Truss4/Arctec version 14

Fine ltd. is pleased to announce the version 14 of truss software Truss4/Arctec. The main target of this version was to improve user interface both in "**Truss 2D**" and "**Truss 3D**".

Improved support of scaling in Windows

The software contains better support of UI scaling in Windows which is used mainly in combination with hi-res screens. All UI components in truss software (e.g. text, icons, menus, symbols) are scaled according the Windows' settings.

New toolbars

New version of toolbars was developed. New toolbars are able to combine more components and icons with different sizes.

New system of graphical selections

The system of object selection in workspaces was changed completely. The new system corresponds to the work in CAD applications. It is possible to select more types of objects (e.g. walls and trusses) in the same time. The selection from left to right selects only objects which are completely in the selected area. The selection from right to left selects also objects which meet the selected area partially. The selected area has dashed boundaries in this case.
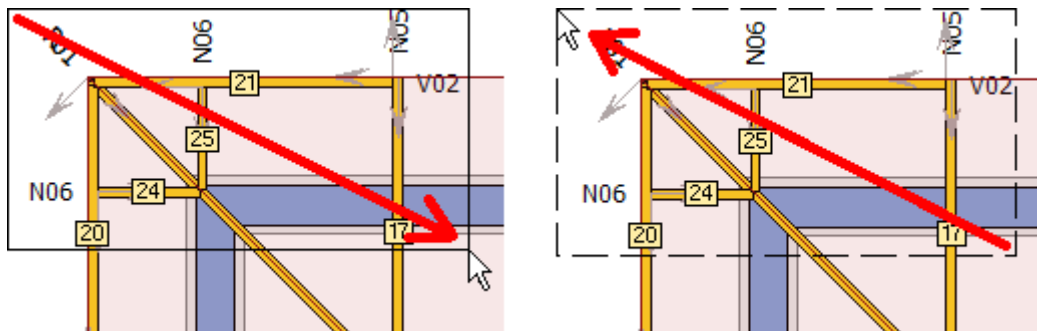
Selection from left to right selects truss positions 21, 24 and 25. The selection from right to left selects all displayed trusses and also both walls.

The selection mode (adding to selection or deleting from selection) is controlled using the keyboard. This eliminates the need to select an appropriate mode in the toolbar. The basic selection without any keyboard input is used to add objects into the selection. If the "**Shift**" key is held during the selection, the program removes objects from the selection. When the "**Ctrl**" key is pressed, the program is inverting the selection (the selection of already selected objects is canceled and the not selected objects are selected).

The graphic selection can be canceled at any time by pressing the "**Esc**" key. The toolbar with the choice of selection area shape (line, rectangle, rhomboid) is still available.
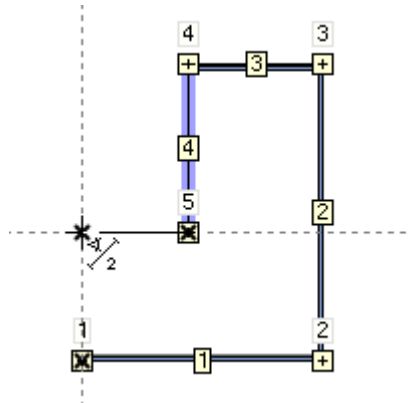
Object snap tracking in 2D input

The object snap tracking can be now used during the input in the 2D workspace. If you hold the cursor for a longer period of time above the snap point during the input, the program marks it with a cross and starts to consider it as a new start of polar tracking.

Symbol of a new object for polar tracking

This function can be used, for example, to specify a point which uses an X-coordinate from one point and a Y-coordinate from another. It is necessary to hold the cursor over the first and then over the second point, in both cases until the symbol of tracking point appears. After that, it is possible to insert a new point into the intersection of rays which come from tracking points.

Input of wall using object snap tracking

The number of points for polar tracking is not limited. This way of input speeds up the work with the software and reduces the work with construction lines

Merged window with settings

Windows "**Truss settings**", "**Design option**", "**Load generator**" and "**Analysis options**" were merged into one window "**Project/Truss options**".

Advanced options for nail plate range in the company catalogue

It is possible to the range of nail plates for certain applications in the tab "**Advanced options**" of "**Nail plates assortment**" window. For example, it is possible to disable certain nail plate type for splices.

Advanced options of nail plate assortment

Export files for CNC saw machines Randek and Hundegger P8/10

The software is able to create controlling files also for CNC saw machines Hundegger P8 and P10 (file extension *.bv) and Randek (for example SPL728).

Saving documents into *.docx file format

Output documents can be saved also as *.docx* files (XML filr format of MS Word).

Truss 3D

Program "**Truss 3D**" has completely new user interface. Main target was to speed up the work with the software and reduce number of redundant steps.

