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1 INTRODUCTION

1.1 GENERAL

Whether you intend to plan a single room, an apartment or even an entire house, this software helps you realise all your creative ideas. Even planning a garden is child's play with this software.

The ability to position objects using numerical reference points and guidelines, as well as with the aid of program assistants, enable you to plan, on different layers, your own four walls down to the smallest detail.

A comprehensive library of 3D objects from all areas of life makes possible a realistic presentation of your dream home. Further objects, which for instance are often offered by manufacturers on the internet – with various formats such as 3DS, 3D-DXF, etc being catered for – can easily be imported should the objects provided with this software not suffice.

By specifying the geographical location of your building, the program can simulate lighting conditions in the building at various times of the day. Other light sources such as punctual lighting, spots and ambient lighting can also be defined. Thus you can obtain in advance a picture of the lighting conditions and help avoid the costs of superfluous lighting.

You can decide yourself with which view you would like to plan, choosing between a 2D plan view, a 3D view and a cross-section view.
A special feature is that different views can be shown simultaneously. For example, during definition of the floor plan in a 2D view, the results can also be viewed in the third dimension.

Various materials such as insulation, plaster, concrete and many others can be allocated to the structural layers used to define brick walls, ceilings and floors. The building materials used in planning, including quantities and assigned task items, can be exported as PDF lists.

Once you have completed planning, you can then place or reposition each object, and add 2D graphic elements to your plans as desired. Finally, you can export the entire project in one of many standard formats, to send for instance to an architect or friends - or simply print it out.

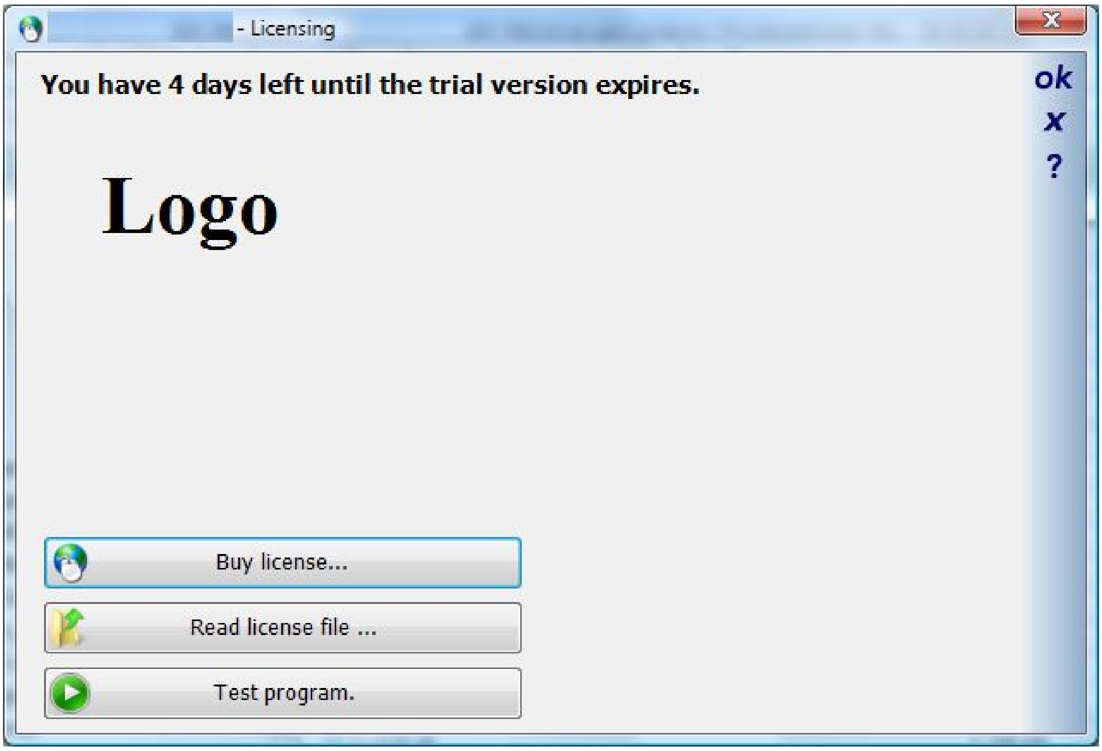
Virtual project planning, visualisation and costing based on manufacturer's catalogs, i.e. as far as possible not abstract objects, materials and components but real, existent and obtainable products, enable the house owner him- or herself to plan and furnish his or her future home. Furthermore, the manufacturer reaches the consumer directly through the software, with no additional marketing costs.
In this respect, information concerning manufacturers is not limited to the building industry, but applies to any product whose depiction and usage is meaningful in a spatial context. This Information helps the user in assessing advice, in deciding what to purchase, to evaluate offers and in further dealings with the suppliers of a product. We are therefore not only interested in professional planning, but in a combination of planning and product presentation.

1.2 DOCUMENTATION

Please note that as a result of the possibility to remove or enhance functions by means of plug-ins, we cannot guarantee that your version of the software contains all features described in this document. Further information on plug-ins and their availability can be obtained from our sales support team via email.

1.3 LICENSING PROGRAM PACKAGES AND PLUG-INS

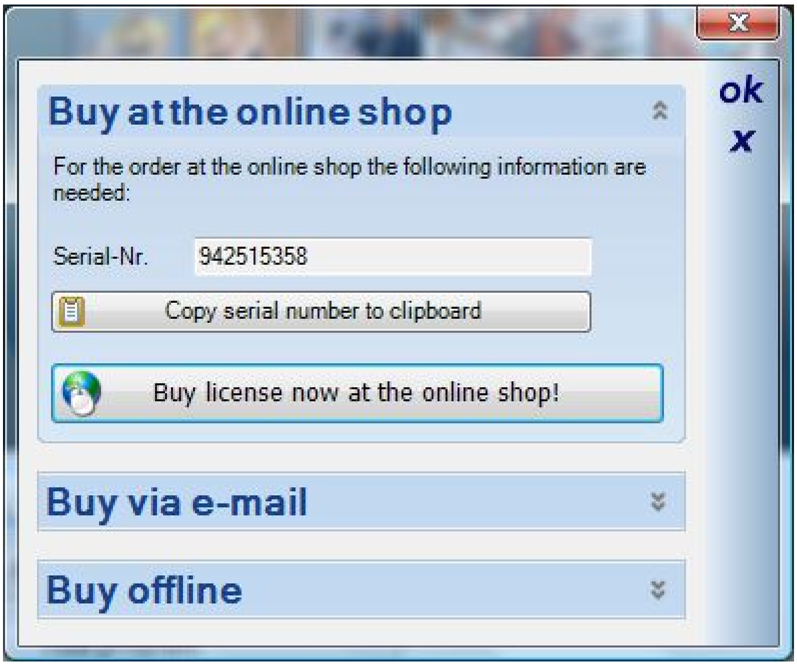
Some program versions must be licensed for the system on which they are installed. When the program is started you can recognize this by the appearance of the following dialog box, which also shows the remaining trial period. After installation, the software and all optionally installed plug-ins are only executable for 5 working days and have to be activated within this period. To do this, simply obtain a license key using the options in the start dialog, or for additional plug-ins under 'Licensing' in the menu. To obtain a license key for a particular program package click on 'Buy license' or alternatively 'Request license'. The license file with the suffix .xml supplied on activation can then be read by clicking on 'Read license file'.



- Licensing

You have 4 days left until the trial version expires.

There are three options for buying a license:



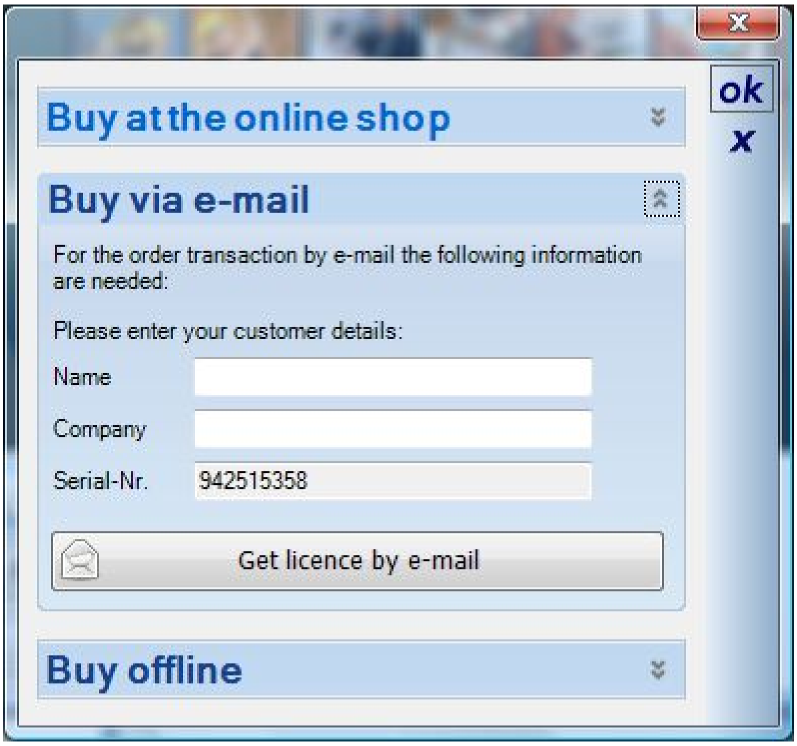
Buy at the online shop

For the order at the online shop the following information are needed:

Serial-Nr. 942515358

Copy serial number to clipboard
Buy license now at the online shop!
Buy via e-mail
Buy offline
ok
x

Buy at the online shop: To go to the online shop click on the appropriate button. At the shop you can then register and buy the program package of your choice. After ordering you will receive an invoice and the license key will be sent to you by email as soon as payment has been completed. The serial number which is shown in the dialog is required for invoicing.



For the order transaction by e-mail the following information are needed:

Please enter your customer details:

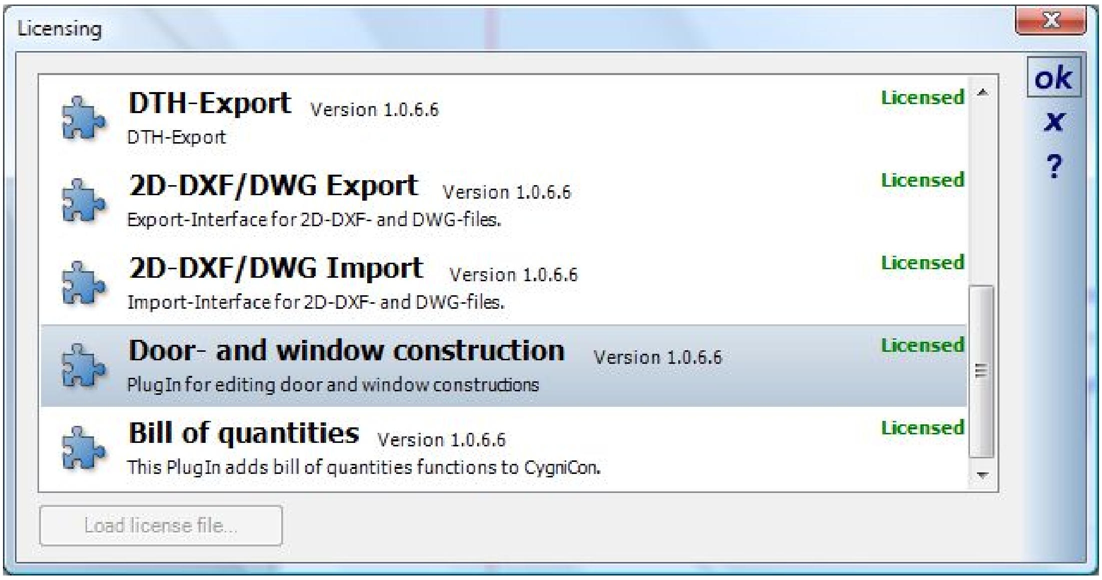
Name

Company

Serial-Nr. 942515358

Buy via e-mail: Enter your name and the company name. By clicking on ‘Purchase license by e-mail’ your e-mail client will be started and an e-mail created with a predefined address. A file called LicenseRequest.xml containing information from the dialog is automatically generated as an attachment to the e-mail. Add to the e-mail all details required for invoicing.

Apart from licensing a program package which includes the standard plug-ins, you can also activate any additional plug-ins, which you have purchased and installed, under ‘Licensing’ in the ‘File’ menu. The procedure for licensing a plug-in is similar to that for licensing a program package.



Licensing

DTH-Export Version 1.0.6.6 Licensed
DTH-Export

2D-DXF/DWG Export Version 1.0.6.6 Licensed
Export-Interface for 2D-DXF- and DWG-files.

2D-DXF/DWG Import Version 1.0.6.6 Licensed
Import-Interface for 2D-DXF- and DWG-files.

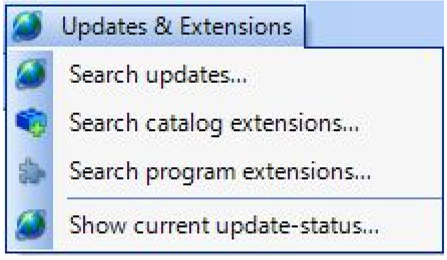
Door- and window construction Version 1.0.6.6 Licensed
PlugIn for editing door and window constructions

Bill of quantities Version 1.0.6.6 Licensed
This PlugIn adds bill of quantities functions to CygniCon.

The dialog box shows each plug-in with its name, version number, a short description and its current status.
Licensing is effected by means of a license file (*.key or *.xml), which can be requested by e-mail or online. The file received can then be saved in any folder.
Next select the plug-in to be activated using the mouse and click on the ‘Load license file’ button. Select the license file (*.key or *.xml) in the ‘Load license file’ dialog. The plug-in is then automatically activated.
Each plug-in requires its own license file, so you may need to repeat this procedure.

1.4 UPDATE FUNCTIONS FOR PROGRAM AND CATALOG

Most program versions include a plug-in which helps you find information about updates, and new program and catalog extensions.



Updates & Extensions
Search updates...
Search catalog extensions...
Search program extensions...
Show current update-status...

The options can differ according to program version. The software checks each time the program is started and an internet connection is active, whether newer program versions are available, however this does not apply to catalog and program extensions. These must be searched for manually using the options under ‘Updates & Extensions’.

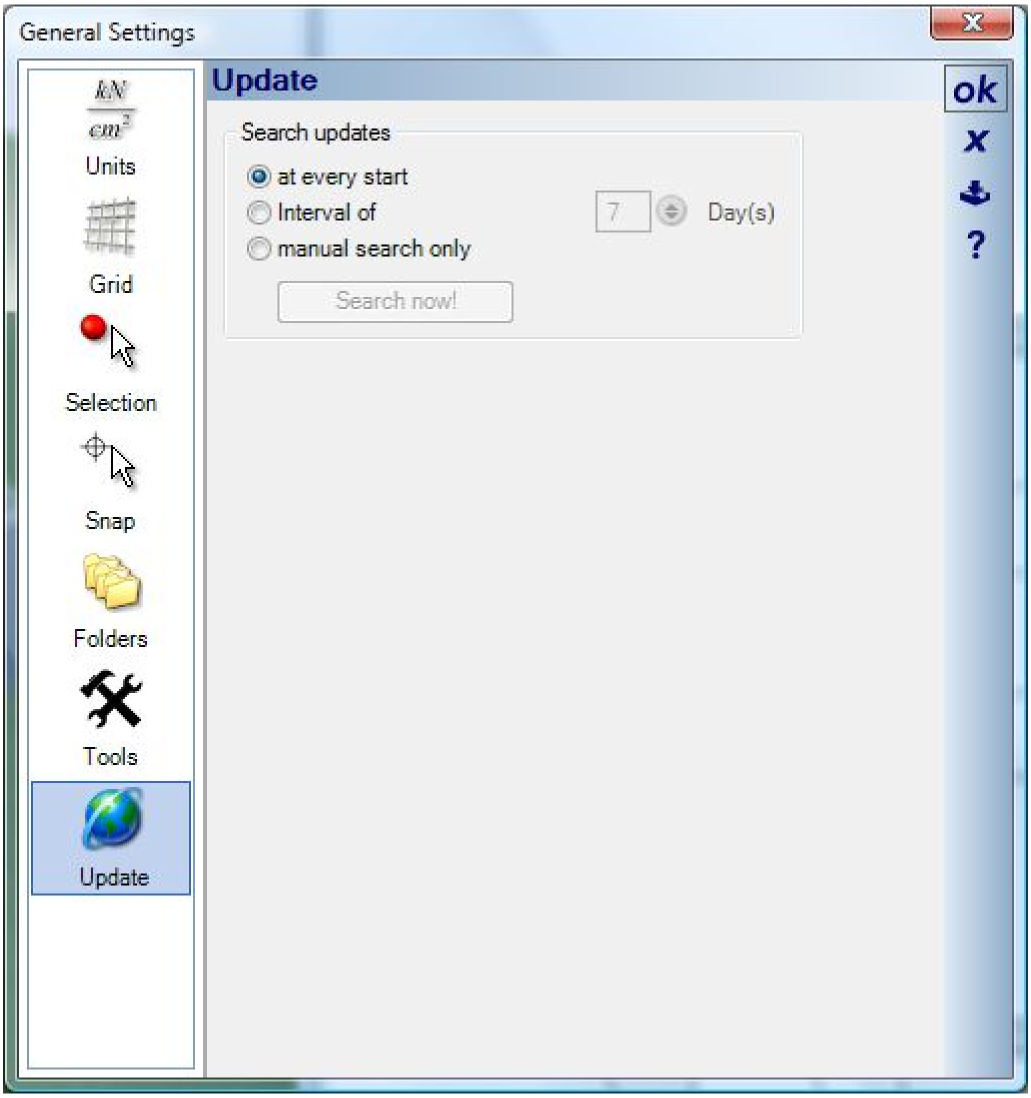
If a new version is available, details of the new version are shown in a dialog box at every program start. You can then decide whether a download should be performed or not. If not, untick the box next to the version. According to update further information is provided in the form of a tooltip, which appears when the mouse is positioned over an entry.

Updates are always downloaded in the background and to avoid effects on normal processing. Only the load on network or internet connections is increased. The downloaded files are stored in the user folder for the application, e.g. C:\Users\Username\Documents\VERSIONNAME\Update.

You can check the status of the download at anytime under ‘Updates & Extensions’. The download will be resumed later even if you terminate the program or switch off your computer.

Once the download has been completed, the next time the program is started you will be requested to now install the update. The installation is performed over the normal Setup, which you must complete as usual. The update file in the user folder can be deleted after successful installation.

The options for the update function can be changed in the ‘Update’ dialog under ‘General Settings’.



Update

Search updates

● at every start

○ Interval of 7 Day(s)

○ manual search only

2 USER INTERFACE

2.1 RIBBONS OR TOOLBARS

- Depending on which version you use, during installation, you have the choice of a ribbon or toolbar user interface. All figures in this document refer to the original toolbar version. This is also true for the buttons. The basic functions are the same, and only the arrangement and the handling in the selection of tool options differ.

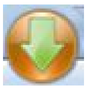
  For those users who are already working with a toolbar version and wish to change to the ribbon interface, here is a short summary of the differences:

  - The previous plugin toolbar that allows you for example to switch between the roof and staircase functions is gone. Instead, we have all the functions of the plug-ins distributed into topic related groups in the ribbons.

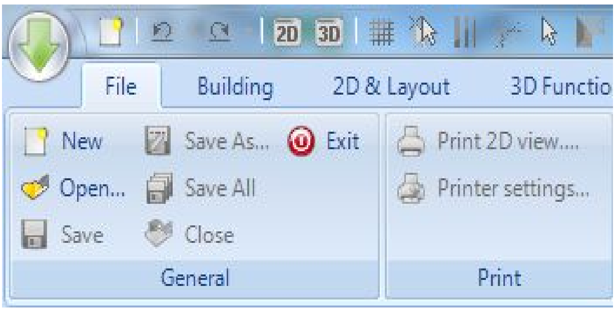
  - The previous WHAT and HOW- toolbars are gone. These functions are selected from the tool button. So you do not select an item, such as a wall type from a separate toolbar, instead the options are displayed as a sub menu to the tool.

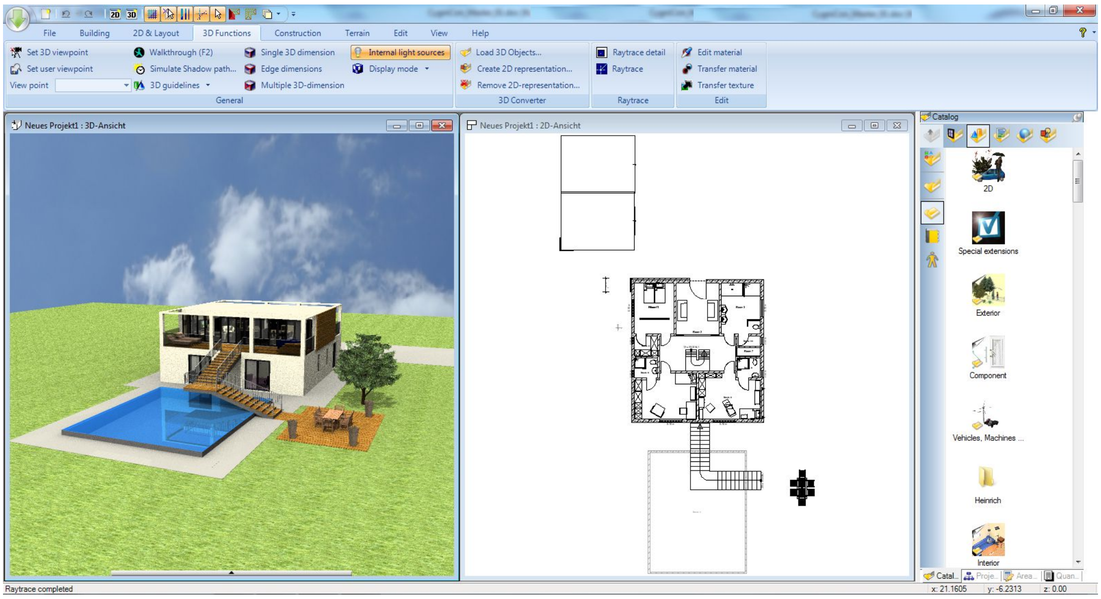
  - The functions for importing or exporting file formats, the settings of the software, the output of reports, essentially, the functions of FILE, SETTINGS and DISPLAY menus have been largely summarized in a new Application menu.

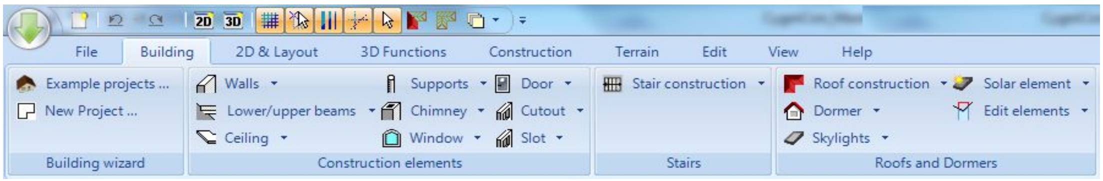
  - The editing functions that appeared in the left toolbar, when you select an element are now located in a separate Ribbon Tab which appears automatically when you select an item.



Note: The button is located on the top left of the software and can look different depending on the version.

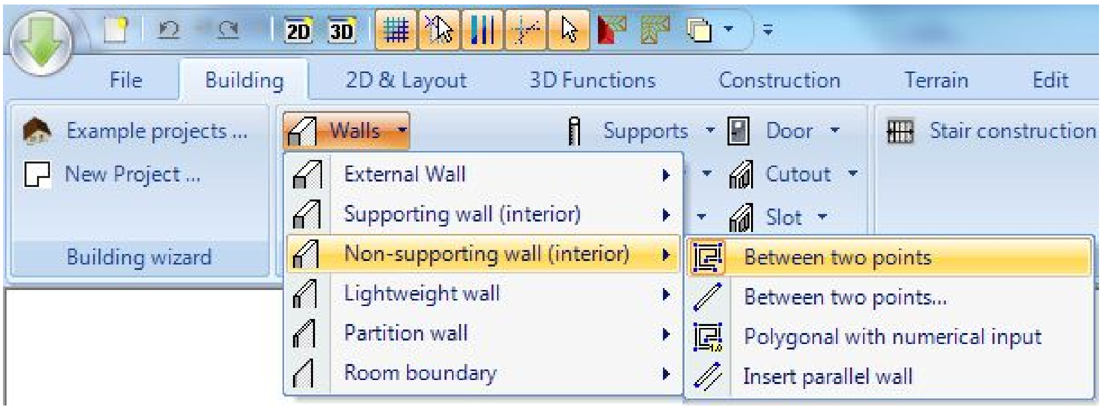






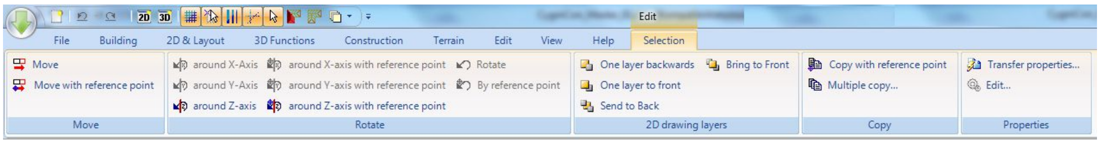
2.1.1 *Selection of input options in a ribbon version*

For each element there is at least one, and often several modes of input. These options are shown as a submenu of the element itself, so select the first item, then the type, and then immediately the input method. The following figure shows the options for a wall-



2.1.2 Editing selected elements

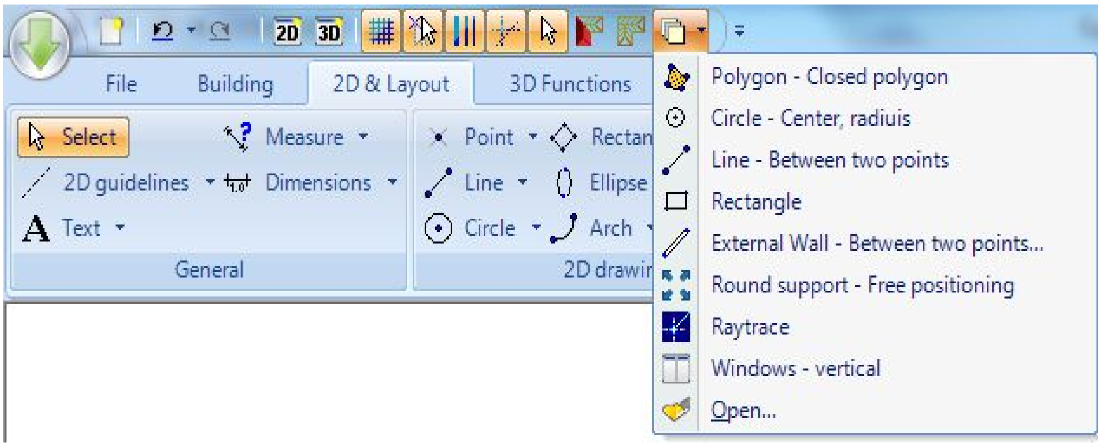
When you select any element, an additional tab page will appear displaying the available editing tools.



2.1.3 Buttons and Menu Last actions

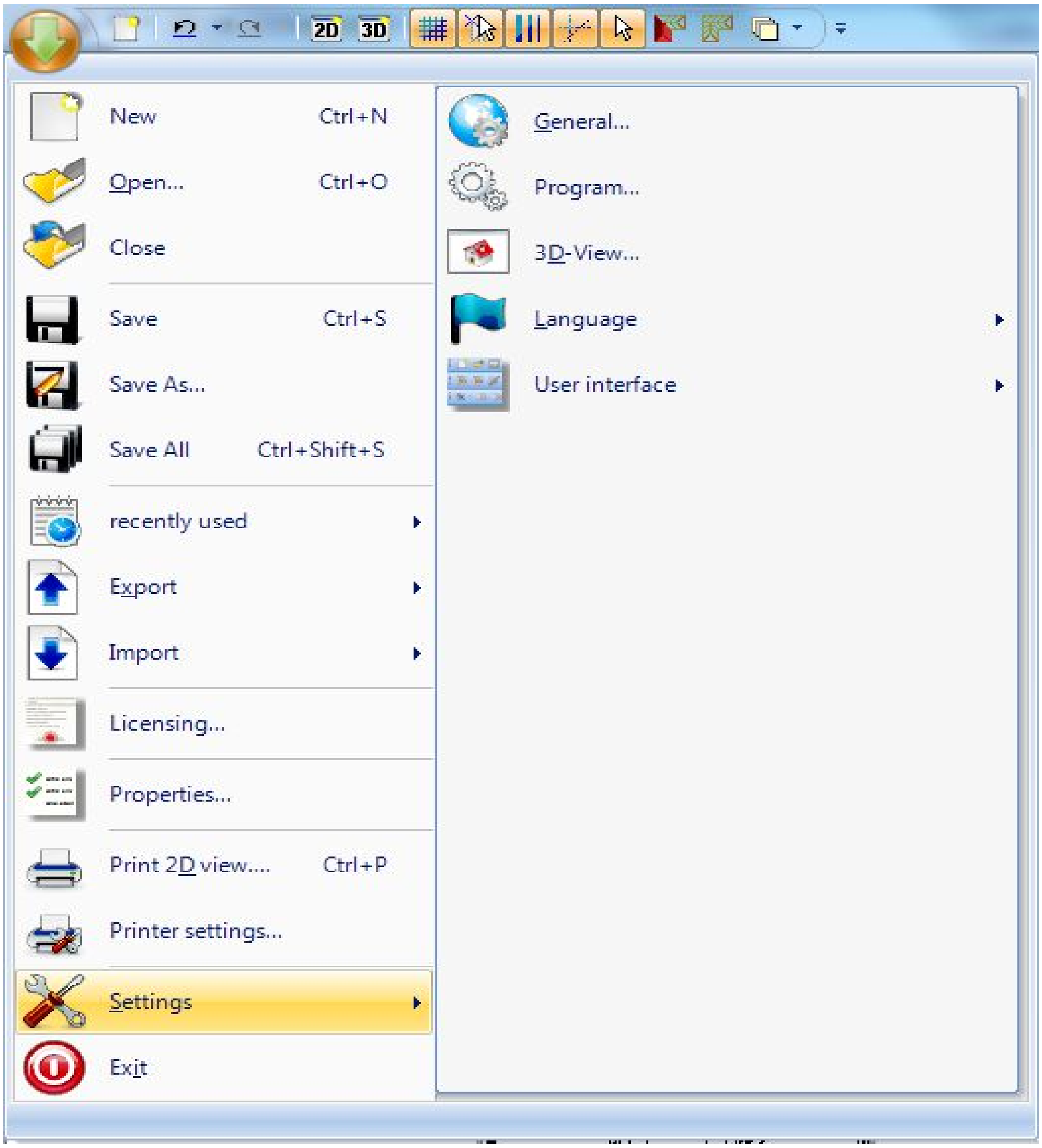
At the top of the software, you will see an extra bar with some predefined actions that allow faster access. In addition, a menu that lists the last 10 actions.

.



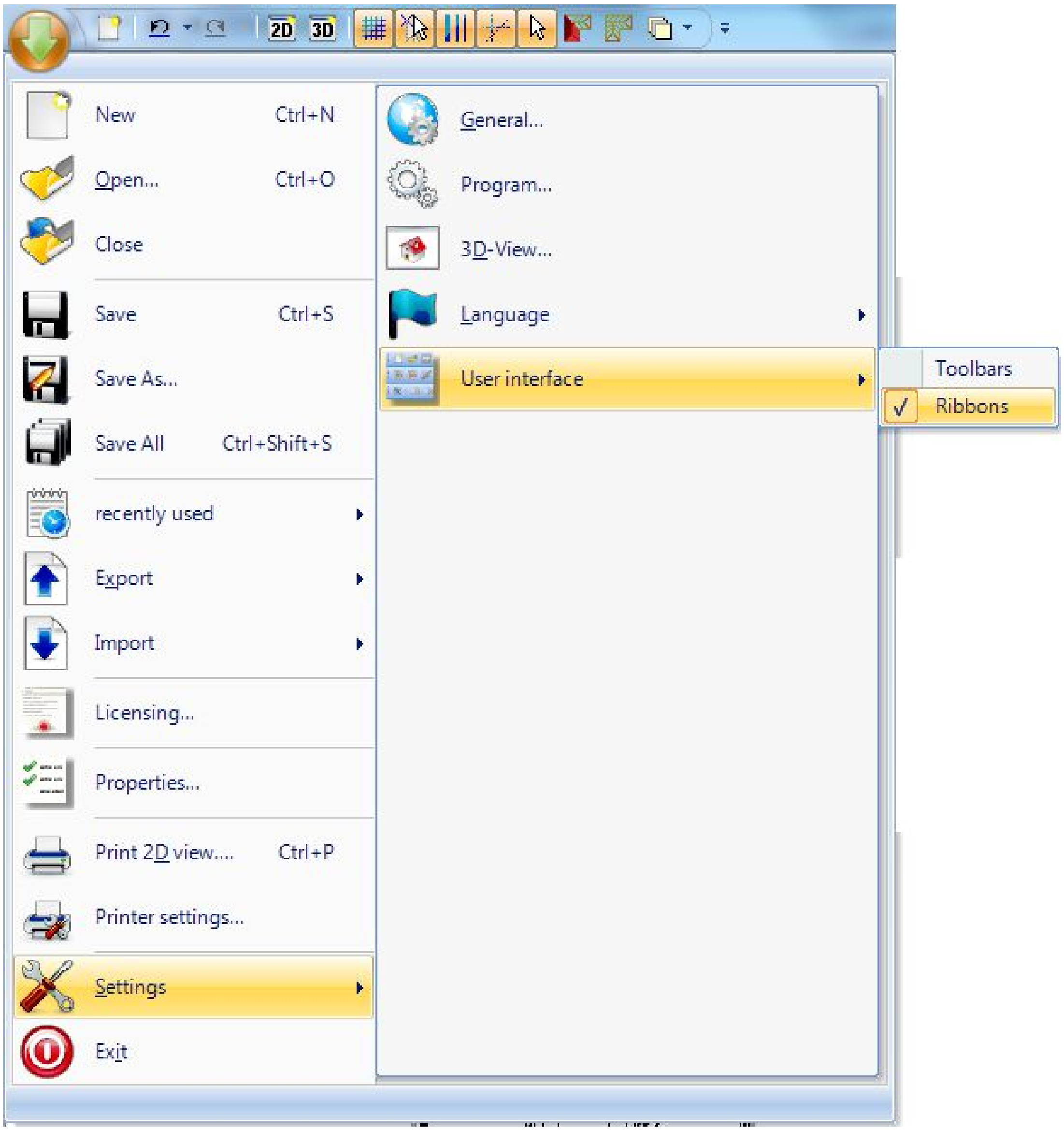
2.1.4 File menu, settings, import, export, language and Ribbon Settings

Many actions that were achieved in the toolbar version on different menus, are now found together.



2.1.5 Switching between a Ribbon and a Toolbar version

You can switch using the File, Settings, User Interface menu as you desire.

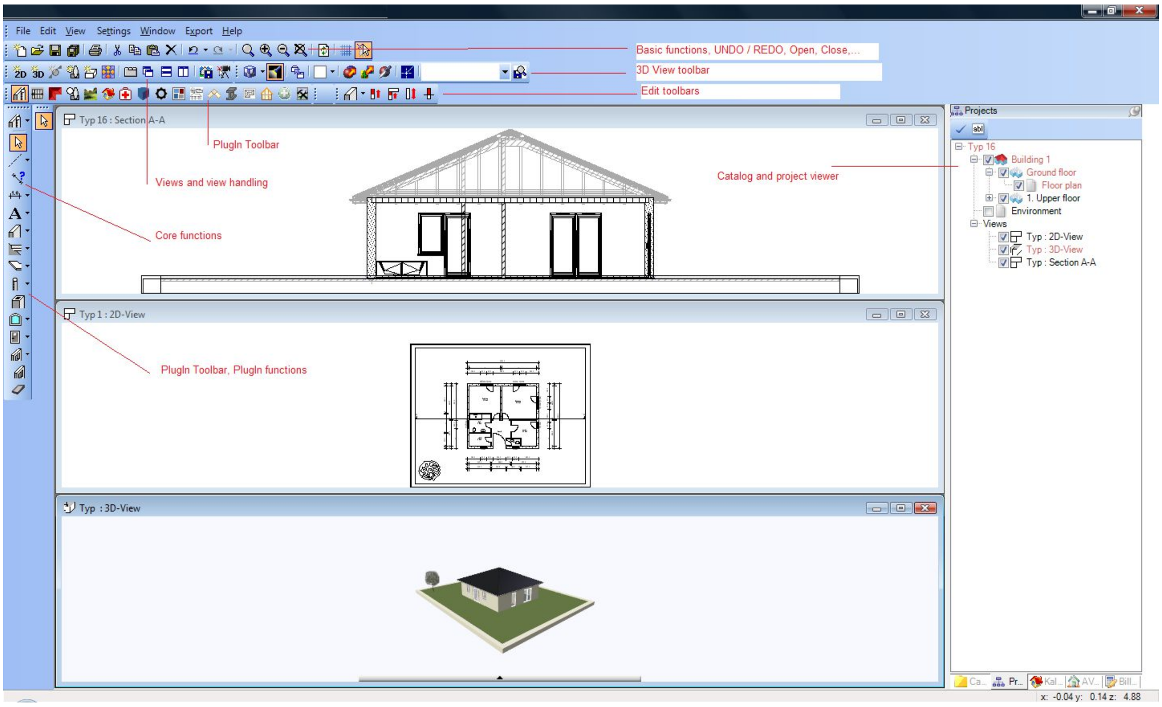


2.2 DOCUMENTS AND VIEWS

Basically functions based on a document in which various views exist are defined. Since internally all views have equal rights, all user actions, e.g. selection, insertion, positioning etc., are, if applicable, performed in the same way in all views. Furthermore, all views are updated simultaneously so that the user can follow the effects of changes in 3D as well as in 2D.

2.3 LAYOUT OF THE USER INTERFACE

The user interface conforms to the operating system settings for the display of windows and buttons. The appearance of the user interface can therefore vary depending on the system being used.



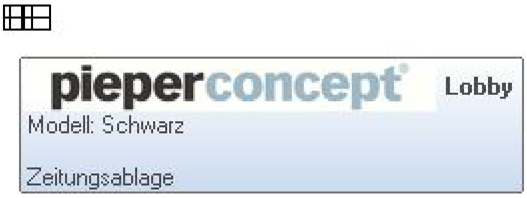
The software has several toolbars which allow the user access to the various program functions. The toolbars and their functions are, from top to bottom and from left to right, as follows:

Standard Toolbar:	Open and Close projects Save Print Copy, Cut, Paste, Delete Redo / Undo Zoom (Rectangle, Zoom in, Zoom out, Show all) Refresh
View Toolbar:	Create 2D plan views Create 3D views Create 2D sectional views Arrange views
3D View Toolbar:	Select representation mode (Textured, Wireframe, Wireframe with hiddenline removal) Parallel view Background mode (monochrome, colour gradient, background image)

	Ray tracing
	Save image
	Select and Create view points
Plug-in Toolbar:	Select functions
	2D Graphics
	Construction elements (walls, supports, chimneys, doors, openings, roofs, dormers, skylights)
General Functions:	Guidelines
	Dimensions
	Measuring functions
	Text

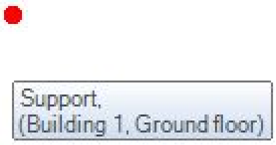
2.4 TOOLTIPS

Generally, pop-up information or tooltips are activated. The pop-up information appears when the mouse cursor hovers for more than 2 seconds over an element that has further information available. After a further 5 seconds the information will disappear. Depending on the object or element, the pop-up information provides information about the product of a particular manufacturer, or displays additional data about the building and the layer in which the element is located. The pop-up information can also be used to identify certain elements.
Example for manufacturer information:



pieperconcept Lobby
Modell: Schwarz
Zeitungsablage

Example for support:



Support,
(Building 1, Ground floor)

2.5 CATALOG AND PROJECT ADMINISTRATION

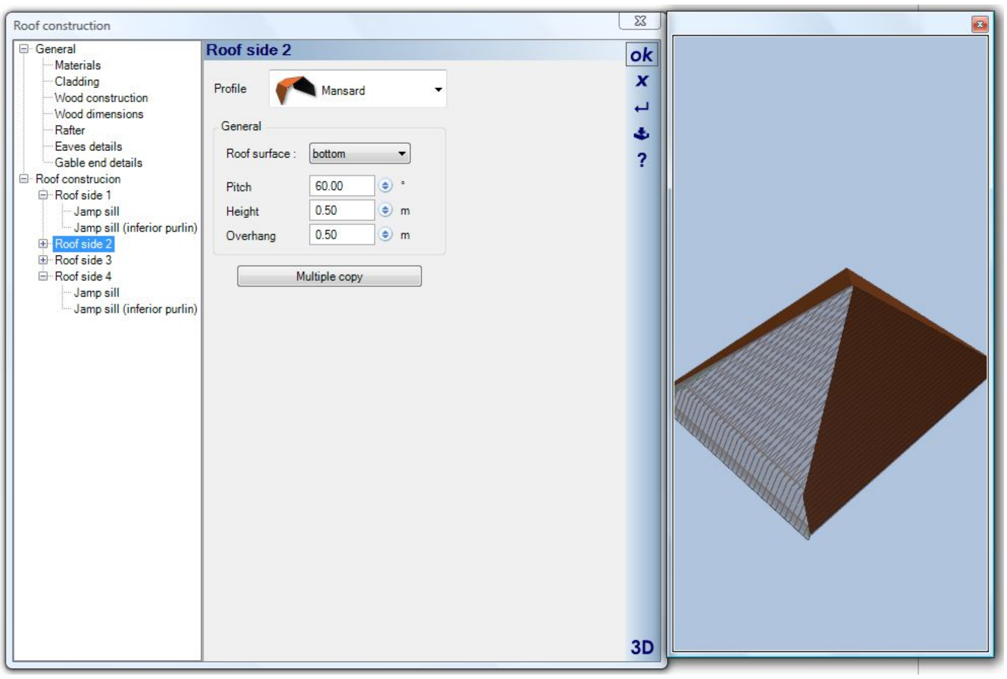
Situated in the right margin of the user interface is a toolbox, the contents of which can be selected using the tabs shown. The toolbox can be displayed permanently by fixing it with a ‘pin’. If the toolbox is not ‘pinned’, it is moved after two seconds to the margin and minimised to increase the available work area. It reappears again if the cursor is positioned on one of the tabs which remain.

