

Truss 4 version 8

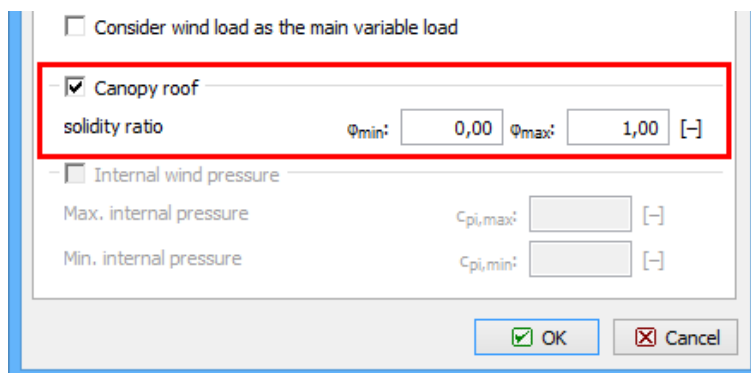
Fine Ltd. is pleased to announce the release of new version 8 of Truss 4 software. The version brings these new features:

Wind load for canopy roofs

The wind load may be calculated also for canopy roofs. The calculations are based on the chapter 7.3 of EN 1991-1-4 and the chapter 8.4 of SANS 10160-3. The following rules are used in the software:

- The net pressure coefficients $C_{p,net}$ are used in accordance with tables 7.6 and 7.7 (EN 1991-1-4) or tables 13 and 14 (SANS 10160-3)
- The unequal load is considered in accordance with the figures 7.17 (EN 1991-1-4) and 20 (SANS 10160-3). Four directions are considered (NW, SW, NE, SE).
- The maximum value from zones B and C is used in the corners (zone E in SANS 10160-3)

This solution is the combination of two methods described in the standards (overall force coefficients and net pressure coefficients). This solution was used due to the fact that the method based on the net pressure coefficients doesn't contain rules for unequal load.



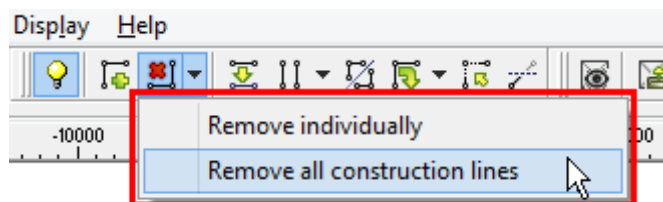
Part "Canopy roof" of load generator

The range of considered degrees of blockage ϕ (figures 7.15 of EN 1991-1-4 or 18 of SANS 10160-3) should be specified for canopy roof. The default range $\langle 0;1,0 \rangle$ includes all possible options from empty to fully blocked canopy.

As the corresponding chapters in standards don't contain special rules for more complicated roofs, the recommendation is to use this feature mainly for simple roofs like mono-pitched or duo-pitched canopies.

Remove all construction lines

All construction lines may be deleted using new tool "Remove all construction lines" both in „Truss 2D” and „Truss 3D”. The command is included in the drop-down menu for tool "Remove" in the construction lines toolbar.



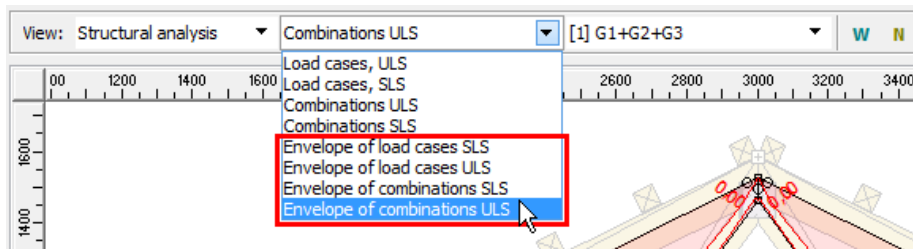
Tool "Remove all construction lines"

The table with maximum values of internal forces for members

The structural analysis documentation may contain new part “**Extreme values of internal forces**”. The table shows maximum values of internal forces (axial force, shear force, bending moment) including for all or selected members. The maximum values may be printed both for load cases and combinations.

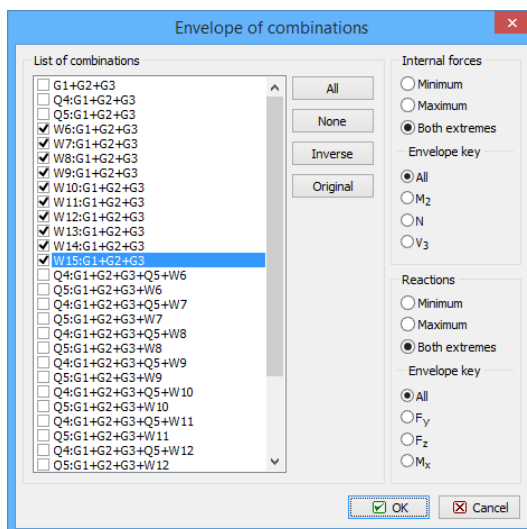
Envelope of internal forces

The envelopes (diagram of maximum and minimum values in any point of structure) of load cases or combinations may be displayed both in „**Truss 2D**” and „**Truss 3D**”.