New 3D engine

The 3D engine was completely rewritten according to the latest OpenGL specification. Result of this change brings faster and more stable 3D environment. Manipulation with 3D model is now smooth and fast. New version of OpenGL engine solves all known issues connected with 3D interface in old versions of the software.
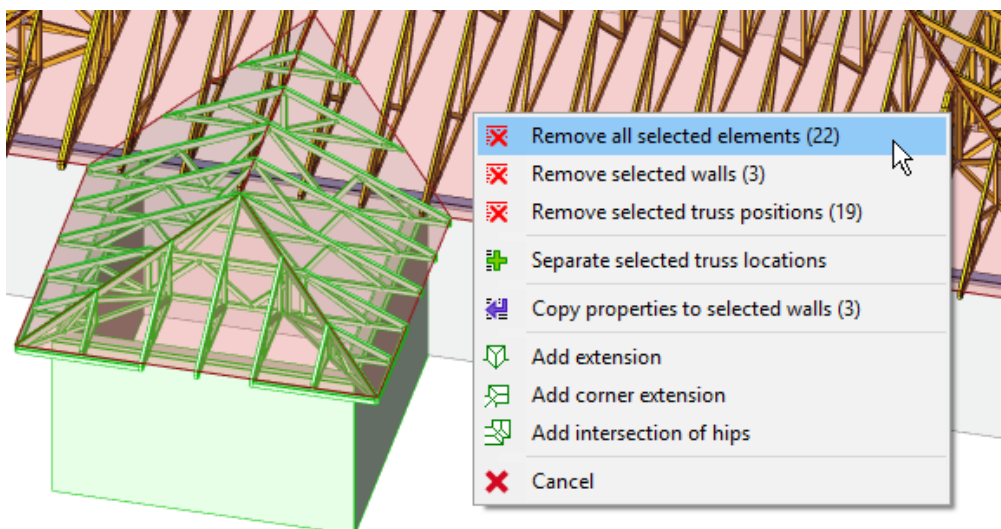
Active workspace

2D and 3D workspaces are active and can be used for direct editing of objects. Double-click on the object (wall, truss, member etc.) opens the window with object properties. Single click opens a context menu with the most frequent commands related to the object. The context menu differs according to the object type. There is also dedicated context menu for the workspace (click outside any object).
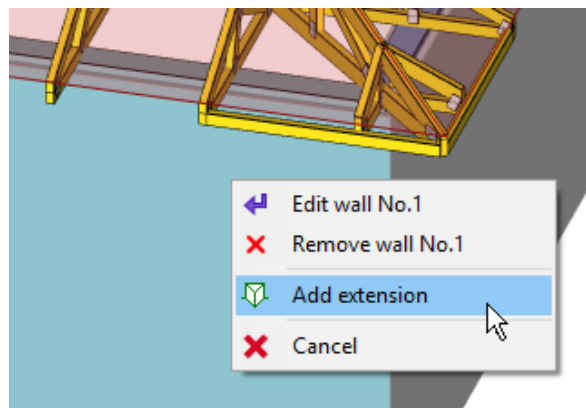
Context menu for wall

It is possible to work with more types of objects (e.g. walls and trusses), it isn't necessary to switch modes in the tree menu anymore. This context menu also contains dedicated functions for work with selected objects.

The context menu for the workspace contains also functions for selected objects

Modified tree menu

The number of items in the tree menu was reduced significantly due to active workspace and the ability to edit more types of objects in the same time.

A complete comparison of the tree menus in the versions 13 and 14 can be found at the end of this document in Table 1.

Graphic modes

The toolbar with graphic modes which was placed on the right side of the tree menu was completely removed. Since the workspace provides an option to edit all objects in the same time, the graphic modes are useless.
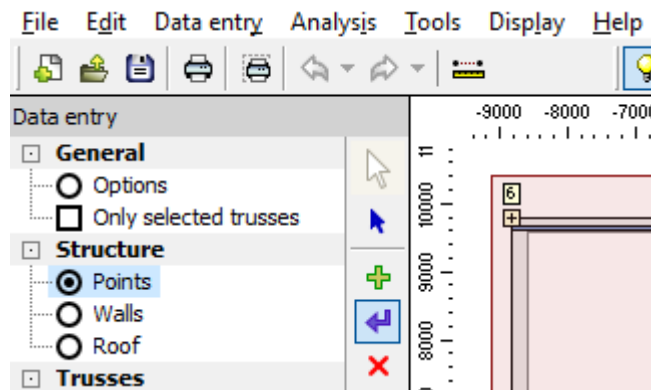

Toolbar with graphic modes in the version 13

Table 2 at the end of this document provides an overview of the new locations of all the functions included in these toolbars.