2.6 FEATURES OF OUR DIALOGS

There are various types of dialogs, but they all have certain basic features in common. A dialog can consist of several parts which can be accessed either over a tree structure or a list of icons. Depending on the requirements of the dialog, various buttons appear in the right margin.

ok	OK
✗	Cancel
⬇	Save as default
?	Open the Help file
3D	Open or close the 3D preview
🗋	Creates a neutral template in dialogs which save files, e.g. Materials
📂	Opens a file, e.g. (*.mat) in the Materials dialog
💾	Saves a file, e.g. (*.mat) in the Materials dialog

Probably the most comprehensive dialog is for roofs. It is used here as an example to demonstrate the possibilities offered in our dialogs and to show, dependant on the dialog, the functions provided.



Roof side 2

Profile: Mansard

Roof surface : bottom

Pitch: 60.00 °

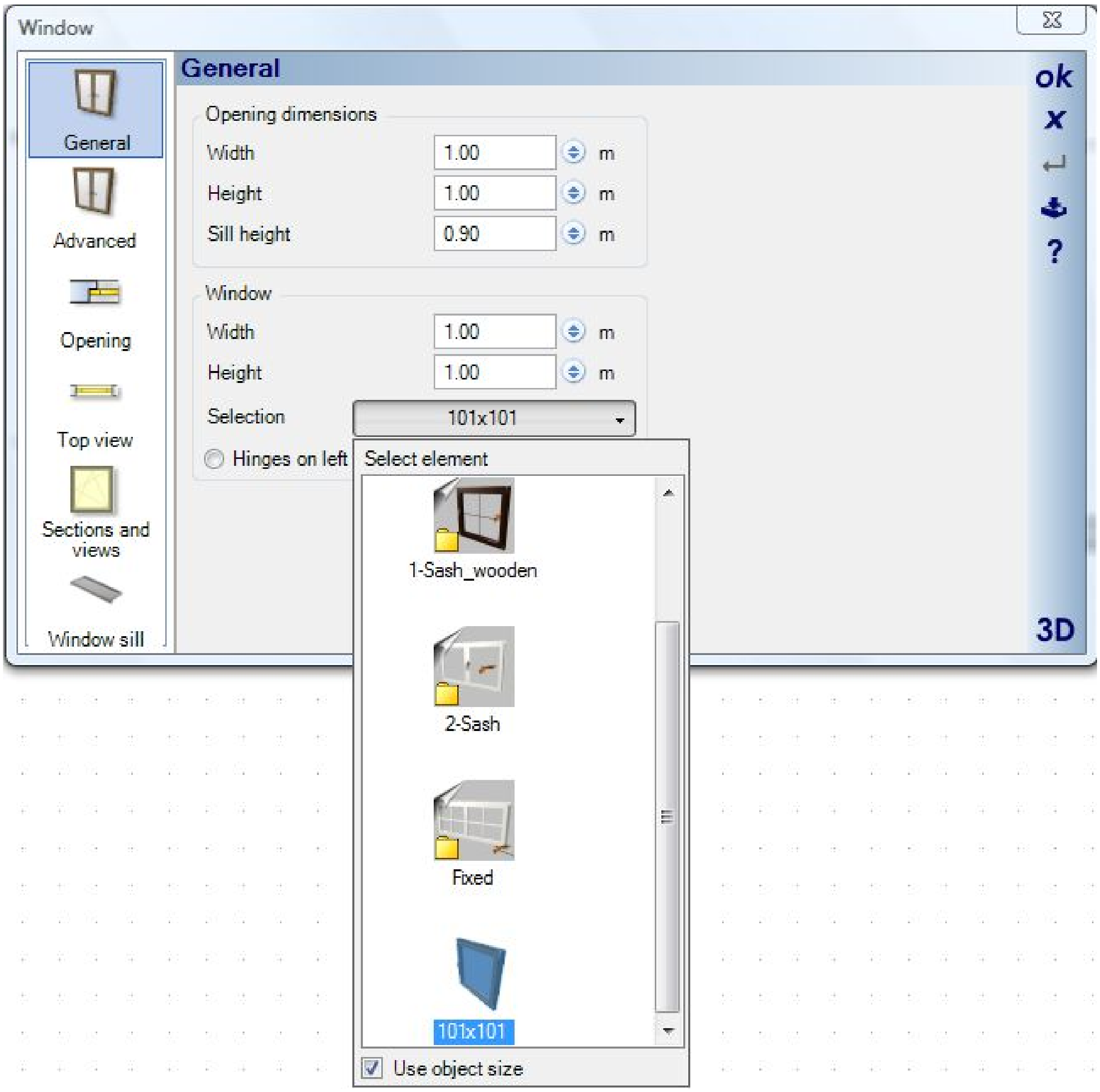
Height: 0.50 m

Overhang: 0.50 m

The 3D preview can in general be detached from the ‘main’ dialog and its size changed. If desired it can also be moved to a second monitor. The preview is also used in the roof dialog to select a roof plane - by simply clicking on the desired roof plane, which then becomes transparent and is highlighted in the associated tree structure. A right click in the 3D preview opens a context menu to change the representation mode, to activate ray tracing or to modify the background settings.

2.6.1 Catalog Selection in our dialogs

In some dialogs, not only „furniture and fittings“, but also building components can be selected from an associated catalog.
In the ‘Windows’ dialog shown below, we see in the section ‘Window’ next to ‘Selection’ a button, which dependent on the component, opens an associated directory in your software. With a double-click one of the objects or subdirectories shown can now be selected.



Window

General

Opening dimensions

Width 1.00 m

Height 1.00 m

Sill height 0.90 m

Window

Width 1.00 m

Height 1.00 m

Selection 101x101

○ Hinges on left

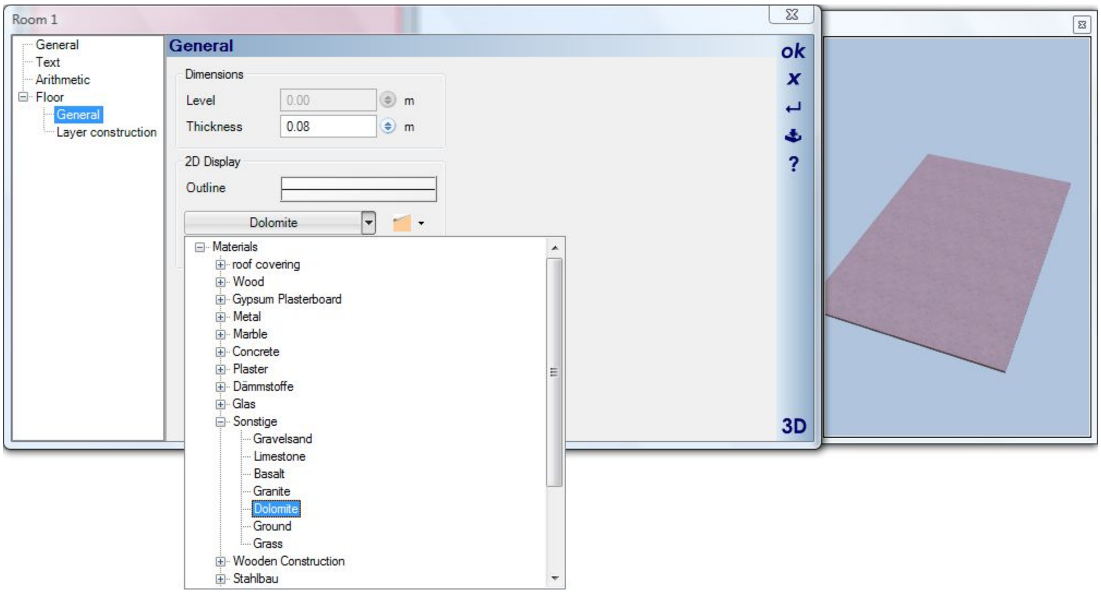
Select element

☑ Use object size

2.6.2 *Material Selection and Texture Coordinates*

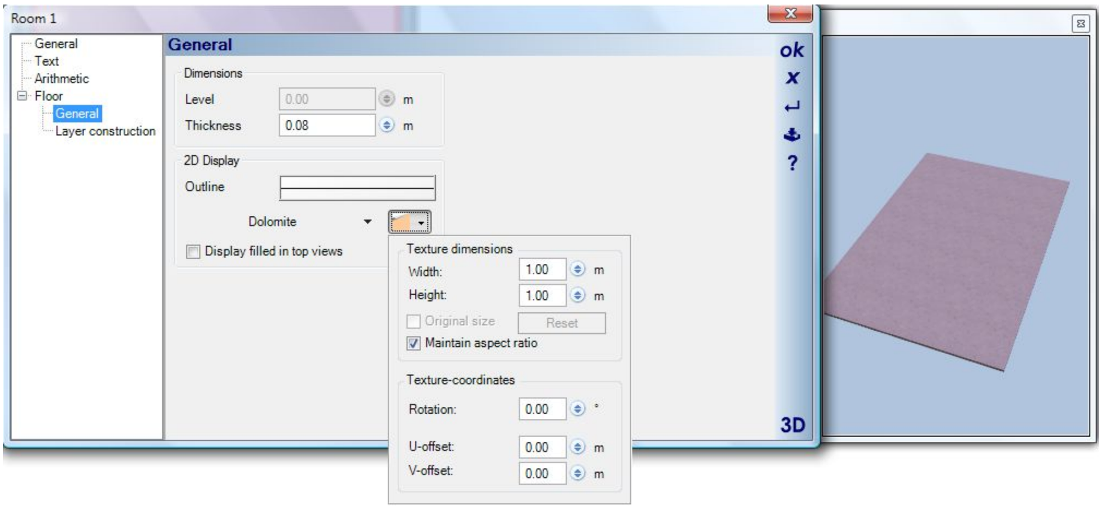
The software distinguishes basically between building materials and visualisation materials. Building materials are defined in a XML file, with a hierarchy, numerous additional properties, and a reference to a visualisation material (*.mat). Their properties, irrespective of the material shown in the 3D visualisation, are available to other plug-ins for analysis purposes, e.g. for energy analysis or for other calculations. In the database, building materials are allocated appropriate visualisation materials, so that a wooden material has a ‘wood’ texture. Nevertheless, the fact that building materials are independent of visualisation materials means that you can allocate any material or texture from the standard catalog to a component in the 3D view. This could result in a component still having the material property of ‘wood’ but in 3D being shown as tiles if you allocated a ‘tile’ texture to it by drag and drop.

The reason for this distinction is to ensure that reliable material properties are always available for analysis purposes, without restricting the creative possibilities in your software.



Level 0.00 m
Thickness 0.08 m
Dolomite

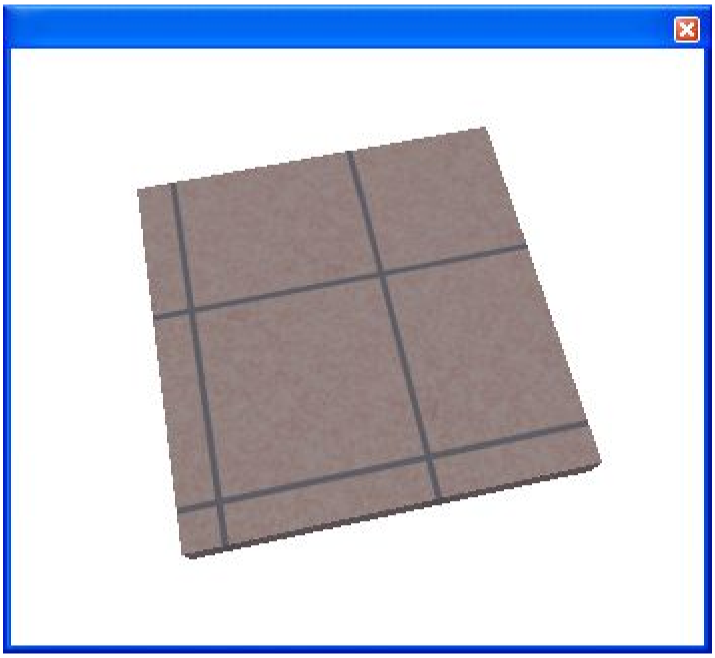
The arrow on the right of the box for material selection allows access to the materials defined in the building material database, which are displayed in a tree structure.
The texture coordinates of the visualisation material can be changed if necessary in the dialog which is activated by the button



Level 0.00 m
Thickness 0.08 m
Dolomite
☐ Display filled in top views
Width: 1.00 m
Height: 1.00 m
☐ Original size
☑ Maintain aspect ratio
Rotation: 0.00 °
U-offset: 0.00 m
V-offset: 0.00 m

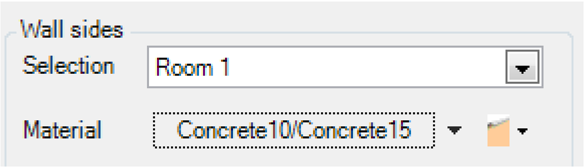
Texture coordinates are set by default to 1 x 1 m. This means that the texture (the image) which covers a surface is shown once for an area of 1 x 1m. If the surface is larger, the texture will be ‘tiled’, i.e. repeated as often as is necessary to completely cover the surface. Over ‘Texture dimensions’ you can adjust the area for which the

texture is shown once, to match the actual size of the textured surface, and additionally define an angle of rotation or offset.
The ‘U / V offset’ has the effect that the area in which the depiction of the texture begins is offset by the values specified. In the example shown a surface of 1 x 1 m is covered with a texture representing 4 tiles. Without an offset the 4 tiles would fit exactly on the surface. In this case, with an U / V offset of 10 cm, the tiling starts offset by 10 cm on either side.



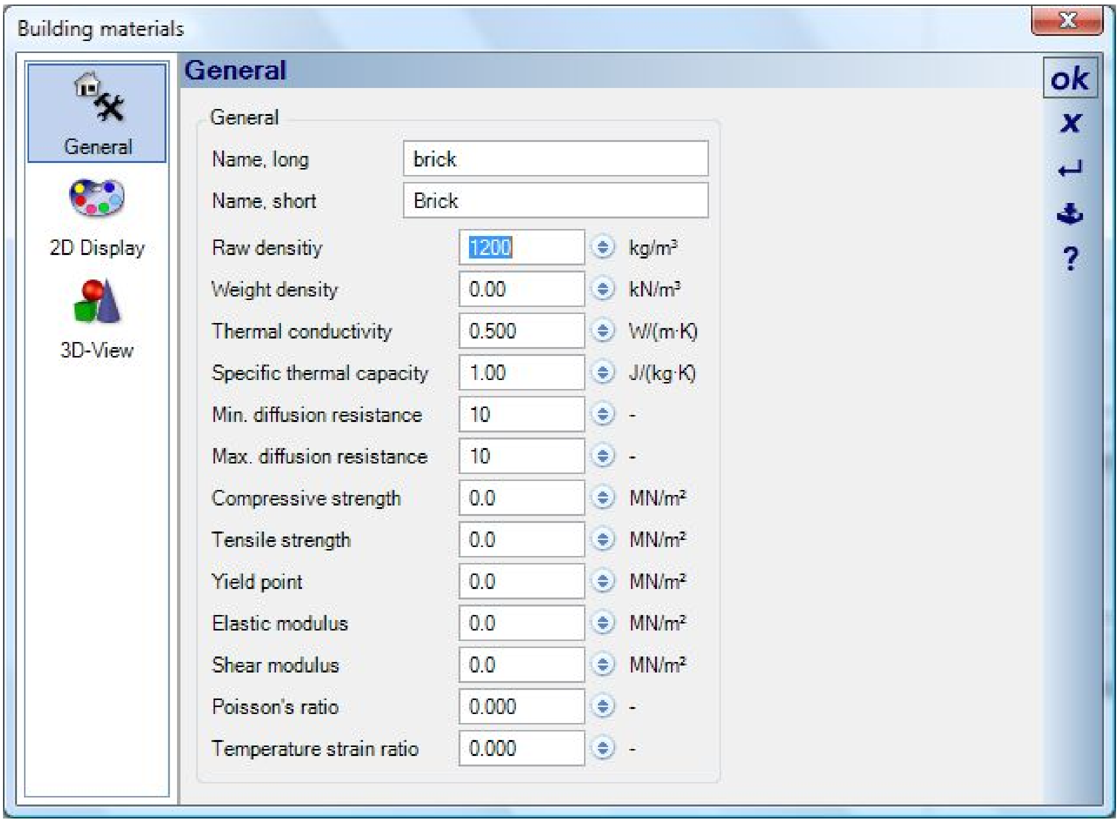
2.6.3 *Properties and Representation of Building Materials*

Access to building materials can be found in many dialogs. The following extract taken from the dialog for walls is shown here as an example.



Wall sides
Selection: Room 1
Material: Concrete10/Concrete15

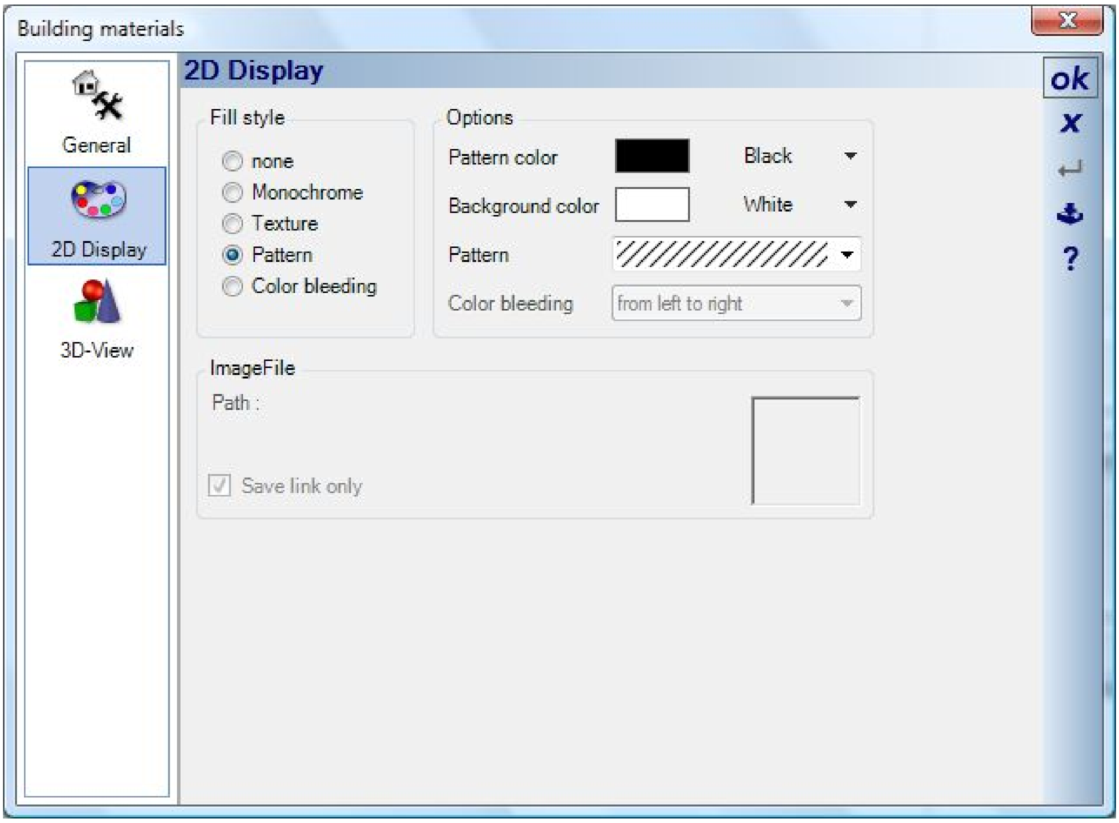
A direct click on the button opens a dialog for the properties of a building material, instead of the tree structure of the material database.



General

Name, long	brick	
Name, short	Brick	
Raw densitiy	1200	kg/m^3
Weight density	0.00	kN/m^3
Thermal conductivity	0.500	W/(m·K)
Specific thermal capacity	1.00	J/(kg·K)
Min. diffusion resistance	10	-
Max. diffusion resistance	10	-
Compressive strength	0.0	MN/m^2
Tensile strength	0.0	MN/m^2
Yield point	0.0	MN/m^2
Elastic modulus	0.0	MN/m^2
Shear modulus	0.0	MN/m^2
Poisson's ratio	0.000	-
Temperature strain ratio	0.000	-

The ‘General’ part shows the name of the building material together with the physical properties allocated to the building material in the database.



2D Display

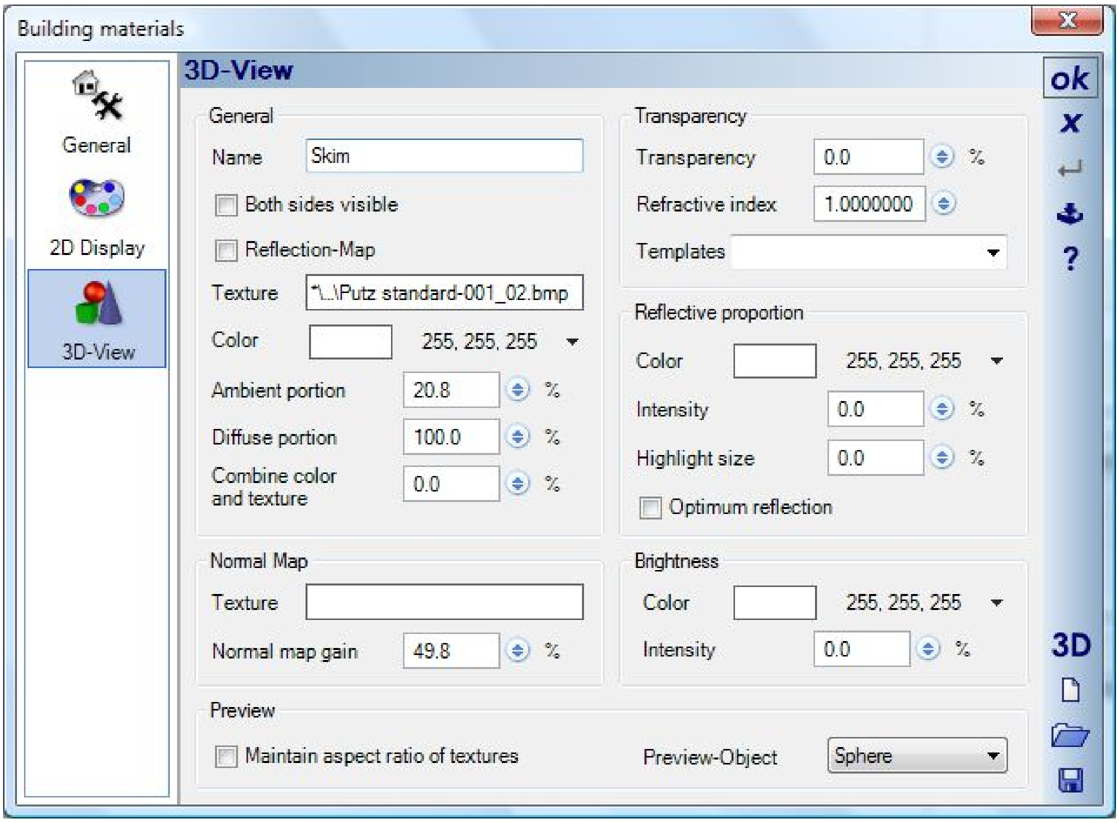
Fill style
- ○ none
- ○ Monochrome
- ○ Texture
- ● Pattern
- ○ Color bleeding

Options

Pattern color	■	Black
Background color	□	White
Pattern	▨	
Color bleeding	from left to right	

ImageFile
Path :
☑ Save link only

The material used for standard brickwork is defined in the building material database as being shown with a pattern in a 2D representation. The ‘2D Display part defines how a component is drawn in 2D plan views and other 2D views. If you wish the wall to be shown filled in with a single colour instead of hatching, then the 2D properties of the building material have to be changed.



3D-View

General
Name: Skim
☐ Both sides visible
☐ Reflection-Map
Texture: "\..\Putz standard-001_02.bmp
Color: 255, 255, 255
Ambient portion: 20.8 %
Diffuse portion: 100.0 %
Combine color and texture: 0.0 %

Transparency
Transparency: 0.0 %
Refractive index: 1.0000000
Templates:

Reflective proportion
Color: 255, 255, 255
Intensity: 0.0 %
Highlight size: 0.0 %
☐ Optimum reflection

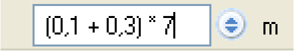
Normal Map
Texture:
Normal map gain: 49.8 %

Brightness
Color: 255, 255, 255
Intensity: 0.0 %

Preview
☐ Maintain aspect ratio of textures
Preview-Object: Sphere

The ‘3D View part for a building material is the same as in the standard dialog for materials and is explained in the chapter ‘Material Properties’.
Note: Changes made in dialogs for building materials only affect the element for which the dialog was opened, in this case just the one wall. The settings specified do not change the values in the building material database.

2.6.4 Calculations in Input Fields

All numeric input fields support certain mathematical functions, which can be entered directly in the field as an expression including parentheses, e.g  (0,1 + 0,3) * 7 m. The result is calculated when you leave the field (Tab key) or press Enter ↵

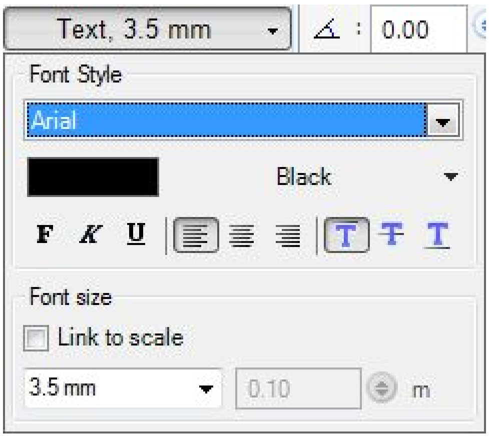
The functions:
"+", "-", "*", "/", "^","(", ")", "=", "TAN", "COS","SIN", "ATAN", "ACOS", "ASIN", "SQRT", "PI".

Examples of input:
100 + 100
100+SQRT(25)
2*(3+2)

ATAN(1)
SIN(60)
COS(60)
3.*((2+5*2/COS(60)))
(3.*((2-5*2/COS(60))))
10+2*(5+1/COS(60))

2.6.5 Text Properties

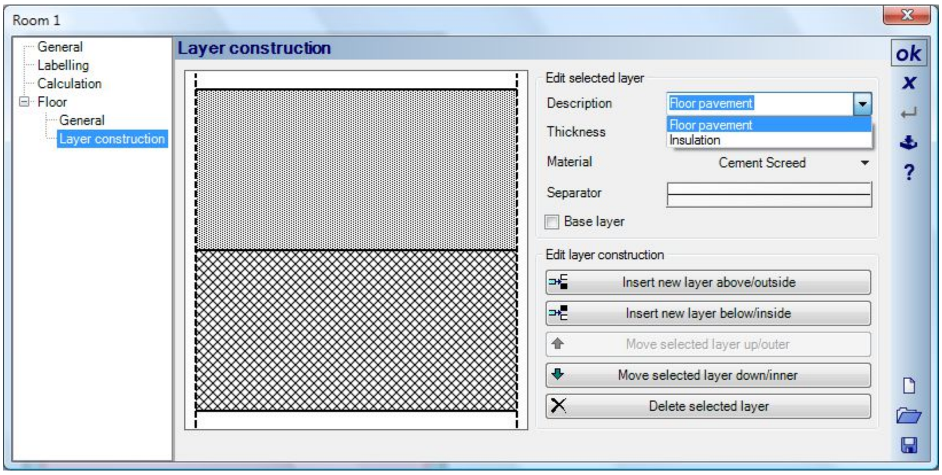
In dialogs for elements which use text (e.g. room descriptions, dimensions etc.) there is generally a sub-dialog available to set the text properties.



The sub-dialog is activated by clicking directly on the button with the text preview or on the arrow on the right side of it. The usual text properties such as font, colour, format and alignment can then be specified. If there is sufficient space, a preview of the changed text is shown on the button itself.
The settings for alignment have no visible effect in the text properties dialog . They only come into effect when the text is used, at which point the size of the 'frame' surrounding the text is determined. Only when the text is used in planning are the lines aligned left- or right-justified. There are two possibilities for setting font size. Either as an absolute size on printout in mm, or dependant on scale. The field for absolute font size offers several common values from which you can choose. Other settings can be specified by simply overwriting the value in the input field.

2.6.6 Layer construction of Building Components

Some of the building components, such as walls, roofs and floors, are composed of layers with their own defined properties. Each of the components mentioned above always has at least one layer defined by default.



Description: Floor pavement (Floor pavement, Insulation)
Thickness
Material: Cement Screed
Separator
☐ Base layer

In the ‘Layer construction’ dialog, further layers can be created and their settings modified. As an aid, the layer being currently modified is highlighted in colour. For each layer you can define a name, thickness, building material and layer separator. The arrows on the right alter the position of the current layer upwards or downwards within the component.

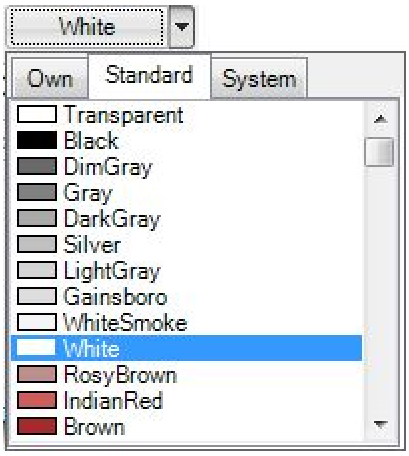
Layer constructions which are frequently used can be saved using the toolbar in the right-hand margin. These layout files are normally found in the directory ‘your software-installation\AEC\Layouts’, which is automatically referenced in the ‘Save’ and ‘Load’ dialogs. You can structure the layouts in the directory yourself by creating subdirectories in the same way as for catalogs.

Note: The thickness of a component is equivalent to the sum of the thicknesses of its layers. For multi-layer components the thickness should be modified over the layers in the ‘Layer construction’ dialog. If the thickness of the component is changed in its normal properties dialog, the top layer of the component will always be modified automatically.

2.6.7 Selecting Colours, Defining your own Colours

In many dialogs you will find a button to select a colour. A click on the button opens the Windows standard dialog for colours, a click on the arrow on the right then gives you three tabs for lists from which you can choose a predefined colour.

The tab Own allows the user to create his own colours and to save them permanently in the file userConfig.xml. You can change an entry in the list of your own colours over the context menu, which is activated with a right mouse click.

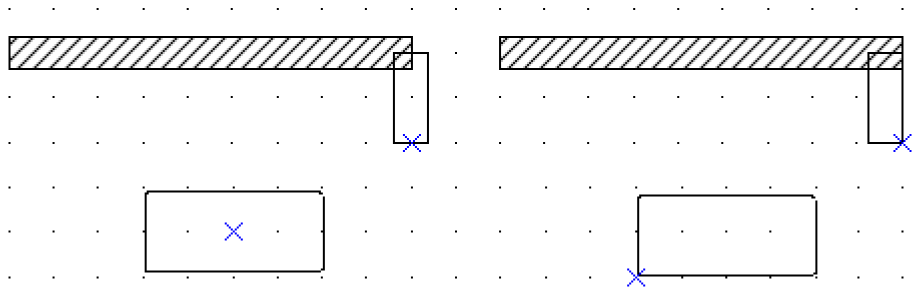


2.7 INPUT AIDS

2.7.1 Insertion using 'Ctrl+ w', Changing Reference Points

When inserting or positioning elements, you can, as long as the particular element allows it and before the process is terminated with a mouse click, change reference points by pressing 'Ctrl+w' as often as required.

The following illustration shows two simple examples which demonstrate this feature. The position of the cursor is indicated by the blue cross. On the left we see the polygonal insertion of a wall and the positioning of a 3D object, a table, without pressing 'Ctrl+w'. The wall is inserted on the cursor relative to its axis and the table is positioned relative to the centre of the object. On the right we see the difference after 'Ctrl+w' has been pressed once. The wall is now aligned on the cursor relative to its right-hand side and the table relative to its lower left-hand corner.

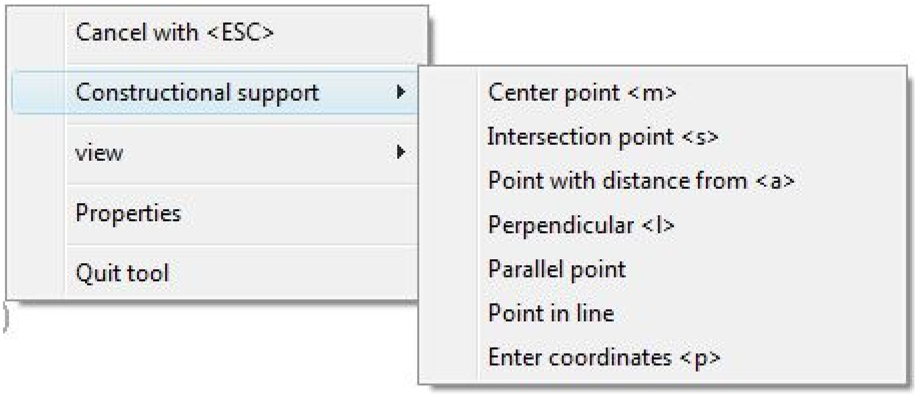


2.7.2 Construction support

For the precise definition of points at which to insert elements, the software offers at any time during the insertion of an element various construction aids which can be activated over the context menu opened with a right mouse click. The result of a construction aid is either a single point, if you like as a replacement for a normal mouse click when planning, or a line along which the next point can be defined, e.g. a perpendicular.

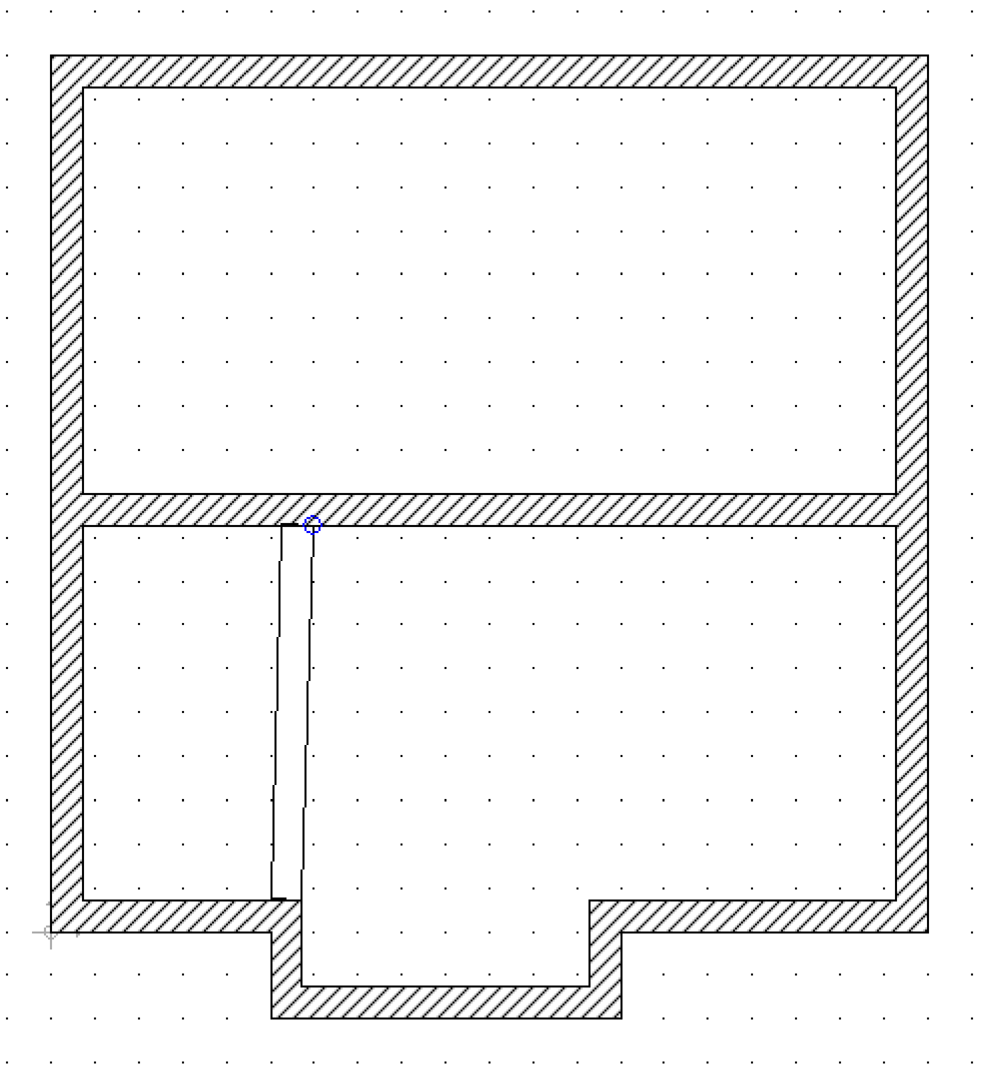
It should be noted that the resultant point is treated exactly like a mouse click. Depending on the input tool being used, elements expect one, two or more clicks during construction. Supports are positioned with one point, walls always expect two points, namely the start point and the end point of the wall. In the case of a tool that expects only one point, e.g. a support, the support is inserted directly at the point defined on termination of the construction aid. To insert a wall therefore, the construction aid can be used twice, to define a start and end point.

The construction aids which are available are listed in the context menu. The letters in parentheses are shortcuts over which a construction aid can be activated at anytime during input. As opposed to other input aids, these shortcuts are not a combination of keys, for instance ‘Ctrl+m, but simply the letter itself, i.e. to call the construction aid ‘Center point’ simply press ‘m’ on the keyboard.

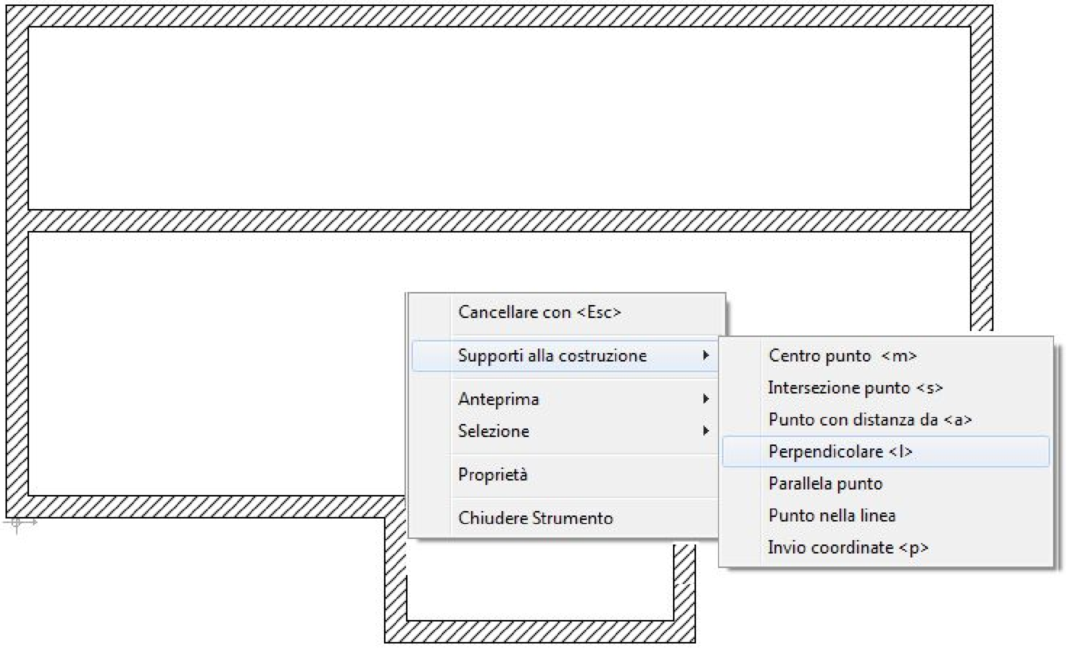


2.7.3 Example of the Use of Construction Aids

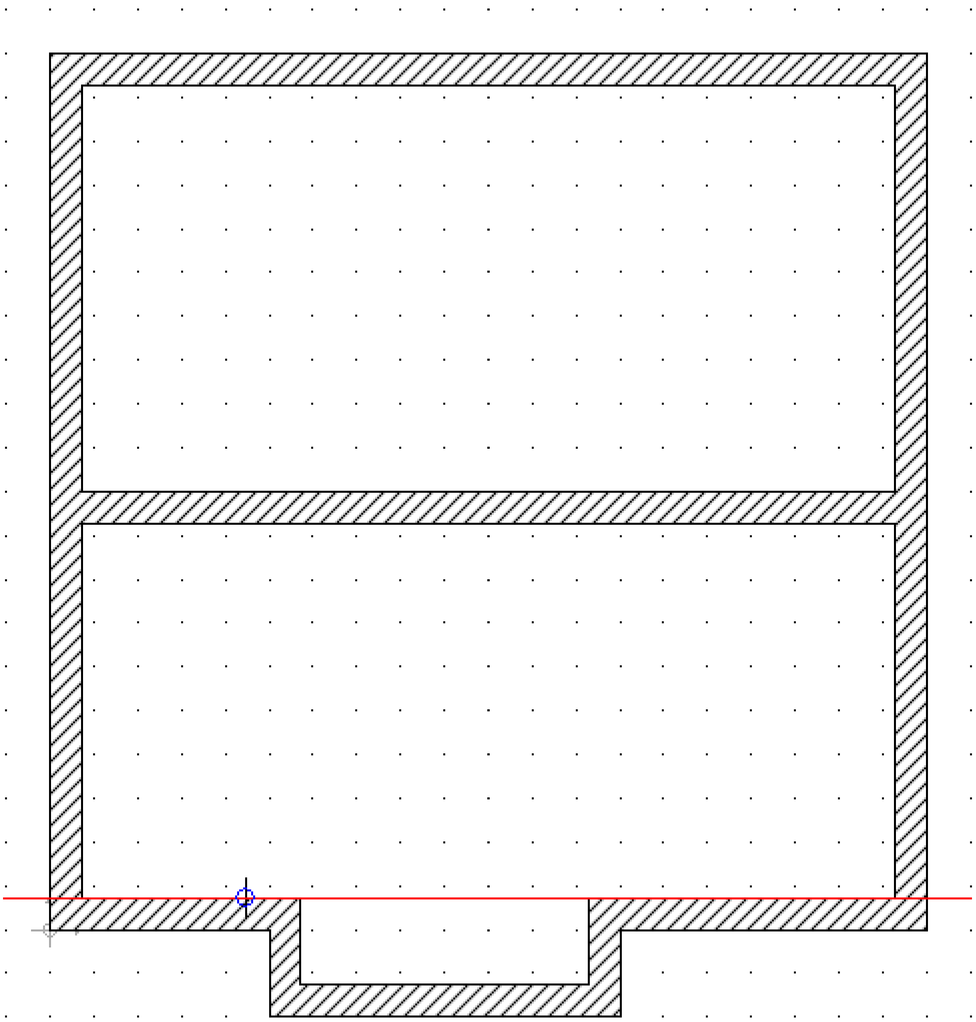
As an example of the use of construction aids, let us go through the steps to insert a perpendicular wall.



