www.consteelsoftware.com

WHAT'S NEW IN CONSTEEL 12

11.05.2018.

Version 12.0

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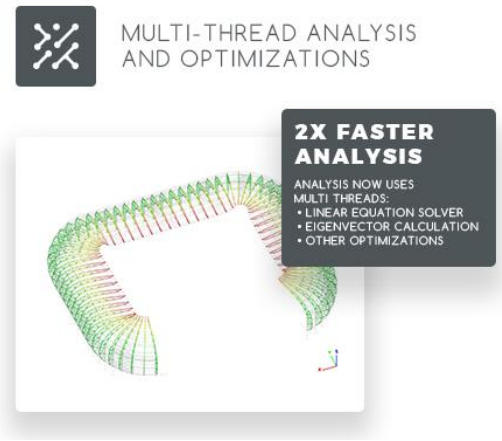
1. System improvements

1.1 Multithreading and system optimizations

Model and design bigger and more complex structures faster! The new system improvements allows you to do more because ConSteel 12 is able to utilize the capacity of the multi-core processors.



Other optimizations were also made. In overall, the analysis runtime (first and second order and buckling) is expected to be two times faster.

2. BIM Interface

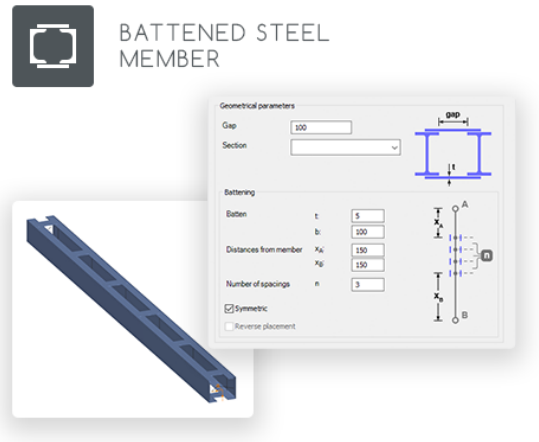
2.1 Tekla model import/export

The complete model exchange is possible to Tekla 2017i version.

3. STRUCTURAL INPUT

3.1 BATTENED STEEL MEMBER

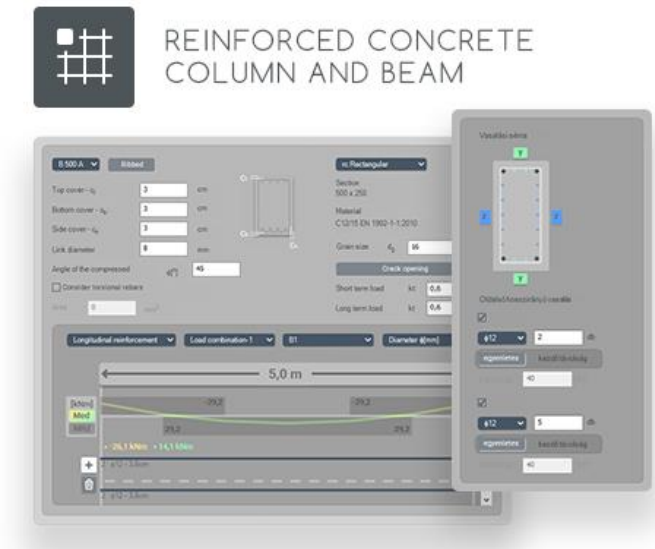
Battened steel member can be modelled easily with the new macro functionality.



The macro can handle I, H or U section. Parameters of the battening plates, that can be placed symmetrically or unsymmetrically, can be set manually.

3.2 REBAR EDITOR

The new version offers integrated design possibilities to concrete beams and columns.