Automatic recognition of identical trusses

A new feature for automatic recognition of similar trusses can be used when creating new trusses or upgrading existing ones. If the "**Search for identical trusses**" option is selected in the upper left corner of the tab "**Truss**" of the "**Properties of truss location**" or "**Properties of truss group**" window, the program tries to find and use an existing truss with identical geometry instead of creating a new truss type. Searching is performed when the user runs the "**Create truss**" or "**Create all trusses**" command.
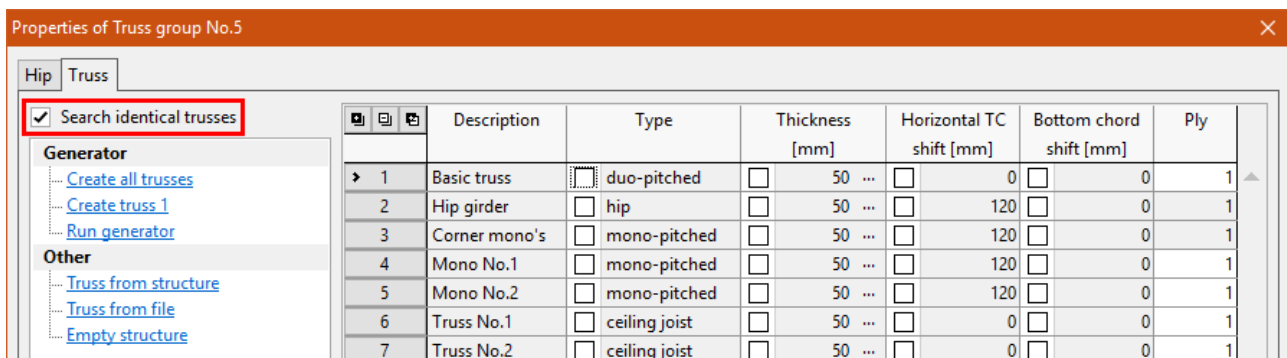

Setting "Search identical trusses"

This function is an automatic alternative to the command "Truss from structure" where the truss type has to be selected manually. If this setting is disabled, the program behaves as in earlier versions.

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Specify the position of the last mono pitched truss on the wall

The position of the last mono pitched truss on the wall can be specified in the hip properties. This value defines positions of all short mono pitched trusses connected to the corner girder. If the same value is entered for hips with different spans, these trusses will be identical in all hips.
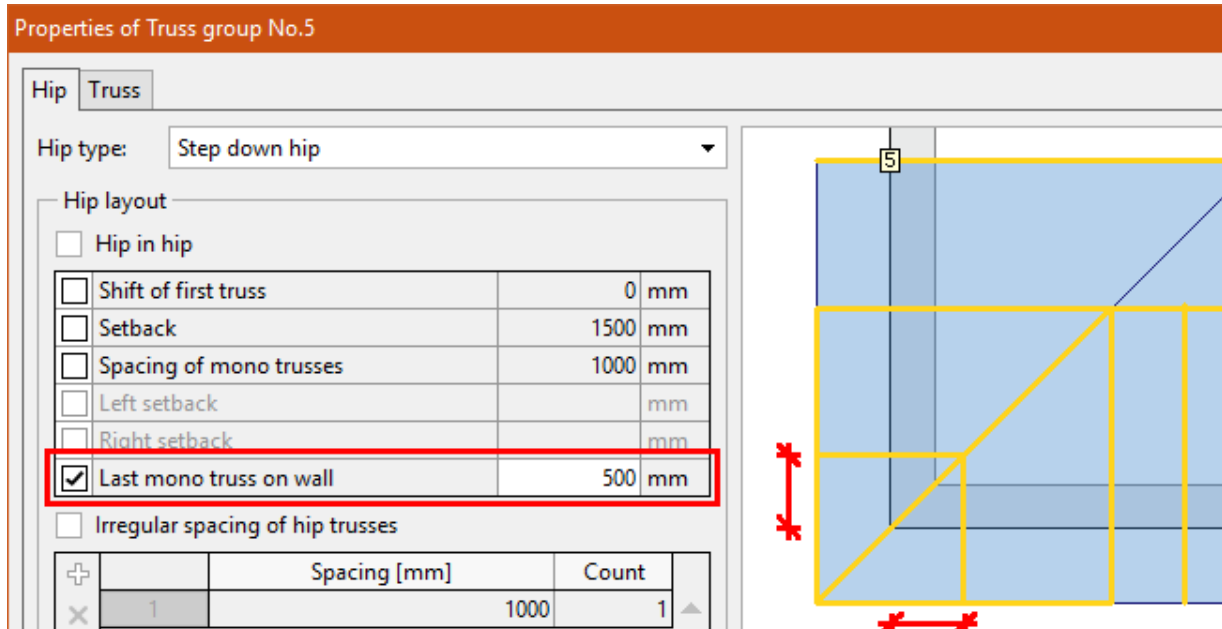
*The setting "Last mono on wall", the figure shows geometric meaning*

Export IFC

The 3D model of the structure can be exported into the *.ifc* file. This file is used for building information modelling (BIM).

Tool for fast input of splices

A new tool "**Add splice to member bay**" has been added to the context menu of a member in the part "**Results**" of the tree menu. This tool is able to insert easily the splice and specify its parameters:

- **Choice of position input** – the splice can be entered exactly according to the cursor's position or the tool will respect the percentage of bay length specified in the "**Project settings**" part "**Splices**".