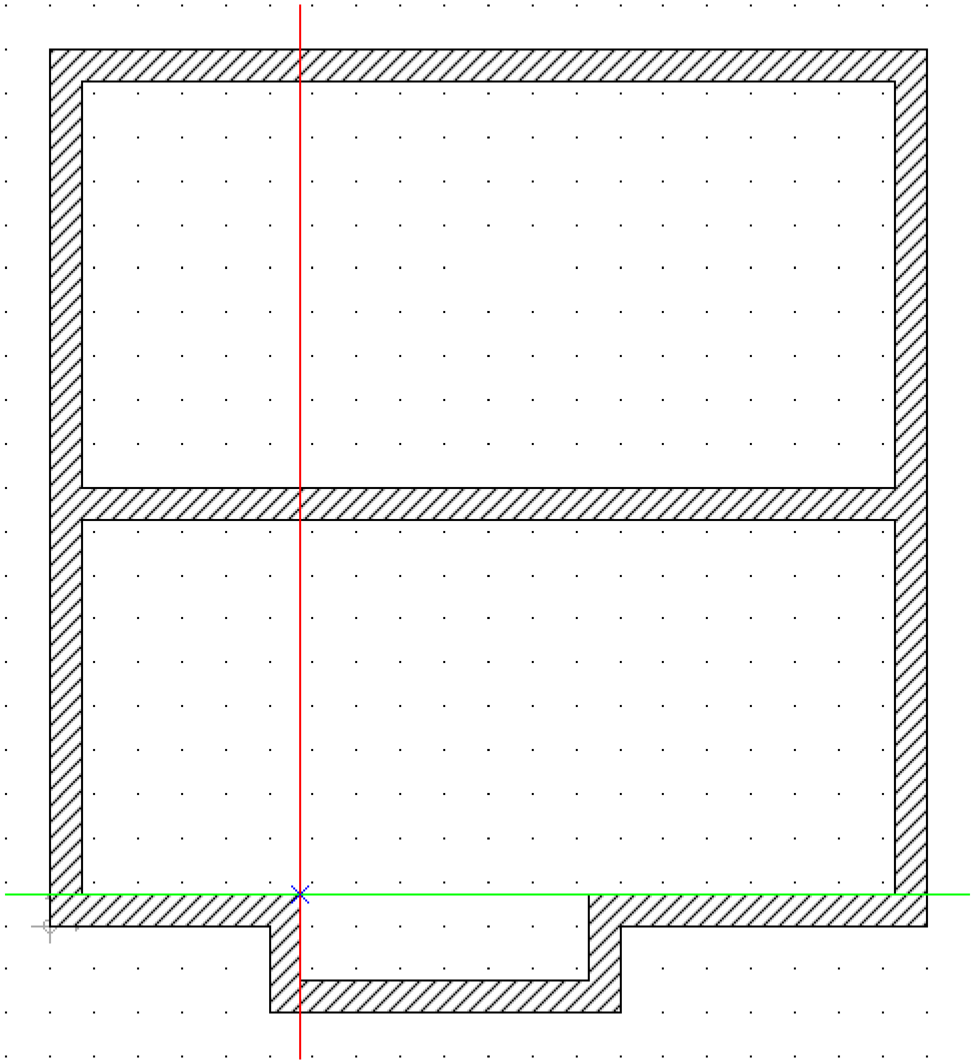
To form a new room we want to insert a wall from the left inside edge of the protrusion straight up to the dividing wall between room 1 and room 2. The start point of the wall has already been defined using ‘Ctrl+w’ (change reference point) so that the right corner of the wall corresponds to corner of the protrusion. As long as the preview of the wall we are creating is still attached to the cursor, a right-click opens the context menu for construction aids.



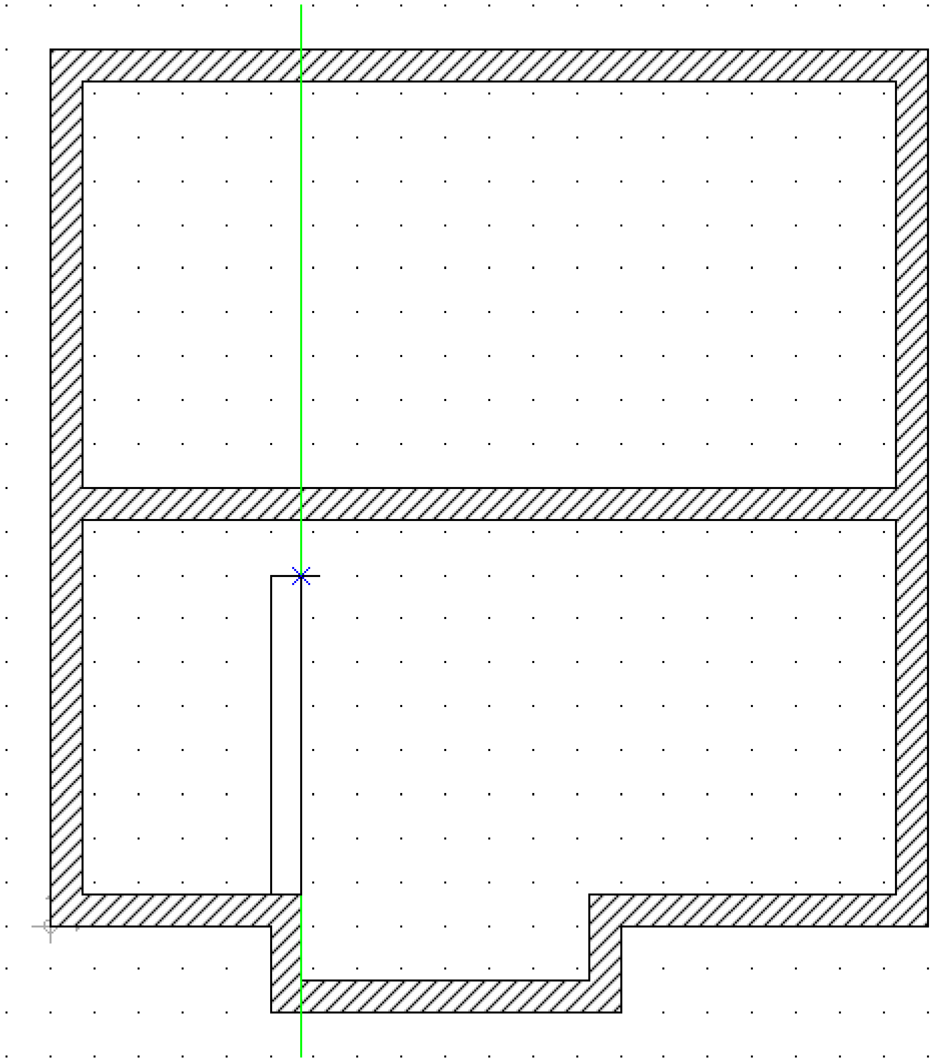
From the list of possible construction aids select ‘Perpendicular’ to insert the wall at an angle of exactly 90 degrees.



A perpendicular is produced by defining two lines, the first of which is the line to which the perpendicular is subsequently dropped. During input each step is accompanied by information in the status line.



After the first line has been defined, the perpendicular is generated automatically and can only be positioned along the line. In the example shown, the perpendicular is positioned exactly on the corner where the wall to be inserted is to start.
A click on the mouse drops the perpendicular and returns so that the end point of the wall can be entered - the start point of the wall had already been defined before the construction aid was activated.

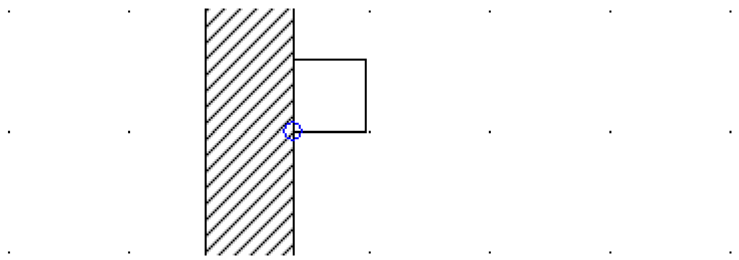


The cursor to insert the wall now snaps to the construction line generated and so enables precise insertion of a perpendicular wall. With a second mouse-click the length of the wall can now be defined. In the example shown, we move the cursor along the perpendicular up to the face of the horizontal wall in the middle, thus creating the new room we wanted.

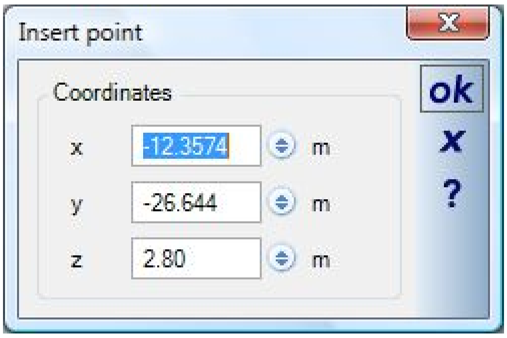
2.7.4 Example using Coordinates

A further construction aid is ‘Coordinates’. It can be used to position elements according to exact specifications.

For instance, you would like to insert a rectangular support with its left lower corner at a distance of 1.25 m from the wall shown. First of all, on input change the reference point of the support to be the left lower corner using ‘Ctrl+w’ and position this exactly on the face of the wall.



Now click the right mouse button and activate over the context menu the construction aid ‘Coordinates’. Alternatively you can press ‘p’ on the keyboard, as indicated by the p in parentheses in the context menu. This now opens the ‘Insert Point’ dialog.

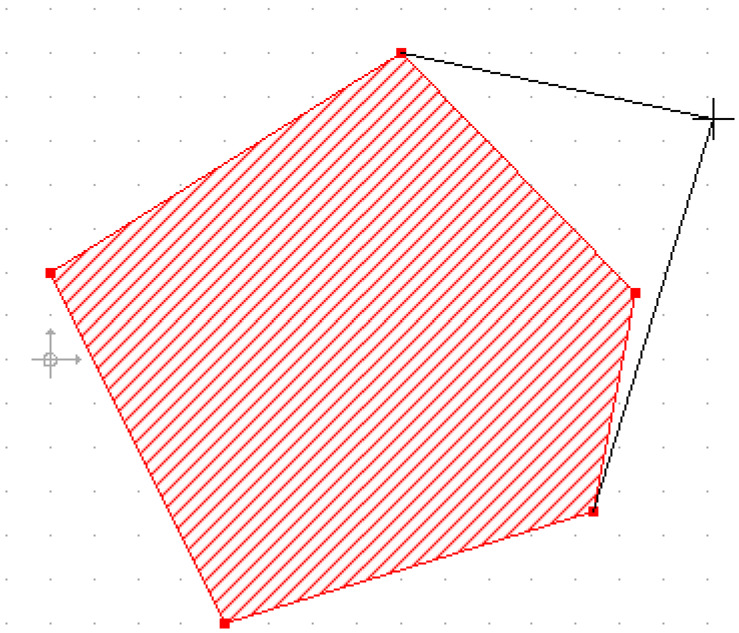


x -12.3574 m
y -26.644 m
z 2.80 m

The dialog already provides the absolute coordinates of the left lower corner of the support in relation to the base of the plan, as this was the position of the cursor at the time the construction aid was activated. To position the corner of the support 1.25 m to the right, i.e positively on the x-axis, you can make use of the possibility in your software of performing calculations in input fields. Simply type 3.18 + 1.25 in the field for the x-coordinate and press ‘OK’.

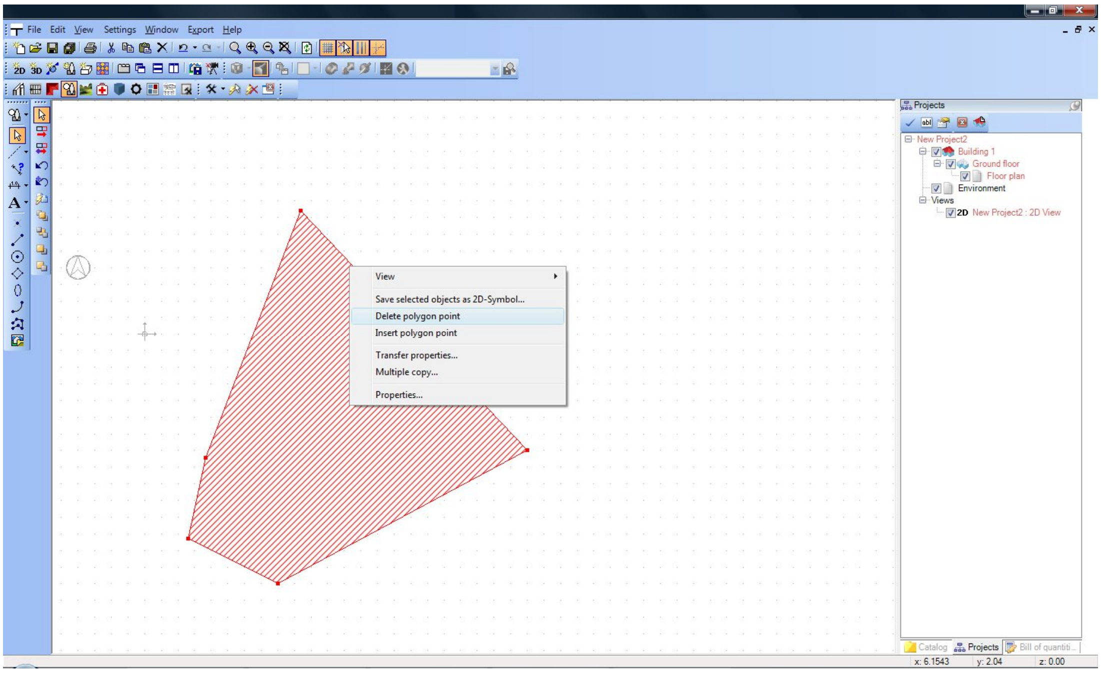
2.7.5 Adjust, Insert and Delete Polygon-points

When selected, various polygonal elements such as ceilings, 2D graphic polygons and even lines show the points specified on insertion.



By clicking on one of the red points it is attached to the cursor and can then be moved and repositioned. In this way the shape of elements can be subsequently modified.

If the element allows it, new polygon-points can also be added or deleted with help of the context menu opened with a right mouse-click.



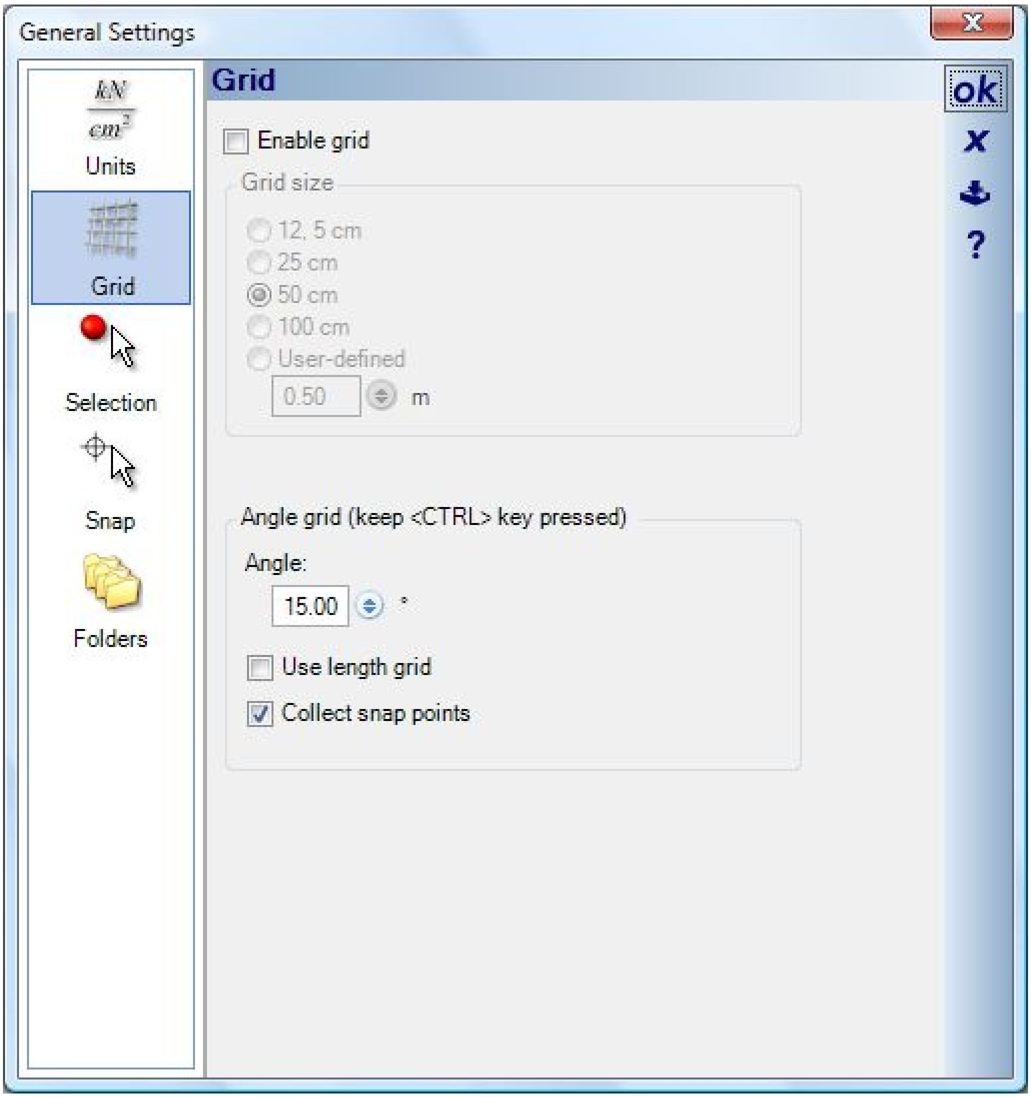
2.7.6 Angle grid

An angle grid can be activated during the input of elements that require a start and an end point (e.g. walls and dimensions), by keeping the ‘CTRL’ key pressed. With an angle grid activated, movement of the mouse cursor is limited to the angle specified. This construction aid simplifies, amongst other things, horizontal and vertical input, without having to worry about precise movement of the mouse.

In addition, the ‘Use length Grid’ option not only makes it possible to rotate elements entered in the angle grid, but also ensures that the length entered for an element is adjusted to match to the grid spacing. A wall is automatically extended, e.g. in 50 cm steps, when the grid spacing is set to 50 cm. When this option is activated you can ‘work’ in a grid, even though the standard grid is deactivated, and even insert diagonal lengths with a fixed spacing.

The basic snap options also apply when the angle grid is activated, so that in certain cases it is possible that input can result in angles that differ from the original angle grid settings. However, this can be prevented with the option ‘Collect snap points’. If this option is set the snap points of other elements are determined, but are adjusted to conform to the angle grid.

This guarantees, that you always work within the specified angle



Grid

☐ Enable grid

Grid size

○ 12, 5 cm
○ 25 cm
● 50 cm
○ 100 cm
○ User-defined
0.50 m

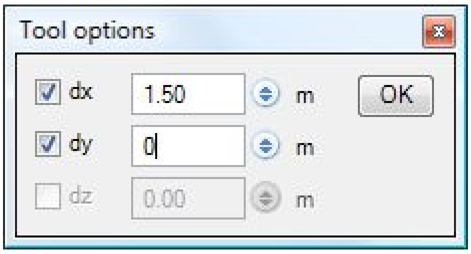
Angle grid (keep <CTRL> key pressed)

Angle:
15.00 °

☐ Use length grid
☑ Collect snap points

2.7.7 *Move Selected Element, Move Selected Element with Reference Point*

Apart from the usual way of positioning using the mouse when it points to a selected element, additionally, the ‘Move selected element’ and ‘Move selected element with reference point’ options are provided. Both options open the ‘Tool options’ dialog in which values for a shift can be specified instead of using the mouse.

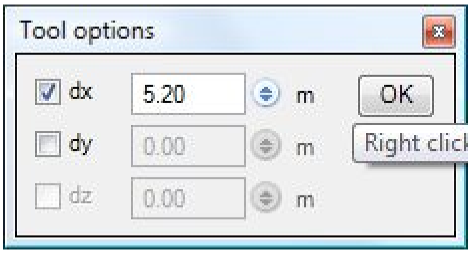


☑ dx 1.50 m
☑ dy 0 m
☐ dz 0.00 m

The ‘Tool options’ dialog is not active at the start of a move, but shows values which were determined by the movement of the cursor. To input values a click on the dialog box is necessary. This in turn however changes the values shown as the cursor is moved to the dialog box. When entering values it is important not to move the cursor outside the dialog box, as otherwise the values entered manually will be automatically overwritten by the position of the cursor in the plan. The ‘Tool options’ dialog is terminated automatically as soon as the input tool is terminated with ESC, or its equivalent ‘Close’ in the top right-hand corner

On clicking the ‘OK’ button the element is moved by the current values specified, and then once more for each further click on the ‘OK’ button. Thus if 1.5 m is specified in the x-direction the component is moved by 1.5 m on each ‘OK’.

Dependent on the component, unallowable moves are deactivated and the input field is shown in grey; for instance a support can not be moved in the z-direction. The move directions allowed can also be restricted manually. In this case by deactivating the dy-direction the element can now only be moved along the x-axis, and so only this value changes if the mouse is moved.

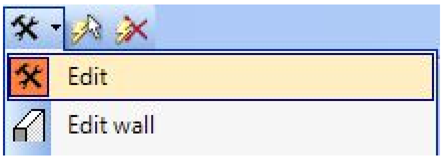


☑ dx 5.20 m
☐ dy 0.00 m
☐ dz 0.00 m

2.8 EDITING TOOLS

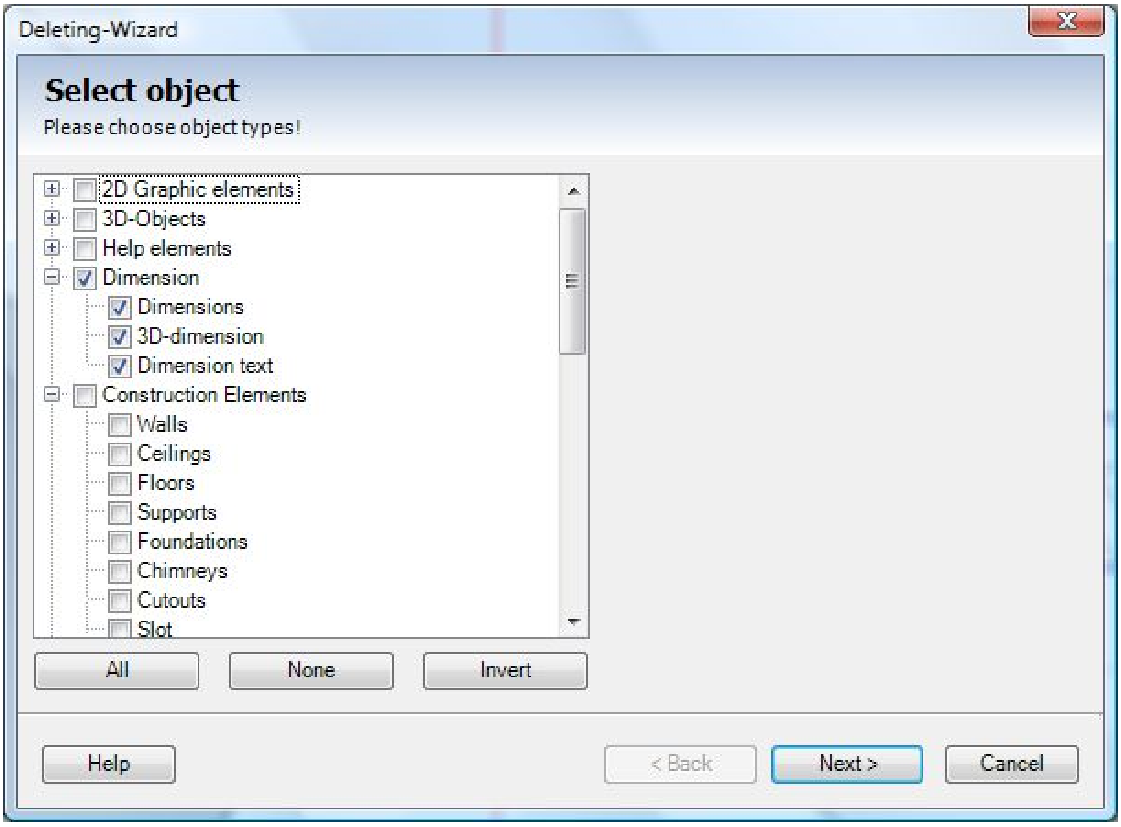
The software provides a general toolbar which can contain tools of a various nature, and not necessarily only tools which apply to the particular element selected.

The tools are assigned to categories. The required category can be chosen from a selection at the left end of the toolbar. Each category contains different tools and buttons which are located on the right of the category after it has been selected.



2.8.1 Delete and Select Wizards

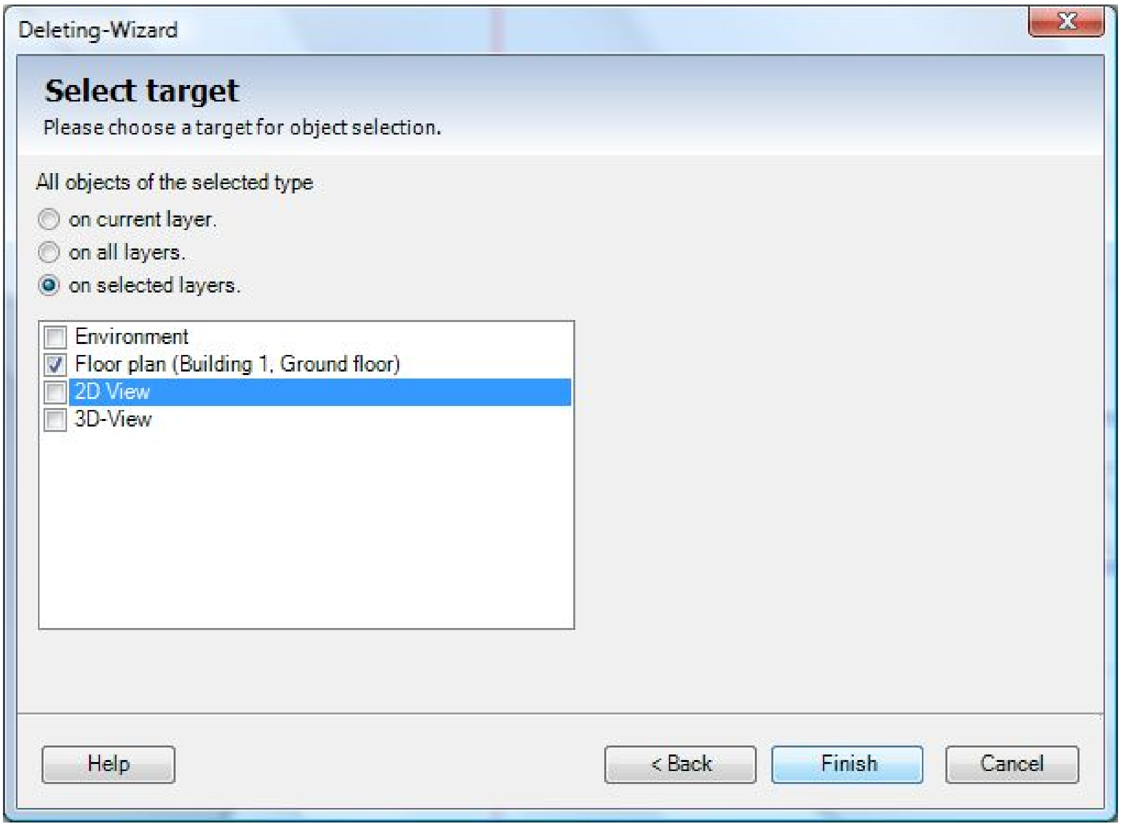
To simplify delete and select operations appropriate wizards are provided in the tool bar.
Both assistants work in the same way. First select the types of element to be processed and then specify the area in which the elements are to be detected.
Elements can be selected in the 'Select Object' dialog using the tree structure. After selecting the element types, click on the 'Next' button to then specify an area.



Select object
Please choose object types!

- ☐ 2D Graphic elements
- ☐ 3D-Objects
- ☐ Help elements
- ☑ Dimension
  - ☑ Dimensions
  - ☑ 3D-dimension
  - ☑ Dimension text
- ☐ Construction Elements
  - ☐ Walls
  - ☐ Ceilings
  - ☐ Floors
  - ☐ Supports
  - ☐ Foundations
  - ☐ Chimneys
  - ☐ Cutouts
  - ☐ Slot

Any layer or view defined in the project can be selected as an area. Selecting a view in this context is only necessary, if you wish to delete elements which are only defined here and cannot be accessed over the normal layer structure. This includes elements such as dimensions, guidelines and 2D symbols in cross-sections, since these only exist in the cross-section view in which they were entered. Therefore, they can only be removed by selecting the appropriate cross-section in the delete assistant.



Deleting-Wizard

Select target

Please choose a target for object selection.

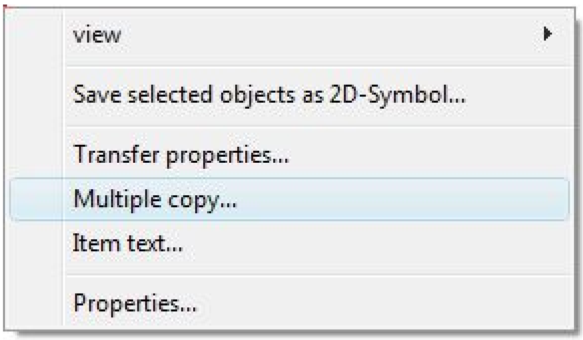
All objects of the selected type

○ on current layer.
○ on all layers.
● on selected layers.

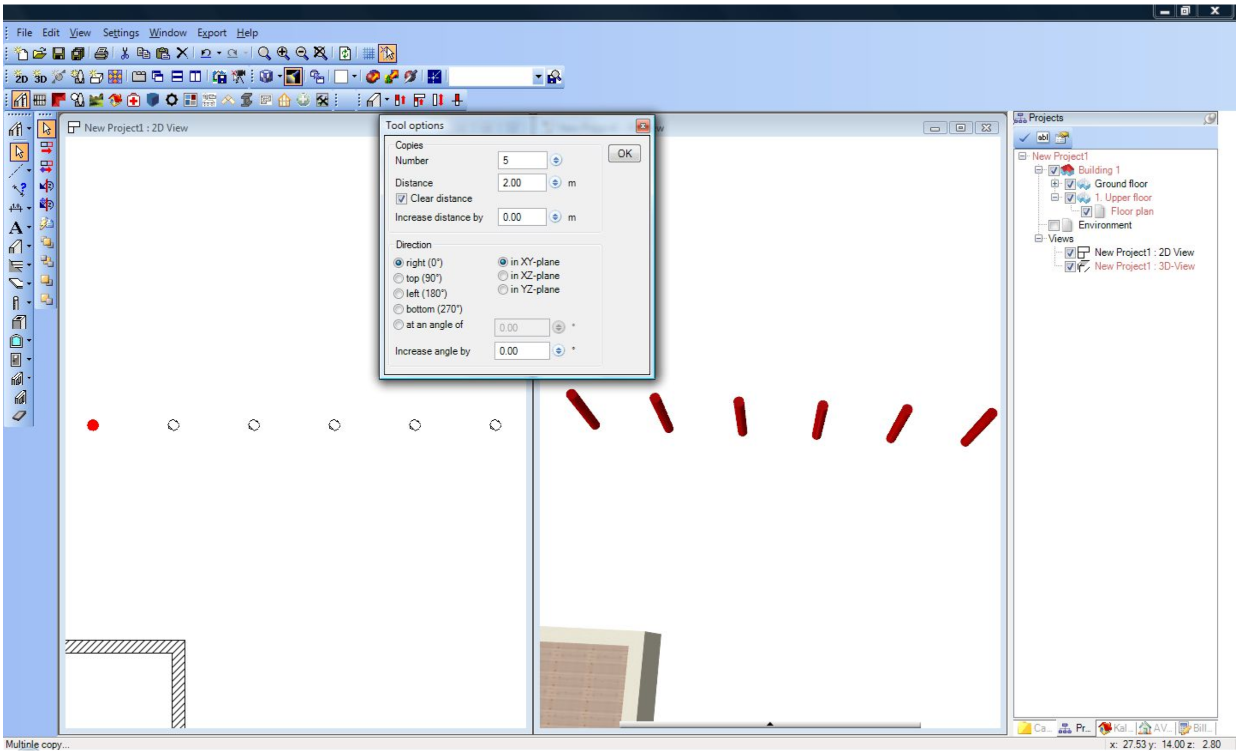
☐ Environment
☑ Floor plan (Building 1, Ground floor)
☐ 2D View
☐ 3D-View

2.9 MULTIPLE COPIES OF OBJECTS

The multiple copy function for a selected object can be found in the context menu activated with a right mouse-click.



After selecting the multiple copy function, the ‘Tool options’ dialog appears, in which the number of copies, the spacing between them and the direction of copy can be specified. All settings are shown in the plan as a preview of the objects to be created. However, the new elements are only finally created when the dialog is terminated with a click on the OK button. Up to this point all settings can be modified to meet your planning requirements. To terminate the dialog without creating any copies, click on the cross in the upper right corner or press 'Esc'.



Tool options

Copies

Number: 5

Distance: 2.00 m

☑ Clear distance

Increase distance by: 0.00 m

Direction

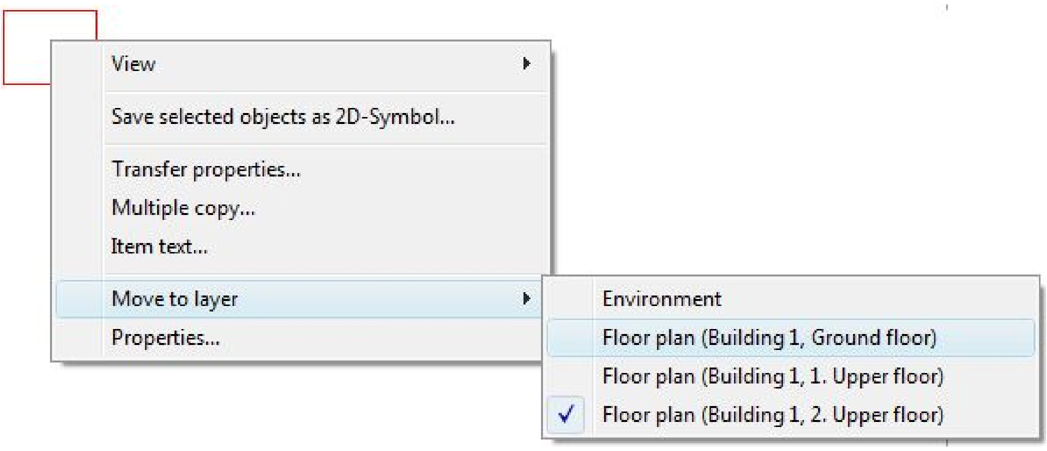
● right (0°)
○ top (90°)
○ left (180°)
○ bottom (270°)
○ at an angle of: 0.00 °

● in XY-plane
○ in XZ-plane
○ in YZ-plane

Increase angle by: 0.00 °

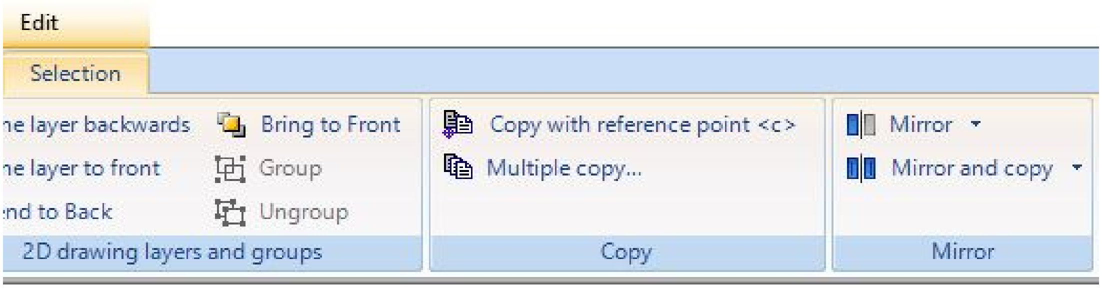
2.10 MOVING OBJECTS TO OTHER LAYERS

During planning you may realize that it would be better for the overall structure of the project, if objects already allocated to certain layers were placed in a new layer e.g ‘Furnishings’. In this case, you can subsequently move objects for selected elements, using the context menu. A list of the available layers is also shown.
Note: Moving construction elements, e.g. walls, or windows out of walls, can of course affect various automatic functions and should be considered carefully beforehand. For instance, if you move a wall belonging to a room to another layer, that room is then lost.

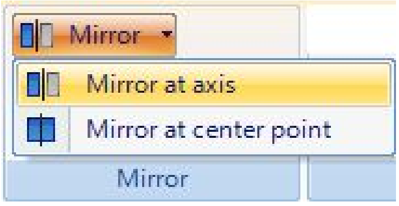

View
Save selected objects as 2D-Symbol...
Transfer properties...
Multiple copy...
Item text...
Move to layer
Properties...
Environment
Floor plan (Building 1, Ground floor)
Floor plan (Building 1, 1. Upper floor)
✓ Floor plan (Building 1, 2. Upper floor)

2.11 MIRROR ELEMENTS

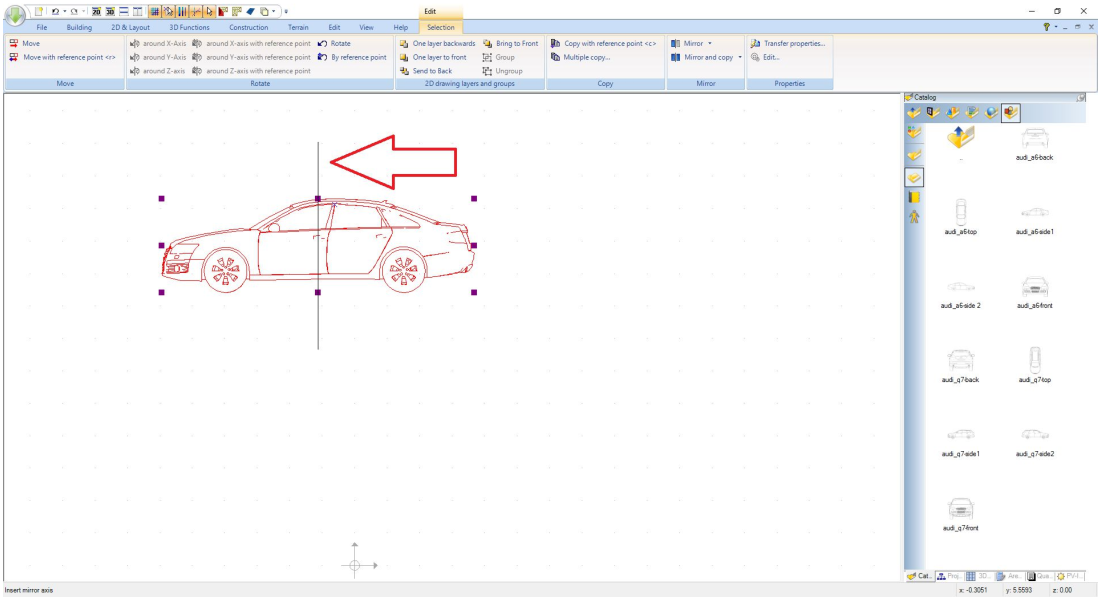
Elements can be mirrored with functions of the „Edit“ Toolbar.



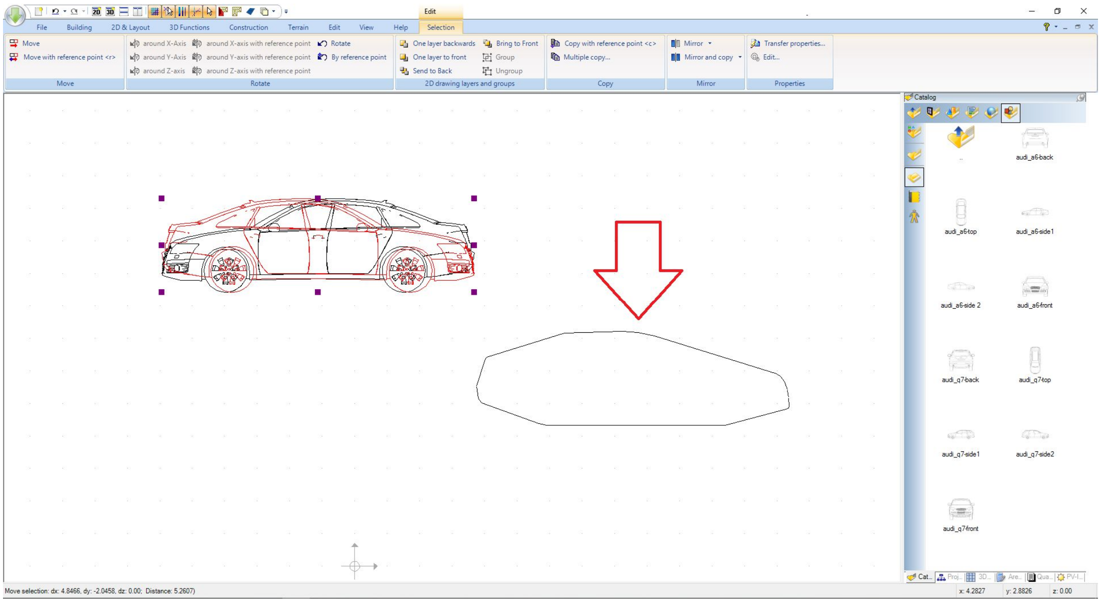
Two variants are available, mirror and mirror with copy. Both with tools to mirror at an axis or at center point.



If you want to mirror at an axis you have to insert the mirror axis with two clicks in your planning at any position you might need.
Note: keep the CTRL key pressed in order to activate the angle grid just to ensure that your axis is vertical or horizontal.
Move your cursor over the selected object if the mirror at center point tool is active. Depending on your mouse position the software shows a vertical or horizontal axis. A left click mirrors the element at the currently active axis.


Insert mirror axis

The tool mirror and copy creates a preview of the mirrored element that needs to be inserted with another left mouse click at its final position.