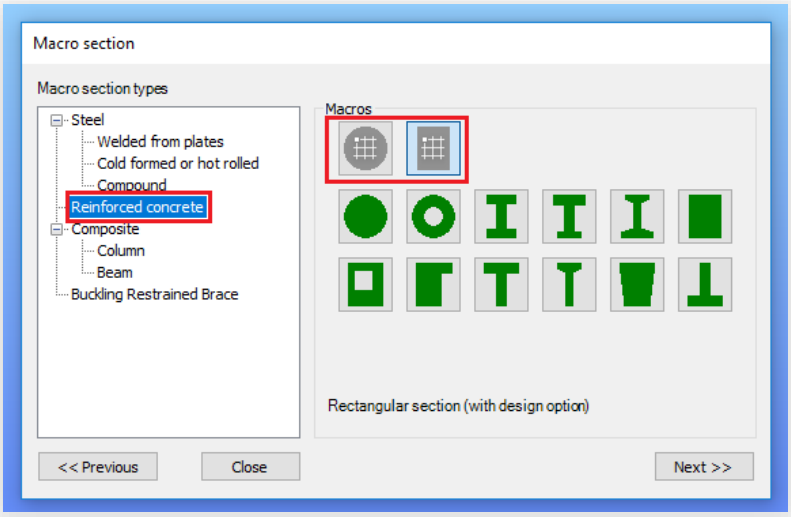
To perform a sophisticated and detailed design, a completely new rebar editor was developed.

With the new rebar editor, arbitrary reinforcement layout can be created and placed on any concrete members in the global model.

Rebar editor is able to show the analysis results from all of the members and load combinations separately or with enveloping results visualization as well.

3.3 New concrete macro section type

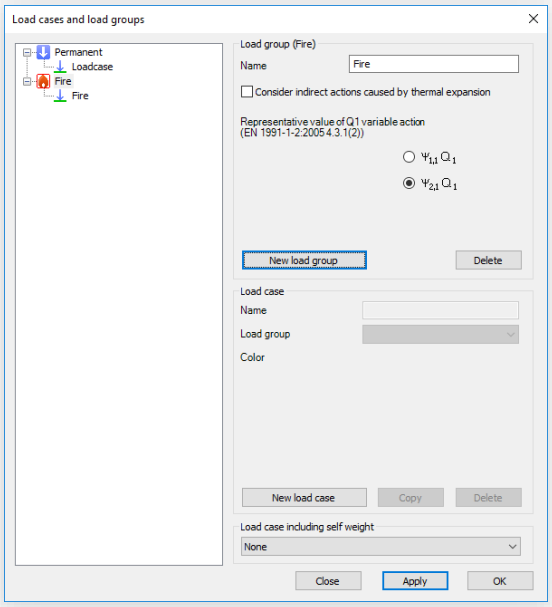
Two new, dedicated, macro section types were created, that is allowed to use in the rebar edit for reinforced concrete design.



3.4 New dedicated fire effect load group

A new, dedicated fire load group was created to handle the specialities of fire effect.

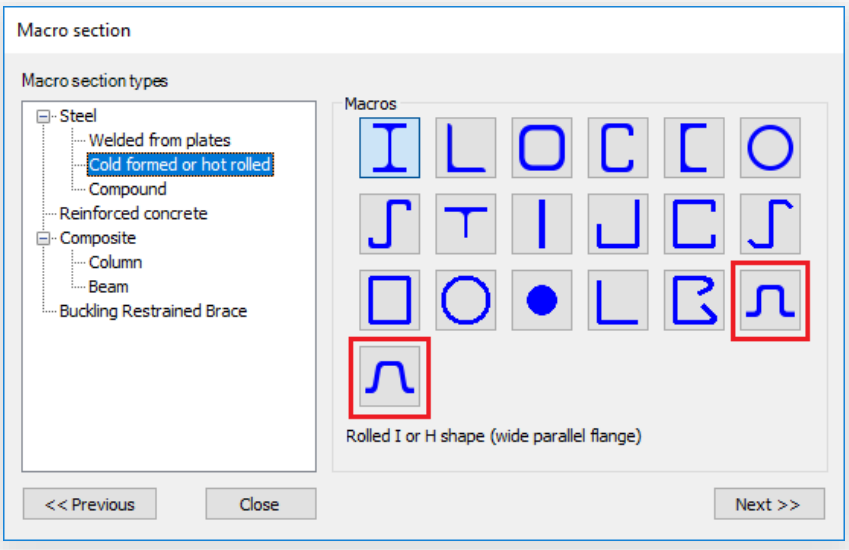
With the new fire effect load group, it is possible to handle the consideration of thermal effect during the structural analysis and it is possible to select which variable coefficient should be used during the load combination generation.