- **Splice type** – splice type can be "**fixed**" or "**pinned**", default values are based on the parameters specified in "**Project settings**" part "**Structure**"

- **Modification of position** – final position can be fine-tuned with the help of all options available for relative joints.
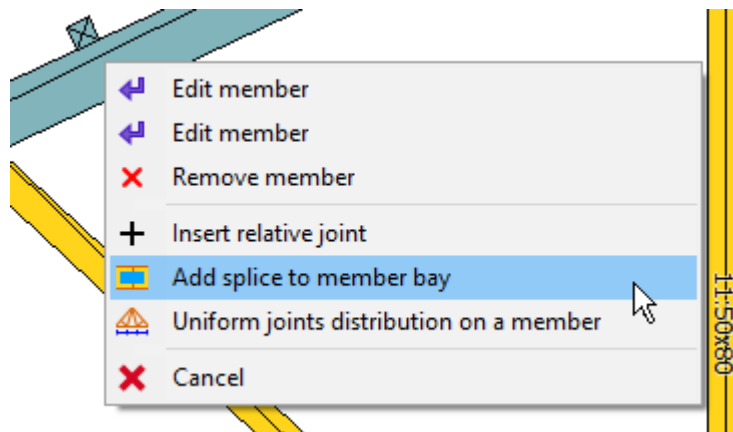
New tool "Add splice to member bay"

New tools in the context menu of the truss in the part "Results"

Two tools "**Renumber structure**" and "**Remove idle rel. joints**" were added into the context menu of the truss in the part "**Results**". These tools were originally available only in the program "**Truss 2D**"
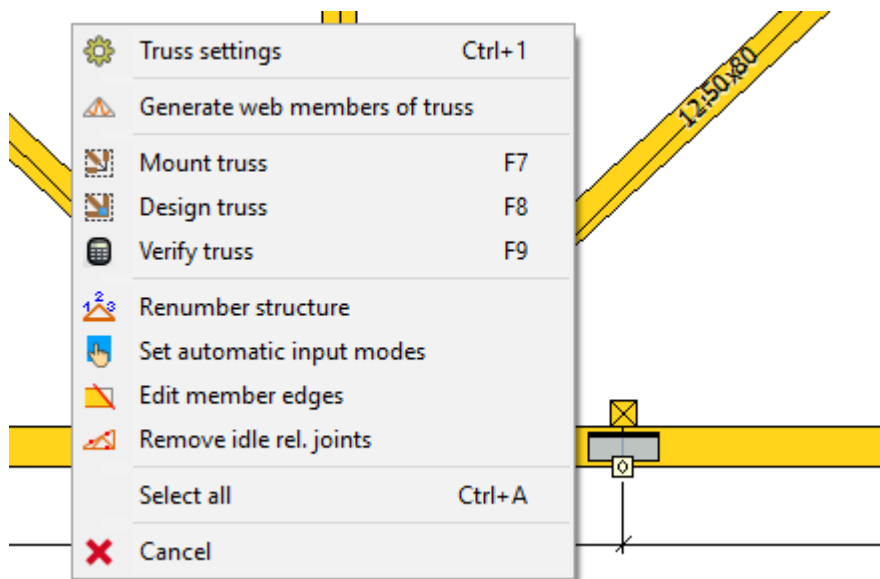
New appearance of the context menu in the part "Results"

Modifications of the truss table

A new column "**Compression in joints**" was added into the truss table in the part "Results". This column corresponds to the setting "**Compressive forces in joints**" which is located in the part "**Standard**" of the window "**Truss settings**". The frame "**Details**" on the right side of the table contains basic price details (timber volume, nail plate area, price).

Truss 2D

The user interface was completely changed also in the program "**Truss 2D**". The main changes are similar to the changes in "**Truss 3D**": active workspace, new selections and modified tree menu.
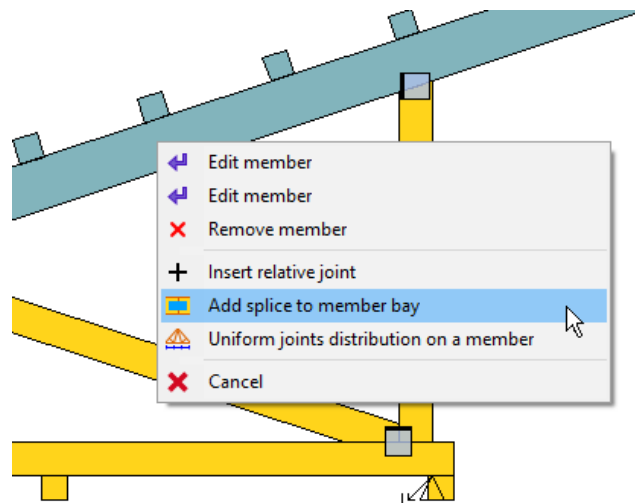
Changes in the tree menu

The tree menu was reduced and it does not contain collapsible parts. These changes

significantly improve the speed of work with the program. Main changes are:

- The menu does not contain non-active items. These parts (headings "**General**", "**Topology**", "**Truss**" etc.) were converted into active items. The bottom frame in these parts contains tabs with corresponding objects

- Dedicated tools for deleting and editing objects (e.g. "**Edit joint**") were replaced by general tools "**Edit**" and "**Remove**".

