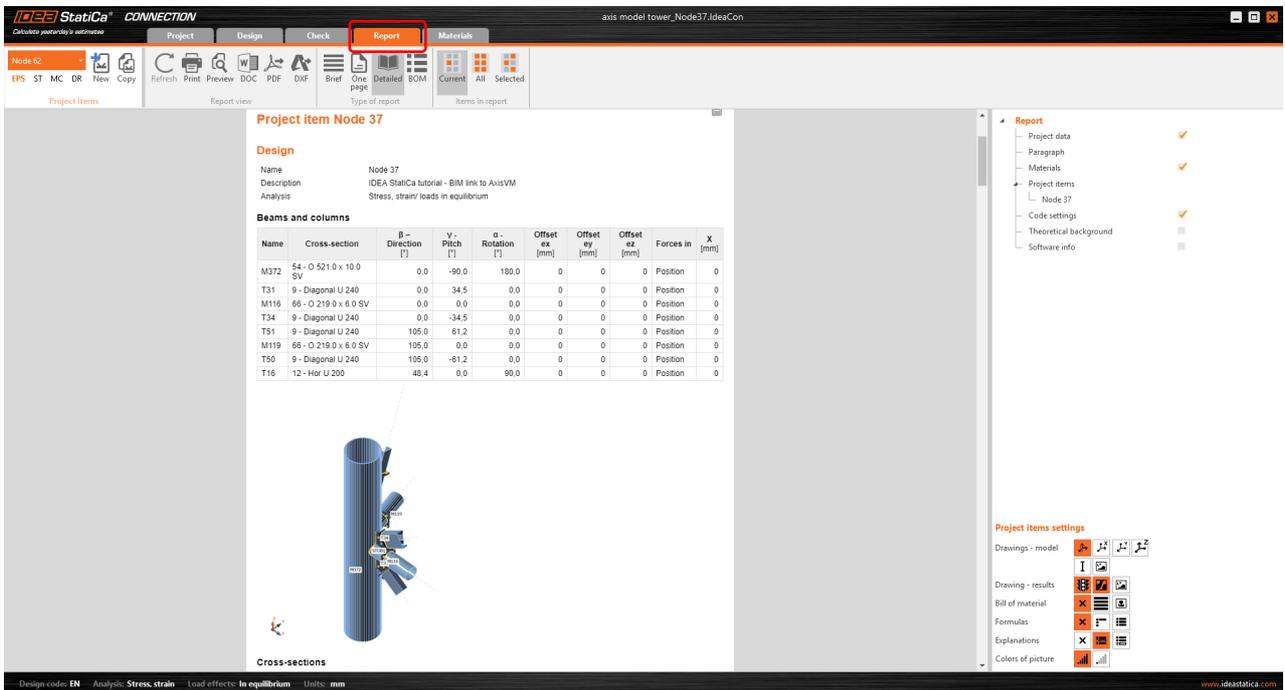
4 Check

Now run the non-linear analysis based on CBFEM.



5 Report

At last we go to the tab Report. IDEA StatiCa offers fully customizable report to print out or save in editable format.



Project data

Project name: BIM link - AxisVM
 Project number: 1
 Author: IDEA StatiCa team

Material

Steel: S 235

Project item Node 37

Design

Name: Node 37
 Description: IDEA StatiCa tutorial - BIM link to AxisVM
 Analysis: Stress, strain/ loads in equilibrium

Beams and columns

Name	Cross-section	β -Direction	γ -Pitch	α -Rotation	Offset ex	Offset ey	Offset ez	Force in X
		[°]	[mm]	[°]	[mm]	[mm]	[mm]	[kN]
M372	S4 - O 521.0 x 10.0 SV	0.0	-90.0	180.0	0	0	0	Position 0
T31	9 - Diagonal U 240	0.0	34.5	0.0	0	0	0	Position 0
M116	86 - O 219.0 x 8.0 SV	0.0	0.0	0.0	0	0	0	Position 0
T34	9 - Diagonal U 240	0.0	-34.5	0.0	0	0	0	Position 0
T51	9 - Diagonal U 240	105.0	81.2	0.0	0	0	0	Position 0
M119	86 - O 219.0 x 8.0 SV	105.0	0.0	0.0	0	0	0	Position 0
T90	9 - Diagonal U 240	105.0	-81.2	0.0	0	0	0	Position 0
T16	12 - I36 U 200	48.4	0.0	90.0	0	0	0	Position 0