Move selection: dx: 4.8466, dy: -2.0458, dz: 0.00; Distance: 5.2607)

3 FIRST STEPS

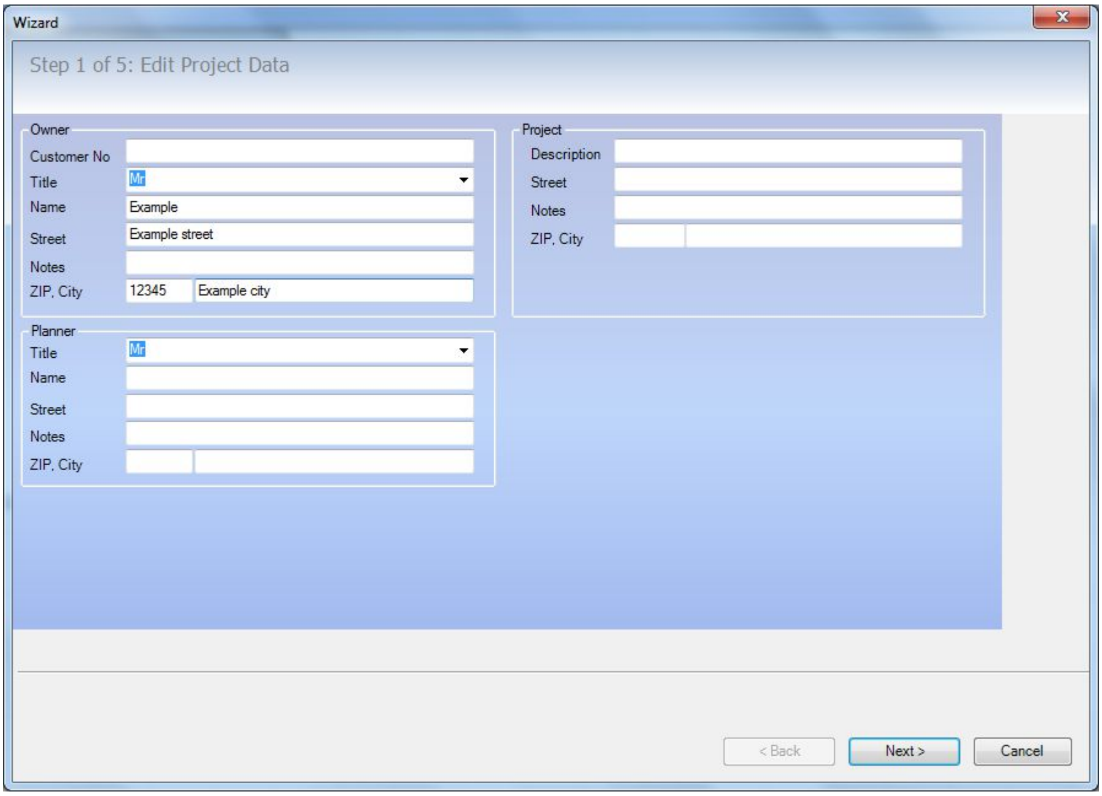
3.1 THE BUILDING- / PROJECT WIZARD

The Project Wizard helps you to quickly generate a basic project. Such a project will contain exterior walls, and a roof.

In 5 steps and a few minutes you will have a building in which you can then simply add windows, doors and interior walls.

3.2 STEP 1: EDIT PROJECT DATA

The project data is for example used in the reports, or in text fields using the AutoText feature. These fields are optional, and you can continue planning without entering this data.



Wizard

Step 1 of 5: Edit Project Data

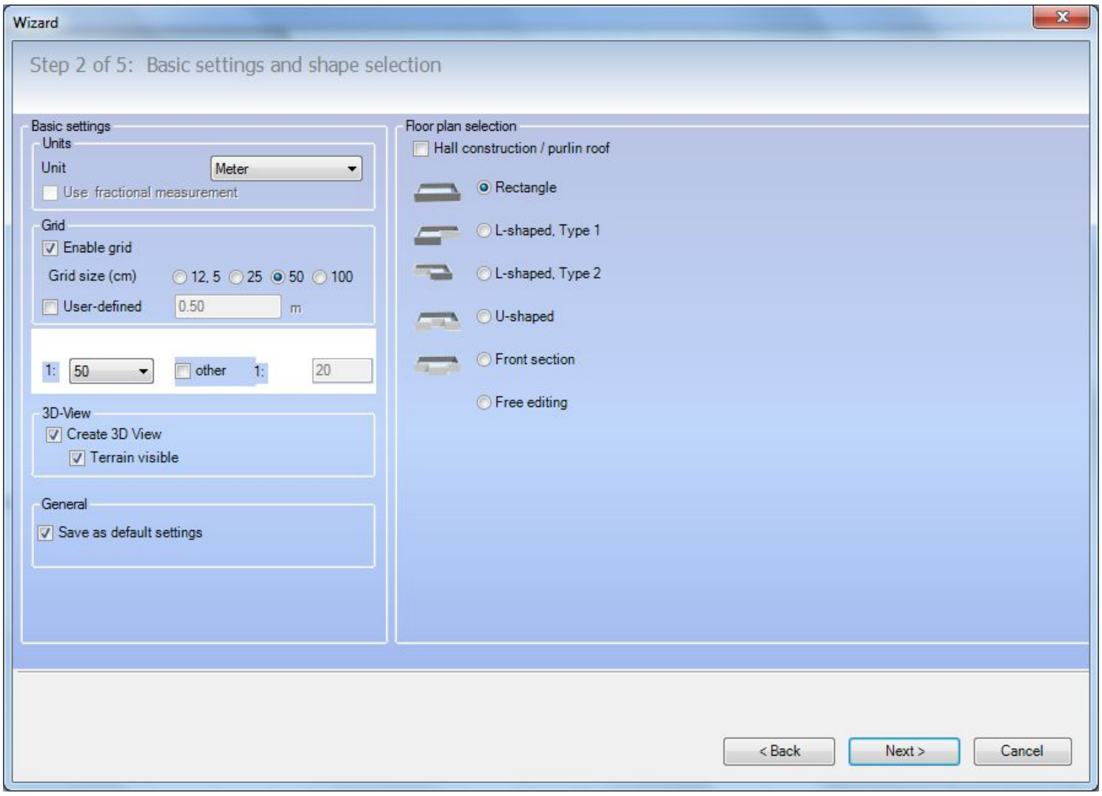
Owner
Title: Mr
Name: Example
Street: Example street
ZIP, City: 12345 Example city

Planner
Title: Mr

3.3 STEP 2: BASIC SETTINGS AND SHAPE SELECTION

In the left pane you will see some of the preferences for your new project:

- The unit of measurementin which you want to work. This can be set at any time via the menu Settings - General – Units
- Enable grid in 2D views, and setting the distance between grid points
- The scale of the 2D view is always requied, and if not set a default value is used. You can adjust the scale at any time by right clicking within the 2D view, selecting Properties from the context menu,and setting the Scale in the General tab.
- Create a 3D view automatically.
- By setting the Save as default settings checkbox, the values used within this wizard are used as the default values in all future projects.


Wizard
Step 2 of 5: Basic settings and shape selection

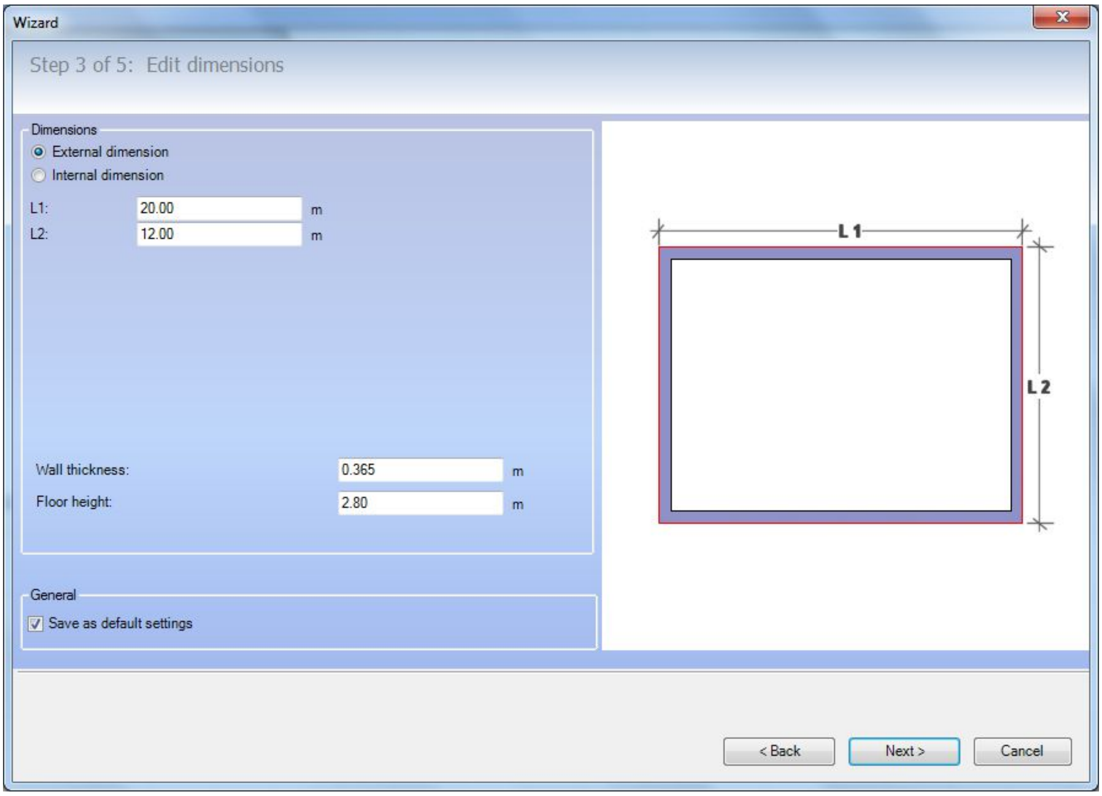
Basic settings
Units
Unit: Meter
☐ Use fractional measurement
Grid
☑ Enable grid
Grid size (cm) ○ 12, 5 ○ 25 ● 50 ○ 100
☐ User-defined 0.50 m
1: 50 ☐ other 1: 20
3D-View
☑ Create 3D View
☑ Terrain visible
General
☑ Save as default settings

Floor plan selection
☐ Hall construction / purlin roof
● Rectangle
○ L-shaped, Type 1
○ L-shaped, Type 2
○ U-shaped
○ Front section
○ Free editing

On the right side you will find a selection of predefined building shapes. This choice determines the contour of the building and the other entries in the wizard. In the next step, depending on the building shape you will see a series of matching sketches with input fields. Should your plan not correspond to the basic building shapes shown, stop the wizard with the "free entry" and draw its outline using the conventional manner.

3.4 STEP 3: EDIT DIMENSIONS

Depending on the building shape selected, you are presented with a matching sketch together with the required dimensions. Fill in the fields for each wall length. Select the wall thickness for the external walls. The floor height can be set to its default value and can be adjusted in the next step.



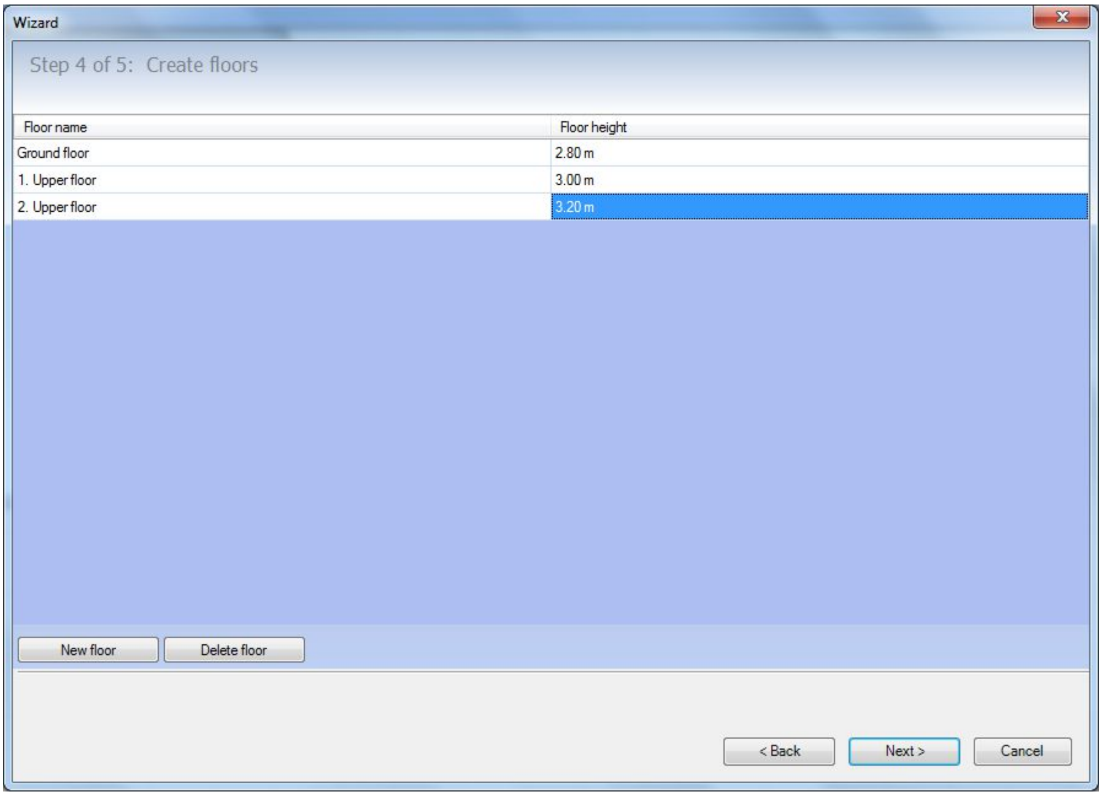
Step 3 of 5: Edit dimensions

Dimensions
● External dimension
○ Internal dimension
L1: 20.00 m
L2: 12.00 m
Wall thickness: 0.365 m
Floor height: 2.80 m

General
☑ Save as default settings

3.5 STEP 4: CREATE FLOORS

Here you can define the floor structure of your project. An attic can be defined here or in the next step. In the table you can change both the default floor names and the floor height of each floor.



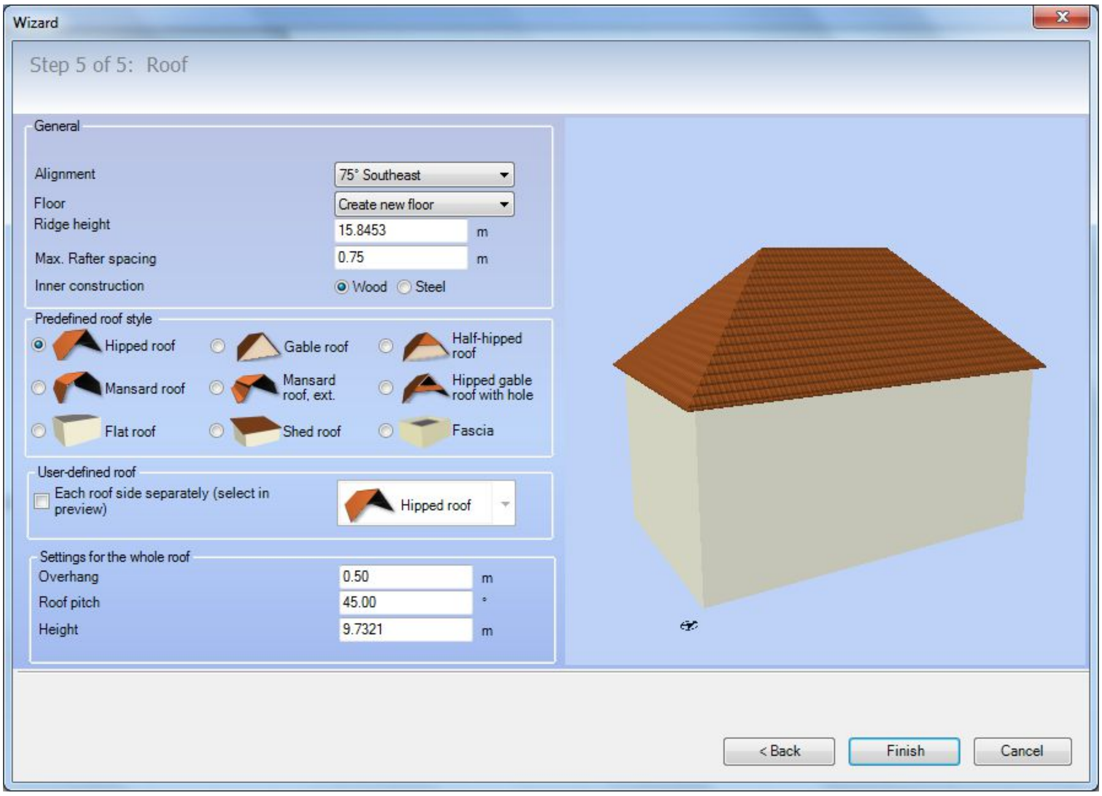
Floor name	Floor height
Ground floor	2.80 m
1. Upper floor	3.00 m
2. Upper floor	3.20 m

3.6 STEP 6: ROOF

With Step 5, the building is completed. In the "General" section, the Alignment setting will orientate the compass in the 3D view.

The Floor drop down list allows you to define where the roof is to be inserted. This does not have to be the top floor of the building.

For example e.g. a detached house with ground floor, first floor and attic, you can use the roof on either the first floor or attic. Ultimately, it is only an organizational setting for your project, because the height of the roof and its position can be adjusted independently from the floor.



Wizard

Step 5 of 5: Roof

General

Alignment: 75° Southeast

Floor: Create new floor

Ridge height: 15.8453 m

Max. Rafter spacing: 0.75 m

Inner construction: ● Wood ○ Steel

Predefined roof style

● Hipped roof ○ Gable roof ○ Half-hipped roof

○ Mansard roof ○ Mansard roof, ext. ○ Hipped gable roof with hole

○ Flat roof ○ Shed roof ○ Fascia

User-defined roof

☐ Each roof side separately (select in preview)

Hipped roof

Settings for the whole roof

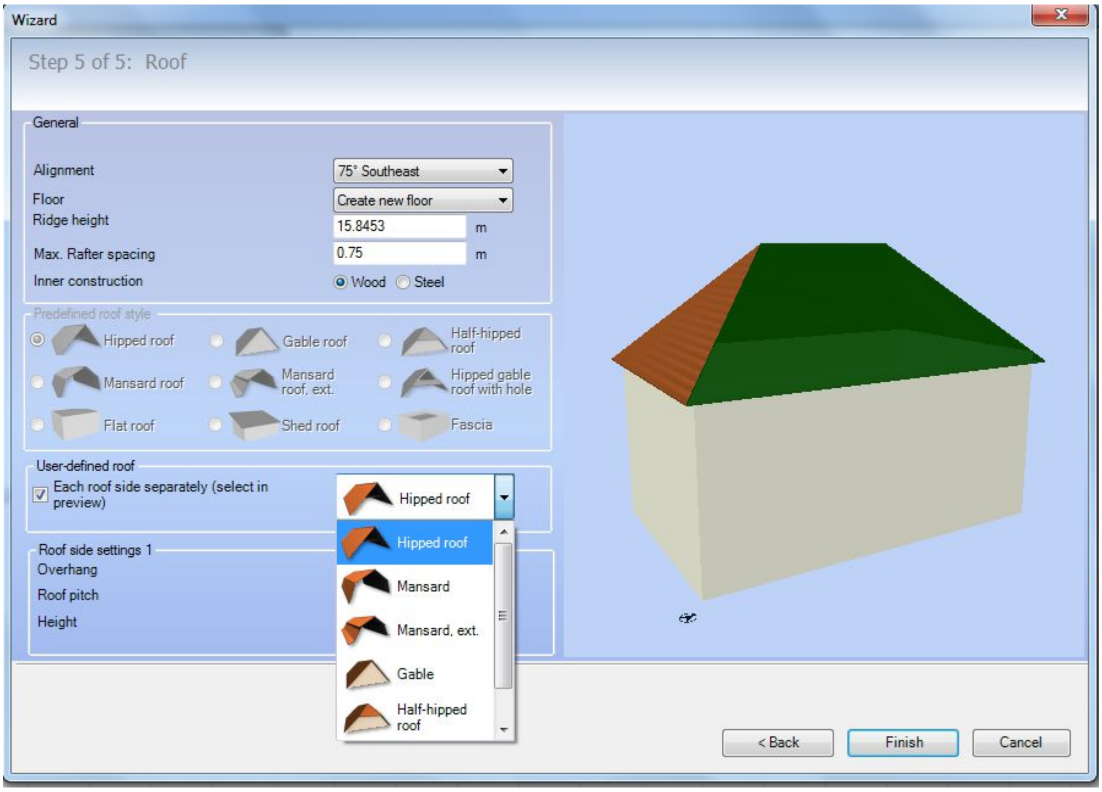
Overhang: 0.50 m

Roof pitch: 45.00 °

Height: 9.7321 m

In the "Predefined roof style" some of the most common roof styles are listed. With each choice, the roof will be recalculated and updated in the 3D preview. The automatic process will make some assumptions regarding the properties of the roof sides for the roof. For example, with the pitched roof the shorter sides of the building are defined as the gable ends.

If you choose the "User-defined roof" option the basic pre-defined roof types are automatically disabled. You now need to determine within the 3D preview the roof first side, by selecting it with the mouse. The active side of the roof is always displayed transparently.



Wizard

Step 5 of 5: Roof

General

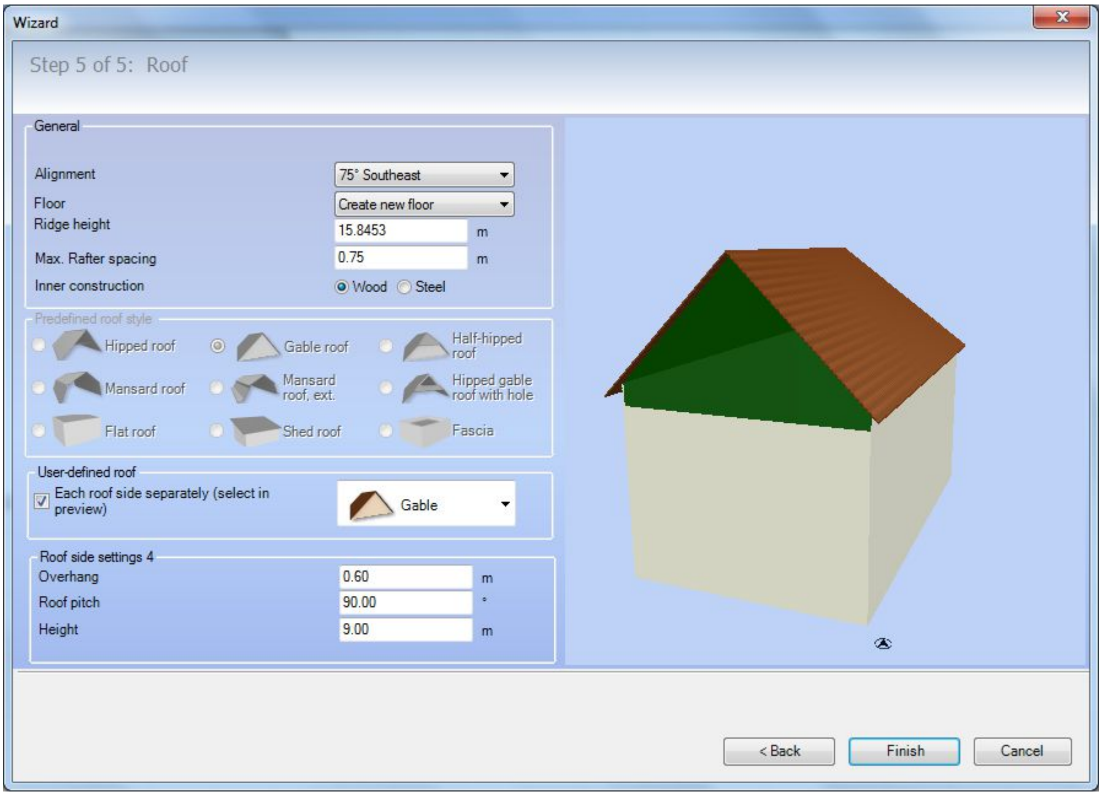
Alignment: 75° Southeast
Floor: Create new floor
Ridge height: 15.8453 m
Max. Rafter spacing: 0.75 m
Inner construction: ● Wood ○ Steel

Predefined roof style: ● Hipped roof ○ Gable roof ○ Half-hipped roof ○ Mansard roof ○ Mansard roof, ext. ○ Hipped gable roof with hole ○ Flat roof ○ Shed roof ○ Fascia

User-defined roof
☑ Each roof side separately (select in preview): Hipped roof

Roof side settings 1
Overhang
Roof pitch
Height

Now you can choose the desired roof shape from the drop down list. This selection only applies to the current active side. To complete your roof, you have to select a rule to edit each roof side.



Wizard

Step 5 of 5: Roof

General

Alignment: 75° Southeast

Floor: Create new floor

Ridge height: 15.8453 m

Max. Rafter spacing: 0.75 m

Inner construction: ● Wood ○ Steel

Predefined roof style

User-defined roof

☑ Each roof side separately (select in preview): Gable

Roof side settings 4

Overhang: 0.60 m

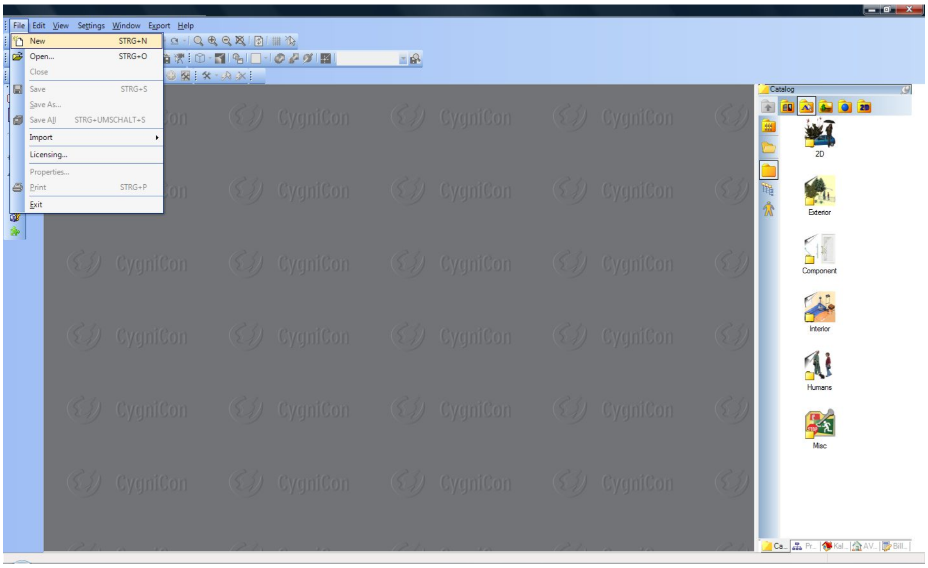
Roof pitch: 90.00 °

Height: 9.00 m

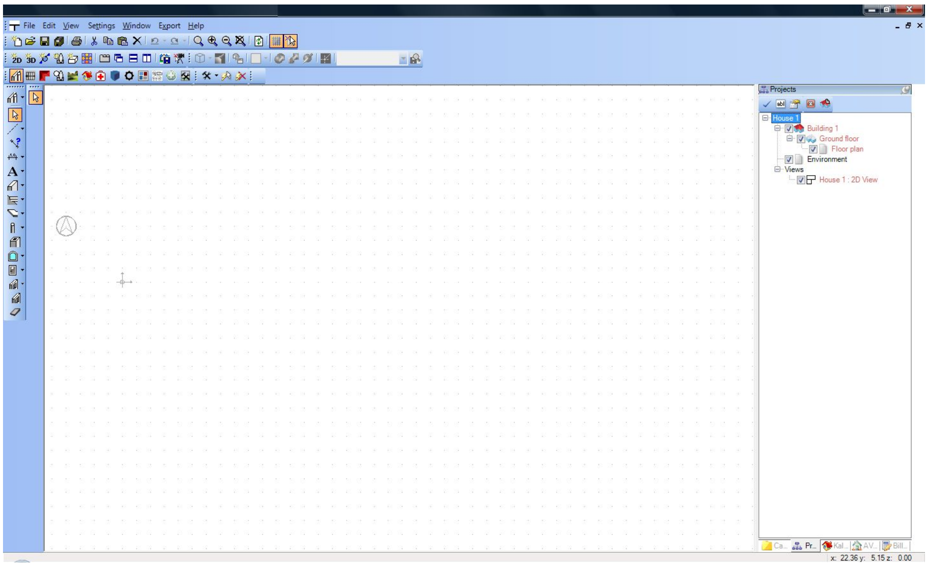
In the "Custom roof shape" the settings for Overhang, Roof pitch and Height are considered separately for each roof side, or alternately for the entire roof.

3.7 CREATING A PROJECT

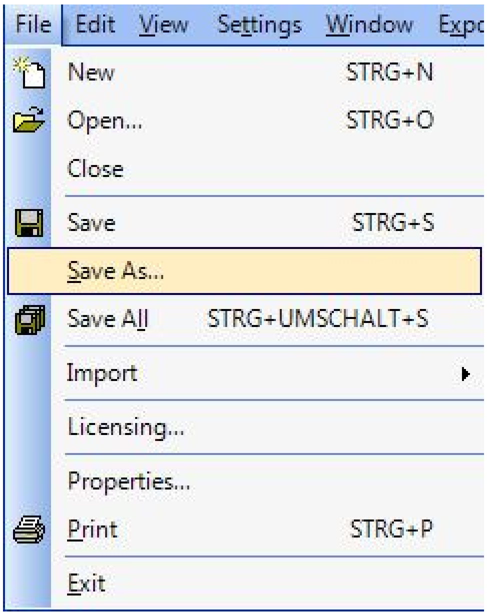
Start the program over ‘Start>Program>Your software’ or over the shortcut on your desktop. The software logo appears on your screen. Next the program window opens with a grey background and the catalog on the right-hand side. Select with the mouse the ‘File’ menu in the taskbar. Now click on ‘New’ to create a new project.



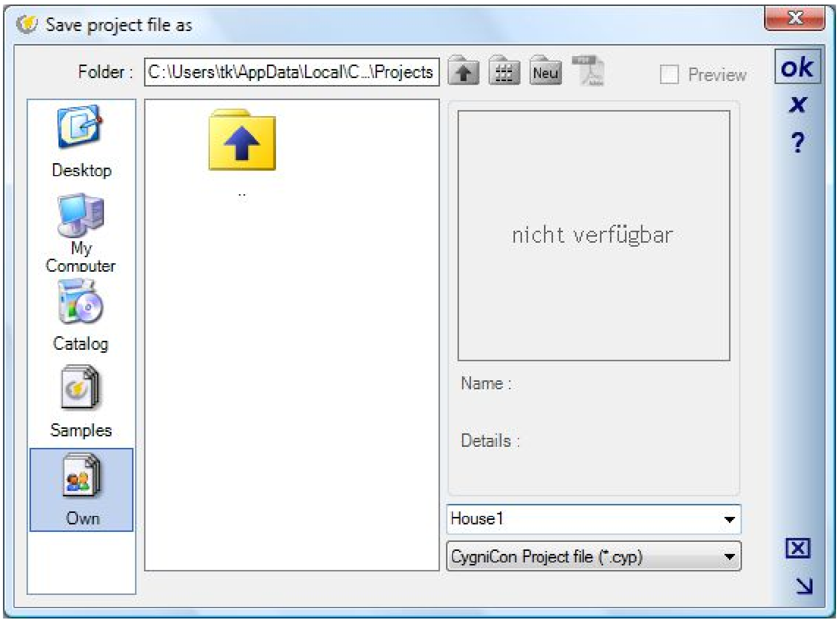
A 2D view with the title ‘New Project 1’ is now opened. This can be enlarged to a full screen with the maximise button in the top right-hand corner of the window. On the right-hand side you can see the project viewer, which shows the structure of the project. Select the title ‘New Project 1’ with a right mouse-click and choose ‘Rename’ in the context menu. Now enter a suitable name for your project, e.g. ‘House 1’. Confirm your input with ‘Enter’. You can now see that the name to identify the window has also changed.



Before you start work on a new project you should first save it. To do this, use the ‘File>Save as’ menu.



The software automatically suggests a directory in which to save your project under 'C:\Documents and Settings\...'. It is also makes sense to enter the project name as the file name in the second-last field on the bottom right of the dialog box.


Save project file as

Folder : C:\Users\tk\AppData\Local\C..\Projects

nicht verfügbar

Name :

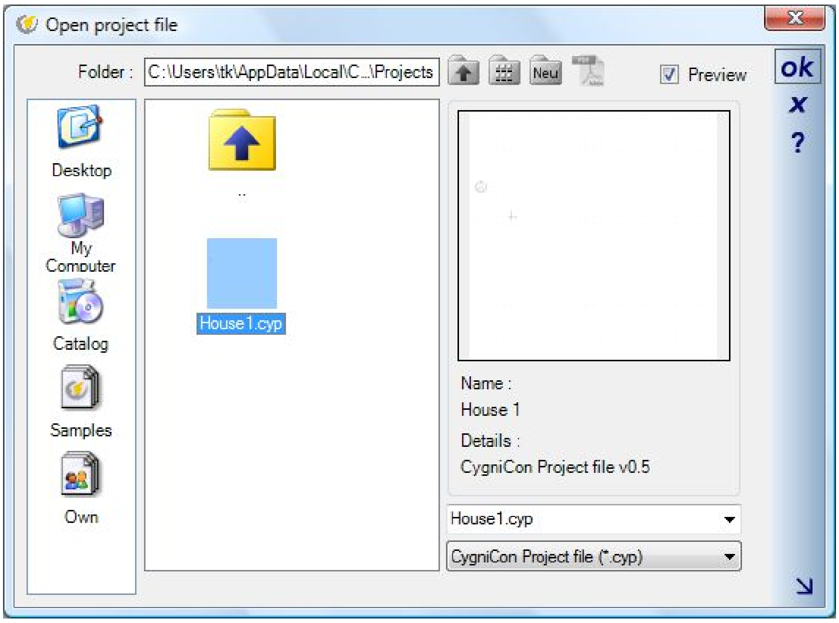
Details :

House1

CygniCon Project file (*.cyp)

The directory that is provided by your software to save your projects is found on the left-hand side of the dialog box with the title 'Own". You can of course use any other directory to save your projects. The quickest way to achieve this is with a click on the icon 'My computer'. Then enter the file name and confirm it with 'OK'. Your project is now saved under a new name and you can save your work at any further stage over the 'File>Save' menu or with a click on the disc icon in the first horizontal task bar.

If at some later date you select the ‘File>Open’ menu to open your project again then a list of the logical project names, and not the file names, is displayed. Therefore in our example ‘House 1’ would be shown. However, if a project has been selected, the name of the file is shown in the second-last field on the bottom right of the dialog box. The project can also be found under this file name in the Windows Explorer.



Folder : C:\Users\tk\AppData\Local\C...\Projects

☑ Preview

House1.cyp

Name :
House 1
Details :
CygniCon Project file v0.5

House1.cyp

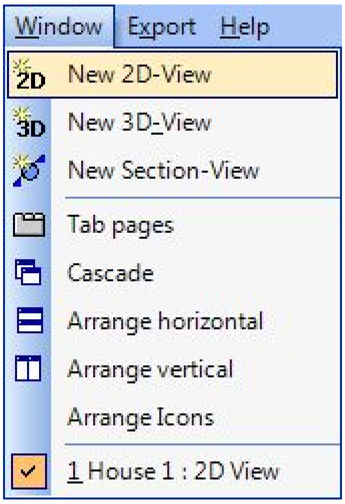
CygniCon Project file (*.cyp)

3.8 CREATING VIEWS

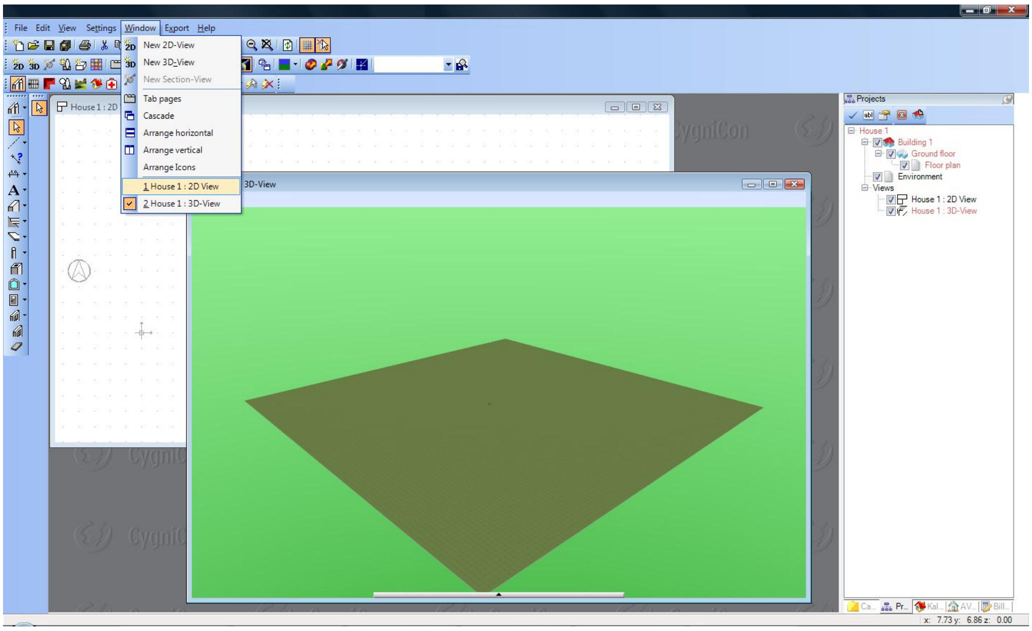
When working on a project the software provides three different kinds of views; the 2D view, the 3D view and the cross-section view. Any number of views of a given kind can be created in the project.

The 2D view serves primarily to define precisely the structure of the building with its components, e.g. walls, windows, doors etc, to scale in a floor plan, while the 3D view provides a visualisation of the project and serves to insert furniture and fittings and to landscape the grounds. The cross-section view creates scaled sections through the building and scaled elevations, according to where the cutting line is located.

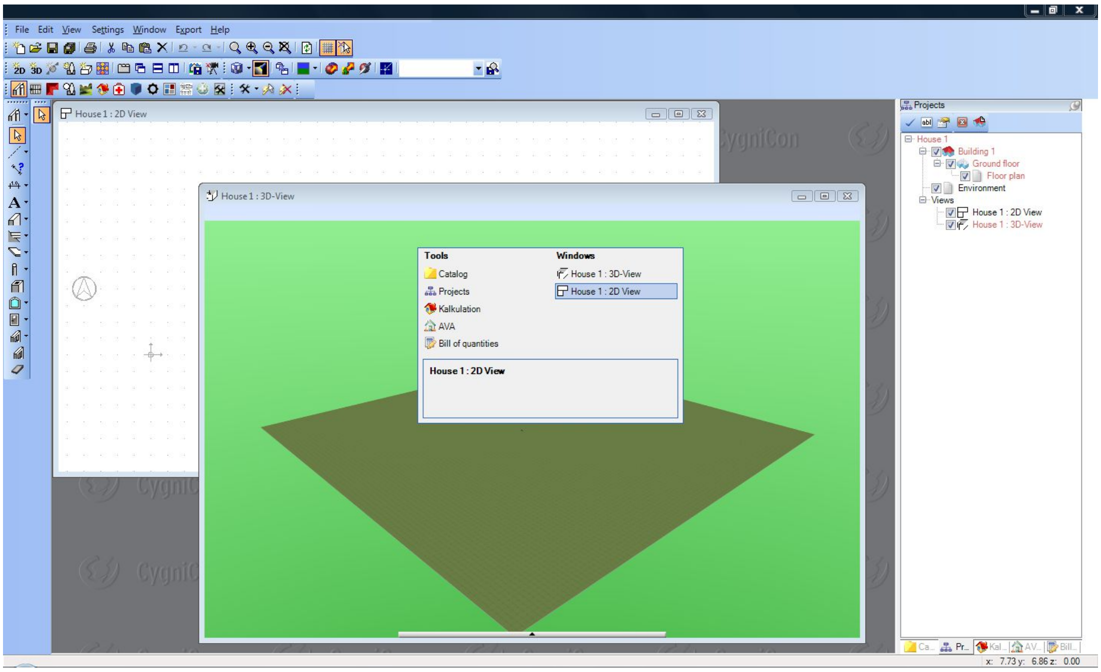
A new view can be created either using one of the first three buttons in the second horizontal taskbar or over the ‘Windows’ menu in which we find the three items ‘New 2D view’, ‘New 3D view’, and ‘New cross-section’.



Views can be accessed in three different ways in the program; firstly over the ‘Windows’ menu, secondly using the ‘Project viewer’,

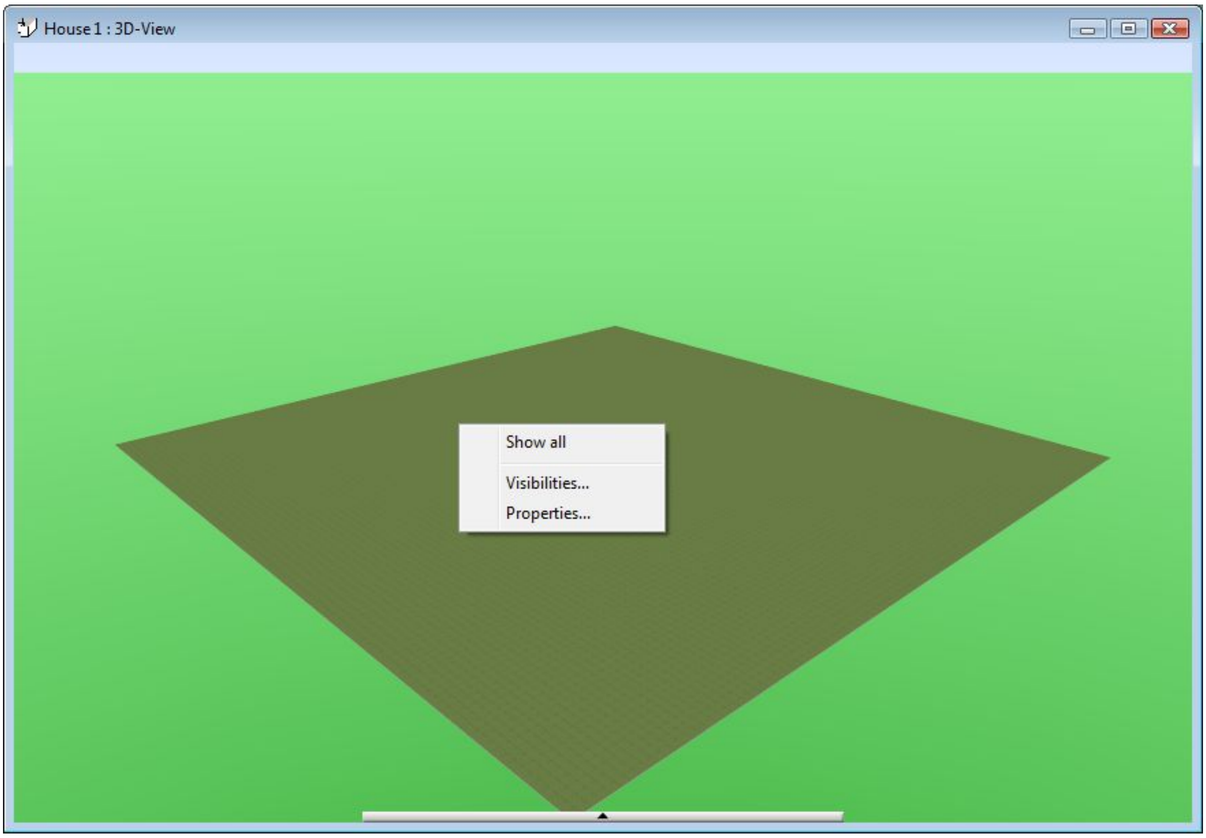


and finally over a context menu which is opened by pressing ‘Ctrl+Tab’ simultaneously.