3.5 NEW MACRO SECTIONS

New macro section types:

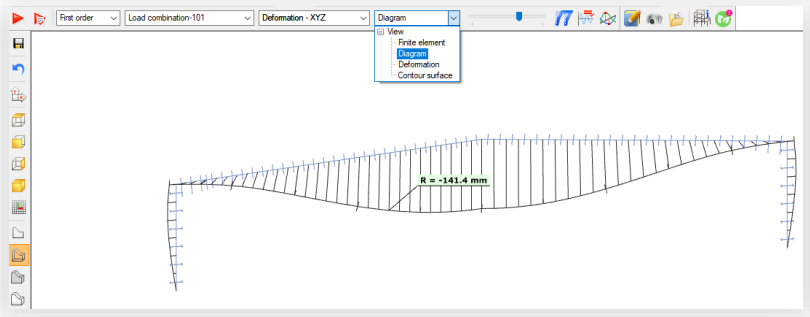
- Cold formed omega section
- Cold formed sloped omega section



4. ANALYSIS IMPROVEMENTS

4.1 DISPLACEMENT AND ROTATION DIAGRAMS

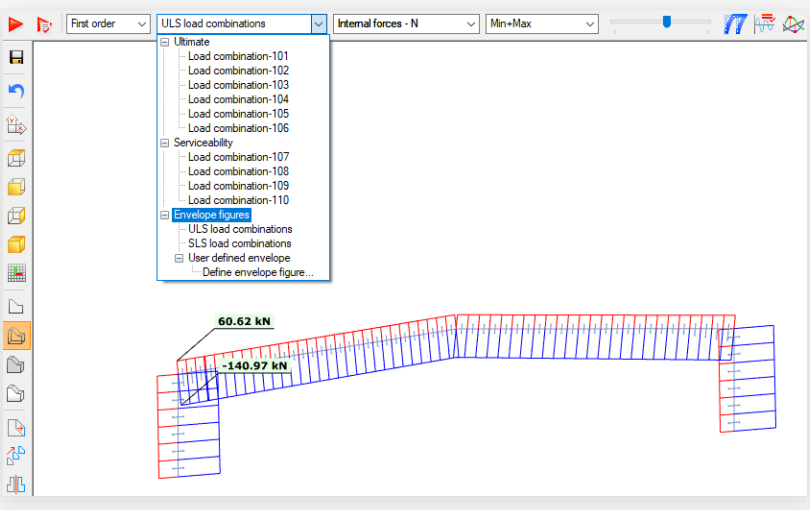
To visualize the deformation and rotation results of the structure, in ConSteel 12, not just the contour surface view, but diagram view is also available.



With the diagram view, not just the displacements can be visualized but the rotations and the warping results also. Result table was also extended with the warping results.

4.2 ENVELOP FIGURES

In ConSteel 12, first and second order analysis results can be viewed not just for load cases and load combinations, but with enveloping visualization as well.