Cross-sections

Name	Material
S4 - O 521.0 x 10.0 SV	S 235
9 - Diagonal U 240	S 235
86 - O 219.0 x 8.0 SV	S 235
9 - Diagonal U 240	S 235
9 - Diagonal U 240	S 235
86 - O 219.0 x 8.0 SV	S 235
9 - Diagonal U 240	S 235
12 - I36 U 200	S 235
86 - O 219.0 x 8.0 SV	S 235
86 - O 219.0 x 8.0 SV	S 235
9 - Diagonal U 240	S 235
9 - Diagonal U 240	S 235

Bolts

Name	Bolt assembly	Diameter [mm]	fu [MPa]	Gross area [mm ²]
M12 10.9	M12 10.9	12	1020.0	113

Load effects (forces in equilibrium)

Design data

Material	fy [MPa]	fm [MPa]
S 235	235.0	350.0

We have imported, designed and code-checked a steel joint according to Eurocode.

6 Synchronize models

IDEA StatiCa® Code-check manager
 Calculate yesterday's estimates

New Open **Synchronize** Calculate Delete **Calculate All**

Project items | Current item

Code-check manager is a BIM tool to export and synchronize connections from other programs. It is launched directly in the 3rd party applications via a command/icon.

Synchronize - IDEA StatiCa detects changes in already imported entities (changes in thickness, changes in cross-section, modification of properties of welds, bolts, etc.) and updates the project in IDEA StatiCa Connection.

Calculate - Synchronize and calculate current item and provide a new set of results.

Calculate all - Synchronize and calculate all items and provide new set of results.

Note

Kindly be aware that IDEA StatiCa syncs with a model of the 3rd party application, not the other way around. If we add operations in IDEA StatiCa and then use the options

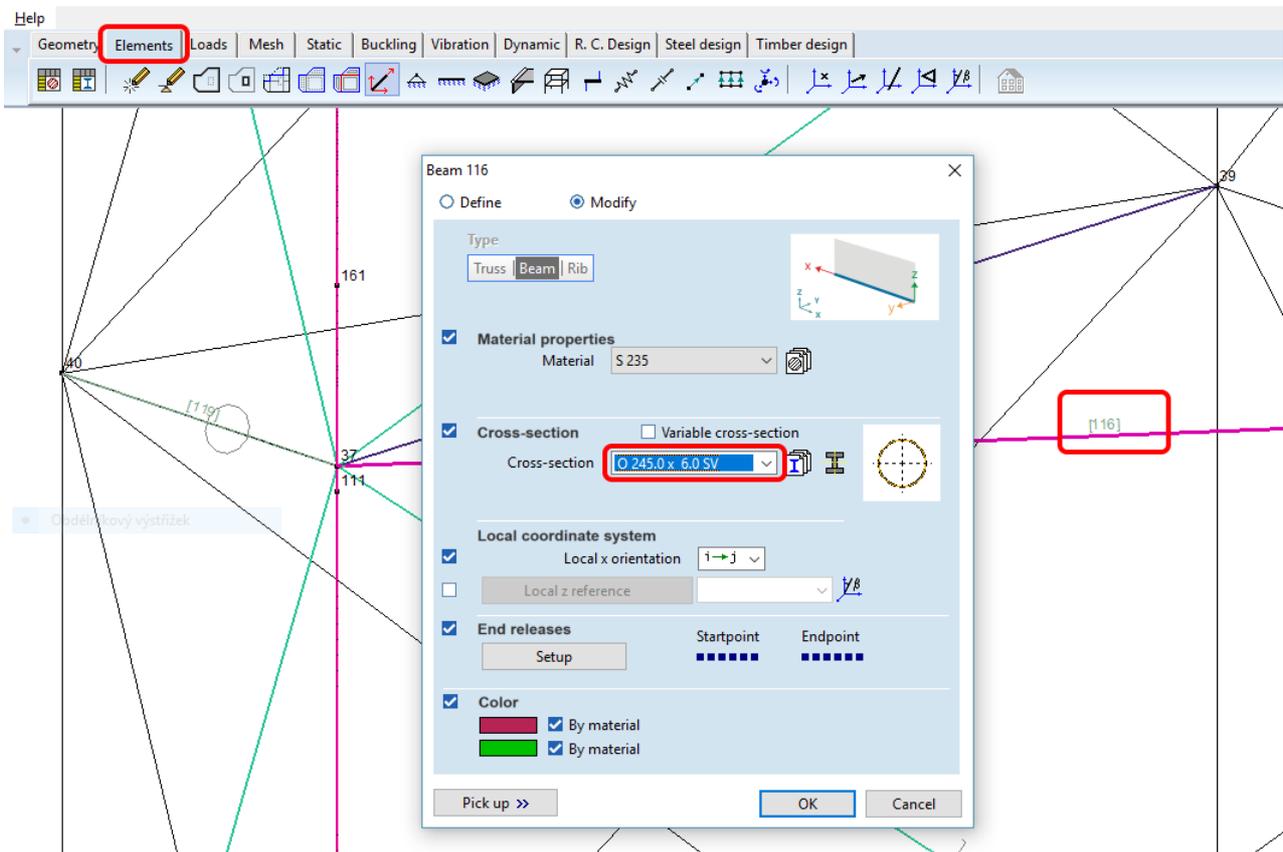
described above (Synchronize; Calculate; Calculate all), the additionally added operations will be deleted.