Views are closed by simply clicking on the cross in the top right-hand corner. When the last view is closed the project is also closed, but beforehand a dialog box is opened which allows the current state of the project to be saved.

In a view the visibility of each element can be set individually – for instance whether or not the roof, the windows or the furnishings are to be seen. The settings for visibility can be specified for the currently active view over a context menu which is opened with a right mouse-click

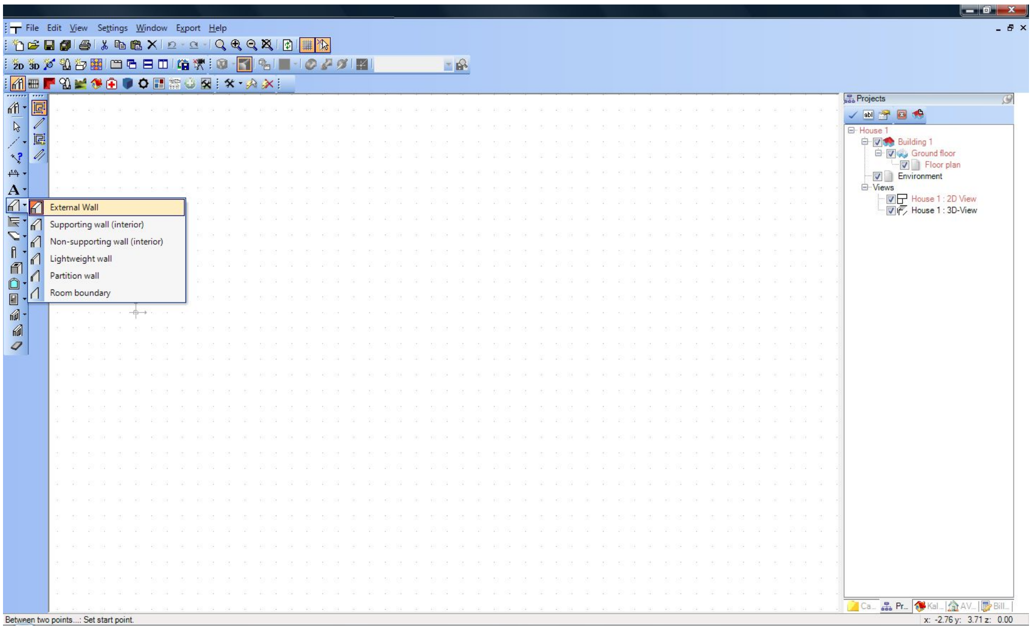


3.9 INSERTING WALLS

Walls are the basic element in planning any building. They form rooms, which themselves create ceilings and floors. Walls are a prerequisite for including windows and doors in the structure.
As a rule the first step is to create the exterior contours of the building with exterior walls and then to insert the interior walls into the structure.

3.9.1 Exterior Walls

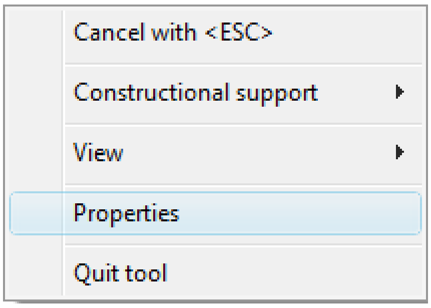
Select from the 'Plug-in toolbar' (the third horizontal toolbar) with the button for 'Building components' the corresponding plug-in. The functions for building components are then shown in the left-hand vertical toolbar (the plug-in functions are situated below the general functions – these are functions that are always available, e.g Guidelines, Text etc.). The top button of the building components is for the function 'Walls'.



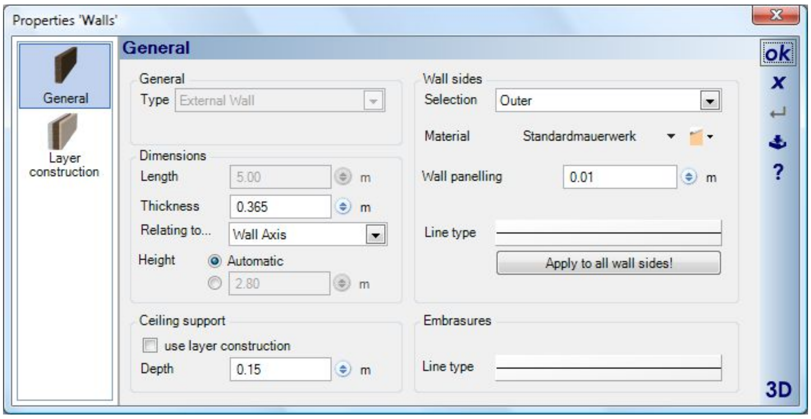
Between two points...: Set start point.

x: -2.76 y: 3.71 z: 0.00

Then activate ‘exterior wall’ with a left mouse click on the button. Buttons offering various insert options are displayed in the second vertical toolbar. Now select the multiple tool ‘Between two points’. A right click in the planning area opens the following context menu.



Now click on the ‘Properties’ menu item, which opens the ‘Wall properties’ dialog.



General

General
Type: External Wall

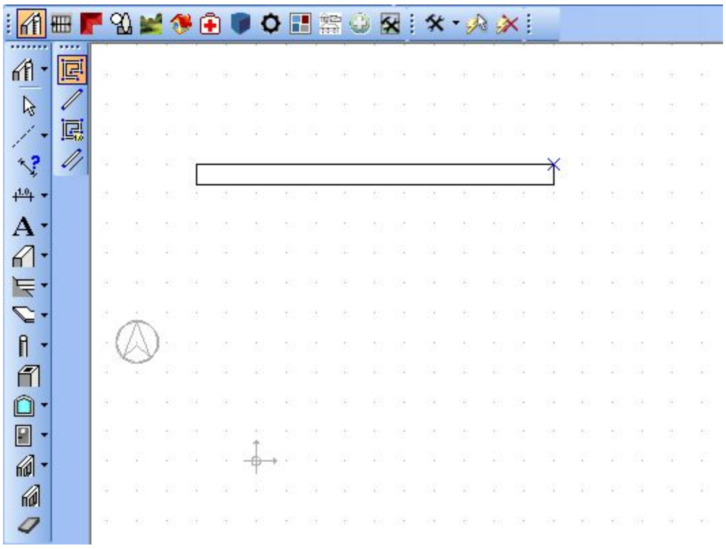
Dimensions
Length: 5.00 m
Thickness: 0.365 m
Relating to...: Wall Axis
Height: ● Automatic
○ 2.80 m

Ceiling support
☐ use layer construction
Depth: 0.15 m

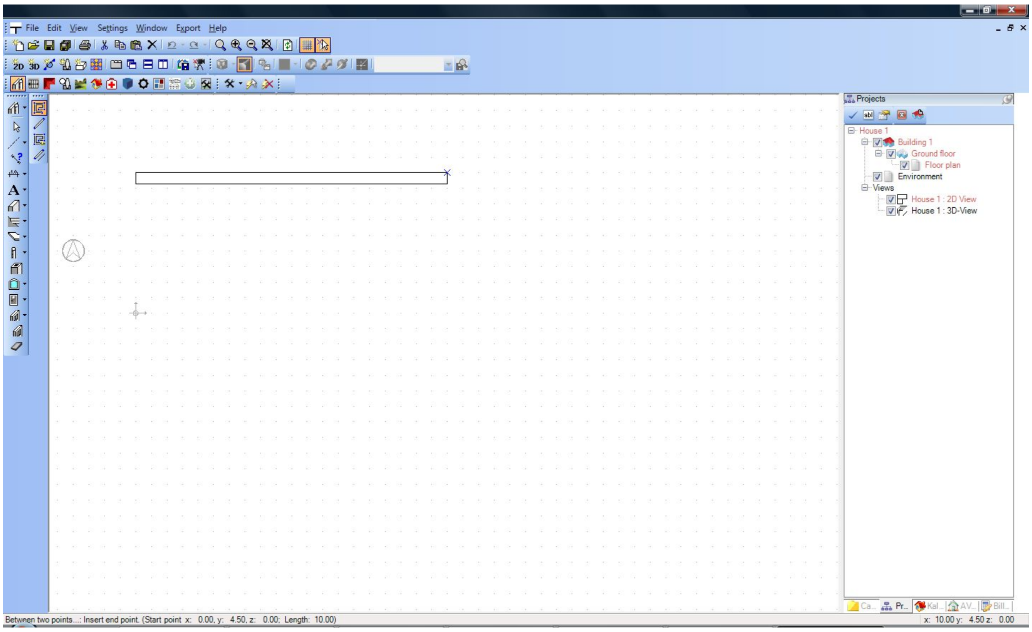
Wall sides
Selection: Outer
Material: Standardmauerwerk
Wall panelling: 0.01 m
Line type
Apply to all wall sides!

Embrasures
Line type

For now we leave the settings as shown in the illustration and close the dialog with ‘OK’. Now set the start point of the first wall to a point on the grid. The wall snaps to the start point along its axis and is attached to the cursor so that it can be positioned. With the key combination ‘Ctrl+W’ the reference point of the wall at the start point can be changed – from axis to inside edge, to outside edge, to axis.



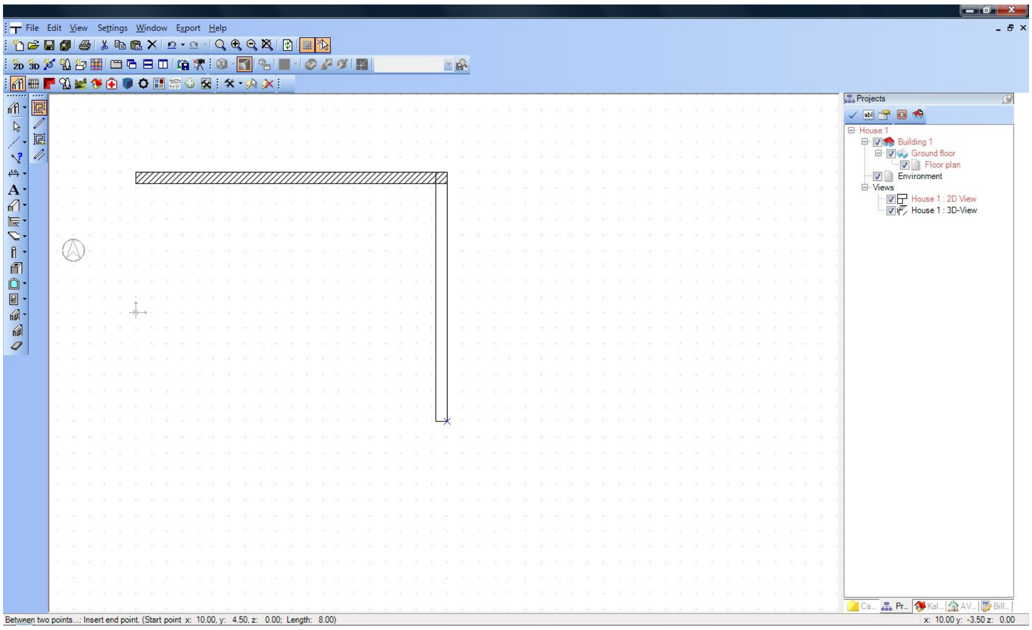
We select the outside edge as the reference point. Drag out the wall horizontally to the right with the mouse and notice how the value for its length changes in the status bar. Drop the wall at 10.00 m with a left mouse-click.



Between two points...: Insert end point. (Start point x: 0.00, y: 4.50, z: 0.00; Length: 10.00)

x: 10.00 y: 4.50 z: 0.00

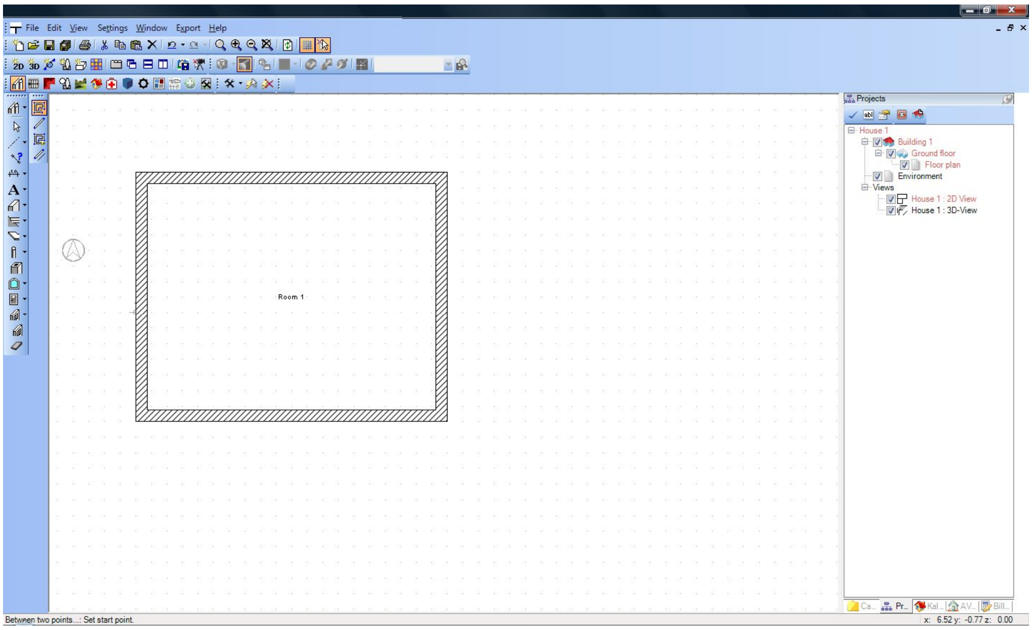
Now drag out the next wall vertically downwards to a length of 8.00 m.



Between two points...: Insert end point. (Start point x: 10.00, y: 4.50, z: 0.00; Length: 8.00)

x: 10.00 y: -3.50 z: 0.00

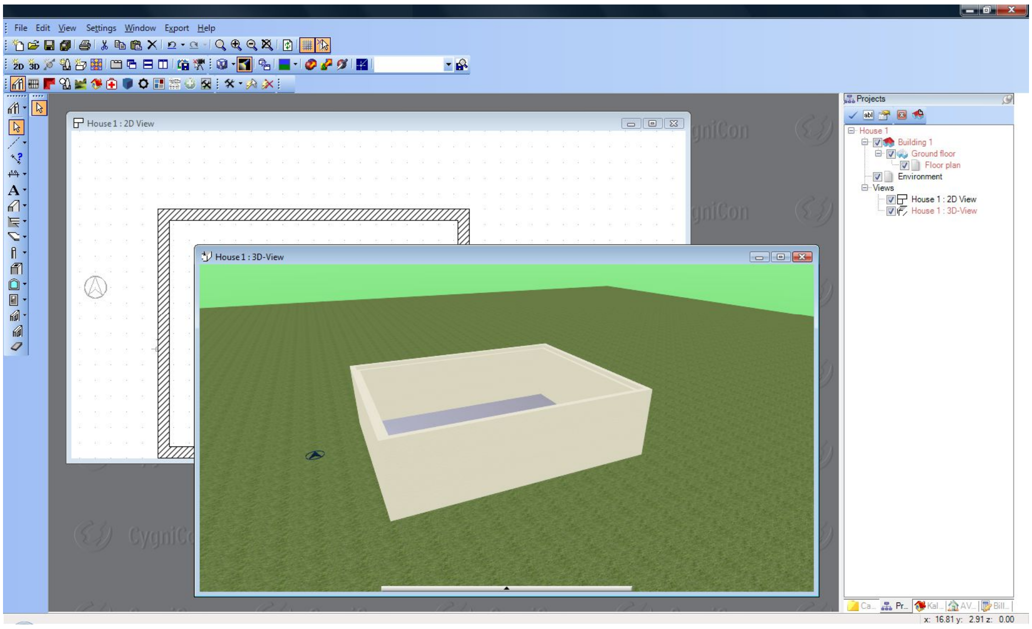
Extend the next wall horizontally 10.00 m to the left and then back to the start point. When the final click is made, and the polygon that forms the contour of the walls is closed, a name for the room appears in the plan. The insert wall function is terminated by pressing the ‘Esc’ key. This should now result in the following picture.



Between two points...: Set start point.

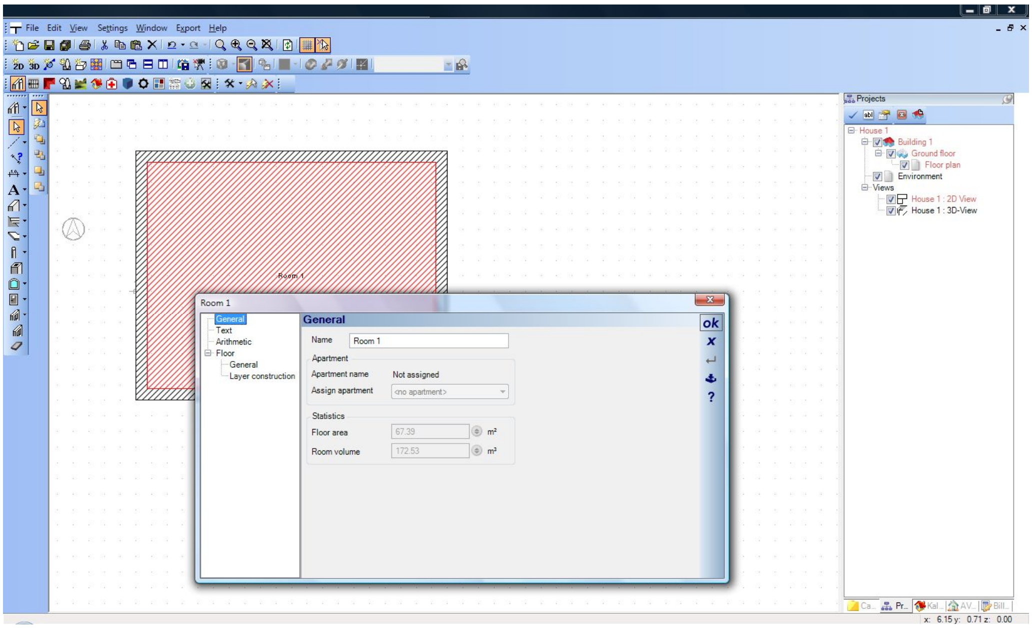
x: 6.52 y: -0.77 z: 0.00

You can check the progress of your work once more in a 3D view, by for example clicking on ‘New 3D view’.



As you can see the room is already provided with a floor, and the recess to support the ceiling is also visible. However ceilings are automatically removed using the visibility settings so that you can see into the structure.

Switch back to the 2D view. If you left click in the room it is highlighted in red to show that it has been selected.. By choosing 'Properties' from the context menu, which is opened with a right mouse-click, the 'Room' dialog appears.



Name: Room 1

Apartment

Apartment name: Not assigned

Assign apartment: <no apartment>

Statistics

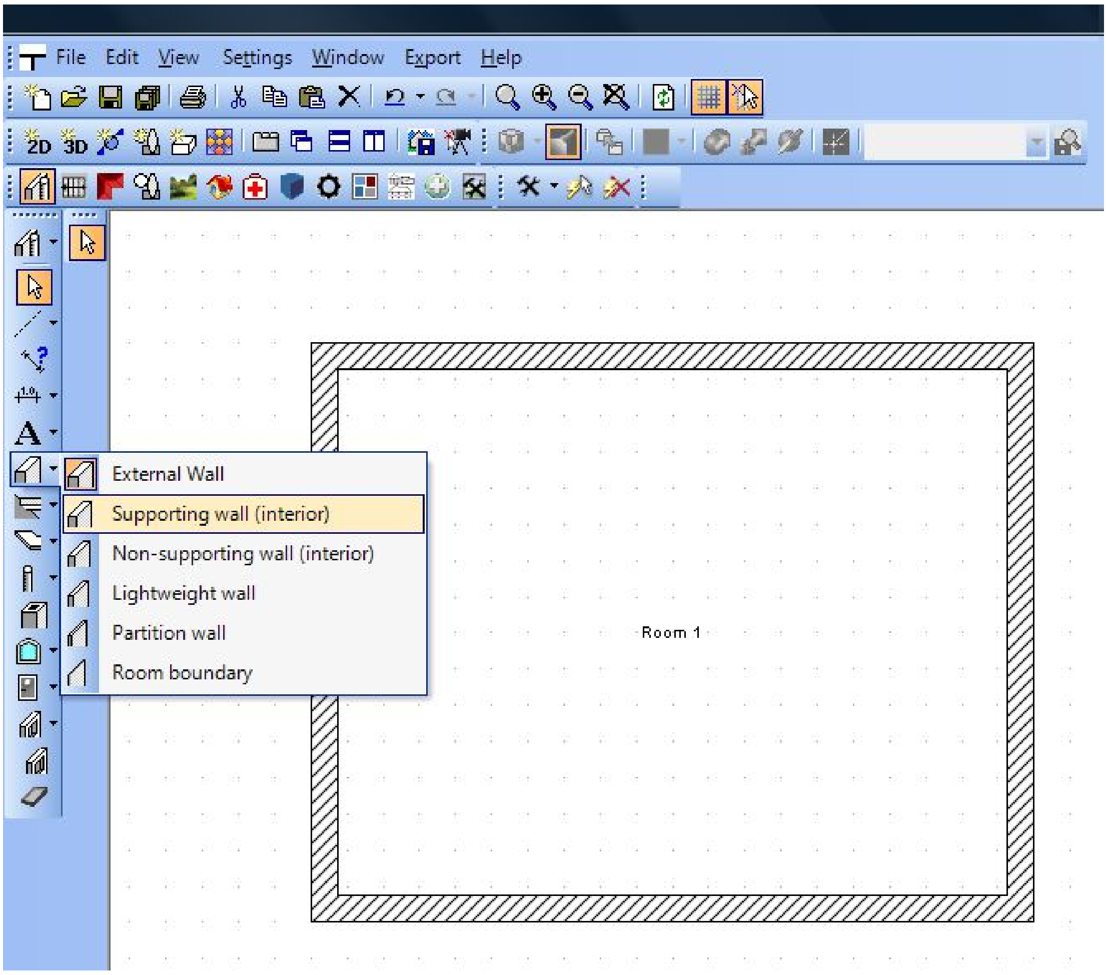
Floor area: 67.39 m²

Room volume: 172.53 m³

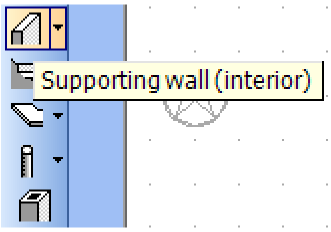
In the 'Room' dialog you can edit the room as regards text, calculation of area, and floor structure.

3.9.2 Interior Walls

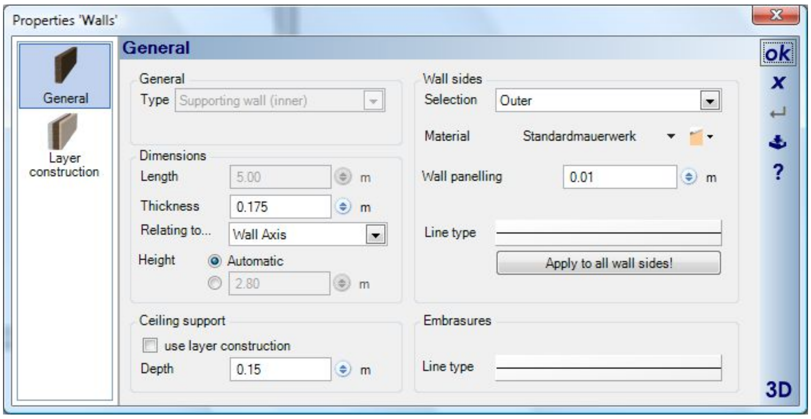
First we want to draw two load-bearing interior walls in the plan. The menu item for ‘Supporting interior wall’ can be found by a click on the arrow next to the button for ‘External wall’in the left-hand vertical toolbar.



A click on the menu item for ‘Supporting wall (interior)· makes the wall available as a tool in the left-hand vertical toolbar. If the cursor is positioned over the button a tool tip indicates that it is for the Supporting wall.



A right mouse-click on the button opens the properties dialog for ‘Walls’. Here we can specify details of how the wall should be constructed.



General

Type: Supporting wall (inner)

Dimensions

Length: 5.00 m

Thickness: 0.175 m

Relating to...: Wall Axis

Height: ● Automatic ○ 2.80 m

Ceiling support

☐ use layer construction

Depth: 0.15 m

Wall sides

Selection: Outer

Material: Standardmauerwerk

Wall panelling: 0.01 m

Line type

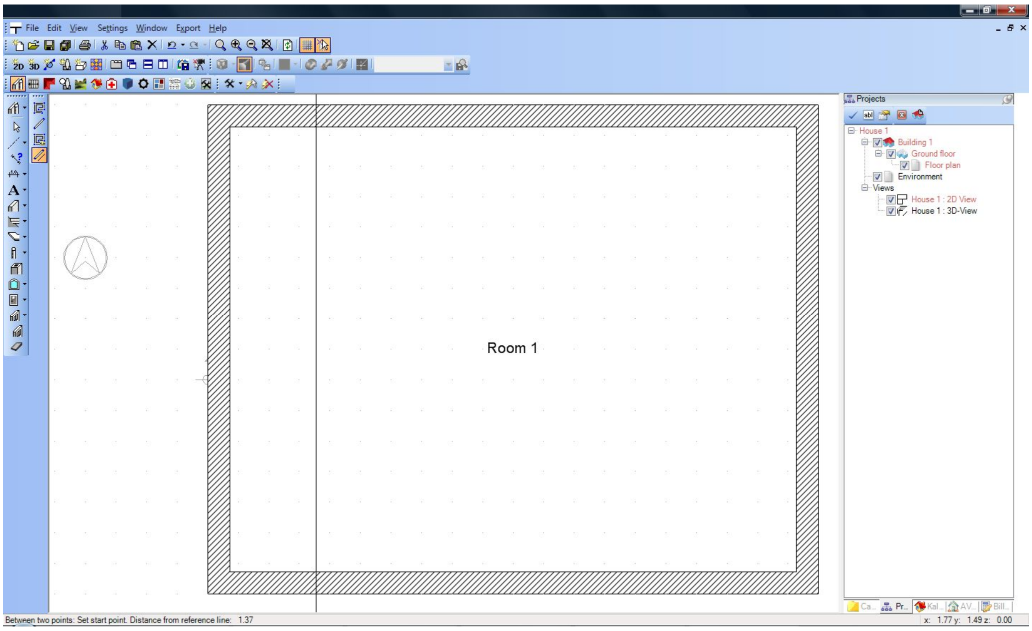
Apply to all wall sides!

Embrasures

Line type

We accept the default settings and close the dialog with ‘OK’.

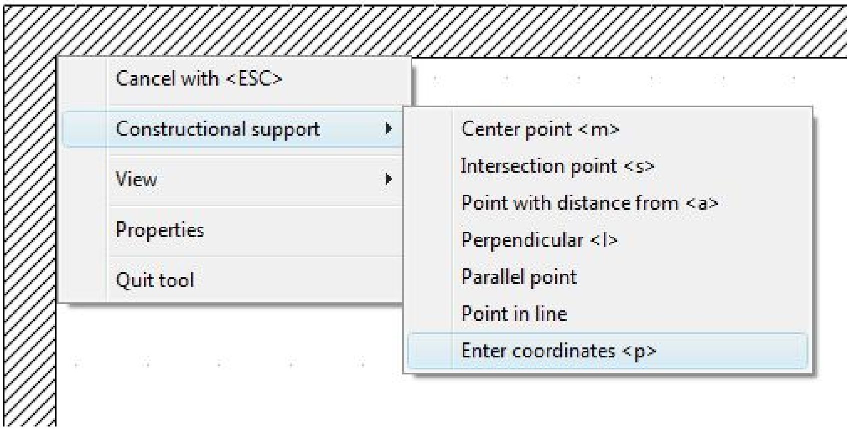
The first interior wall is to be inserted in the plan parallel to the left-hand exterior wall and at a distance of 4.00 m from it. To do this, click on the fourth button in the second vertical toolbar, ‘Insert parallel wall’.



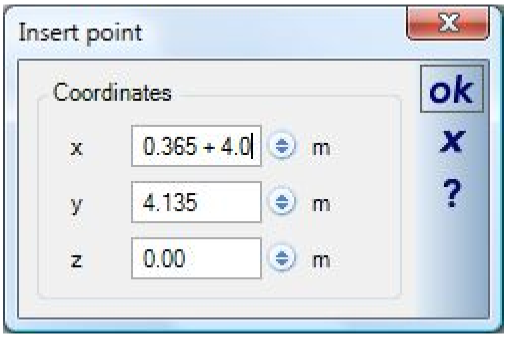
Between two points: Set start point. Distance from reference line: 1.37

x: 1.77 y: 1.49 z: 0.00

Next the program expects, as you can see in the status bar at the bottom of the window, a reference line to be selected. Click on the inside edge of the left-hand exterior wall. Subsequently a parallel line is attached to the cursor. Now move the cursor to the left bottom inside corner of the plan until the blue cross, which indicates its exact position, snaps to the inside corner. With a right mouse-click open the context menu, select ‘Constructional support’ and then ‘Coordinates’ “.



This opens the ‘Insert point’ dialog. The same dialog can also be opened by pressing ‘p’ on the keyboard as soon as the blue cross is positioned at the inside corner.



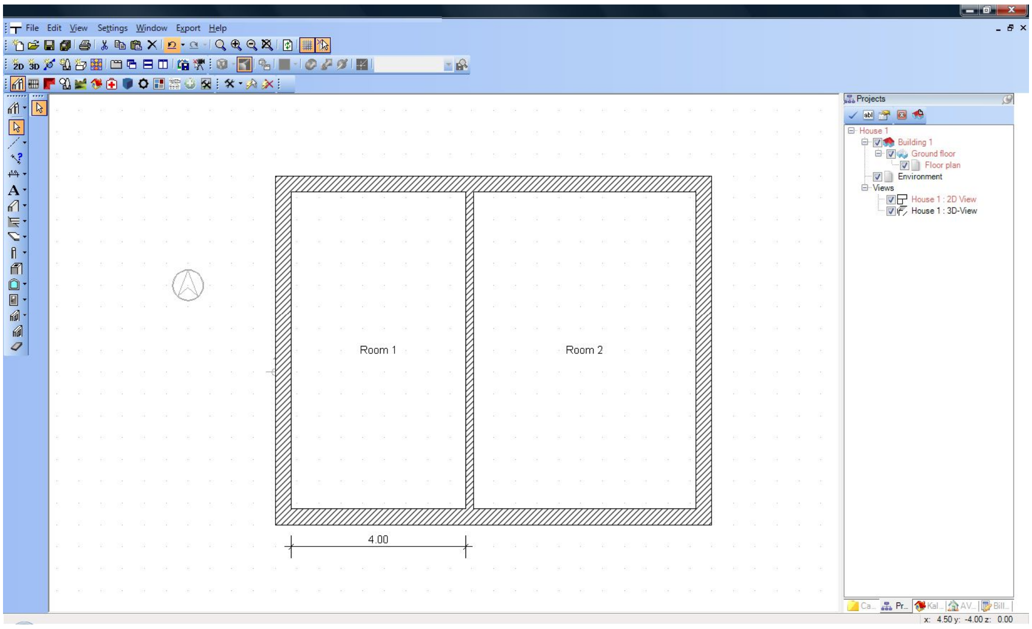
Coordinates

x 0.365 + 4.0 m

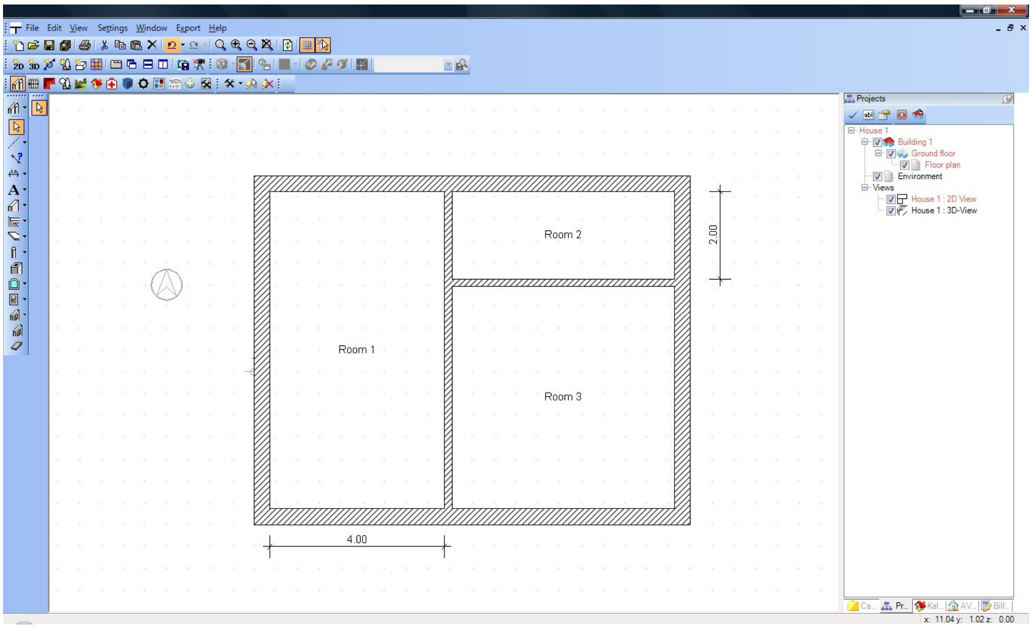
y 4.135 m

z 0.00 m

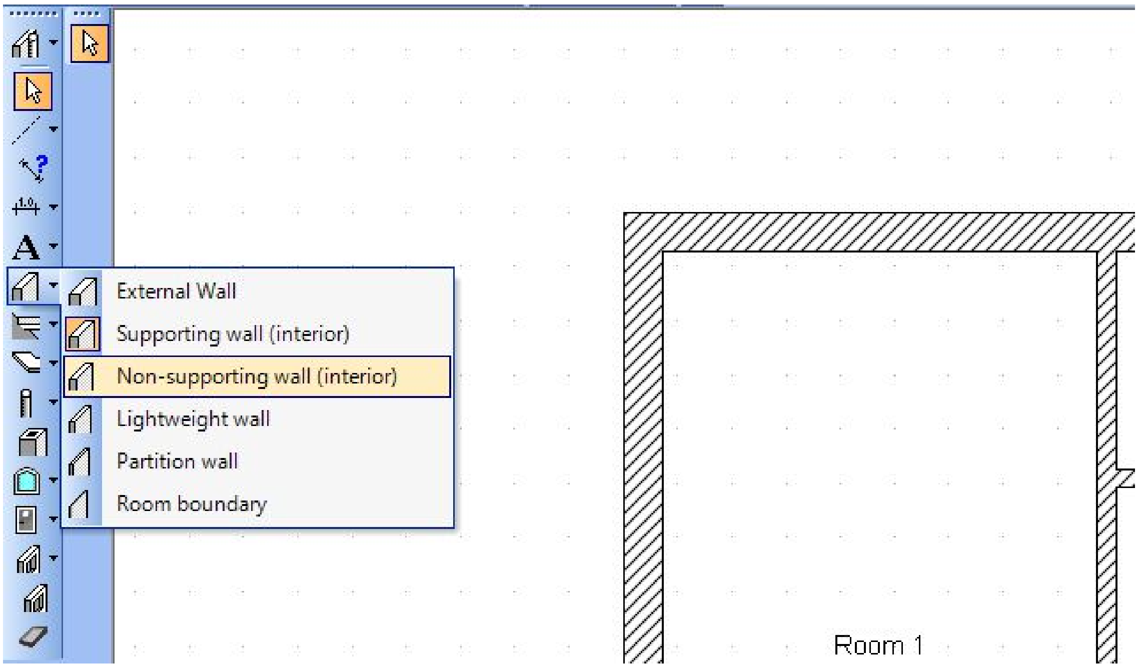
As you can see in the illustration you can perform calculations in the input fields of the dialog. Enter ‘+4.0’ in the field for the x-coordinate and confirm it with ‘OK’. The interior wall is now attached to the cursor. Using the key combination ‘Ctrl+w’ select the left-hand side of the wall as the reference side and drag it out to the opposite exterior wall. Drop it there with a left mouse-click.



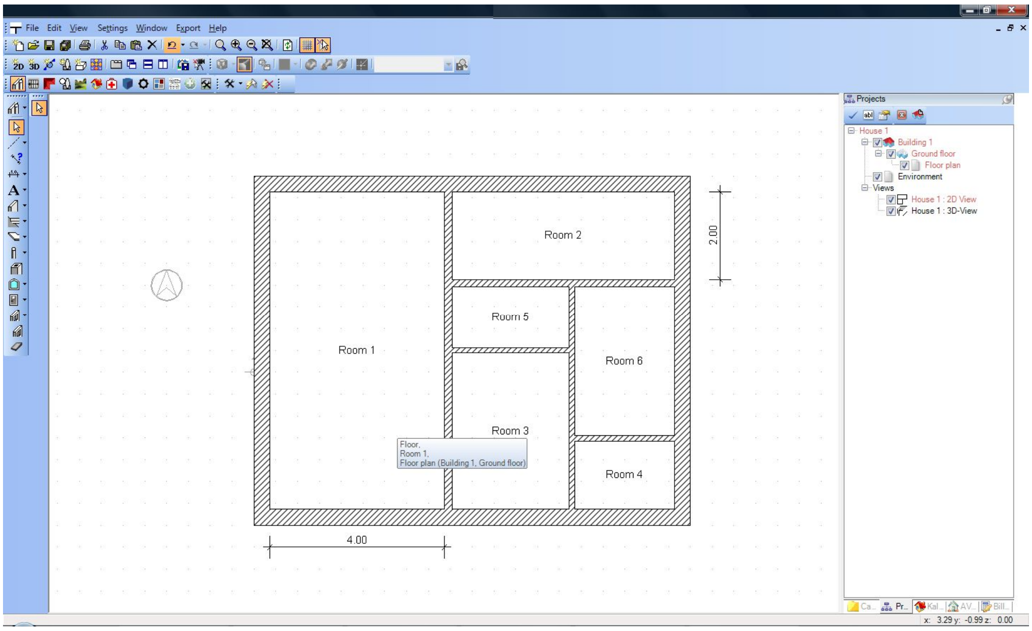
You can check the position of the wall with a dimension line. To do this, click on the 'Dimensions' button . In the second vertical toolbar click on the topmost button 'Single dimension'. With the first and second mouse-click we set the start and end point of the dimension line, with the third mouse-click its position.
We now insert a second supporting interior wall, as shown in the illustration.



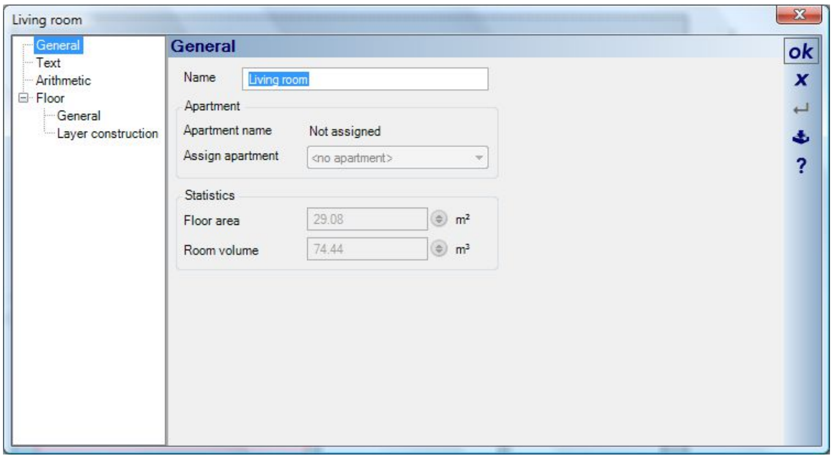
For this you can use the same construction aids as for the first interior wall. In this case however we need to use the y-coordinate. Do not forget to select the reference side of the wall with 'Ctrl+w'. Now select 'Non-supporting interior wall'.



Insert in the plan a non-load-bearing interior wall as a parallel wall using the construction aid ‘Coordinates’, in the same way as previously for a supporting interior wall.



Now select the large room on the left so that it is highlighted in red. Activate the ‘Room’ dialog with a click on ‘Properties’ in the context menu, which is opened with a right mouse-click.