Selection of the envelope of combinations in Truss 3D

The envelope properties have to be specified in the dedicated window, that appears after the choosing of envelope in the menu. This window may be opened again with the help of the button “**Envelope**”.



Window with the envelope properties

The load cases or combinations that should be included in the envelope may be selected in the left part of the window. An important input is the “**Envelope key**”. The option “**All**” shows maximum and minimum values for forces and moment. If one force or moment is selected as the key, the maximum and minimum values are shown only for this force/moment. The corresponding values in the decisive load case/combination are shown for the other forces/moment.

Change of web orientation in “Web generator”

The web generator contains new tool for the change of the web orientation. The ascending web can be changed easily into descending one with the help of this feature. The tool is included in the toolbar “**Webs**”.



Button for the tool "Change direction"

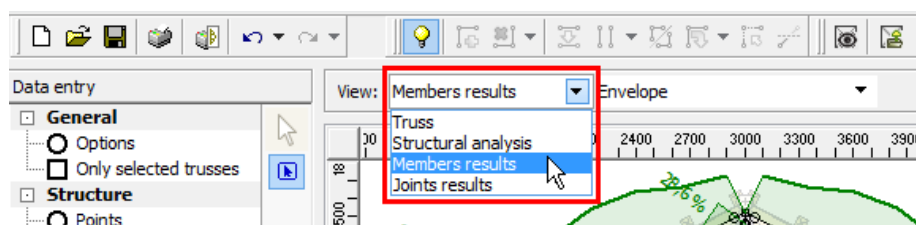
New icons

Icons in toolbars were updated.

Truss 3D

Results view and edit tools in the part "Truss check"

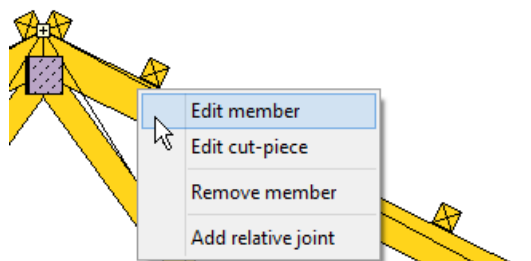
The 2D workspace with truss view in the part "**Truss check**" contains new toolbar for results view. Additionally, the workspace is active and may be used for the most common modifications of trusses.



Toolbar for results view

The left mouse button click on a member opens the window with properties of member (in modes "**Truss**" and "**Structural analysis**") or with detailed results for the member (modes "**Members results**" and "**Joints results**"). The left mouse button click on a nail plate opens the window for nail plate edit (including detailed results, if the truss is verified). The click on a joint mark, wall plate or wedge opens the window with joint properties'

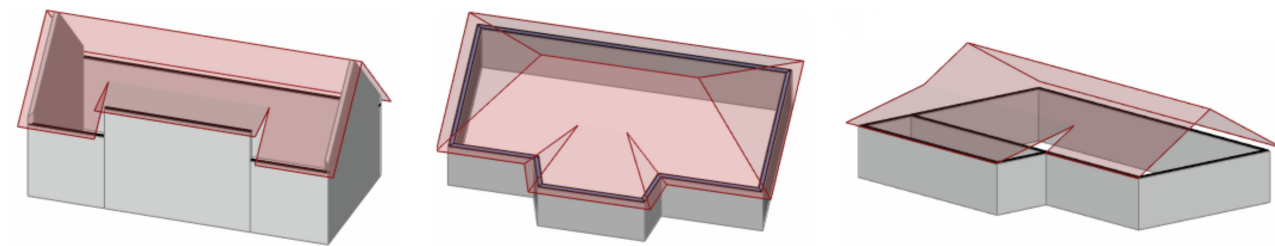
The context menus with the most common tools can be opened by the right mouse button click. The context menus differ when clicking on members (contains tools for member edit, remove member, add relative joint to the member) and on nail plate, joint mark or wall plate (edit joint, detail, nail plate and convert relative joint to absolute one). When clicking outside the truss, the context menu contains tools for a general work with the whole truss (web generator, mount/design/verify truss, "**Truss properties**" and "**Design options**" for the particular truss, renumber structure, edit timber cuts). The active object is highlighted by violet colour.