We save the project in IDEA StatiCa and close the application Connection. All joints exported from AxisVM project to IDEA StatiCa are kept on the list inside AxisVM.

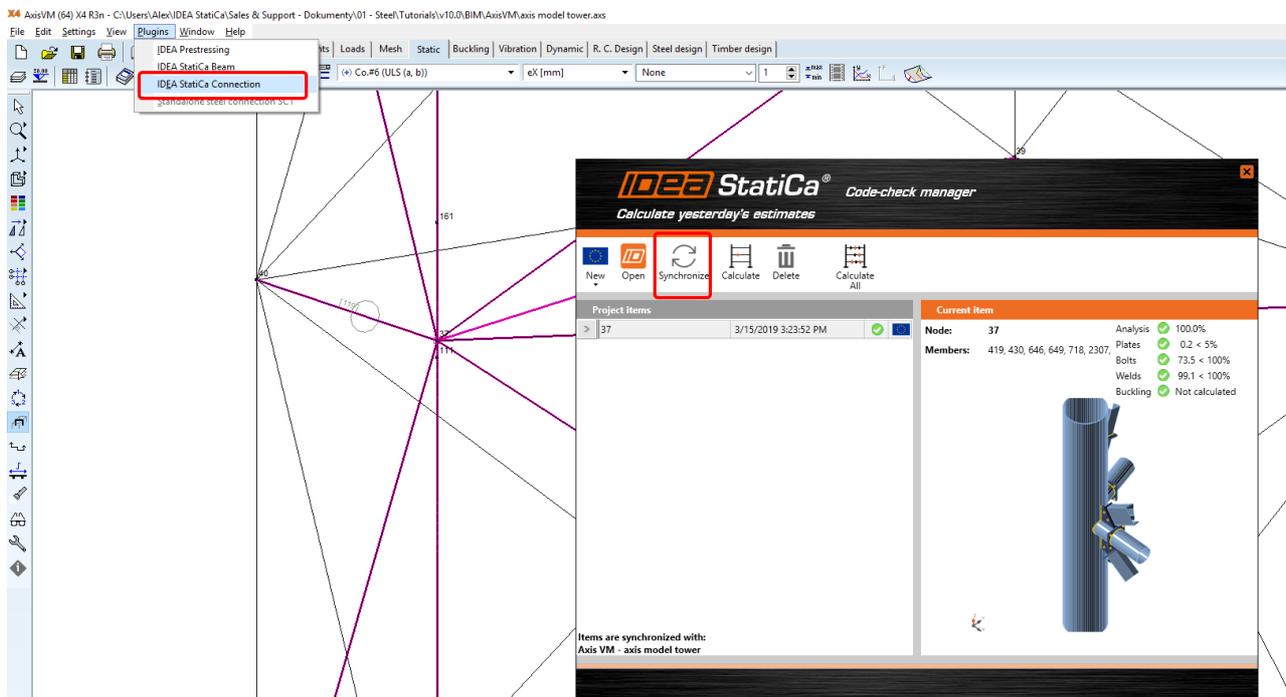


If we modify the project in AxisVM (e.g. change cross section of any member or add another loads) we can simply update the project in IDEA StatiCa without modeling it all again. Let's change the cross section of one of the members.