- The tools in the parts "**Topology**" and "**Truss**" were merged into one list

- Some functions from the tree menu (e.g. "**Rel. to abs.**") were moved into corresponding context menus (conversion of the relative joint into the absolute one can be found in the context menu of the relative joint).

- The content of the part "**Truss**" was moved into the part "**General**", the content of the part "**Structural analysis**" was moved into the part "**Results**".

Active workspace

The program "**Truss 2D**" has also an active workspace with context menus and an ability to work with more types of objects in the same time. The fundamental principles were copied from "**Truss 3D**", part "**Results**".


Example of context menu: the menu for a member

Changes in tools

Tools in the parts "**Topology**" and "**Truss**" were merged into the one list "**Tools**" which is located in the part "**Topology**" of the tree menu.

Some tools were removed as the abilities of new workspace are much wider and these tools became useless.

The most common tools are available also in the new toolbar "**Tools**". This toolbar also contains buttons for opening "**Truss settings**" or for measuring tool.
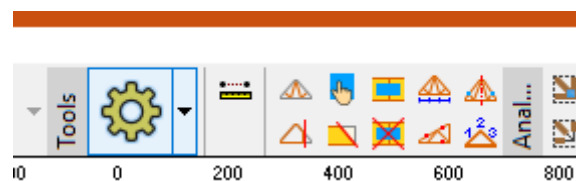
Toolbar "Tools"

New eaves detail "Vertical with cantilever"

The "**Truss generator**" contains new eaves detail "**cantilever**". This detail can be used in cases when the cantilever is higher than the end of bottom chord. Inputs for this detail are the cantilever length, eaves height and cantilever height or height of the vertical web. Meaning of these dimensions is shown in the following figure.
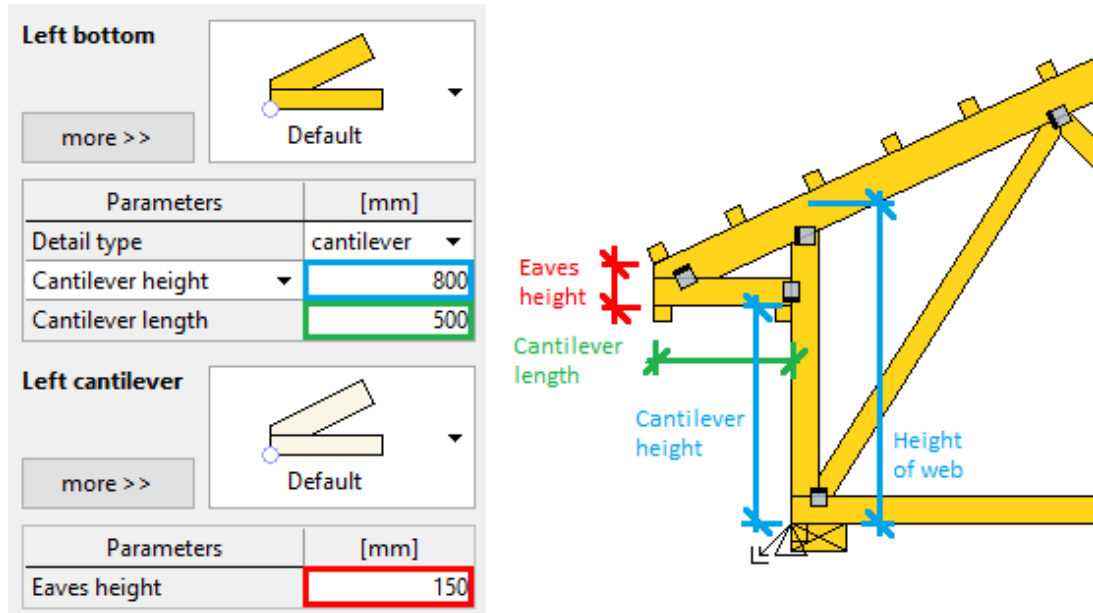
Meaning of particular inputs. The cantilever height and height of the vertical web are alternative inputs

This detail is included only in "**Truss generator**", it isn't available in the "**Wall properties**" in "**Truss 3D**". The detail with edge vertical and overhang of top chord should be specified in these cases. Such detail can be easily converted into the new one by changing the detail type and input of eaves height in "**Truss generator**". The rest of inputs will be filled automatically.

New detail for supports on the bottom chord

New detail type was added for absolute joints on bottom chord. Vertical web is extended to the lower edge of the bottom chord. This detail is helpful mainly for joints with supports as it provides much better capacity in compression.

The detail is available for joint codes 15 (bottom chord, corner left) and 16 (bottom chord, corner right). As the most of joints on bottom chord are the relative ones, it is necessary to convert such joint into the absolute one with the help of the tool "**Relative to absolute**" first.

The vertical web with code 2 (vertical web) is extended automatically. If there are only inclined webs (code 3) connected into the joint, the smallest angle between web and vertical line is the decisive rule.