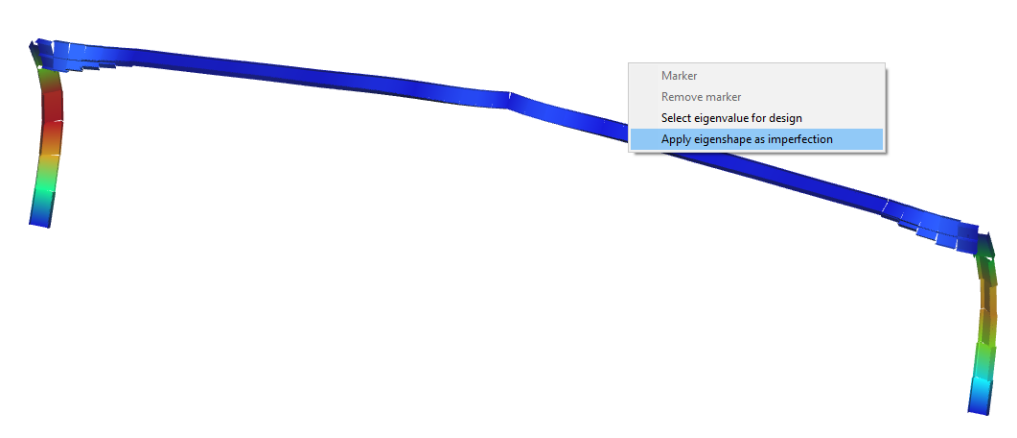
Envelop figures can be viewed separately for ULS and SLS combinations or for user defined settings.

In case of envelop visualization, table result shows the dominant load combination.

Min/Max N	Element	Load combination	N [kN]	V_Y [kN]	V_Z [kN]	T [kNm]	M_Y [kNm]	M_Z [kNm]	B [kNm²]
Minimal	B1	Load combination-101	-173,633	0,000	127,170	0,000	0,000	0,000	0,000
Minimal	B2	Load combination-101	-173,633	0,000	-127,170	0,000	0,000	0,000	0,000
Minimal	B4	Load combination-101	-140,966	0,000	-152,190	0,000	730,080	0,000	0,000
Minimal	B3	Load combination-101	-140,965	0,000	-152,190	0,000	729,550	0,000	0,000
Maximal	B4	Load combination-102	63,574	0,000	-12,230	0,000	126,740	0,000	0,000
Maximal	B2	Load combination-102	64,244	0,000	54,070	0,000	235,540	0,000	0,000
Maximal	B3	Load combination-102	64,732	0,000	1,010	0,000	126,740	0,000	0,000
Maximal	B1	Load combination-102	86,889	0,000	-53,250	0,000	-442,280	0,000	0,000

4.3 BUCKLING MODE BASED GLOBAL IMPERFECTION APPLICATION

Buckling mode based imperfection application was improved in ConSteel 12 to make possible the universal application of buckling mode based imperfection for all of the load combinations.



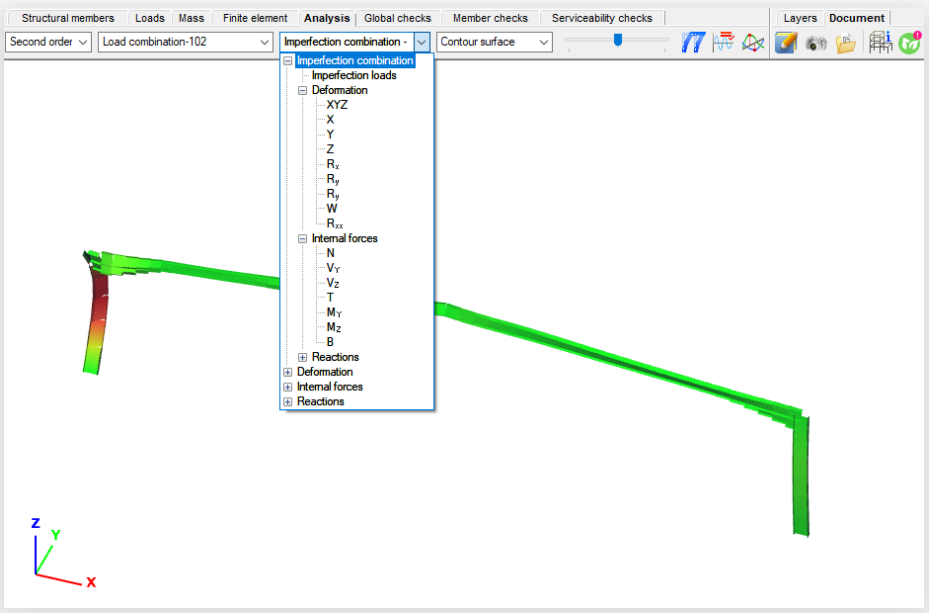
The new automatization, in case each load combinations, defines the proper direction of the imperfections and apply them accordingly during the analysis.