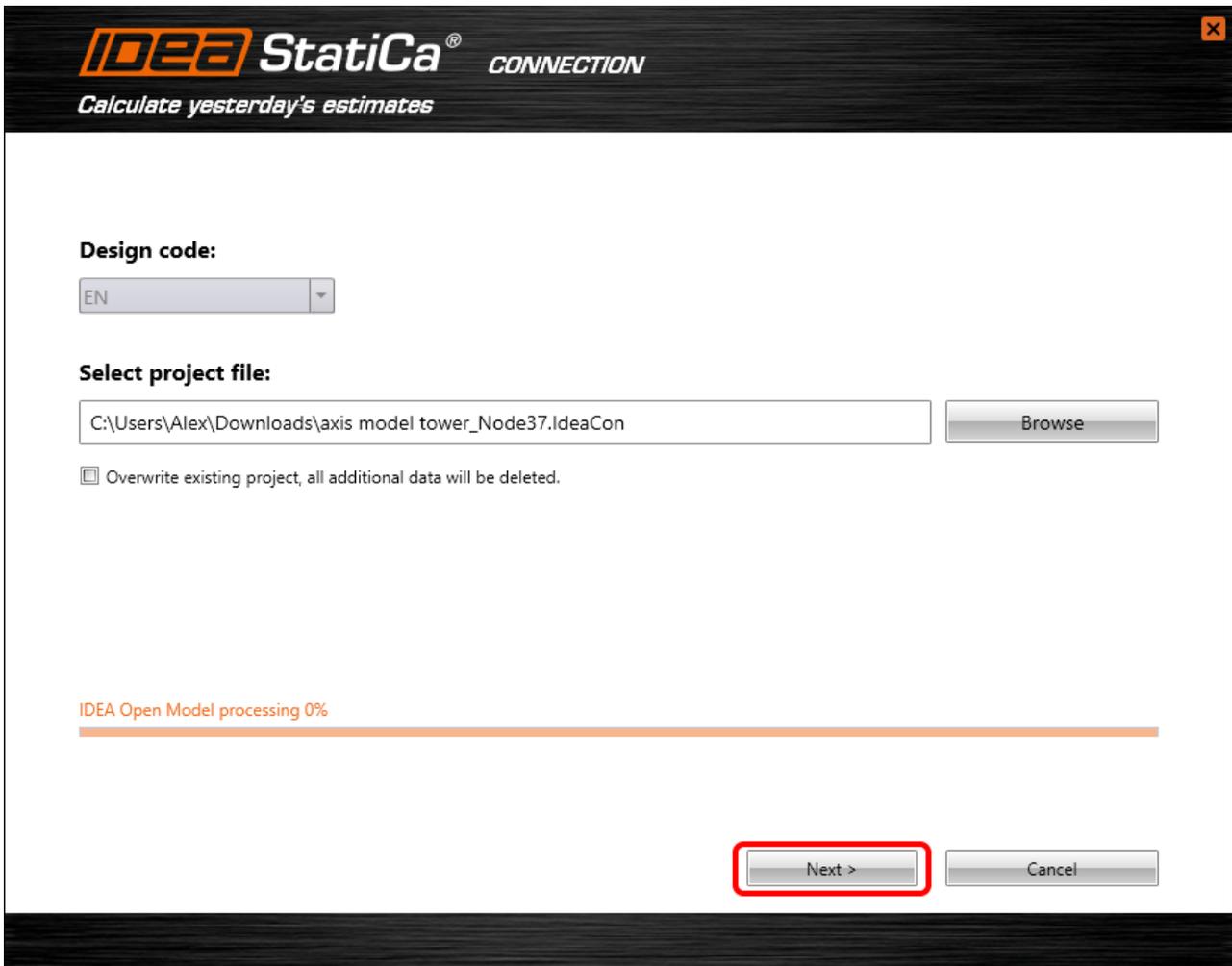
In this case, start AxisVM, go to tab Elements and change the member M116 from O 219x6 to **O 245x6**.