The topology of bottom chord is not limited. The bottom chord can be horizontal, inclined or there can be a change of angle in the joint.

The web can be extended under the bottom chord. The support can be also specified at the end of this extension.

The compression in the support is calculated according to the chapter 6.2.2 of EN 1995-1-1. This analysis provides significantly higher bearing capacity comparing to the standard supports with continuous bottom chord.
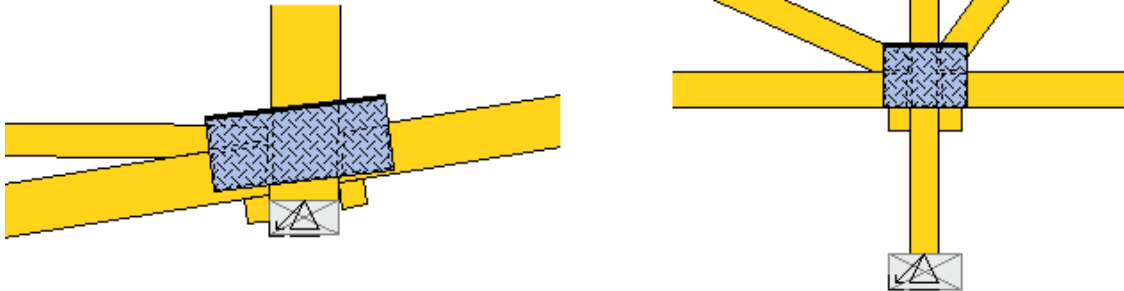
Examples of the new detail

## Different detail for small angles between webs and chords

The different cutting style can be specified for small angles between webs and chords. The default cutting style usually provides very long cuts in these cases which complicates the production.

The new item "**Web cutting mode for small angles**" was added into the part "**Details**" of the window "**Project/truss settings**". If the value "**Different cut**" is set to "**YES...**", it is possible to specify limiting angle and type of cutting mode (using the button "**Modify**" in the right part of the window).
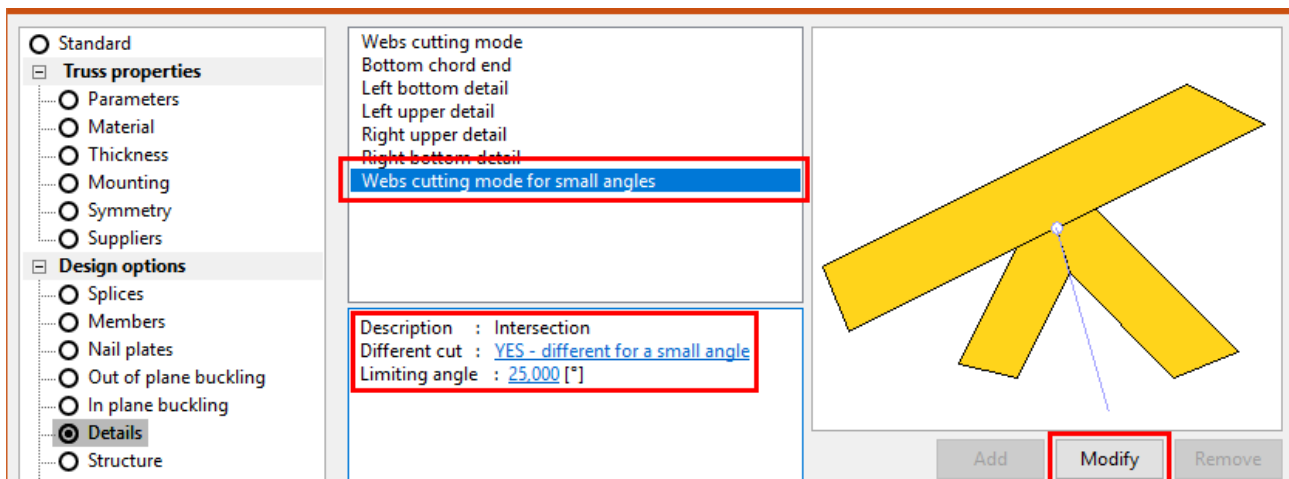
Settings related to the new details

Limiting angle is checked for mounting scheme at this moment. The real angle is therefore usually smaller.
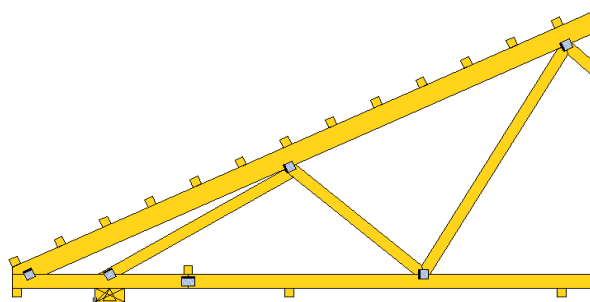
First joint on the top chord has different cuts since the angle between chord and first web is too small

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An option to specify number of nail plates in the eaves detail with wedge