4.4 BUCKLING MODE BASED GLOBAL IMPERFECTION RESULTS

In ConSteel 12, not only the buckling mode based imperfections can be applied to analysis, but the effect on the structure can also be viewed and checked.

The following results are available for the buckling mode based imperfections:

- Imperfection loads
- Deformation
- Internal forces
- Reactions

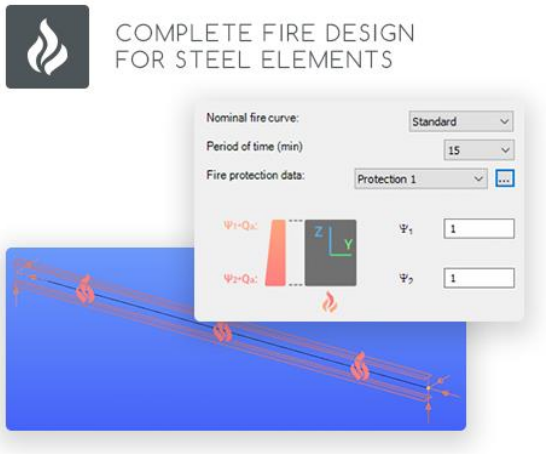


5. STANDARD DESIGN

5.1 COMPLETE FIRE DESIGN FOR STEEL MEMBERS

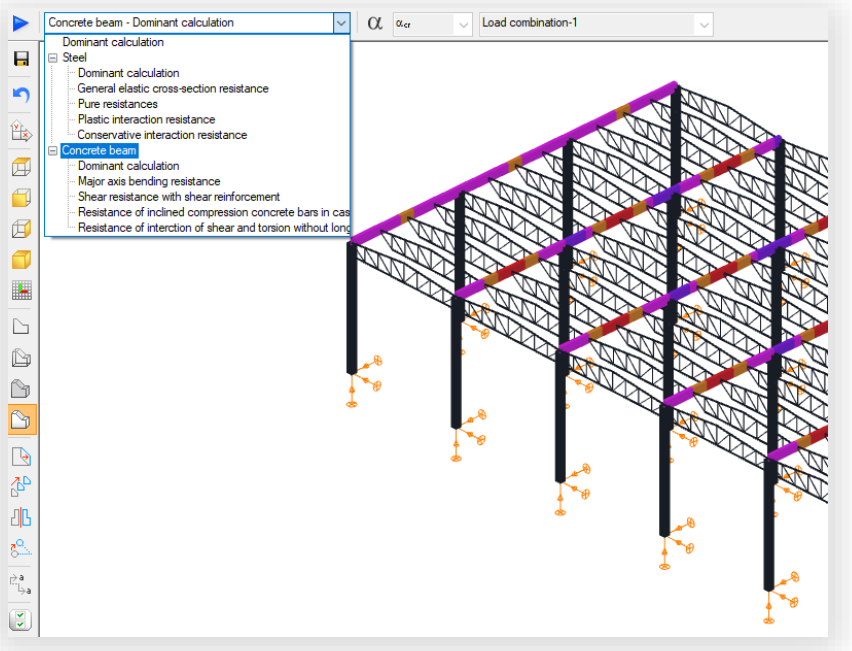
Steel member design in fire design situation was improved with the followings:

- Cross-section classification according to the EN 1993-1-2 chapter 4.2.2
- χ_{fi} – buckling reduction factor acc. 1993-1-2 chapter 4.2.3.2 is used for compressed members
- χ_{LTfi} – lateral-torsion buckling reduction factor acc. 1993-1-2 chapter 4.2.3.3 is used for bended members
- General method based buckling check was extended for fire design situation

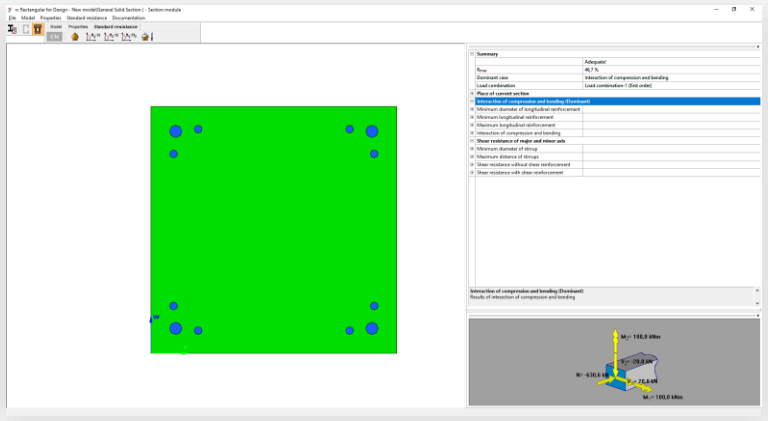


5.2 REINFORCED CONCRETE BEAM AND COLUMN DESIGN

The new version introduces reinforce concrete beam and column checks according to the EuroCode EN 1992-1-1 standard as an integrated part of our simple and efficient design process.



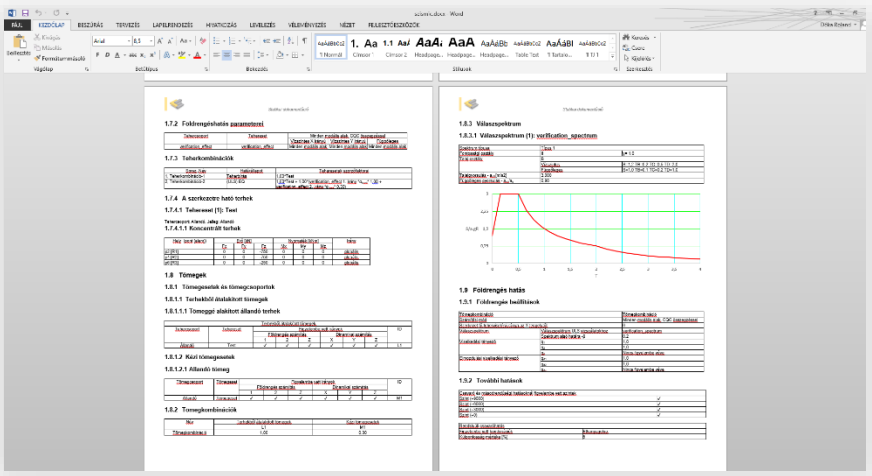
All of the possible standard checks can be performed such as bending, shear and torsion resistance for beams and interaction of compression and bending and shear resistance for columns. Furthermore, ConSteel checks the minimum and maximum EuroCode detailing rules.



6. DOCUMENTATION

6.1 DOCUMENTATION EXPORT TO MS WORD

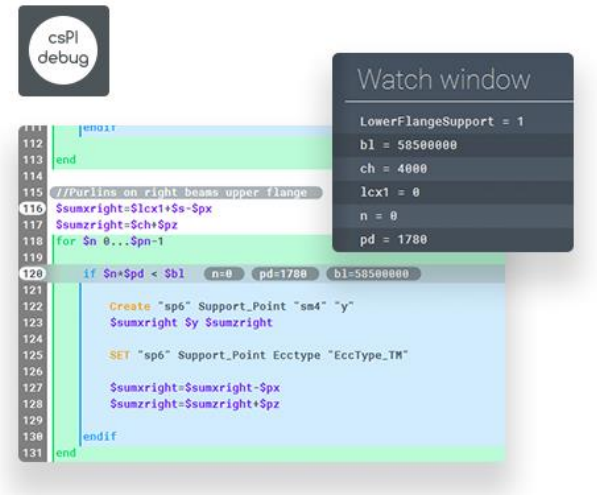
The complete documentation can be exported to MS Word in an editable format.