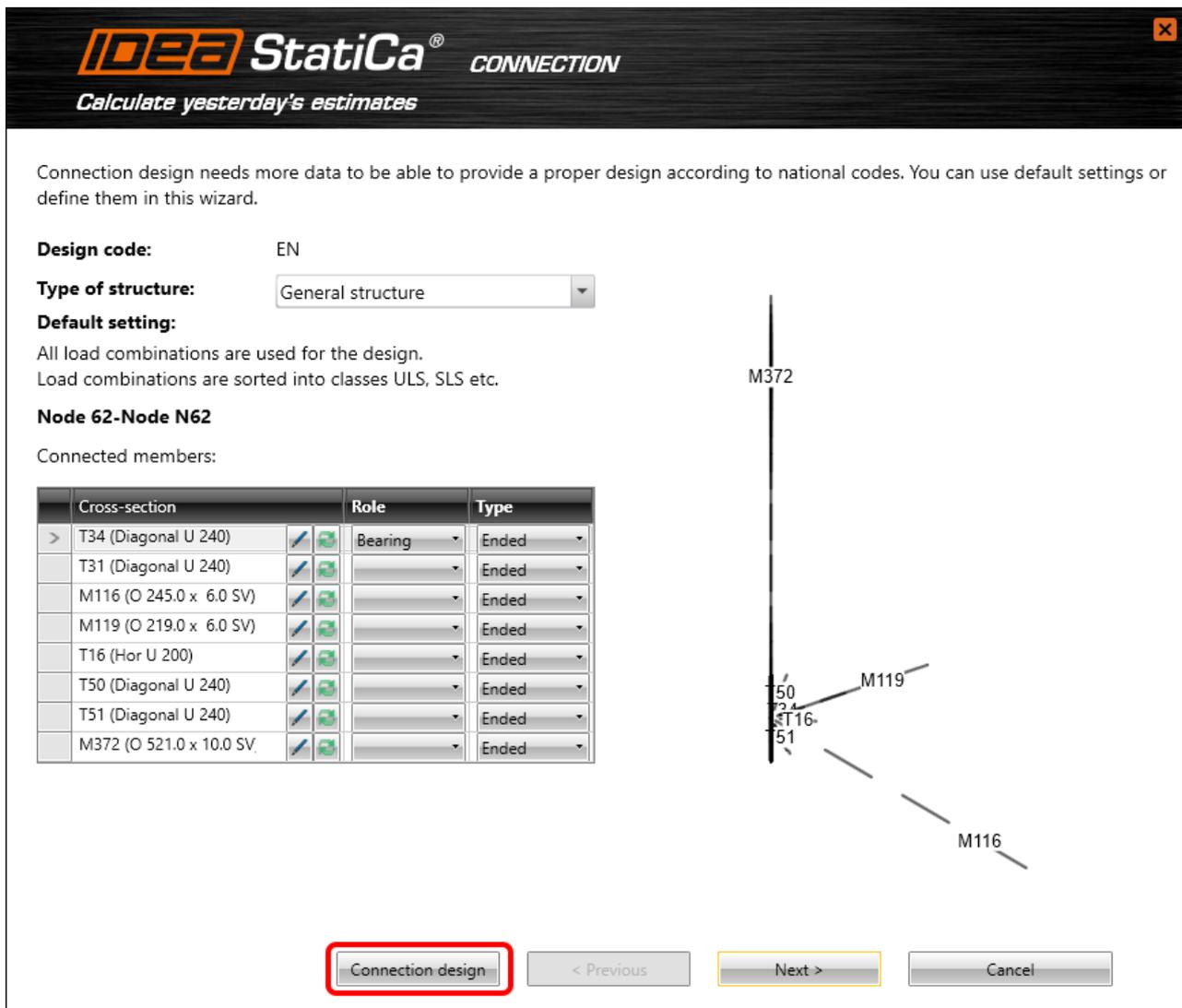
Run the analysis, select **IDEA StatiCa Connection** in the upper ribbon and in the IDEA StatiCa wizard click on **Synchronize**.



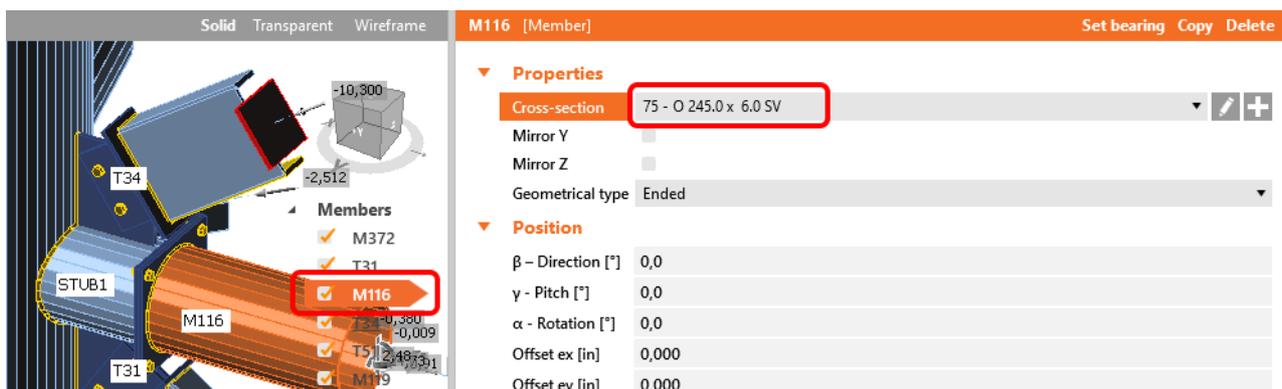
In the wizard click **Next**.



In the next window just select **Connection design**.



As you can see, the cross-section of the Member M116 has changed, but all previous operations remained.



Keywords:

connection, joint, Eurocode, nonlinear analysis, bevel, cut, stub, AxisVM, BIM, BIM link, CBFEM