The number of nail plates on the wedge can be specified in the properties of the bottom detail. An automatic mode is switched on as a default. The number of nail plates is selected according to the topology in this mode.
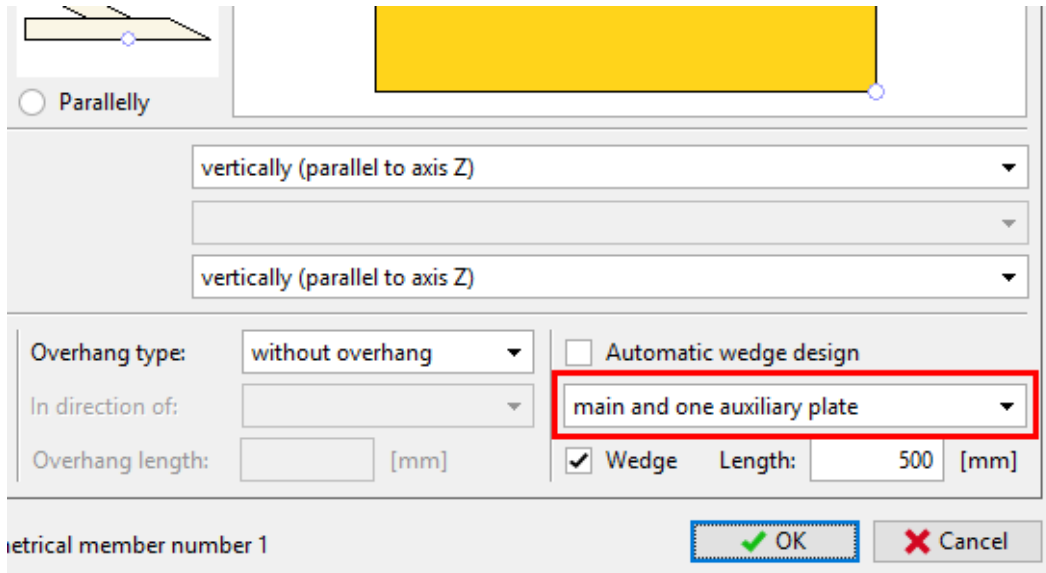
Number of nail plates for a wedge

Do not reduce bottom chord depth in the eaves detail

The eaves detail „**Standard**" has the new setting "**Do not reduce BC depth**". If this check box is ticked on, the software will cut bottom chord only by the vertical cut. This setting is useful mainly in valley when the eaves height is smaller than the bottom chord depth.
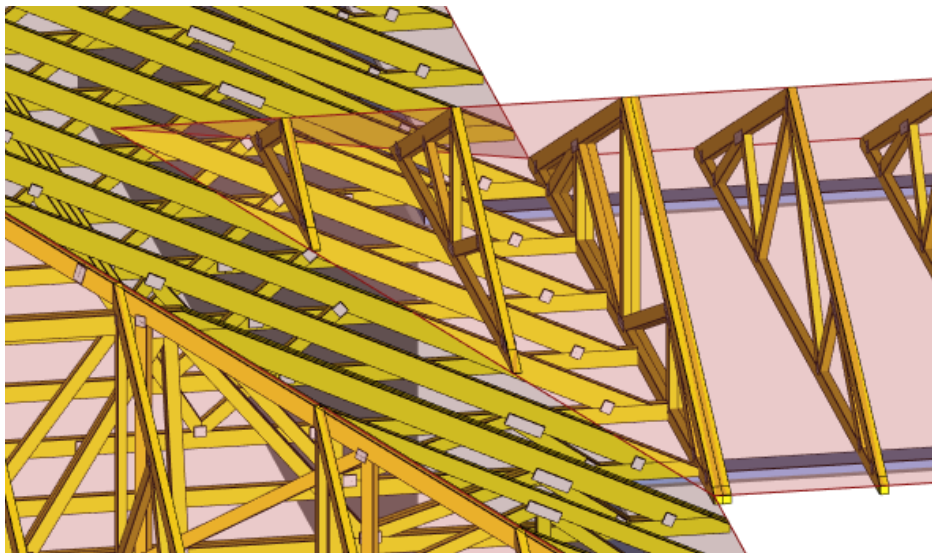
Trusses with new detail in a valley

Extended options for "Edge cut"

The input line "**Edge cut**" in the properties of eaves detail has extended range of allowed values:

- **Positive values** – the positive value represents final (remaining) dimension. This way of input is helpful mainly in "**Truss 3D**" where the top chord depths may

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differ for particular truss types.