7. CSPI – CONSTEEL PROGRAMMING INTERFACE

7.1 DEBUG FUNCTION AND AUTOMATIC CODE CHECK

The parametric model build is very powerful and effective, but without an automatic, continuously running code check and an effective debugging function it could be very struggling.



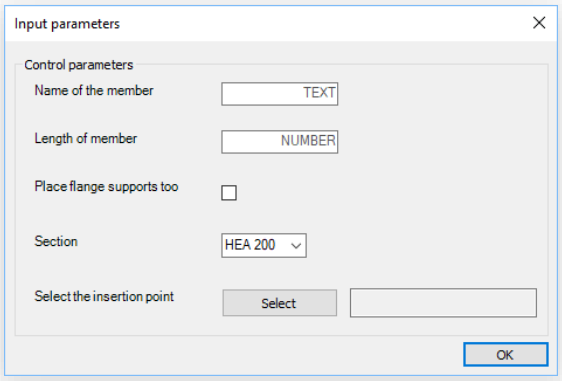
Automatic code check is automatically and continuously runs and evaluates the written code and highlights the possible errors and warnings.

With the debug functions, codes can be stepped line-by-line and stopped at the crucial points. The values of the variables are continuously displayed in the watch window.

7.2 INPUT AND MODELLING FUNCTIONS

Thanks to the new csPI functionalities, different kind of controls (edit box, checkbox, dropdown menu) can be placed on dynamic dialogues to request the user to define the value of variables during runtime.

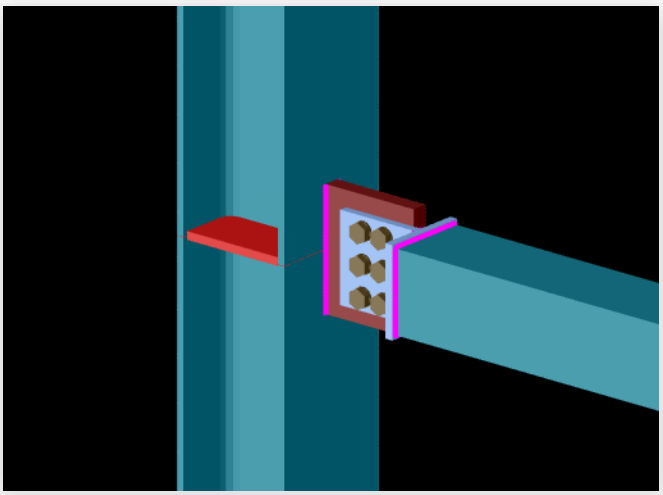
For example, cross-section or material grade can be selected from a dropdown menu, or an insertion point's coordinate can be set with a simple click on the modelling area.



8. CSJOINT JOINT MODULE

8.1 FRONT PANEL HOLLOW SECTION SPLICE PLATE CONNECTION

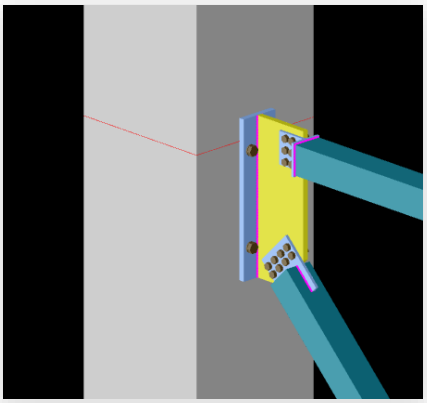
A new type of bracing connection can be used for hollow section members. Front panel hollow section splice plate connection can be used for beam-to-column and bracing joints.