Name: Living room

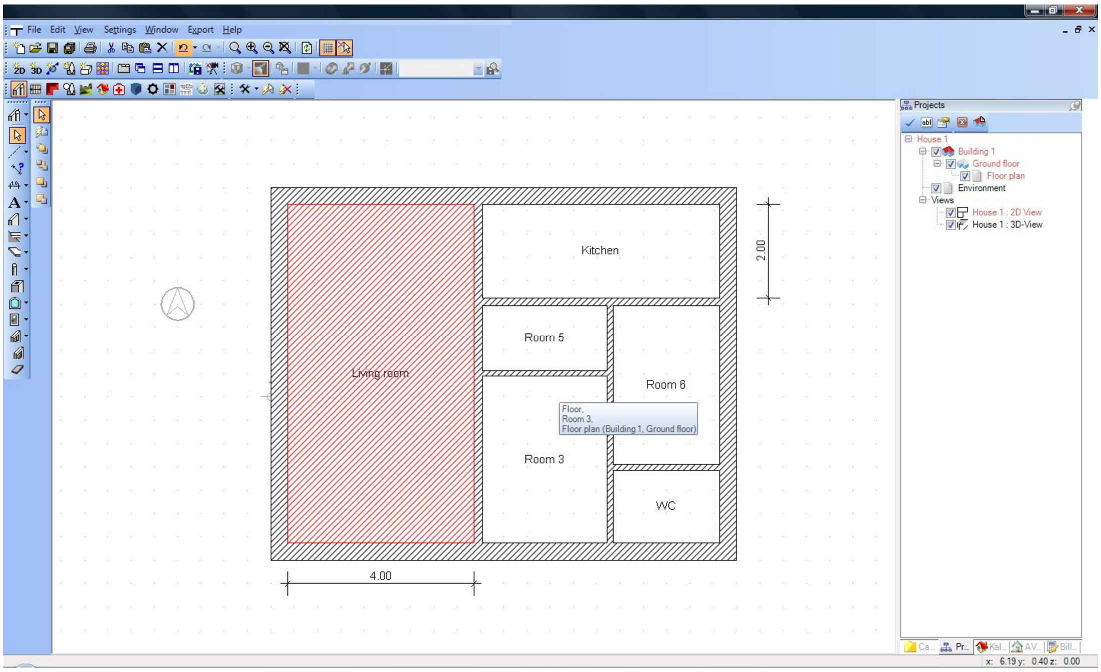
Apartment name: Not assigned

Assign apartment: <no apartment>

Floor area: 29.08 m²

Room volume: 74.44 m³

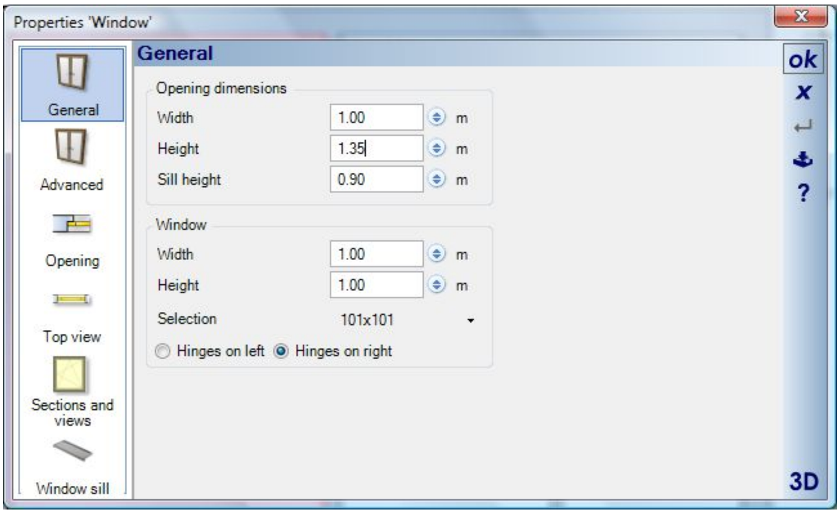
Change the name of the room to ‘Lounge’. In the same way change the names of the other rooms appropriately.



3.10 INSERTING WINDOWS AND DOORS

3.10.1 Inserting Windows

The software offers a selection of different windows and doors. We begin by inserting a standard window. Locate the button for ‘Window’ in the left-hand vertical toolbar and activate it with a left mouse click. A right mouse click on the button now opens the properties dialog for ‘Windows’. Change the height to 135 cm. and confirm it with ‘OK’.



Properties 'Window'

General

Opening dimensions

Width 1.00 m

Height 1.35 m

Sill height 0.90 m

Window

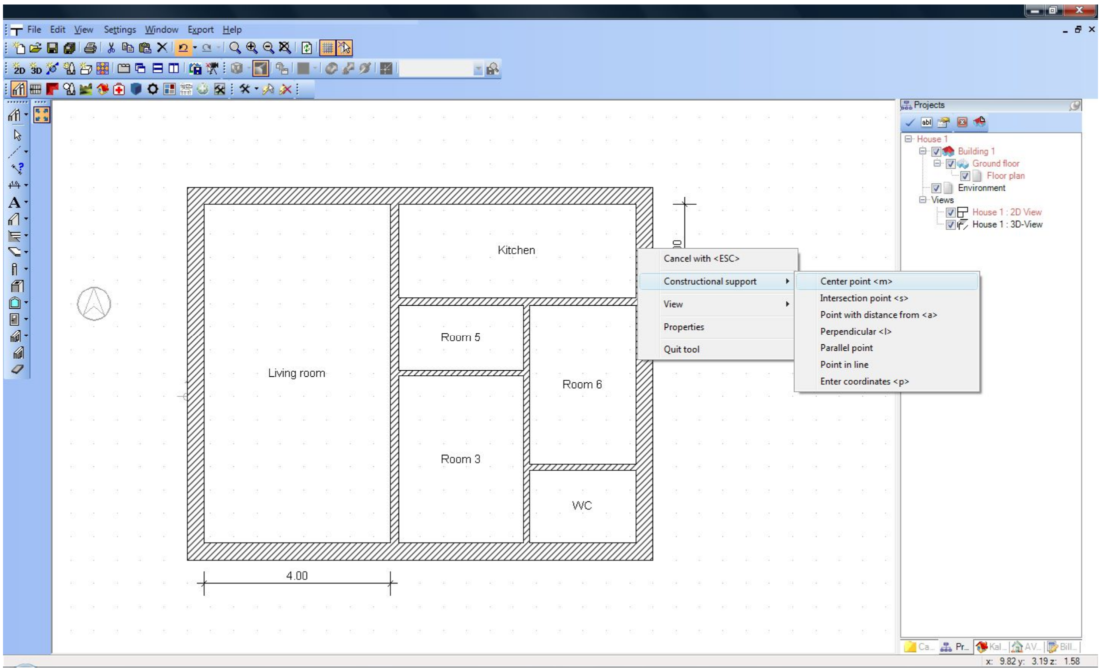
Width 1.00 m

Height 1.00 m

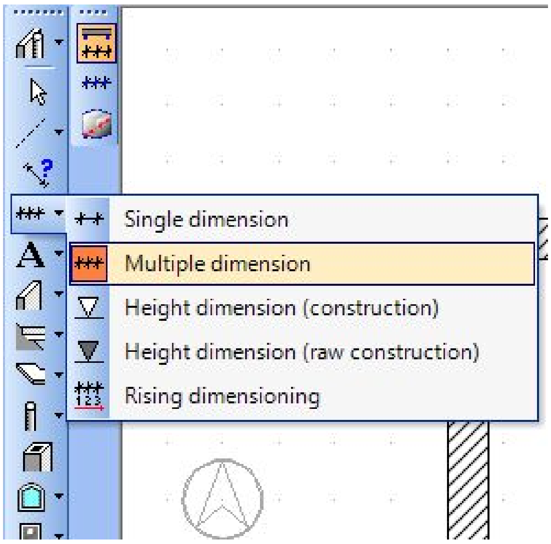
Selection 101x101

○ Hinges on left ● Hinges on right

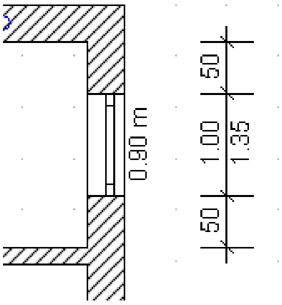
If you move the cursor over the plan, then in the vicinity of walls a preview of the window you are inserting is shown. You can see an arrow which symbolises the direction of opening of the window depending on which side of the wall the cursor is positioned. You can now position the window freely in the wall. However we want to position the window in the middle of the exterior wall of the room marked ‘Kitchen’. To do this, we once again use the construction aids. Move the window over the right-hand exterior wall of the ‘Kitchen’ until the arrow for the direction off opening points inwards. With a right mouse-click open the context menu and select ‘Constructional support>Center point’



You are now requested in the status bar to enter the start point of the length to be halved. Choose as the start point the inside corner of the exterior walls on the top right. As the end point choose the inside corner adjacent to the Utility room. The window is now inserted in the middle of the wall. You can check this by activating ‘Multiple dimensions’ in the left-hand vertical toolbar.

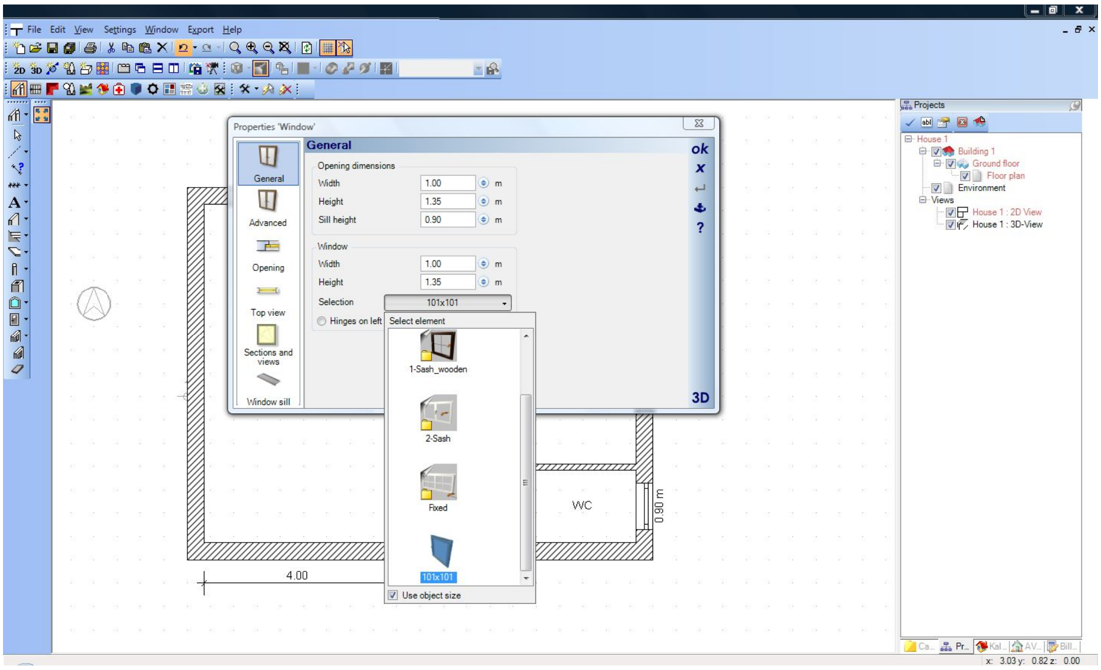

Single dimension
Multiple dimension
Height dimension (construction)
Height dimension (raw construction)
Rising dimensioning

The chained dimensions are entered using the same two points as were used to construct the midpoint of the wall.



Using the same process insert further windows in the utility room and the WC. Midpoint insertion can also be activated by pressing ‘m’ on the keyboard instead of over the context menu item for ‘Construction aids’

With a right mouse-click on the ‘Window’ button in the left-hand vertical toolbar open the properties dialog for ‘Window’ and click on the ‘Standard’ button to open a selection of windows.



Opening dimensions

Width 1.00 m

Height 1.35 m

Sill height 0.90 m

Window

Width 1.00 m

Height 1.35 m

Selection 101x101

○ Hinges on left

Select element

1-Sash_wooden

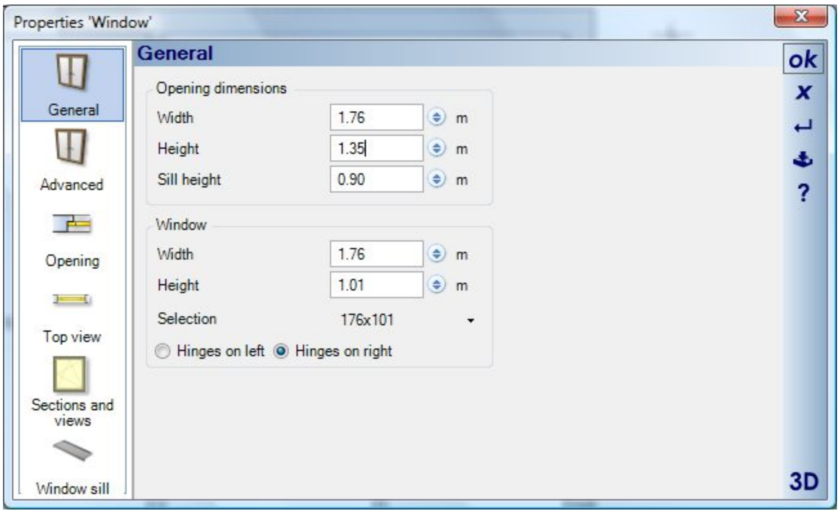
2-Sash

Fixed

101x101

☑ Use object size

Check the box ‘Use object size’. at the bottom of the selection window. With a double-click open the ‘Double casement’ folder and with a further double-click select the window ‘176 x 101.cyg’. Set the height of the window to 135 cm.



General

Opening dimensions

Width 1.76 m

Height 1.35 m

Sill height 0.90 m

Window

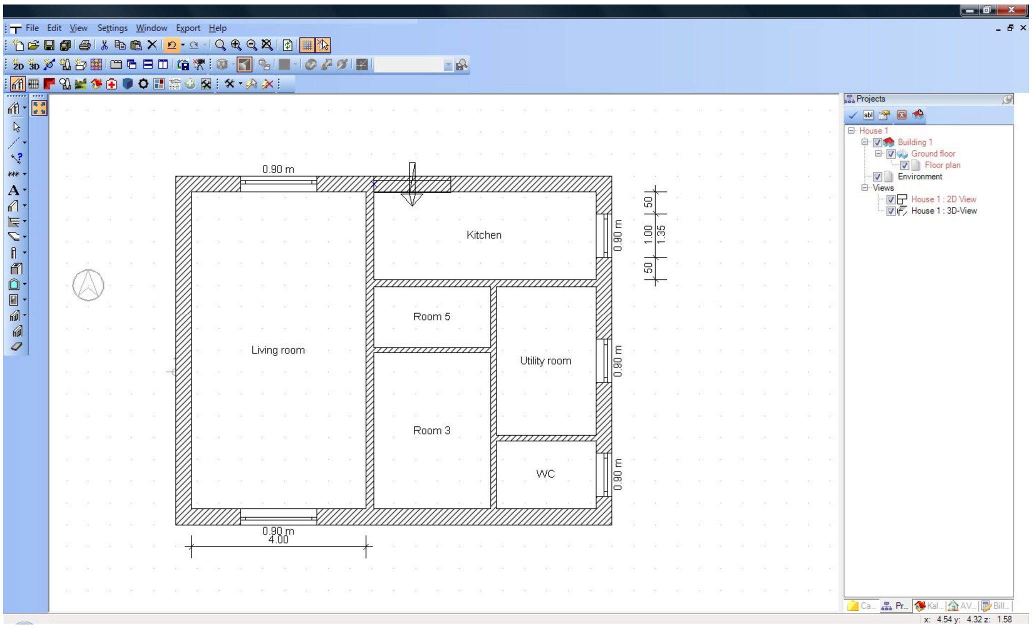
Width 1.76 m

Height 1.01 m

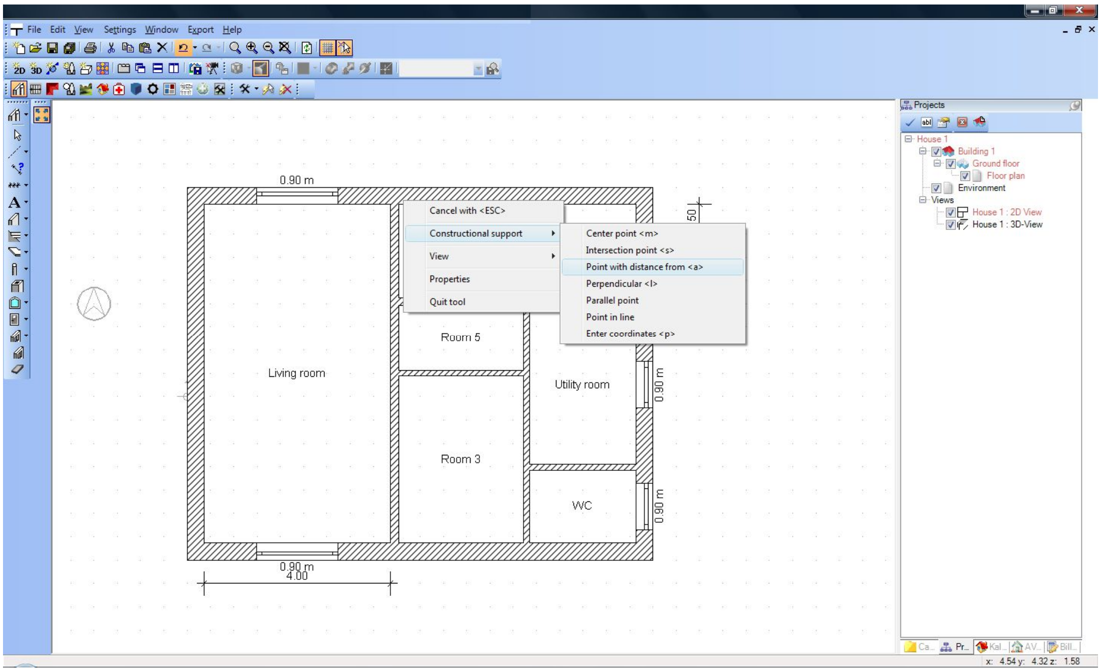
Selection 176x101

○ Hinges on left ● Hinges on right

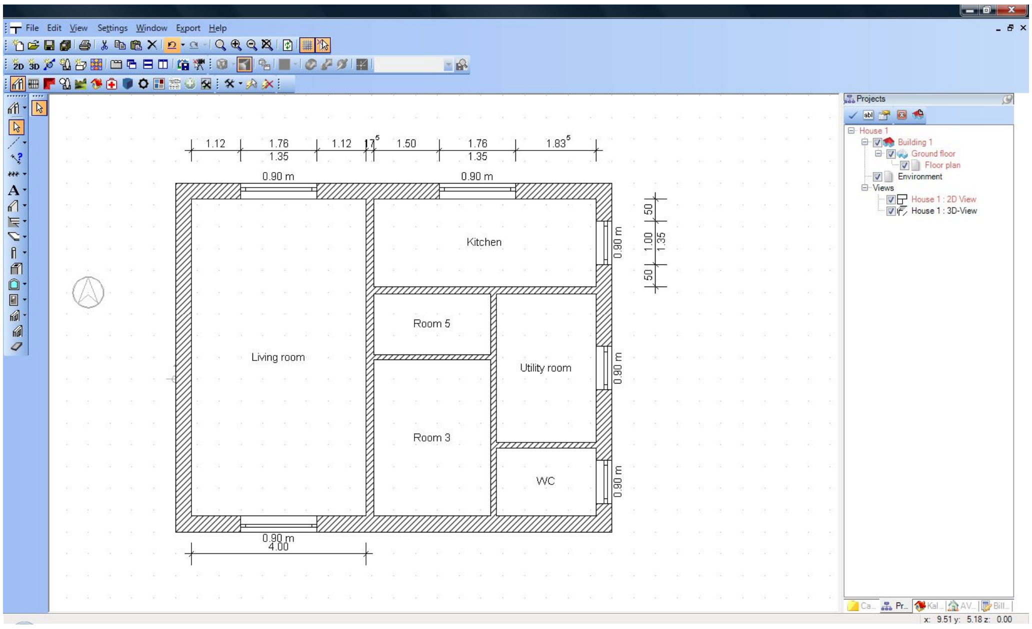
Position this window in the middle of the wall at the narrow end of the living room. In the kitchen we want to position the window at a distance of 1.50 m from the living room wall. To do this, press the key combination ‘Ctrl+w’ until the left edge of the window is selected as the reference point. Move the cursor up to the interior wall so that the blue cross snaps to it.



Choose the constructional support ‘Point with distance from’.

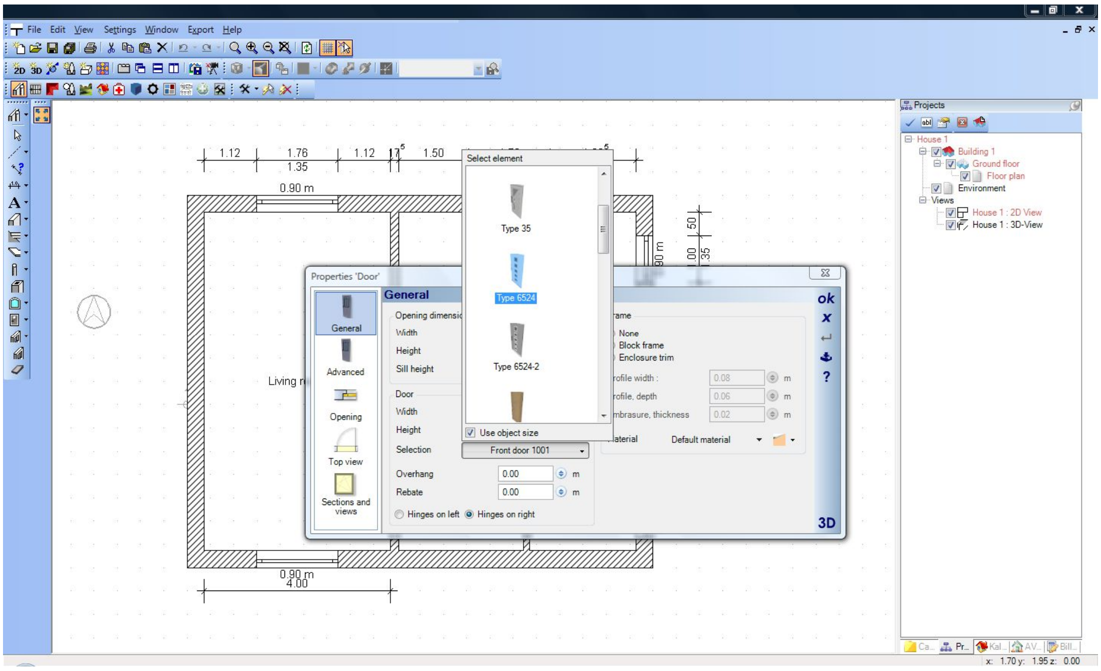


This tool now requires a start point and a direction. Start point is the left corner. Enter now the direction and place the window with another mouse click on the inner side of the wall. Enter 1.50 m in the appearing dialog.



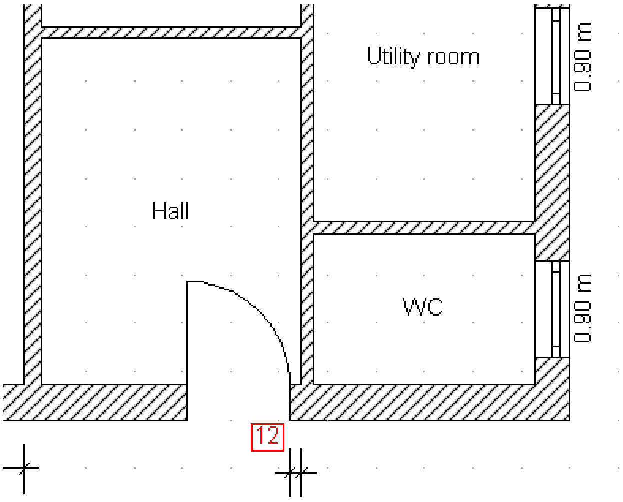
3.10.2 *Inserting Doors*

Doors are inserted in basically the same way as windows. The button for 'Door' is located under the button for 'Window' in the left-hand vertical toolbar. A right mouse click on the button opens the properties dialog for 'Door' with the 'Selection' button located in the middle.



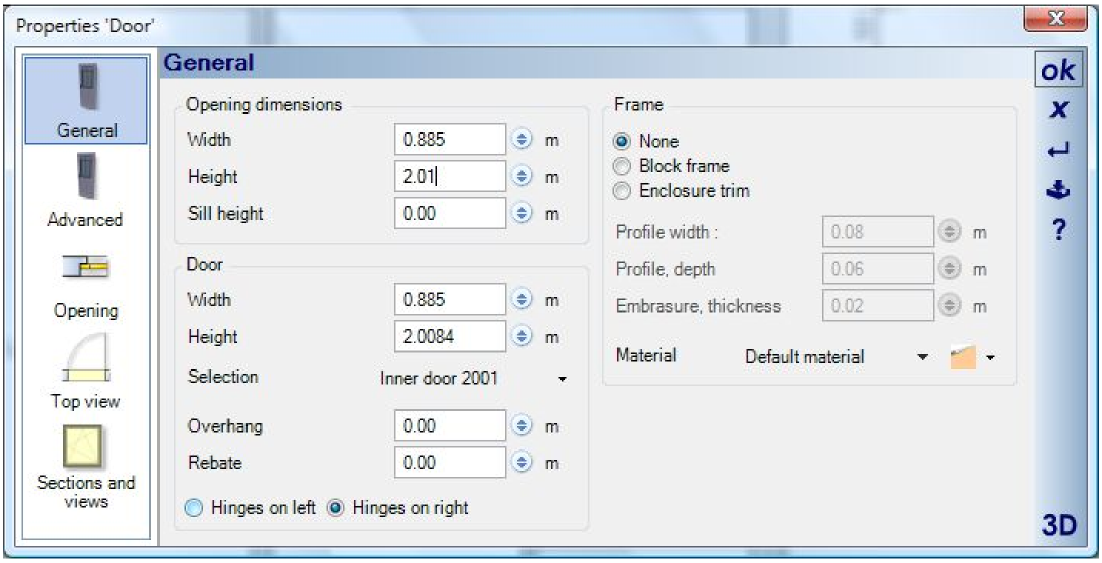
General
Opening dimensio
Width
Height
Sill height
Door
Width
Height
Selection: Front door 1001
Overhang: 0.00 m
Rebate: 0.00 m
○ Hinges on left ● Hinges on right
☑ Use object size
rame
None
Block frame
Enclosure trim
rofile width : 0.08 m
rofile, depth 0.06 m
mbrasure, thickness 0.02 m
aterial: Default material

Check the ‘Use object size’ box at the bottom of the selection window and with a double-click select ‘Type 6524’. Accept the settings with ‘OK’ and insert the door in the exterior wall of the hall at a distance of 12 cm from the wall of the WC. To do this, select the right side of the door as the reference side with the key combination ‘Cntl+w’ and move the cursor to the edge of the interior wall adjacent to the WC.



Press ‘a’ on the keyboard and enter ‘-0.12’ after having selected the corner and the direction. Click on ‘OK’ to position the door.

To insert the interior doors right-click on the ‘Door’ button in the vertical toolbar and then select the door ‘Inner door 01’. Enter 88.5 cm for the width and 2.01 m for the height.



Properties 'Door'

General

Opening dimensions

Width 0.885 m
Height 2.01 m
Sill height 0.00 m

Door

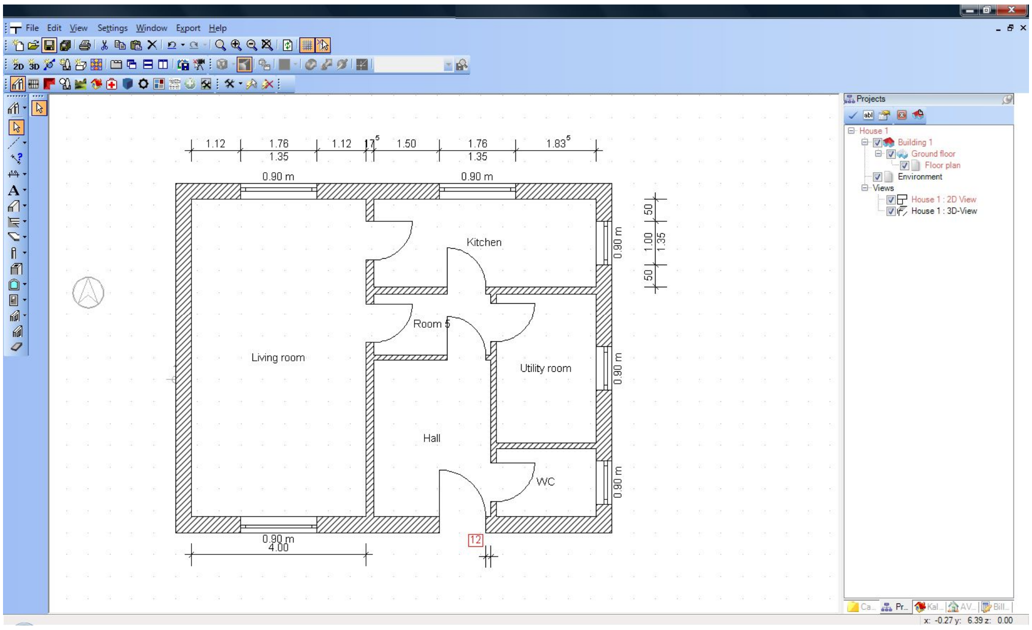
Width 0.885 m
Height 2.0084 m
Selection Inner door 2001
Overhang 0.00 m
Rebate 0.00 m
○ Hinges on left ● Hinges on right

Frame

● None
○ Block frame
○ Enclosure trim

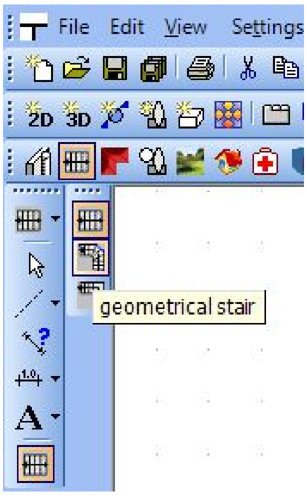
Profile width : 0.08 m
Profile, depth 0.06 m
Embrasure, thickness 0.02 m
Material Default material

After inserting the interior doors in the plan, some at a specified distance from other walls, some in the middle of walls, the plan might appear as follows:

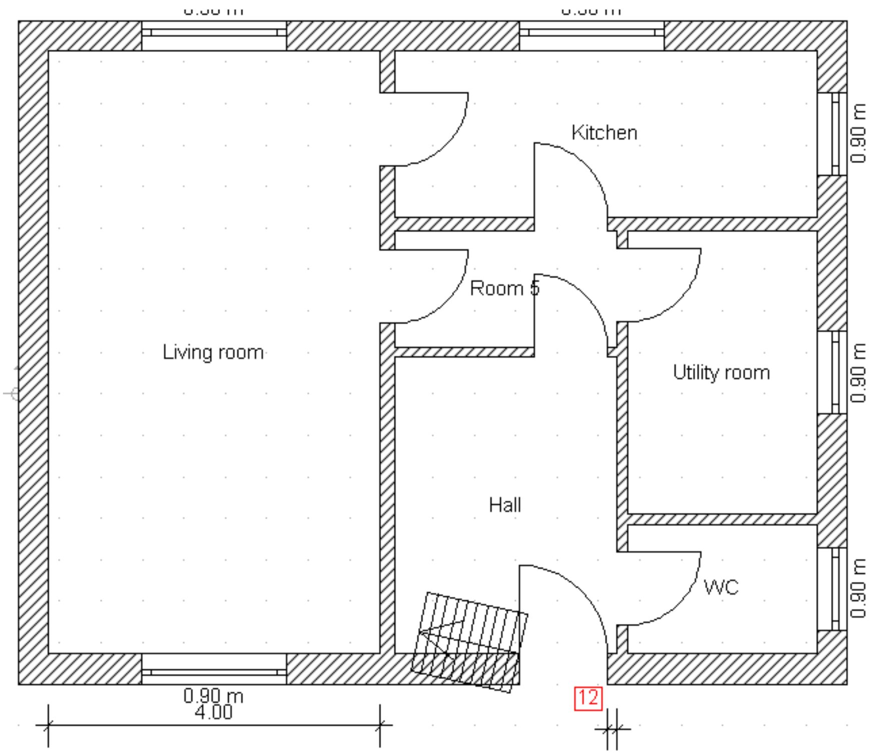


3.11 INSERTING STAIRS

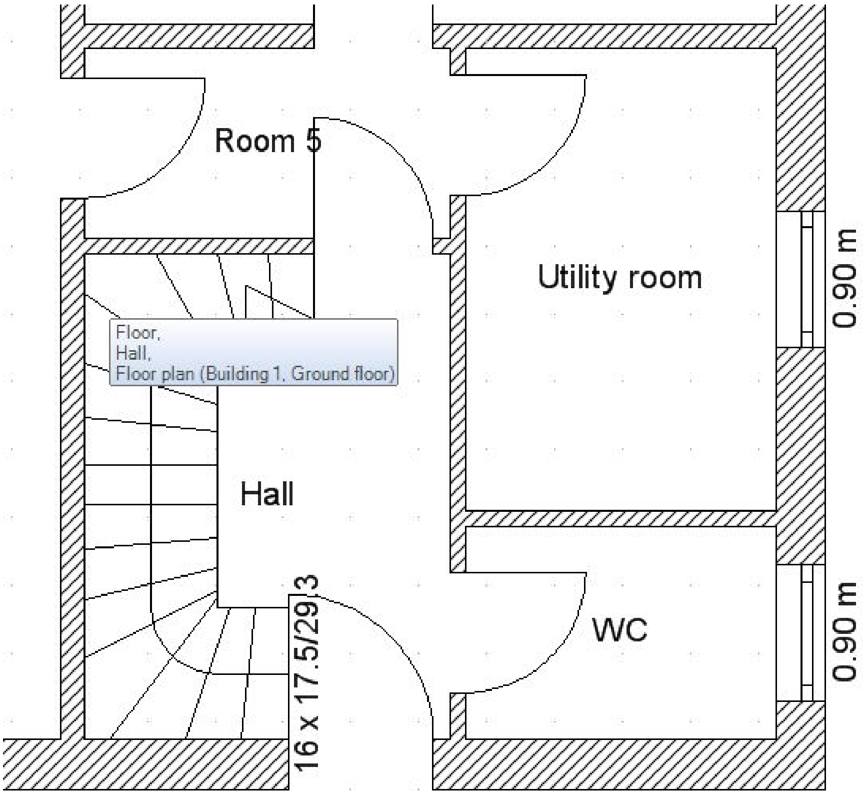
The ‘Stairs’ plug-in is located in the third horizontal toolbar, the plug-in toolbar. After the ‘Stairs’ plug-in has been activated the toolbar with the plug-in functions is updated and you start by clicking on the button for ‘Staircase construction’. You can choose from three types of staircase



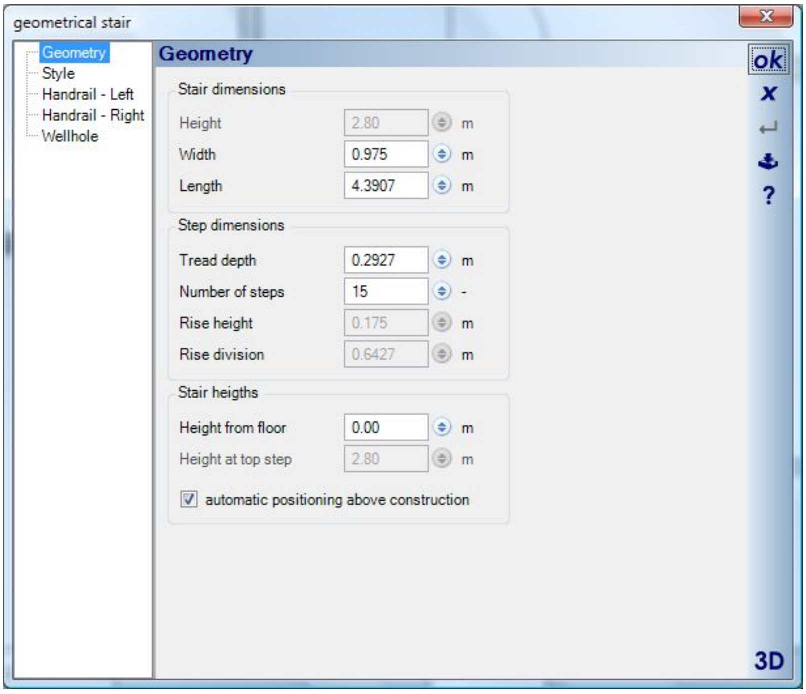
Select the ‘Geometrical stair’. Set the start point in the hall on the inside edge of the front door. The stairs are now attached to the cursor.



Change the reference point of the stairs with the key combination ‘Ctrl+w’ (select the bottom lower reference point). Click a second time in the bottom left-hand corner of the hall, a third time in the top left-hand corner of the hall and finally on the left edge of the door in the hall. Now press ‘Enter’ and the ‘stair’ dialog appears. Simply click on ‘OK’. The plan of the stairs should now appear as shown in the following illustration.



To edit the stairs select them with a left mouse click so that they are highlighted in red. With a right mouse click open the context menu and select properties. The ‘stair’ dialog appears.



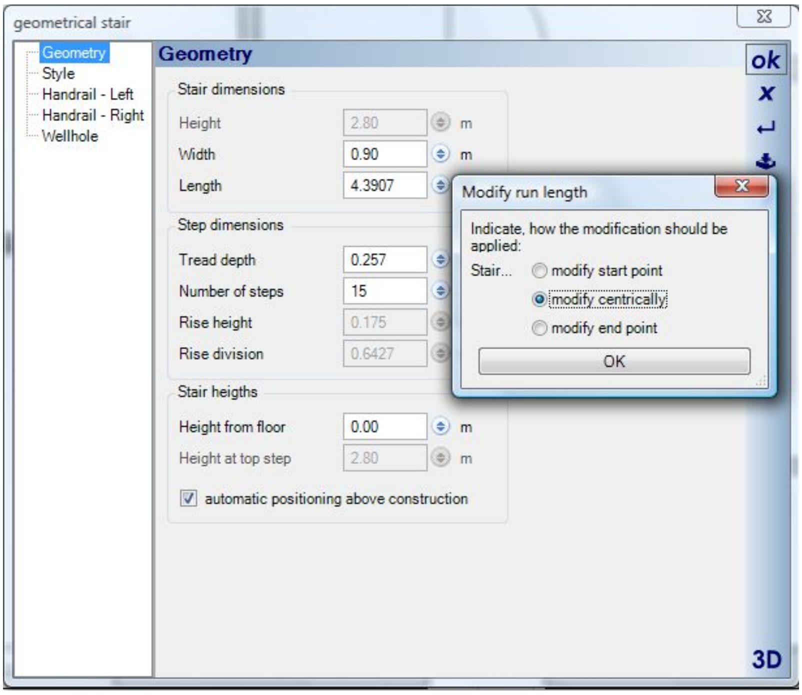
Geometry

Stair dimensions
Height 2.80 m
Width 0.975 m
Length 4.3907 m

Step dimensions
Tread depth 0.2927 m
Number of steps 15 -
Rise height 0.175 m
Rise division 0.6427 m

Stair heigths
Height from floor 0.00 m
Height at top step 2.80 m
☑ automatic positioning above construction

The dialog provides settings for the type of staircase construction (solid stairs or wooden stairs), for the type of banisters and the size of the wellhole Under ‘Geometry’ of the stair, set the width in ‘Stair dimensions’ to 90 cm and the tread depth to 25,7 cm. If you click on one of the other input fields the message ‘modify run length’ appears.



Geometry

Stair dimensions

Height 2.80 m
Width 0.90 m
Length 4.3907

Step dimensions

Tread depth 0.257
Number of steps 15
Rise height 0.175
Rise division 0.6427

Stair heigths

Height from floor 0.00 m
Height at top step 2.80 m

☑ automatic positioning above construction

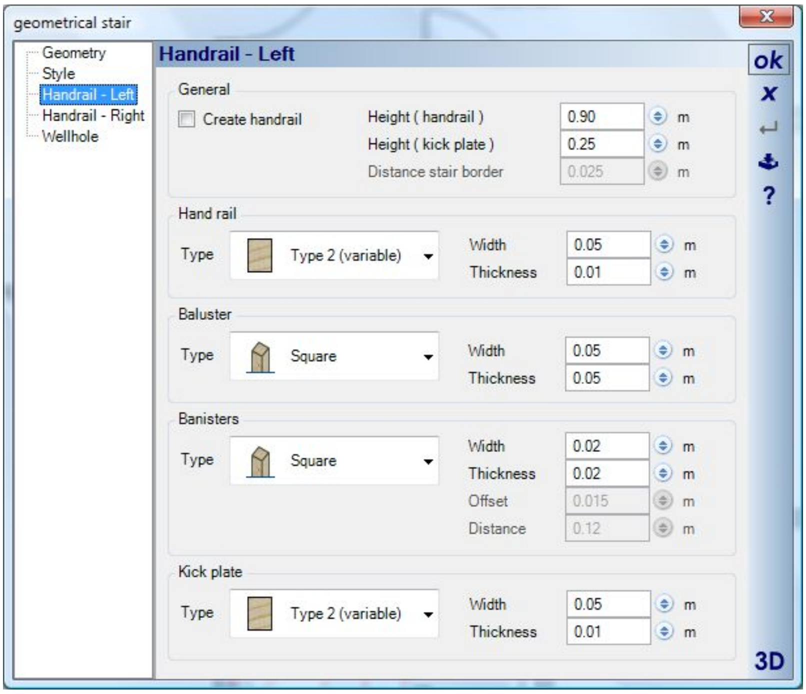
Modify run length

Indicate, how the modification should be applied:

Stair... ○ modify start point
● modify centrically
○ modify end point

OK

Select ‘modify centrically’ and close the dialog with ‘OK’. From the menu on the left select the properties dialog for ‘Handrail left’ and deactivate the option for ‘Create handrail’.