Context menu for members

Mono-pitched extension

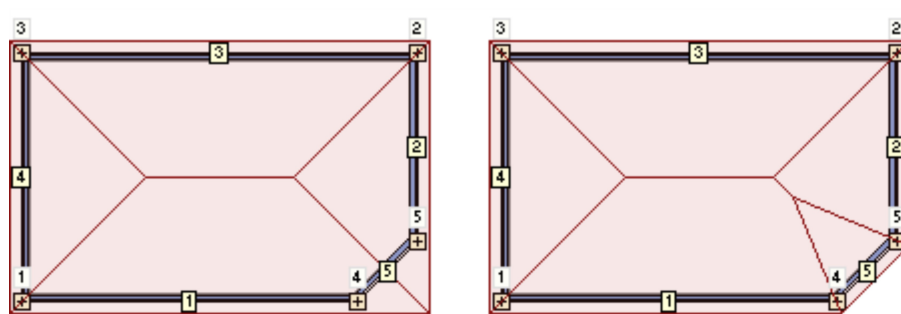
The new step "**Mono-pitched extension**" is available in the part "**Roof**". It may be helpful for roofs with dormers or low-pitched extensions.



Examples of mono-pitched extension

Stubbing the hip

The hip end may be stubbed by additional step "Hip". Simple example is shown below. This solution keeps the values of pitch for all walls (contrary to "Polygonal hip").



Basic rectangular roof on the left figure is stubbed by the hip (walls 5,1,2) on the second figure

Manual changes of metalwork are stored

Any manual change in the metalwork is stored in the project data. Any redesign of the structure doesn't rewrite these changes anymore. The automatic design may be restored by using the setting "Use automatically designed metalwork" in the metalwork properties.

Keyboard shortcuts

Following keyboard shortcuts are newly available in Truss 3D:

<i>Ctrl+1</i>	Launches the window „ Common properties “ with the general properties of trusses (designing standard, timber properties etc.)
<i>Ctrl+2</i>	Launches the window „ Design options “ for the whole project
<i>F7</i>	Mounts the active truss (active only in the part " Truss check " of the tree menu)
<i>F8</i>	Designs the active truss including an update of reactions from supported trusses (active only in the part " Truss check " of the tree menu)
<i>F9</i>	Verifies the active truss including an update of reactions from supported trusses (active only in the part " Truss check " of the tree menu)

Truss 2D

Load generator

The load generator was added into the program. It may be launched by the button "🔧" in the toolbar for load cases table. The range of inputs is similar to the load generator in "Truss 3D".

As the standards EN 1991-1-4 and SANS 10160 are quite complicated, it isn't possible to find exact values of the wind load without detailed knowledge of the roof shape whole roof. Therefore, the values provided by the generator in "**Truss 2D**" are relevant mainly for simple truss shapes (duo-pitched, mono-pitched, hip trusses) with the span equal to the width of the roof. In other cases, program "**Truss 3D**" should provide more precise results. The generator contains new tab "**Truss position**" with properties of the roof (type, dimensions) and with the scheme, where the position of the truss in the structure should be specified. The roof is divided into four areas according to the used pressure factors. As a default, area 3 is selected (regular truss, no significant effect of increased wind values at the roof edges). Following load areas from corresponding tables in the standards are applied for these four areas:

Roof type/wind direction	Area 1	Area 2	Area 3	Area 4
Duo-pitched/parallel*	F,G;I	H;I	H;I	I;I
Duo-pitched/perpendicular	F,H,J,I	F,H,J,I	G,H,J,I	G,H,J,I
Mono-pitched/parallel*	F _{high} ,G,F _{low} ;I	H;I	H;I	I
Mono-pitched/perpendicular	F,H	F,H	G,H	G,H
Flat/parallel	F,H	F,H	G,H	G,H
Flat/perpendicular*	F,G,F;I	H;I	H;I	I
Hip/parallel (duo-pitched)	N	N	N	N
Hip/perpend. (duo-pitched)	G,H,K,I	G,H,K,I	G,H,K,I	G,H,K,I
Hip/parallel (hip truss)*	L,F,G;N,J,I	M,L,H;N,J,I	M,L,H;N,J,I	N
Hip/perpendicular (hip truss)	F,H,L,M,J,I	F,H,L,M,J,I	G,H,L,M,J,I	G,H,L,M,K,I
Duo-pitched canopy	B(C)**	A,C,D	A,C,D	A,C,D
Mono-pitched canopy	B(C)**	C,A,C	C,A,C	C,A,C

* Two options considered (separated by ";")

** The maximum is selected in corners

Assembly height of the truss

The option for drawing the assembly height of the truss (vertical distance between bottom chord and the apex) was added.

Horizontal and inclined dimensions together

Certain dimensions (mainly lengths and joints on bottom chords and rafters) may be displayed both in horizontal direction and along the chord length.

Values of deflection between joints

The maximum values of deflection are calculated also between joints. It isn't necessary to add relative joints into these positions anymore.

Keyboard shortcuts

Following keyboard shortcuts are newly available in Truss 3D:

Ctrl+1	Launches the window „ Truss properties “ for the whole project
Ctrl+2	Launches the window „ Design options “