- **Value 0** – The cut corresponds automatically to the lower edge of the bottom chord

- **Negative values** – The dimension of the part which was removed by the cut. This is the way of input which was used in previous versions.
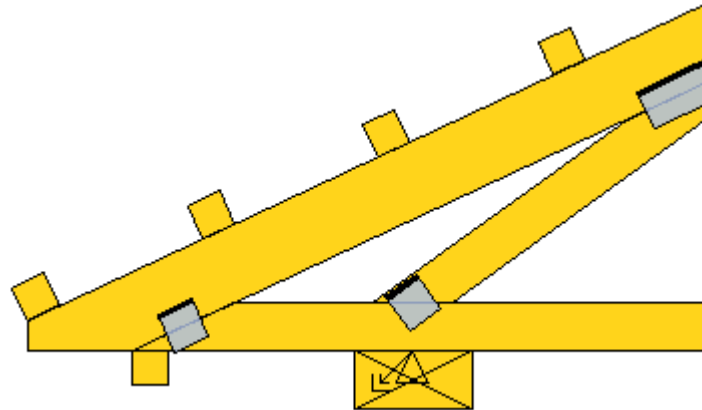
Eaves detail where the "Edge cut" is equal to 0

Option to switch off all auxiliary nail plates

Auxiliary nail plates are added automatically into eaves details and apex if the joint is not covered by a nail plate properly. Unchecking the setting "**Generate auxiliary nail plates**" removes all these nail plates from all joints.

Insert splices from the top for top chords

Inclined top and bottom chords have new mode for inserting splices. If the setting "Start at the top for inclined members" is switched on, the software starts with inserting splices on the higher end of the inclined member.

Table 1: Differences between versions 13 and 14 for all items in the tree menu of the program „**Truss 3D**".

Version 13	*Version 14*
General	This non-active item was removed.
Options	No changes.
Only selected trusses	Moved into the heading of the truss table in the part "**Results**". New name of this setting is "**Export and print only selected types**".
Structure	The active part which incorporate the content of the parts "**Points**" and "**Walls**"
Points	This part was deleted, content was moved into the part "**Structure**".
Walls	This part was deleted, content was moved into the part "**Structure**".
Roof	No changes.
Trusses	The active part which incorporate the content of the part "**Trusses**" – "**Individually**"
Groups	No changes, the new name is „**Truss groups**".
Individually	This part was deleted, content was moved into the part "**Trusses**"
Metalwork	No changes.
Load	The active item which contains tabs with tables of load cases, combinations and truss loads.
Load cases	This part was deleted, content was moved into the first tab of the part "**Load**". Load generator is available in the tree menu (item "**Generate**"
Combinations ULS	This part was deleted, content was moved into the part "**Load**", tab "**Combinations ULS**".
Combinations SLS	This part was deleted, content was moved into the part "**Load**", tab "**Combinations SLS**".
Truss loads	This part was deleted, content was moved into the part "**Load**", tab "**Truss loads**".
Results	The active part which incorporate the content of the part "**Truss check**"
Truss check	This part was deleted, content was moved into the part "**Results**"
Additional parts	This non-active item was removed.
Bracing	The part was moved to the section "**Trusses**"

Table 2: This table describes now locations of functions in toolbar with graphic modes.

Part of tree menu	Icon	Name	New location
Points		**Individually**	Point can be focused by single click using the left mouse button.
		Add	Replaced by the item "**Add point**" in the tree menu
		Edit	The point can be edited by double-click on the point
		Remove	The tool "**Remove point**" is included in the context menu of the point which appears after clicking by the right mouse button. The alternative way is to select the point (highlighted by green) and remove it by the command "**Remove all selected elements**" which is located in the context menu of the workspace. The key "**Del**" on the keyboard works as a shortcut for this command.
		Relative to absolute	This tool is located in the context menu of the relative point.
		Absolute to relative	This tool is located in the context menu of the absolute point.
		Remove selected	Selected points can be deleted with the help of corresponding command which is located in the context menu of the workspace.
Walls		**Individually**	Wall can be focused by single click using the left mouse button.
		Add	Replaced by the item "**Add wall**" in the tree menu
		Edit	The wall can be edited by double-click on the wall
		Remove	The tool "**Remove wall**" is included in the context menu of the wall which appears after clicking by the right mouse button.
		Copy properties	This command will appear in the context menu of the workspace if one or more walls are selected. This tool can be found also in the context menu of the wall (it isn't necessary to specify reference wall in this case)
		Remove selected	Selected walls can be deleted with the help of corresponding command which is located in the context menu of the workspace.
		Add extension	This tool is located in the context menus of the workspace and walls (it isn't necessary to specify reference wall in this case)
		Corner extension	This tool is located in the context menus of the workspace.
		Intersection of hips	This tool is located in the context menus of the workspace.

Trusses individually		**Individually**	Truss can be focused by single click using the left mouse button.
		Add	The command "**Add truss**" is now located in the tree menu
		Edit	The truss can be edited by double-click on the truss
		Remove	The tool "**Remove truss**" is included in the context menu of the truss which appears after clicking by the right mouse button on the truss.
		Select design location	This command is located in the context menu of the truss location
		Remove selected	Selected trusses can be deleted with the help of corresponding command which is located in the context menu of the workspace.
		Separate selected locations	This command is now located in the context menu of the workspace
Metalwork		**Edit**	The metalwork can be edited by double-click on the metalwork mark in the workspace
		Remove	Selected metalworks can be deleted with the help of corresponding command which is located in the context menu of the workspace.