Handrail - Left

General

☐ Create handrail

Height (handrail) 0.90 m

Height (kick plate) 0.25 m

Distance stair border 0.025 m

Hand rail

Type: Type 2 (variable)

Width 0.05 m

Thickness 0.01 m

Baluster

Type: Square

Width 0.05 m

Thickness 0.05 m

Banisters

Type: Square

Width 0.02 m

Thickness 0.02 m

Offset 0.015 m

Distance 0.12 m

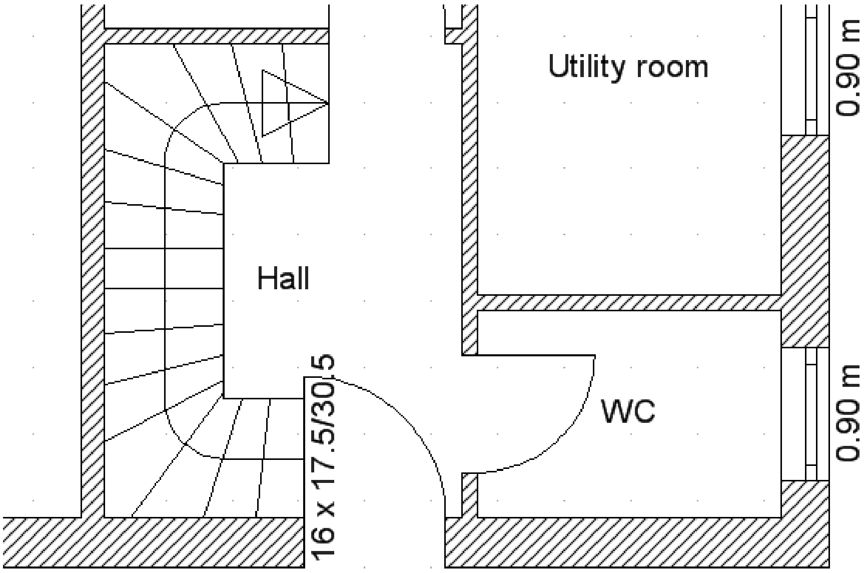
Kick plate

Type: Type 2 (variable)

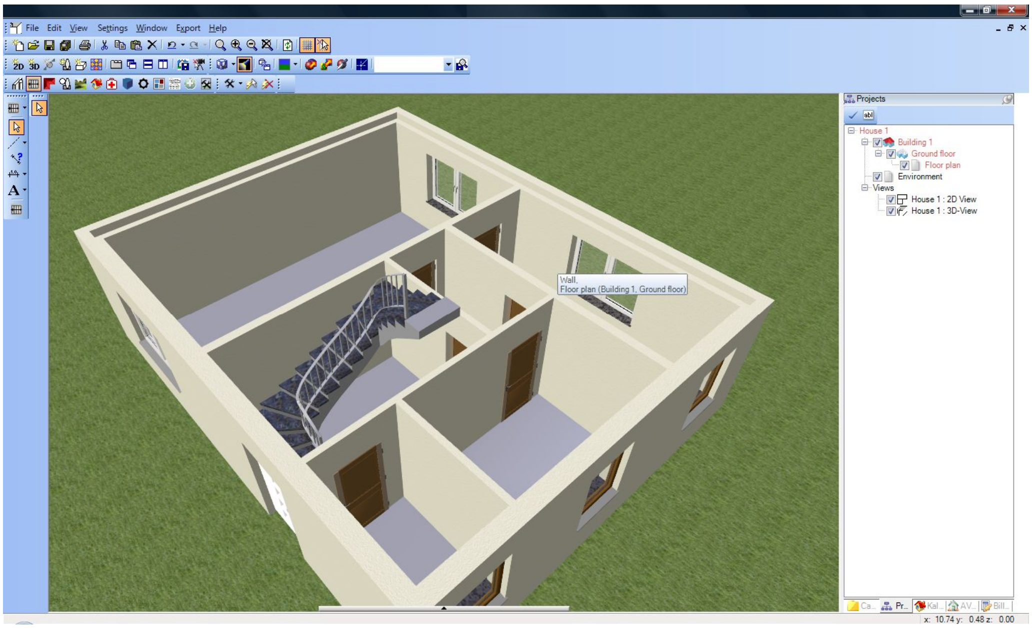
Width 0.05 m

Thickness 0.01 m

Close the dialog with ‘OK’. The stairs should now appear in the plan as shown in the following illustration:

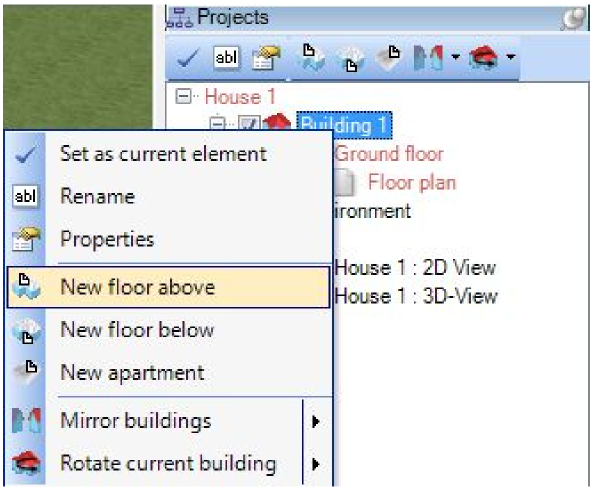


If you switch to the 3D view the following view should appear:

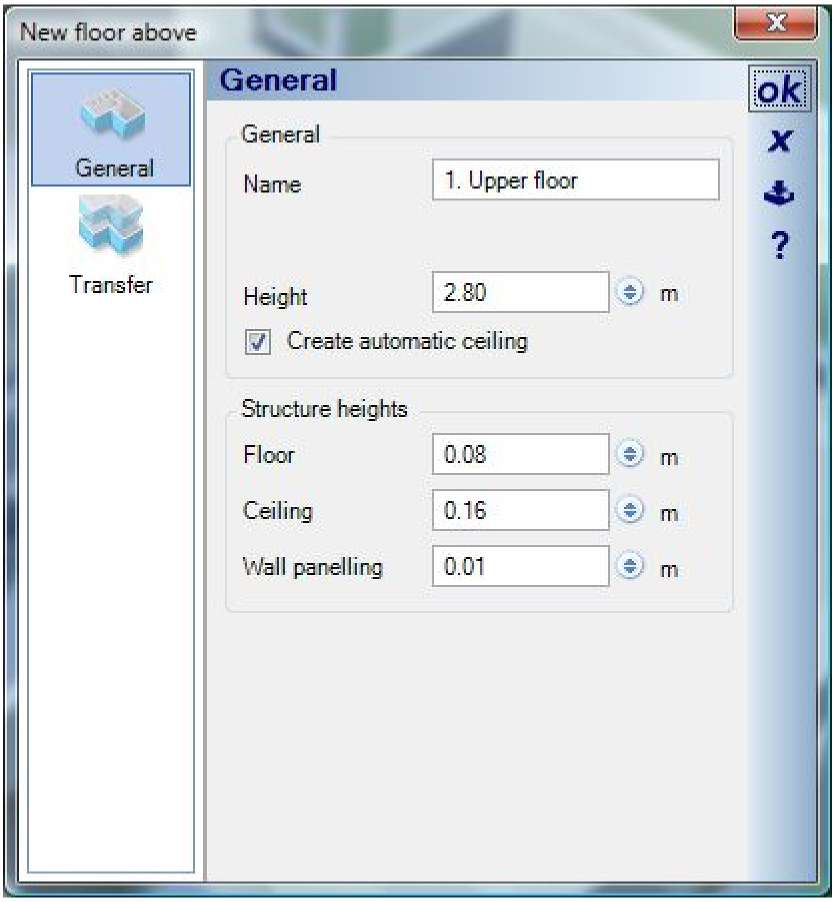


3.12 COPYING A FLOOR

To create a new floor above the current one, go to the project viewer, highlight Building 1 and open the following context menu with a right mouse click:



A click on ‘New floor above ‘opens the following dialog:



General

General

Name: 1. Upper floor

Height: 2.80 m

☑ Create automatic ceiling

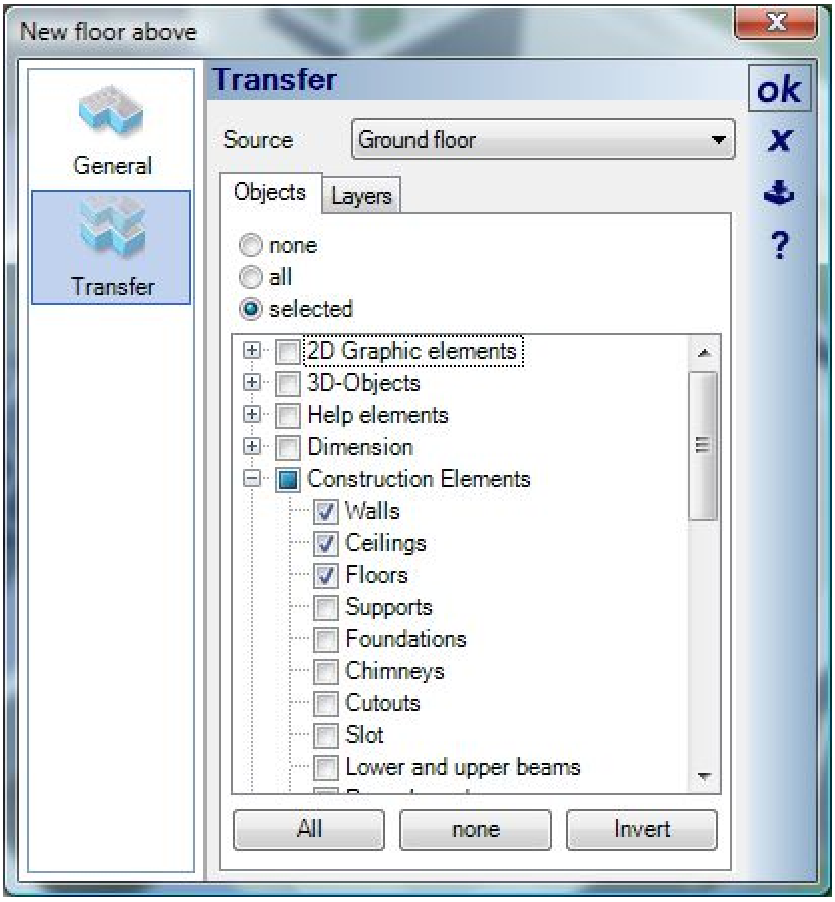
Structure heights

Floor: 0.08 m

Ceiling: 0.16 m

Wall panelling: 0.01 m

You can also open this ‘Floor’ dialog by clicking on the ‘New floor above’ button in the toolbar of the project viewer.
In the ‘Floor’ dialog select ‘Transfer’ in the left-hand column. Select under Objects ‘none’ to cancel the current selection, followed by ‘Selected’. Activate under ‘Construction elements’ only walls, floors and ceilings.



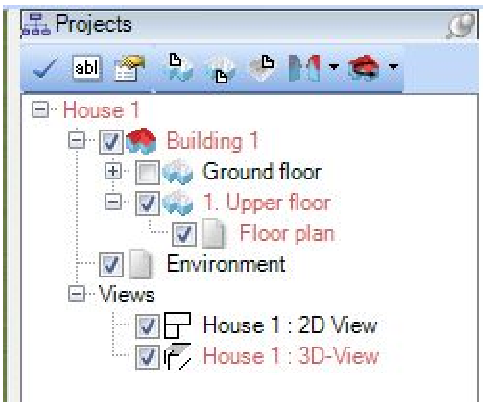
Transfer

Source: Ground floor

○ none
○ all
● selected

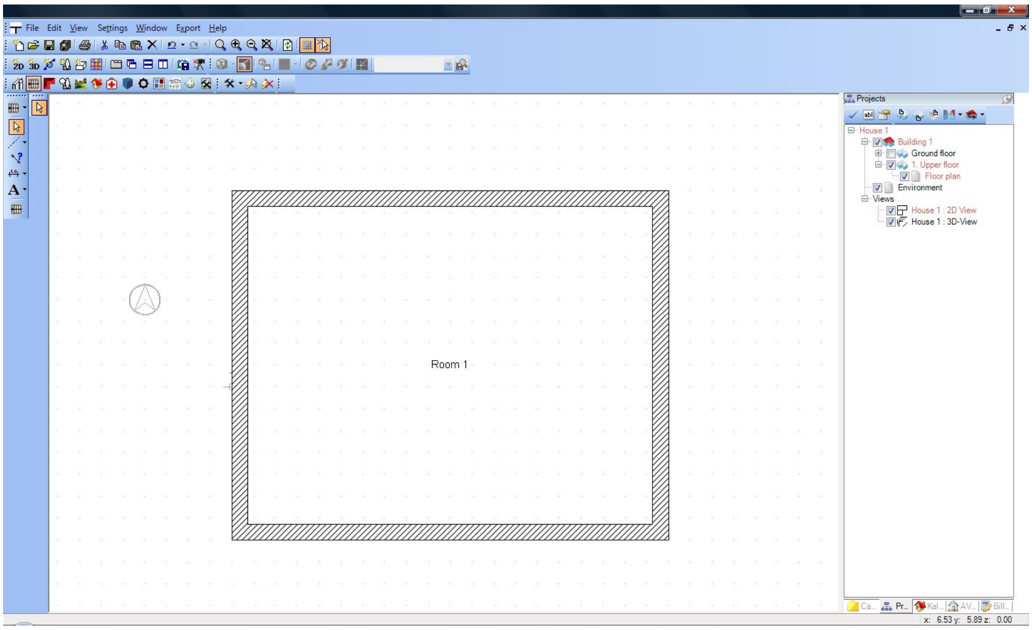
- ☐ 2D Graphic elements
- ☐ 3D-Objects
- ☐ Help elements
- ☐ Dimension
- ■ Construction Elements
  - ☑ Walls
  - ☑ Ceilings
  - ☑ Floors
  - ☐ Supports
  - ☐ Foundations
  - ☐ Chimneys
  - ☐ Cutouts
  - ☐ Slot
  - ☐ Lower and upper beams

Confirm the settings with ‘OK’. You now see the ground floor and the upper floor on top of each other. To show just the upper floor deactivate the ground floor in the project viewer.



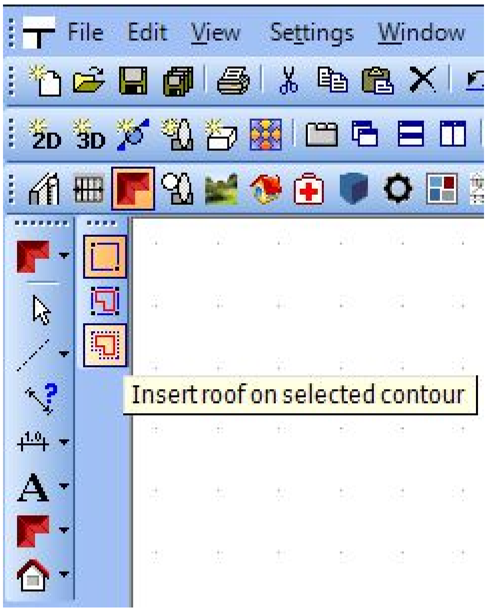
- House 1
  - ☑ Building 1
    - ☐ Ground floor
    - ☑ 1. Upper floor
      - ☑ Floor plan
  - ☑ Environment
  - Views
    - ☑ House 1 : 2D View
    - ☑ House 1 : 3D-View

Delete the interior walls by selecting a wall and then pressing ‘Del’ on the keyboard.

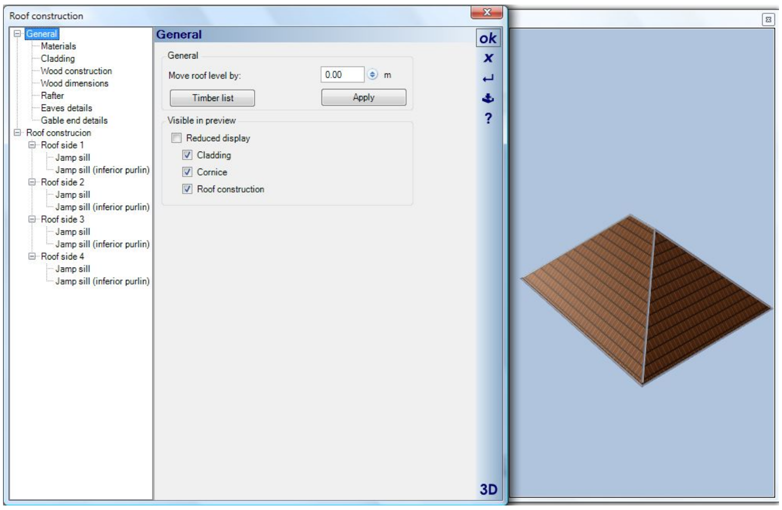


3.13 INSERTING A ROOF

To insert a roof on the top floor, select the 'Roof construction' plug-in in the plug-in toolbar (the third horizontal toolbar). Now click again on the 'Roof construction' button in the plug-in functions in the left-hand vertical toolbar.



Select 'Insert roof on selected contour'. Move the cursor over the plan. As soon as the contour of the building is recognised it is outlined in green. With a left mouse-click open the ‘Roof construction’ dialog. Click on the ‘3D’ button in the bottom right-hand corner to obtain a 3D view of the roof.



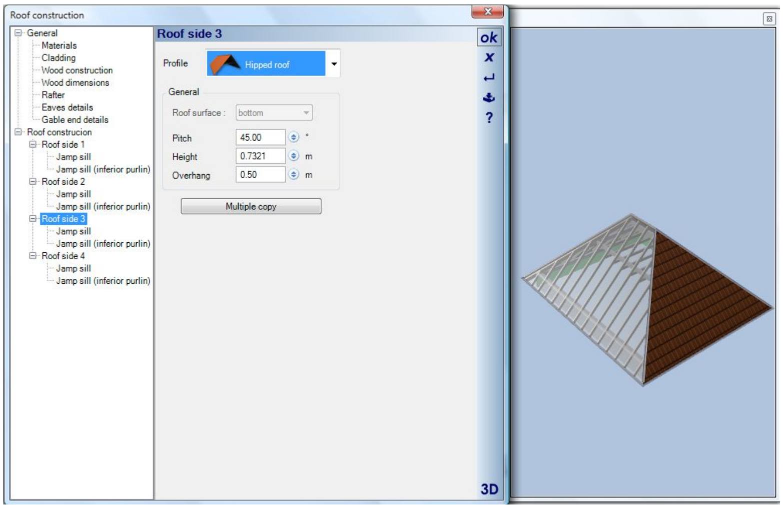
General

Move roof level by: 0.00 m

Visible in preview

☐ Reduced display
☑ Cladding
☑ Cornice
☑ Roof construction

In the 3D view you can select a roof plane directly with a mouse-click and specify settings for profile, pitch, height and overhang.

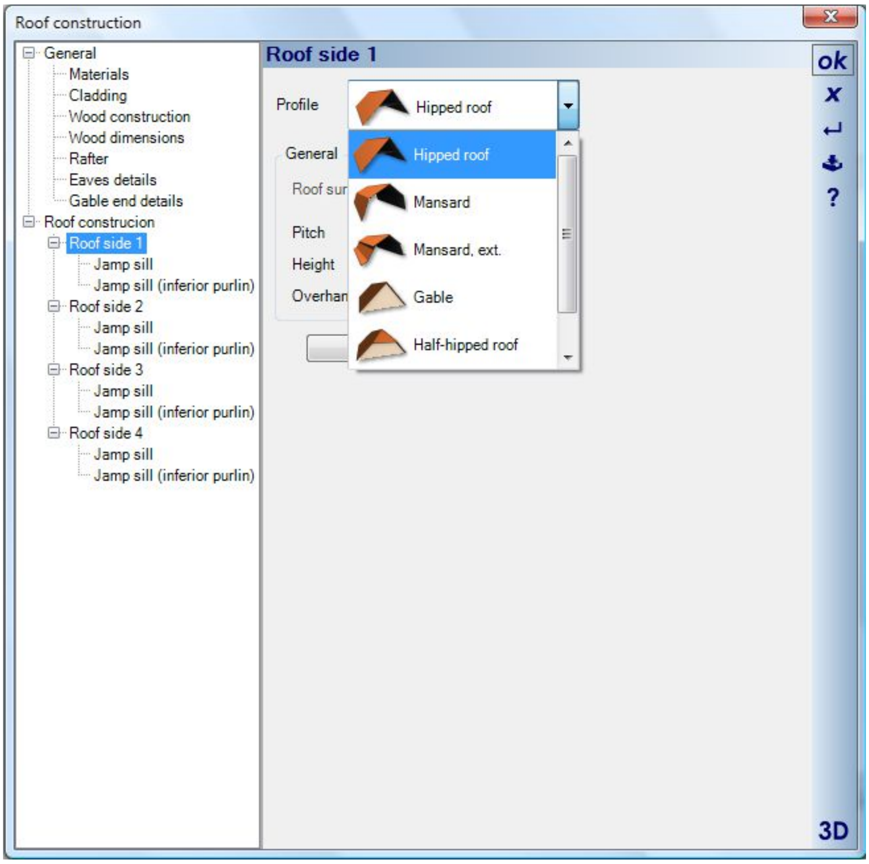


Profile: Hipped roof

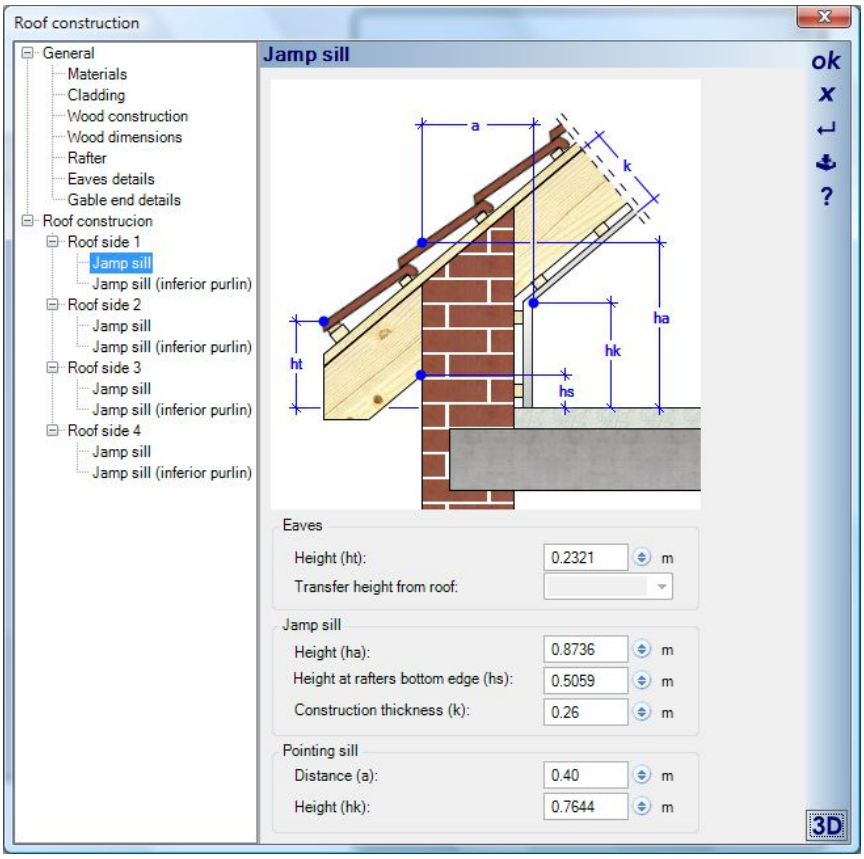
General

Roof surface : bottom
Pitch: 45.00 °
Height: 0.7321 m
Overhang: 0.50 m

Under ‘Profile’ you can choose from the most common types of roof profile.



For Roof side 1 click on ‘Jamp sill’



Eaves

Height (ht): 0.2321 m

Transfer height from roof:

Jamp sill

Height (ha): 0.8736 m

Height at rafters bottom edge (hs): 0.5059 m

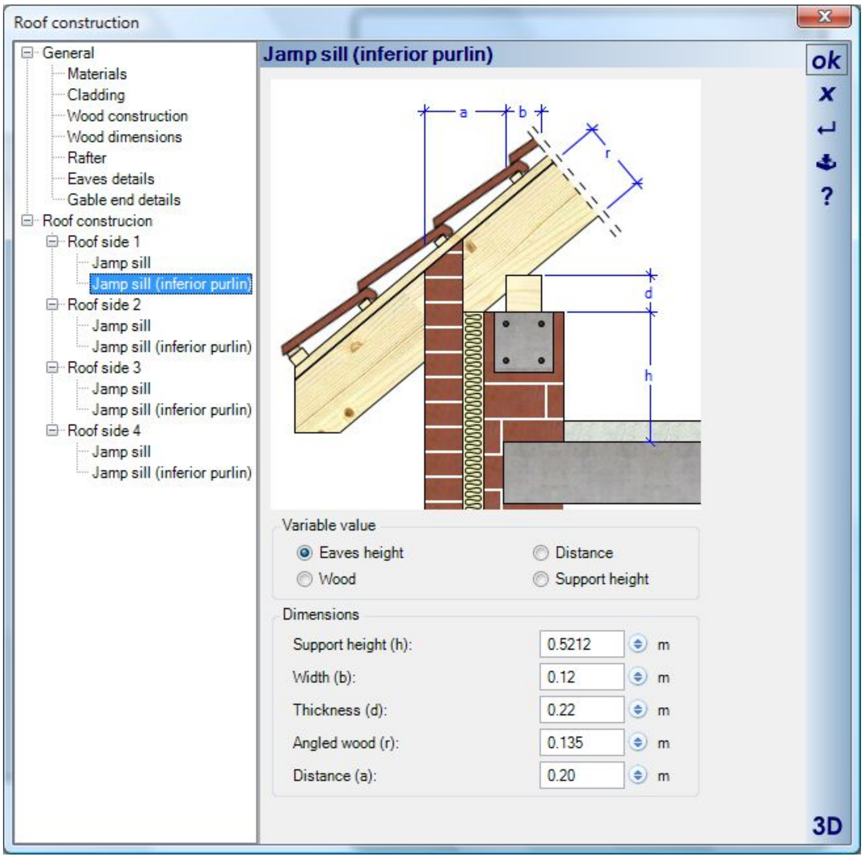
Construction thickness (k): 0.26 m

Pointing sill

Distance (a): 0.40 m

Height (hk): 0.7644 m

Here you can specify the parameters for the architectural aspects of the roof, e.g. height of the intersection: outside edge of brickwork / top edge of roof, or height of the eaves above the finished floor level, or height of the pointing sill etc.
If on the other hand, you click on ‘Jamp sill (inferior purlin)’ for Roof side 1,



Jamp sill (inferior purlin)

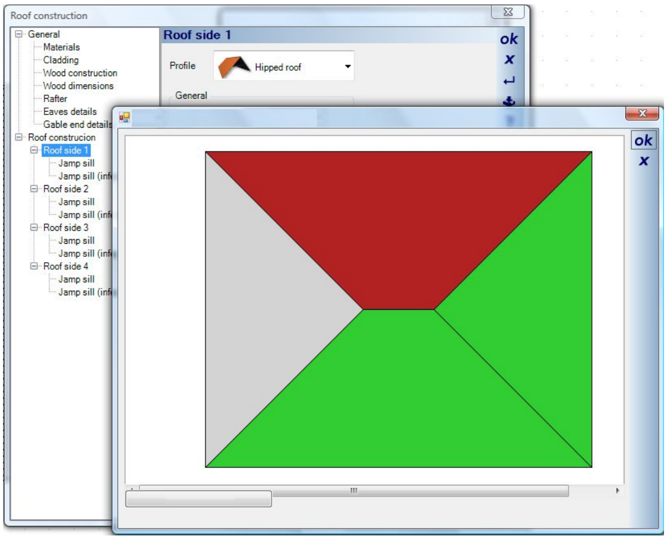
Variable value

● Eaves height ○ Distance
○ Wood ○ Support height

Dimensions

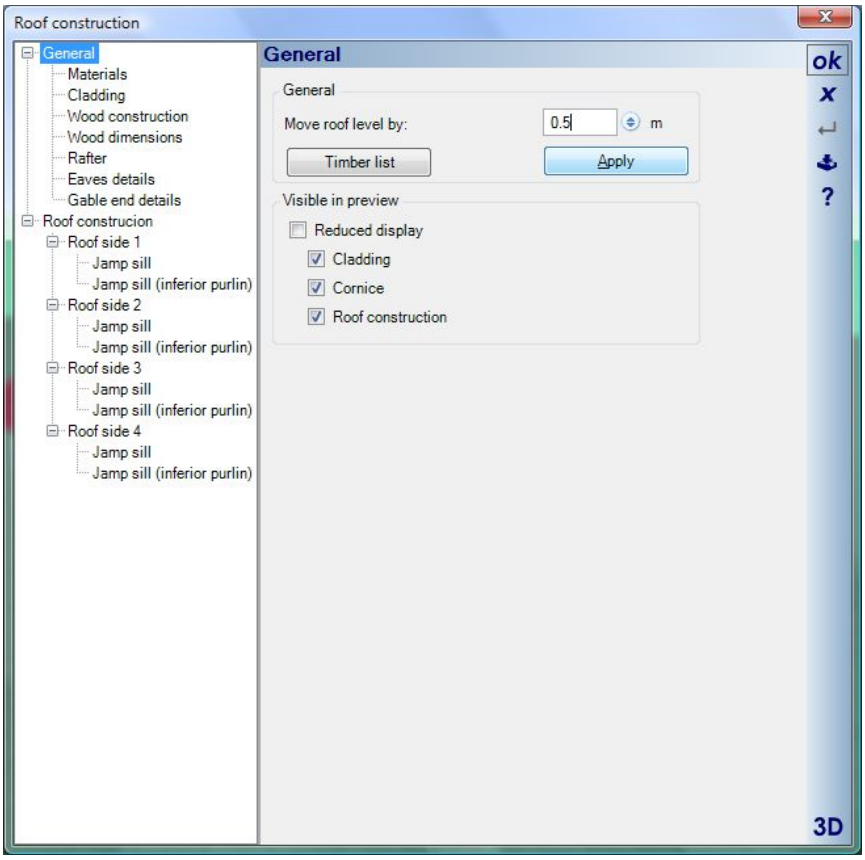
Support height (h): 0.5212 m
Width (b): 0.12 m
Thickness (d): 0.22 m
Angled wood (r): 0.135 m
Distance (a): 0.20 m

here you can specify the roof heights for the structural aspects, e.g. support height of the eaves , width and thickness of the purlin etc. You can specify individual settings for each roof plane, or alternatively you can copy the settings from one roof plane to other roof planes. If for example you are in roof plane 1,



you can copy the settings for profile, pitch/, height and overhang.
Accept the default settings by clicking on ‘OK’.

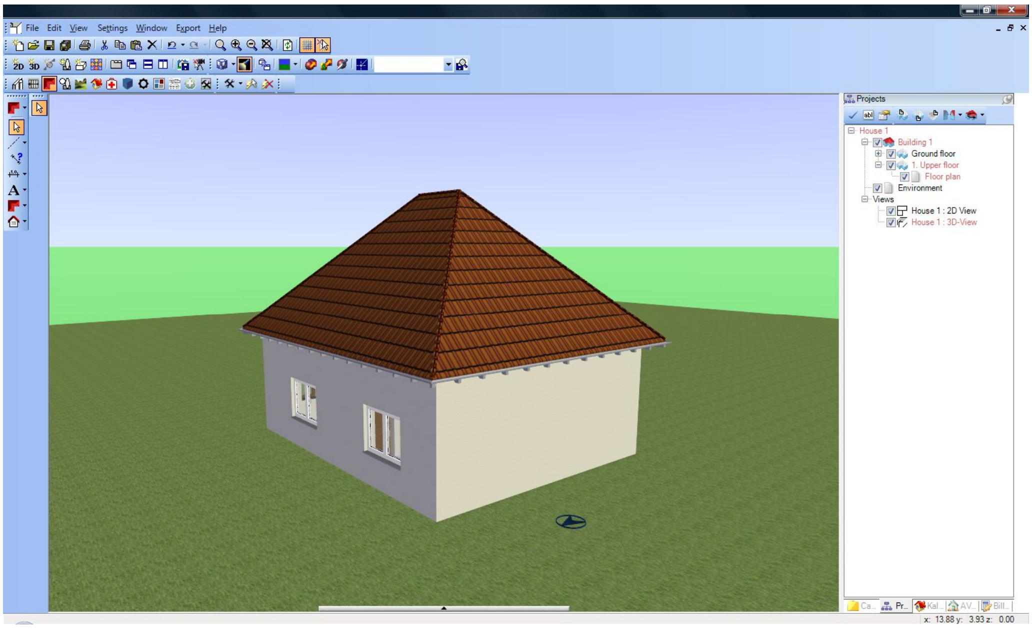
In the plan the top view of a hipped roof is shown. If you switch to the 3D view you can see that the roof is set slightly too low. Select the roof in the 3D view and with a double-click enter the ‘Roof construction’ dialog again. Under ‘General’ we find ‘Move roof level by“. Enter 50 cm here and click on ‘Apply“.



Move roof level by: 0.5 m

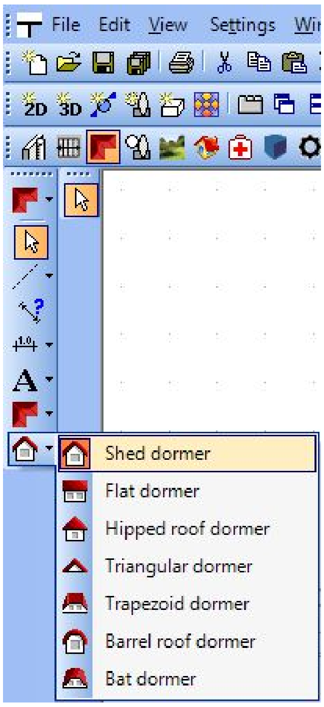
☐ Reduced display
☑ Cladding
☑ Cornice
☑ Roof construction

Click on ‘OK’ to exit the dialog, resulting the following view:

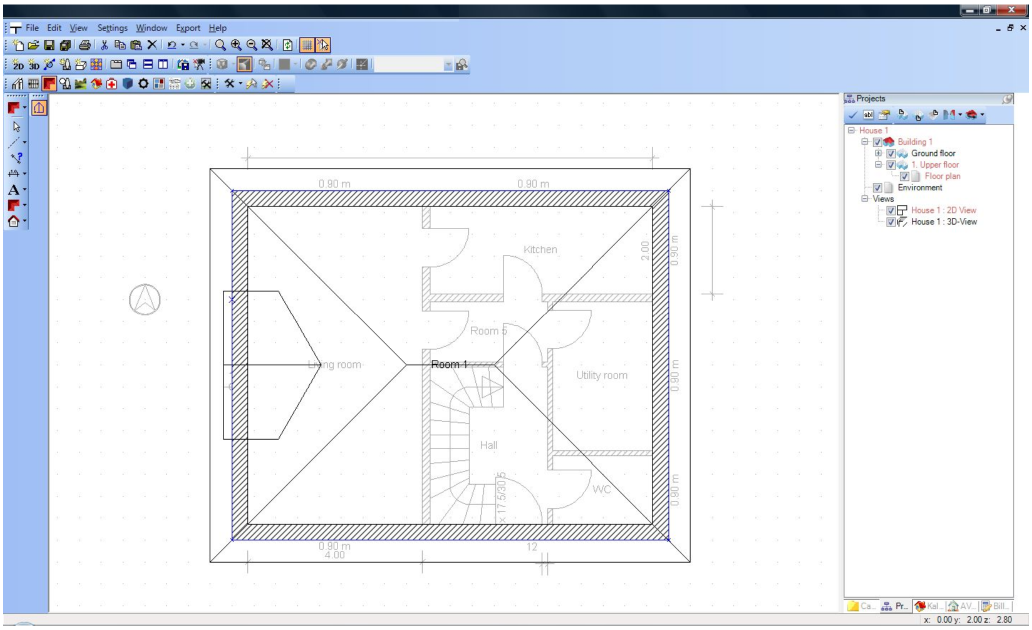


3.14 INSERTING DORMERS

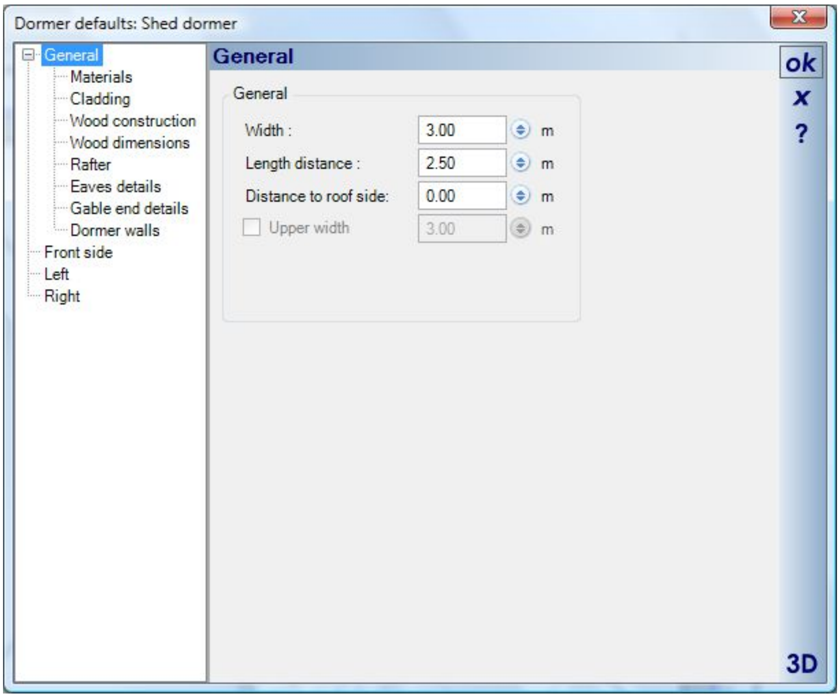
Click on the ‘Roof construction’ button in the plug-in toolbar (the third horizontal toolbar). At the end of the plug-in functions in the vertical toolbar we now see the button for ‘dormers with an arrow to open the selection window.



Select the Shed dormer. The dormer is now attached to the cursor and can be dropped onto the roof. Move the cursor to the outside edge of the left exterior wall and drop the dormer on the roof with a left mouse click.



The ‘Dormer’ dialog is now opened.


Dormer defaults: Shed dormer

General

General

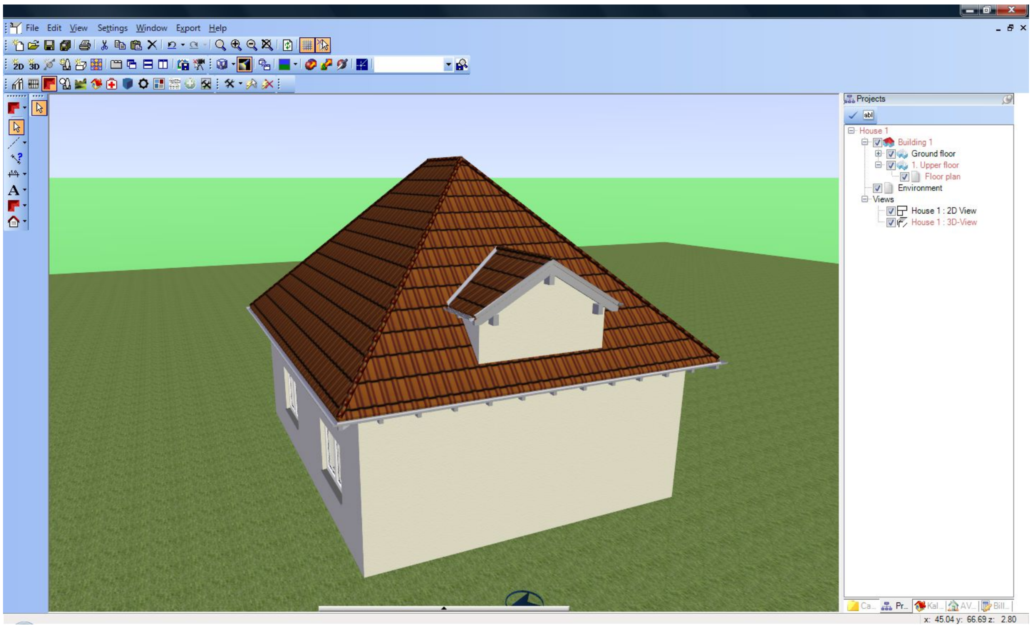
Width : 3.00 m

Length distance : 2.50 m

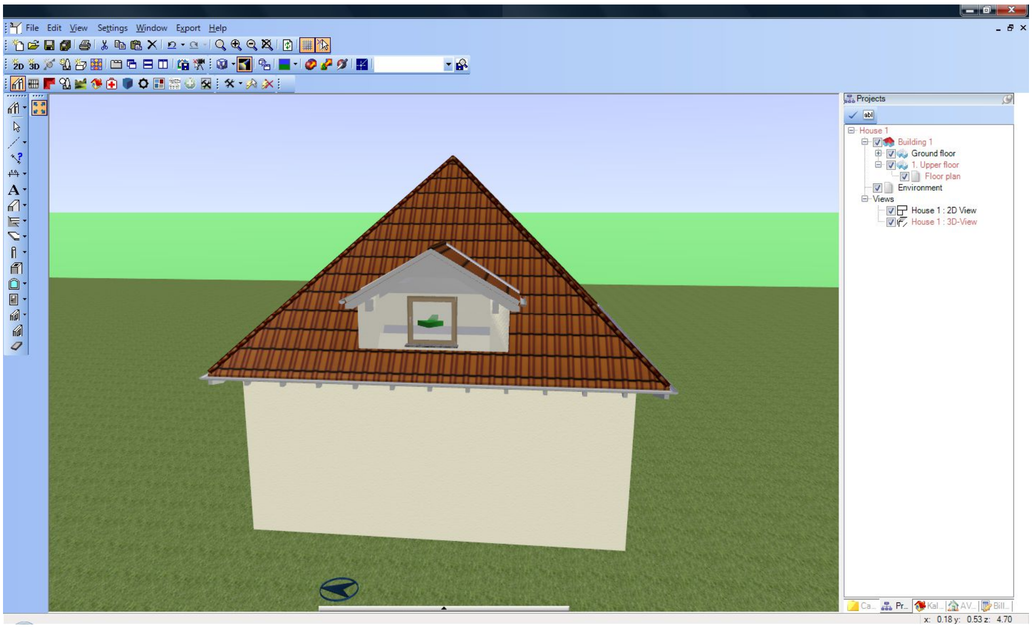
Distance to roof side: 0.00 m

☐ Upper width 3.00 m

Click on ‘OK’ to accept the settings shown under ‘General’. Over the sub-items of ‘General’ we can specify the settings for ‘Materials’, ‘Cladding’, ‘Timber construction', 'Timber dimensions etc., which we are familiar with from the 'Roof construction' dialog.

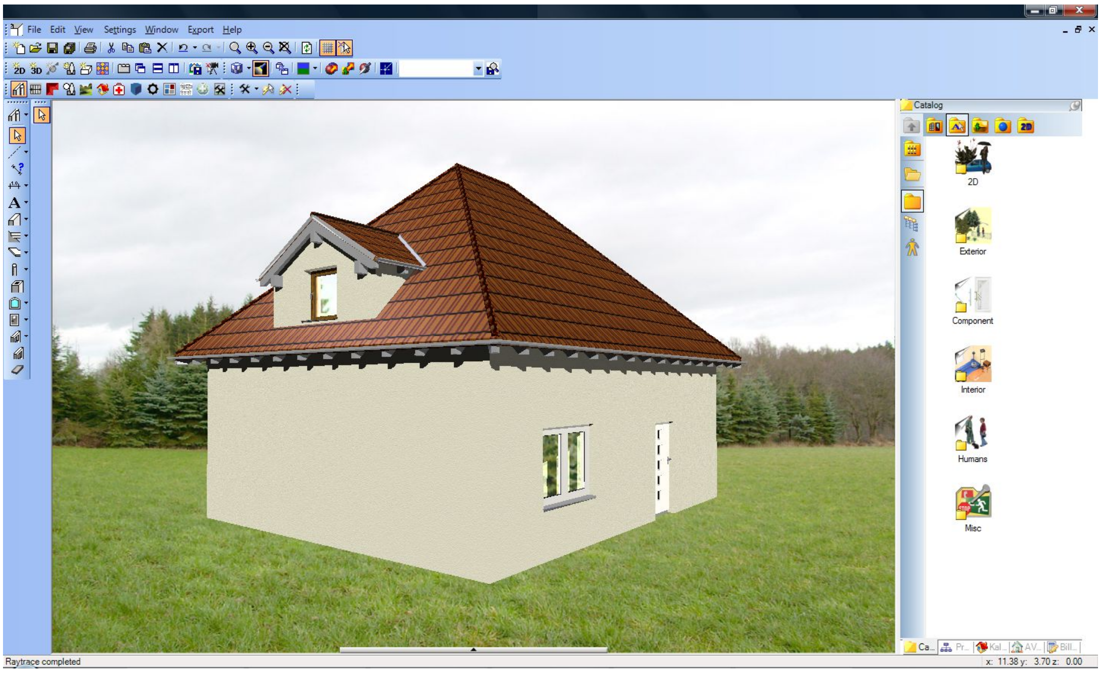


Now you can insert a window in the front wall of the dormer.