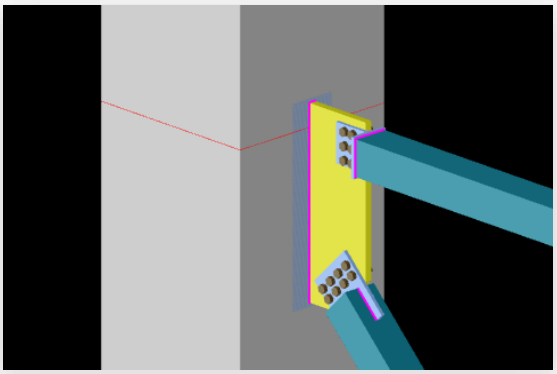


8.2 CONCRETE COLUMN WITH STEEL BRACING JOINT

From csJoint 12, bracing joint is available not only for steel columns, but for concrete as well.

Gusset plate can be bolted with end-plate, or welded to the concrete column.

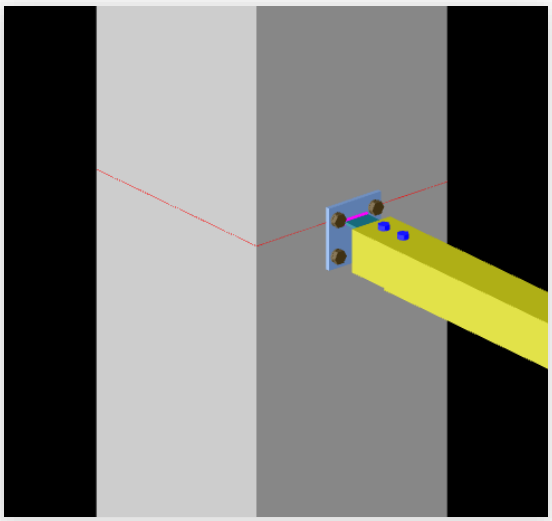




8.3 WALL FRAMING JOINTS

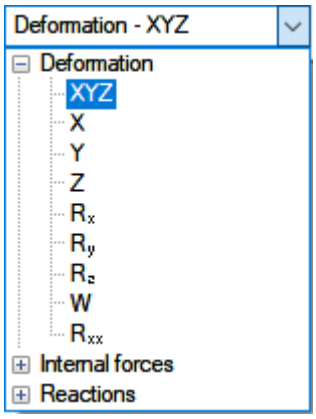
With this new joint type, RHS wall framing header beam and column joints can be checked.

Wall framing joint can be connected to steel and concrete elements as well.



9. REALIZED USER REQUESTS

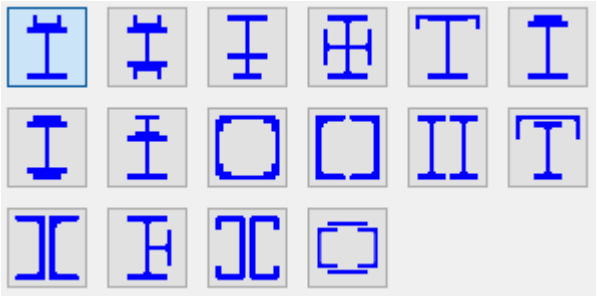
- Rotations and warping results are now available at the deformations



- csPI – Excel import: Excel files can now be accessed from csPI by defining a relative path to them, beside of the absolute path

```
EXCEL_OPEN "3d_1span_tapered_hall_symmetric_EN.xlsx"
```

- csPI - available macro sections: compound macro section are also now available with csPI codes



- Section administration dialog: the content of the section administrator can be exported to *.csv format, and the dialogue itself is resizable
- Analysis report dialog can be reopened at any time