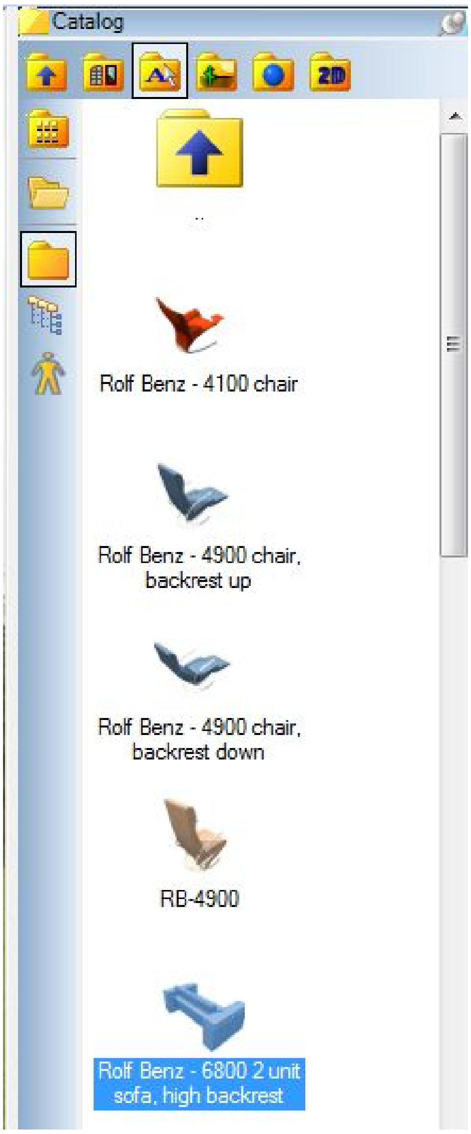
3.15 OBJECTS, TEXTURES AND MATERIALS

Objects, textures and materials are found in the ‘Catalog’ on the right-hand side (bottom left-hand tab), where the ‘Project viewer’ is also located.

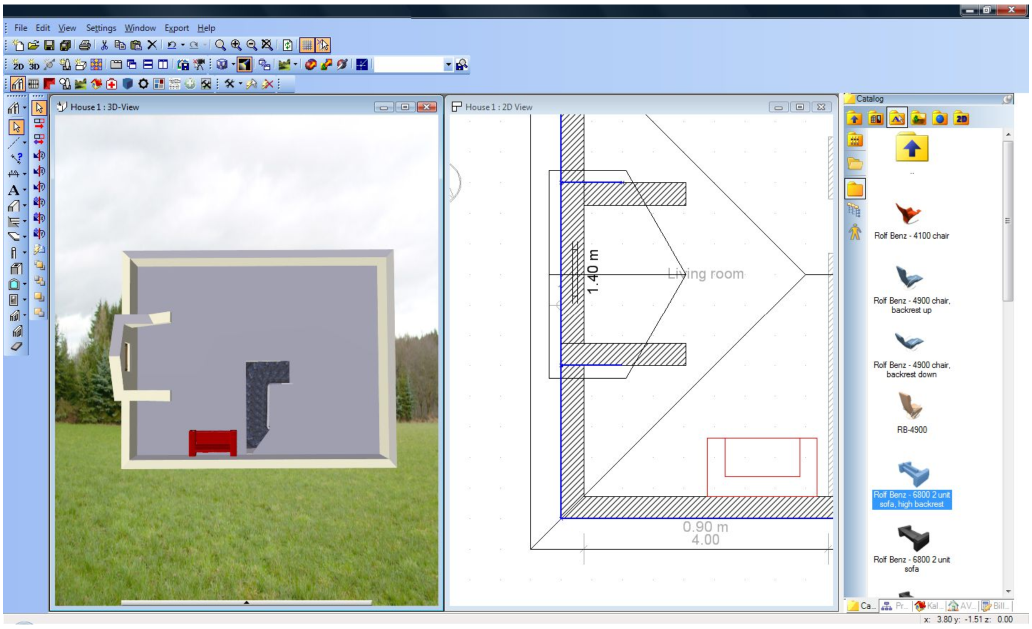


3.15.1 Objects

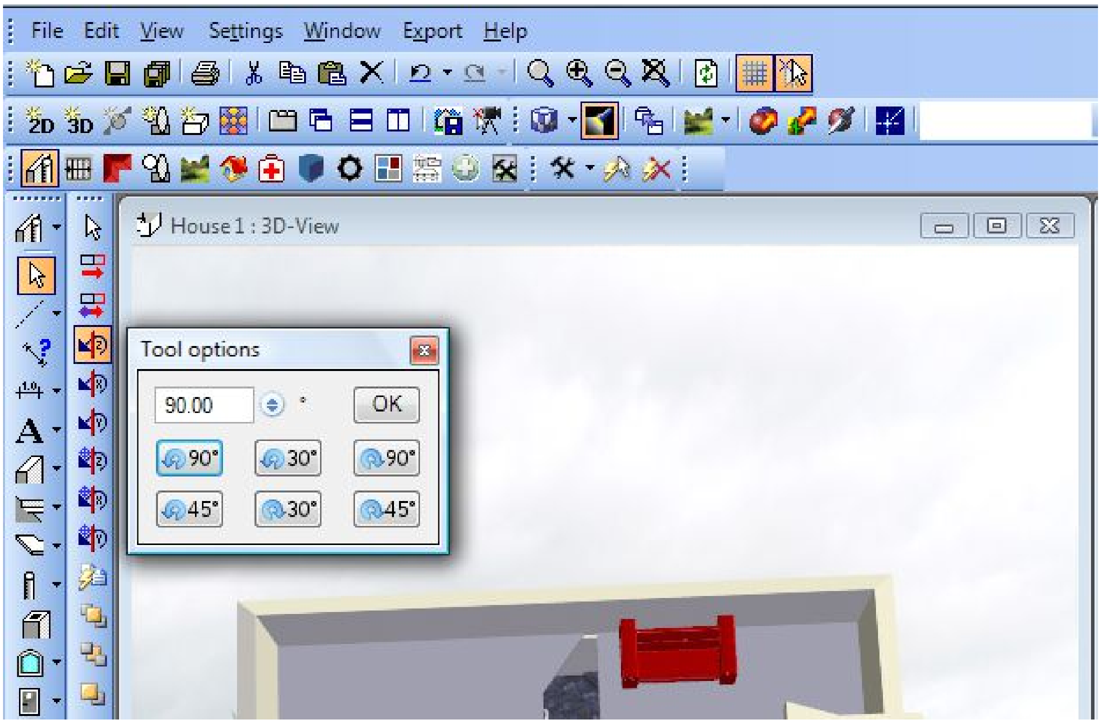
The object catalog is activated over the ‘Object’ button in the catalog toolbar on the top right. A list appears with various folders (sub-directories), as can be seen in the above illustration. Here we find not only 3D objects such as furnishings and plants, but also human figures and 2D projections, which you can use to enliven scenes.
To insert such an object in the plan, we proceed as follows:
With a double click open the folder for ‘Interior\Seats’ and select one of the sofas.


Catalog
2D
..
Rolf Benz - 4100 chair
Rolf Benz - 4900 chair, backrest up
Rolf Benz - 4900 chair, backrest down
RB-4900
Rolf Benz - 6800 2 unit sofa, high backrest

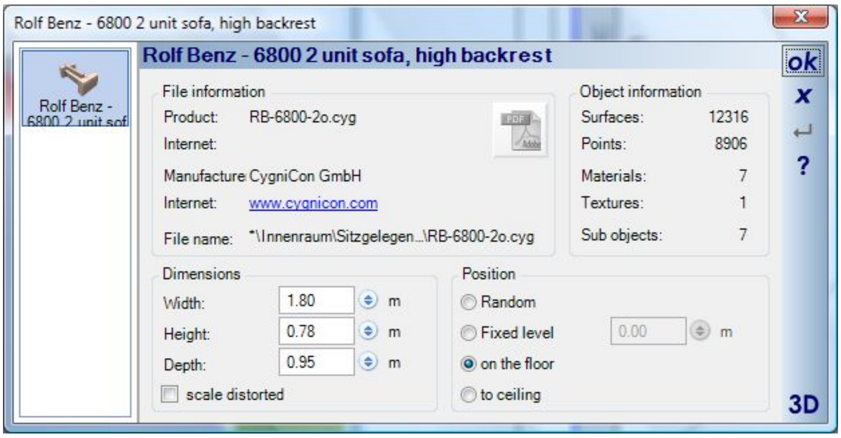
Using drag and drop move the object into the plan and place it with a left mouse click.


File Edit View Settings Window Export Help
House 1 : 3D-View
House 1 : 2D View
1.40 m
Living room
0.90 m
4.00
Catalog
Rolf Benz - 4100 chair
Rolf Benz - 4900 chair, backrest up
Rolf Benz - 4900 chair, backrest down
RB-4900
Rolf Benz - 6800 2 unit sofa, high backrest
Rolf Benz - 6800 2 unit sofa
x: 3.80 y: -1.51 z: 0.00

The insertion and editing of objects is possible in both 2D and 3D views. When an object is selected, functions for editing the object, e.g. ‘Rotate object about z-axis’, ‘Position object’ etc., are activated in the second vertical toolbar to the left of the view.



A right mouse-click opens a context menu and over ‘Properties’ the object dialog can be activated, in which settings for the dimensions and installation height of the object can be specified.



Rolf Benz - 6800 2 unit sofa, high backrest

Rolf Benz - 6800 2 unit sofa, high backrest

File information
Product: RB-6800-2o.cyg
Internet:
Manufacture CygniCon GmbH
Internet: www.cygnicon.com
File name: *\Innenraum\Sitzgelegen...\RB-6800-2o.cyg

Object information
Surfaces: 12316
Points: 8906
Materials: 7
Textures: 1
Sub objects: 7

Dimensions
Width: 1.80 m
Height: 0.78 m
Depth: 0.95 m
☐ scale distorted

Position
○ Random
○ Fixed level 0.00 m
● on the floor
○ to ceiling

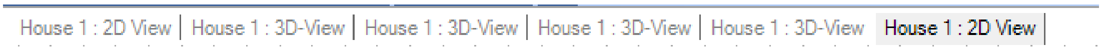
Additionally, certain information such as manufacturer and suppliers may be provided for the object.

4 PROPERTIES OF VIEWS

4.1 ARRANGING VIEWS

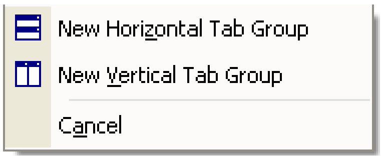
The 'View' toolbar and the corresponding menu offer the usual functions for arranging views – cascaded, and horizontally or vertically tiled. In addition, the software offers with the button, the option of presenting the views in tabbed form. After the button has been activated it is locked to prevent access to the other functions for arranging views. By clicking once more on the tab option button the views are once again cascaded.

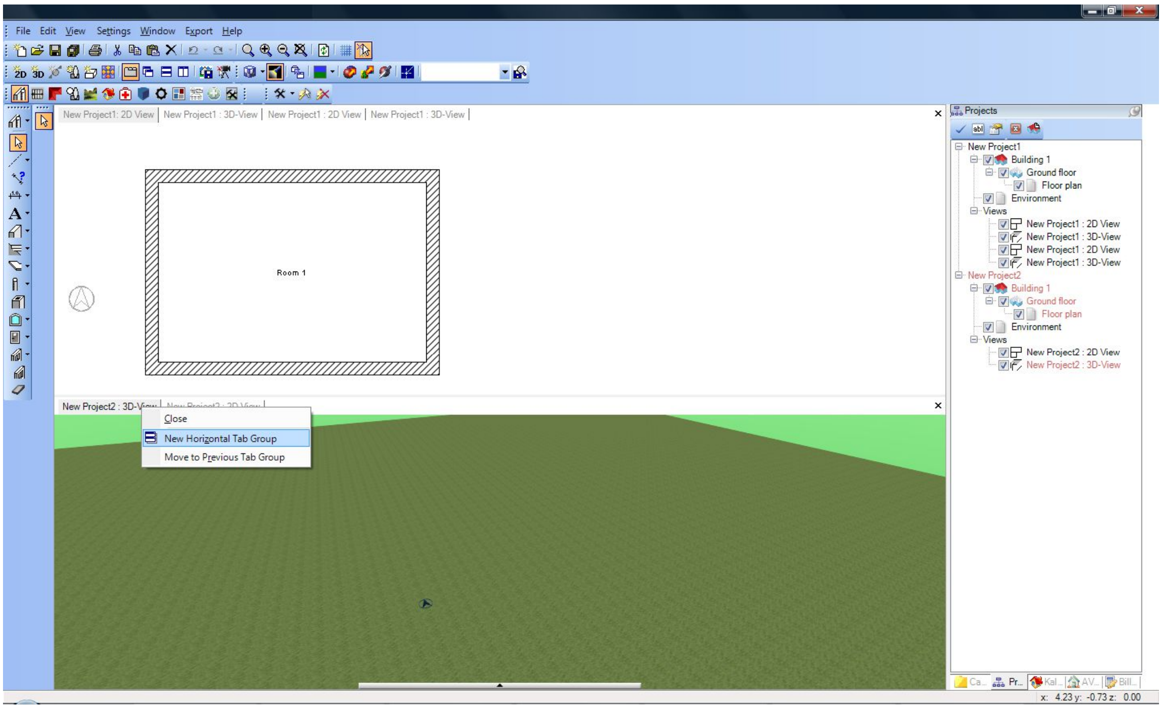
4.2 TAB PAGES



With the tab option, all the views are grouped together in the top margin of the planning area. If there is not sufficient space to show all views, the views that are not shown can be accessed over the left and right arrow buttons ◁ ▶ ✕. The currently active view can be closed with the ✕ button.

Tabs can be grouped together horizontally or vertically by dragging one of the displayed views into the planning area of an active group using the mouse. On releasing the left mouse button, a context menu appears over which the type of tab group can be defined or the action cancelled.

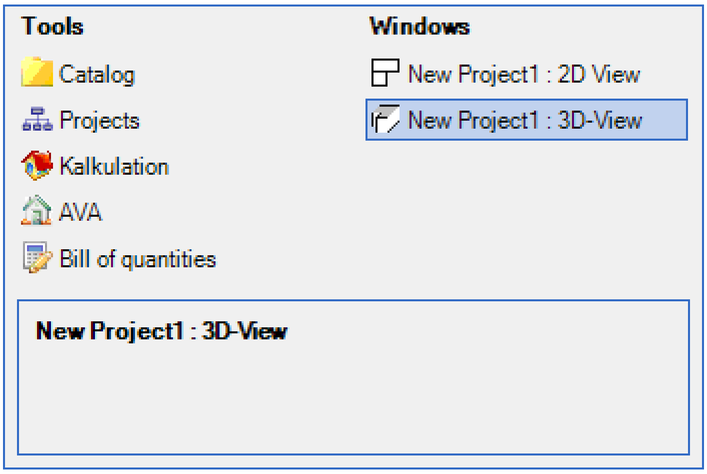




The size of the displayed groups can be modified with the mouse at their borders.

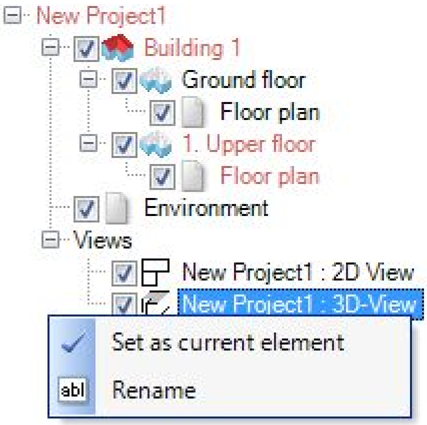
4.3 SWITCHING VIEWS

In addition to the usual ways of switching views, i.e. over the menu box, the title bar or the corresponding tab, there are two other possibilities. First, the key combination ‘Ctrl+Tab’ activates a dialog to switch views.



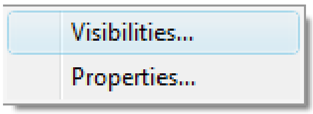
By holding down ‘Ctrl’ you can switch between the views and the tools with the arrow keys on the keyboard. As soon as you release ‘Ctrl’, the dialog is closed and the selected view is activated.

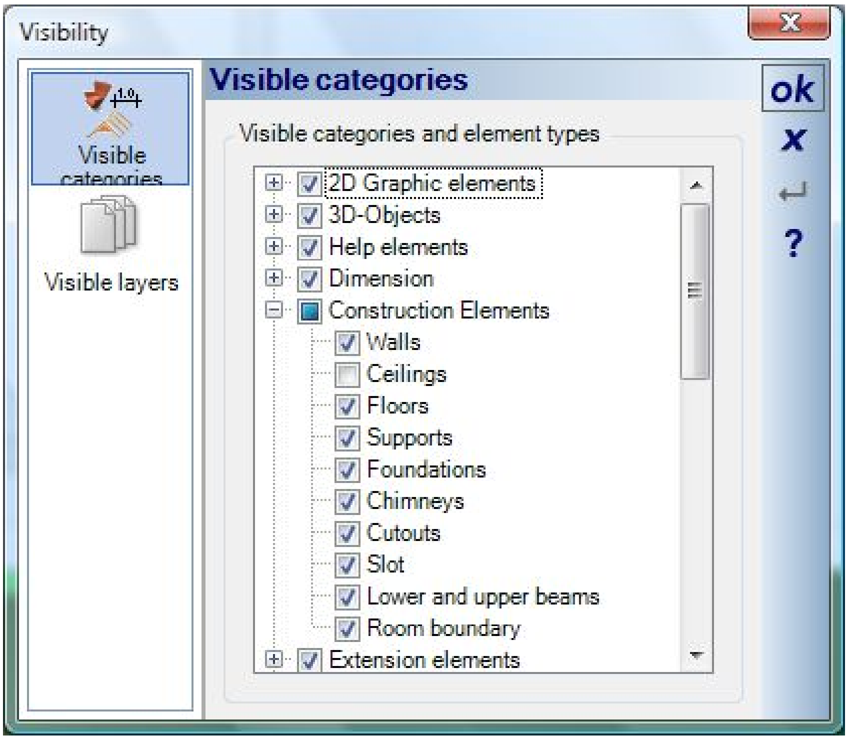
Second, in the project viewer click on a view to select it, right-click to open the context menu and then set it as the current element.



4.4 VISIBILITIES

The visibility settings for the object types registered in your software can be modified separately for each view. Use of the visibility feature improves clarity and speeds up planning.
The ‘Visibility’ dialog with parts for ‘Visible categories’ and ‘Visible layers’, can be activated over the context menu opened by a right mouse-click on the selected view.

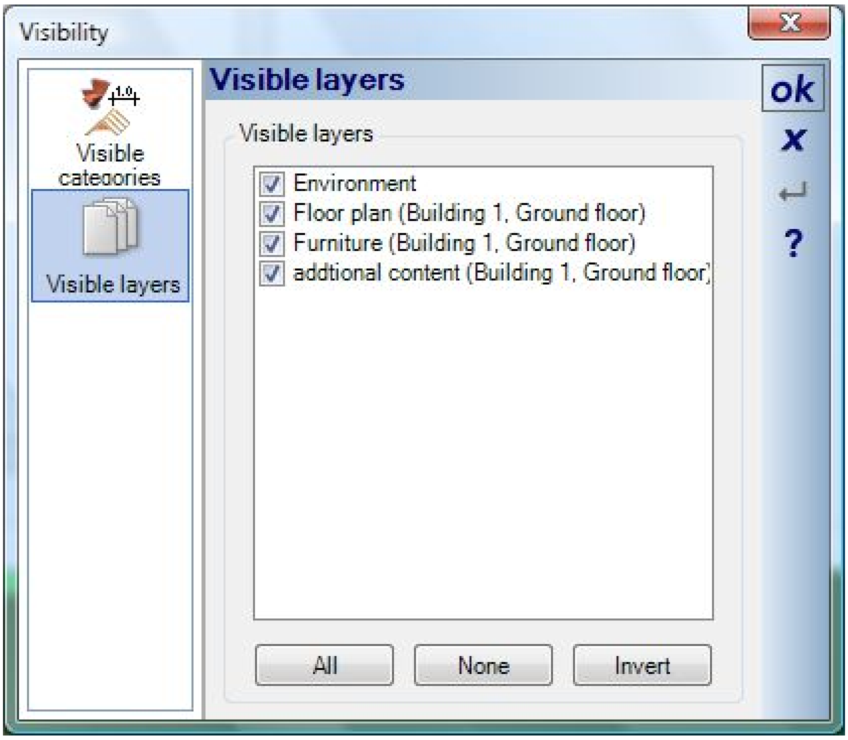




Visible categories and element types

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension
- ▣ Construction Elements
  - ☑ Walls
  - ☐ Ceilings
  - ☑ Floors
  - ☑ Supports
  - ☑ Foundations
  - ☑ Chimneys
  - ☑ Cutouts
  - ☑ Slot
  - ☑ Lower and upper beams
  - ☑ Room boundary
- ☑ Extension elements

All elements registered in your software are presented hierarchically in the ‘Visible Categories’ area of the dialog box. In the tree structure you can deactivate each element individually. A checked box ☑ indicates that the corresponding element or the entire category is visible. ▣ indicates that at least one of the elements in this category has been set to invisible.



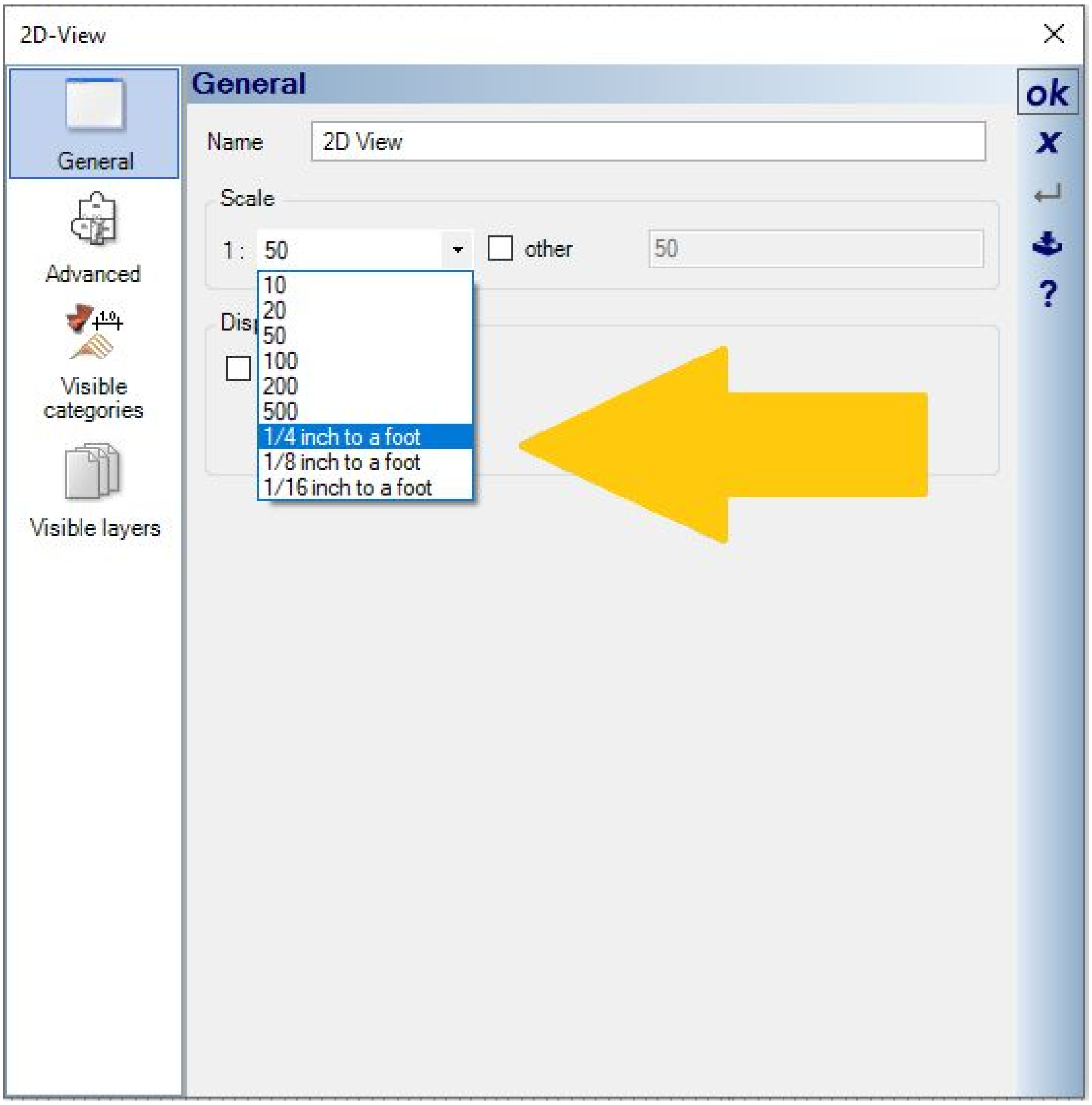
Visible layers

- ☑ Environment
- ☑ Floor plan (Building 1, Ground floor)
- ☑ Furniture (Building 1, Ground floor)
- ☑ addtional content (Building 1, Ground floor)

'Visible layers' shows all layers for the project to which the view, belongs, from which the dialog was opened. You can also change the visibility of layers, buildings and floors (which are also just layers) over the project viewer.

4.5 SCALE

You can set the scale individually for each 2D view over the properties dialog, which is activated over the context menu opened by a right mouse click in the active 2D view.



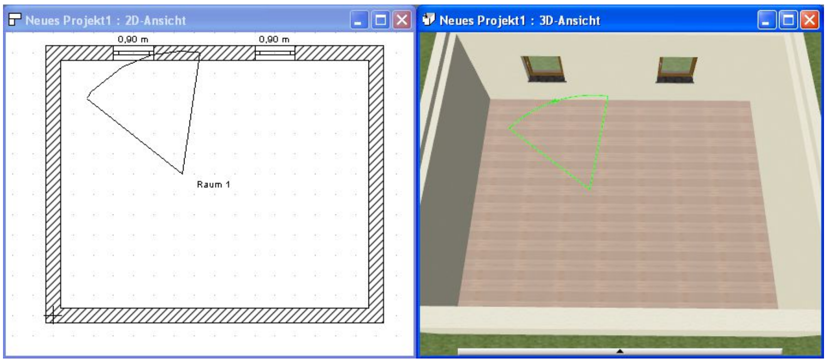
Name: 2D View

Scale

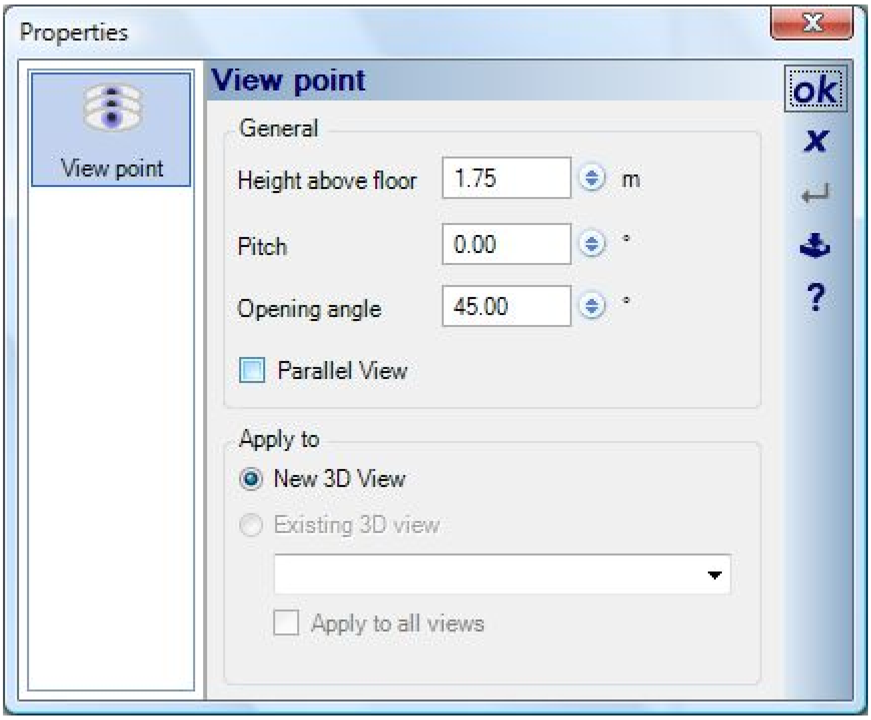
1 : 50 ☐ other 50

4.6 SETTING A 3D VIEW POINT

With the button you can activate the dialog to set a view point. Although the result only has an affect on one or more 3D views, it is possible to set a view point equally in 2D plan views as well as in 3D views. After a click on the button, you can define in the chosen view, with the first left mouse click the view point, and then with the second left mouse click a direction. As an aid, a preview of the direction and current angle defined is shown in all views.



The second mouse-click opens the ‘Properties’ dialog. Apart from the height above the floor, the pitch and the opening angle, you can also specify whether a new 3D view should be opened, or whether the new view point should apply to an existing or all 3D views.


Properties

View point

General

Height above floor 1.75 m

Pitch 0.00 °

Opening angle 45.00 °

☐ Parallel View

Apply to

● New 3D View

○ Existing 3D view

☐ Apply to all views

Setting a view point, initially only facilitates navigation to the same position using the other possibilities for 3D views, and is not automatically saved as a view point. If this is desired, the view point must be saved with the button.

4.7 ZOOMING, SCROLLING AND ROTATING

4.7.1 Zooming

Located in the toolbar are the usual methods for zooming, which function the same in all views.

- Zoom rectangle
- Zoom in
- Zoom out
- Show all

Additionally, there is the function 'Zoom to Cursor'. With this function zooming takes place directly at the cursor position using the mouse wheel, if the key combination 'Ctrl+Shift' is kept pressed.

'Ctrl+mouse wheel' results in 'Zoom in' or 'Zoom out', depending on the direction in which the mouse wheel is turned.

4.7.2 Additional Functions in 3D Views

Apart from the functions mentioned above, you can also zoom in 3D views by holding down the right mouse button and dragging the mouse up or down. This movement corresponds to the functions 'Zoom in' and 'Zoom out', although here the zooming is continuous and not in predefined steps as with the buttons.

With the aid of the key combination 'Shift + left mouse button', you can reposition the scene to prevent the 3D model from sliding out of the window when zooming.

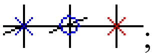
4.7.3 Scrolling

There are also several options for scrolling:
Mouse wheel: Up and down
'Shift+ mouse wheel': left and right
The arrow keys provide the same functions as the mouse wheel.

4.7.4 Rotating in 3D Views

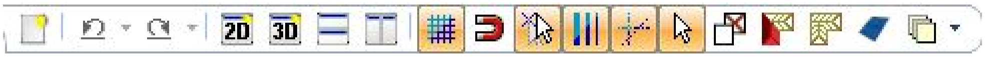
In 3D views, the scene can be rotated in all directions using the mouse or the arrow keys by holding down the left mouse button. Note when rotating a scene, that the cursor should not be positioned over a element which has been selected, otherwise the movement of the mouse is interpreted as a repositioning of that element.

4.8 SNAP FUNCTION

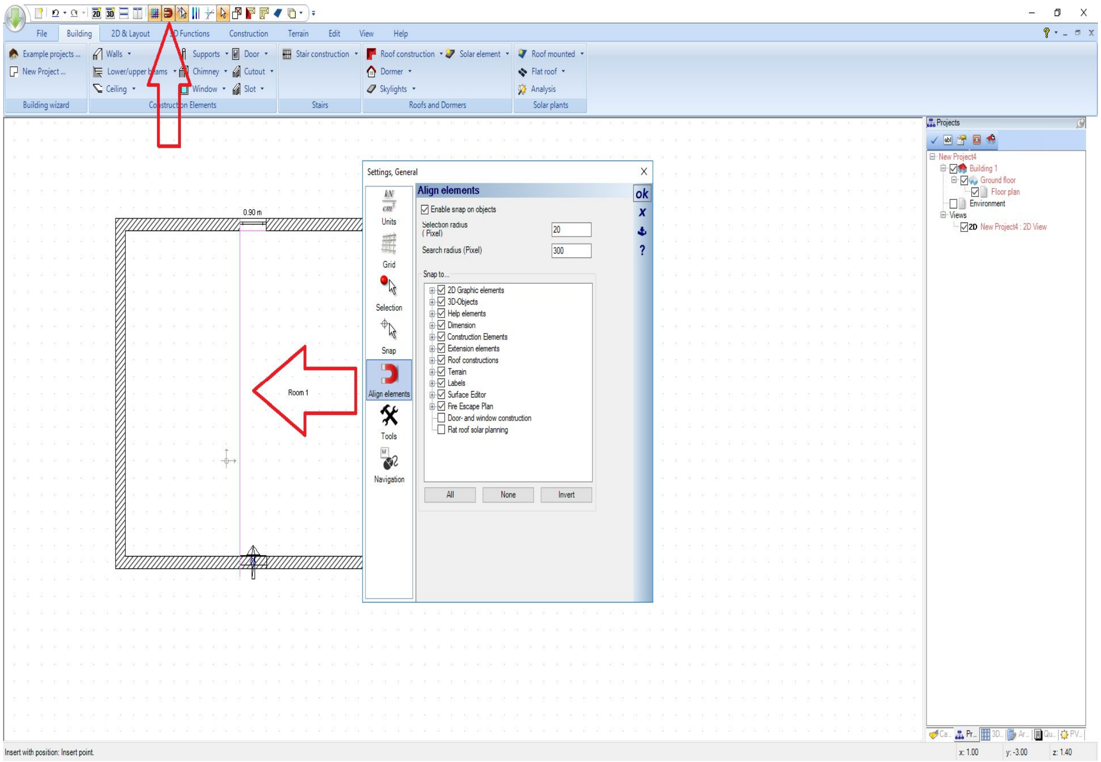
The snap properties are defined over the ‘Options>General…’ menu. The defaults specified aid the insertion of elements using the snap-cursor. There are three versions of the snap-cursor ; the symbols denote, from left to right, snap to a point, snap to a line and snap to the intersection of two lines.

4.9 ALIGN FUNCTION

In addition, or as an alternative to the current snap function, there is the "Align" mode, which can be activated via the upper toolbar (or switched on and off at any time with CTRL + A).



The alignment mode searches for matching edges that are identified from existing objects when placing or moving elements within an adjustable radius, and marks them as a preview with a line. At the same time, the active element snaps at this line and can be aligned with another element without using guidelines or other construction aids. This behaviour works in principle with all elements, so texts can be aligned, windows or doors at opposite windows or doors, ... ,



Settings, General

Align elements

☑ Enable snap on objects

Selection radius (Pixel): 20

Search radius (Pixel): 300

Snap to...

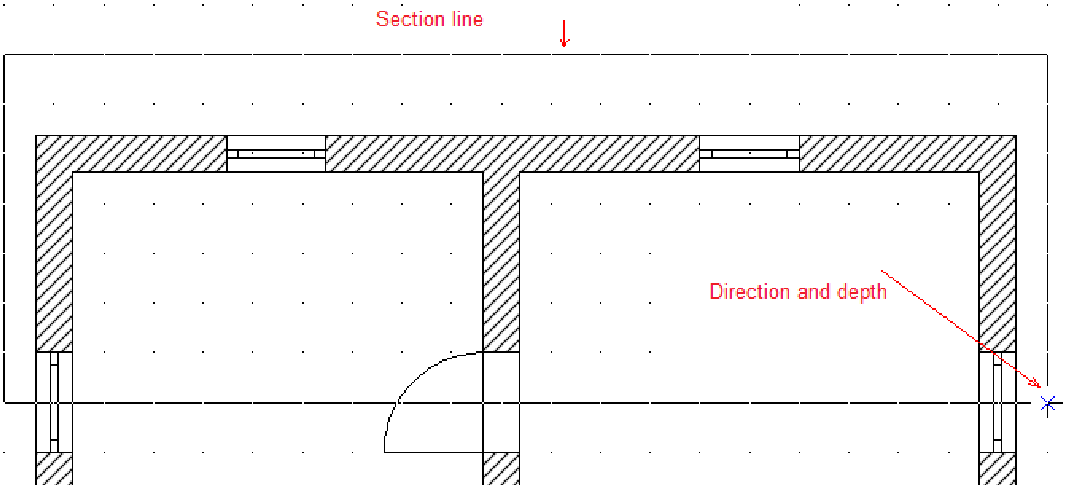
- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension
- ☑ Construction Elements
- ☑ Extension elements
- ☑ Roof constructions
- ☑ Terrain
- ☑ Labels
- ☑ Surface Editor
- ☑ Fire Escape Plan
- ☐ Door- and window construction
- ☐ Flat roof solar planning

All | None | Invert

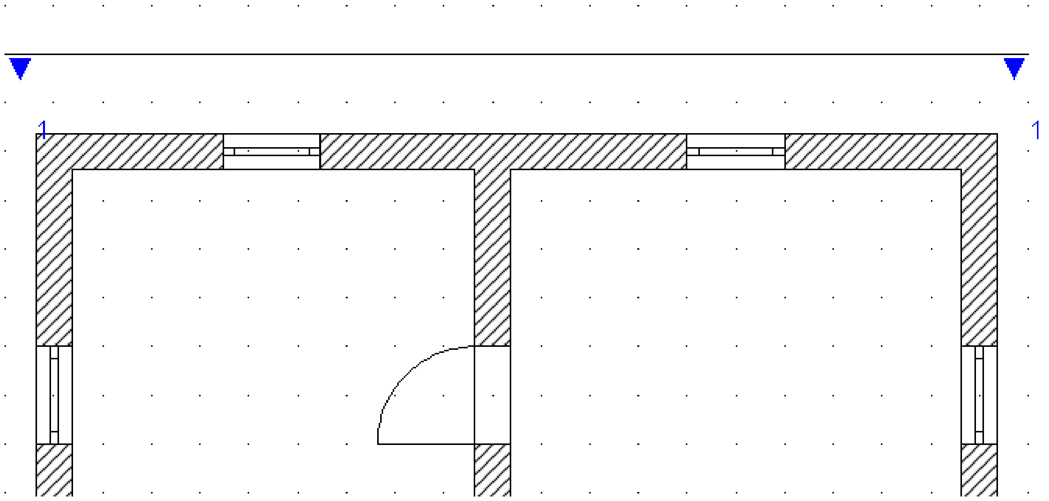
4.10 2D VIEWS / CROSS-SECTIONS

4.10.1 Creating Cross-Sections

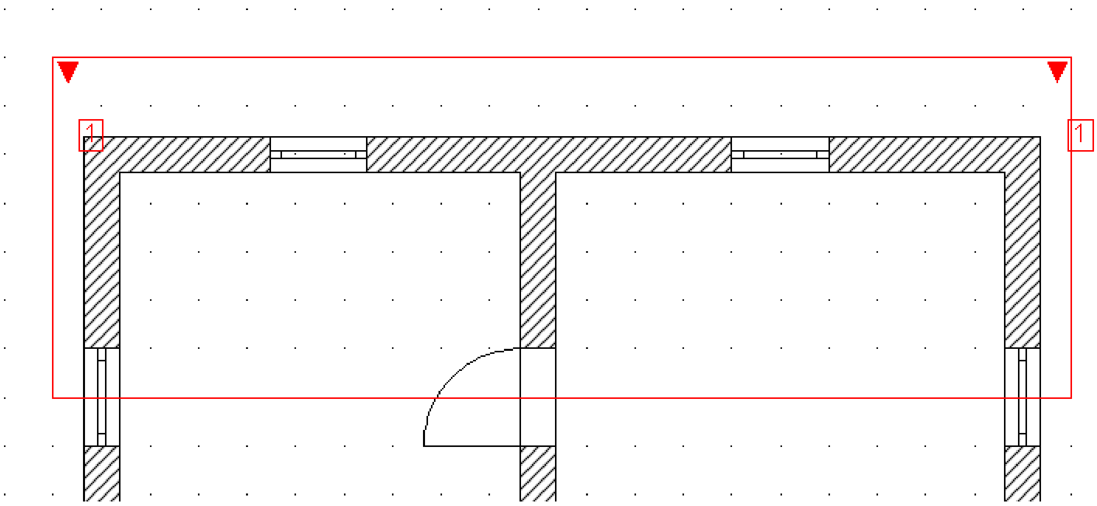
A new cross-section view can be created with the button and its corresponding tool in the vertical toolbar. Using the mouse, first the cut line is defined, and then with a rectangle, the direction and depth of the cross-section view.



After the cross-section has been defined with the rectangle, the new view is calculated and immediately displayed. A cross-section symbol, which indicates the line and depth of the cross-section, is inserted in the 2D plan view.

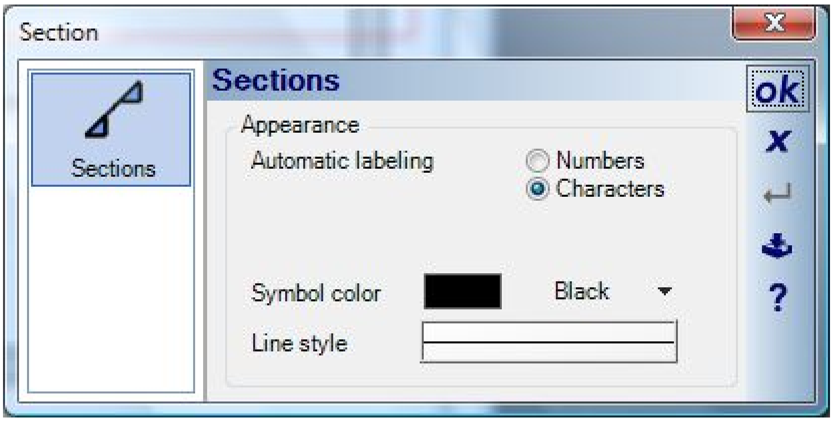


If the cross-section symbol is selected, the depth and the exact position of the cross-section are shown.



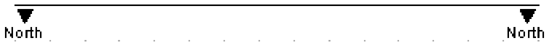
4.10.2 Options for Cross-Section Symbols

There are various options for the notation of cross-section symbols in 2D plan views. You can choose between automatic notation with capital letters or numbers. These are displayed below the arrows of the cross-section symbol, starting with A – A for capital letters and 1 – 1 for numbers.



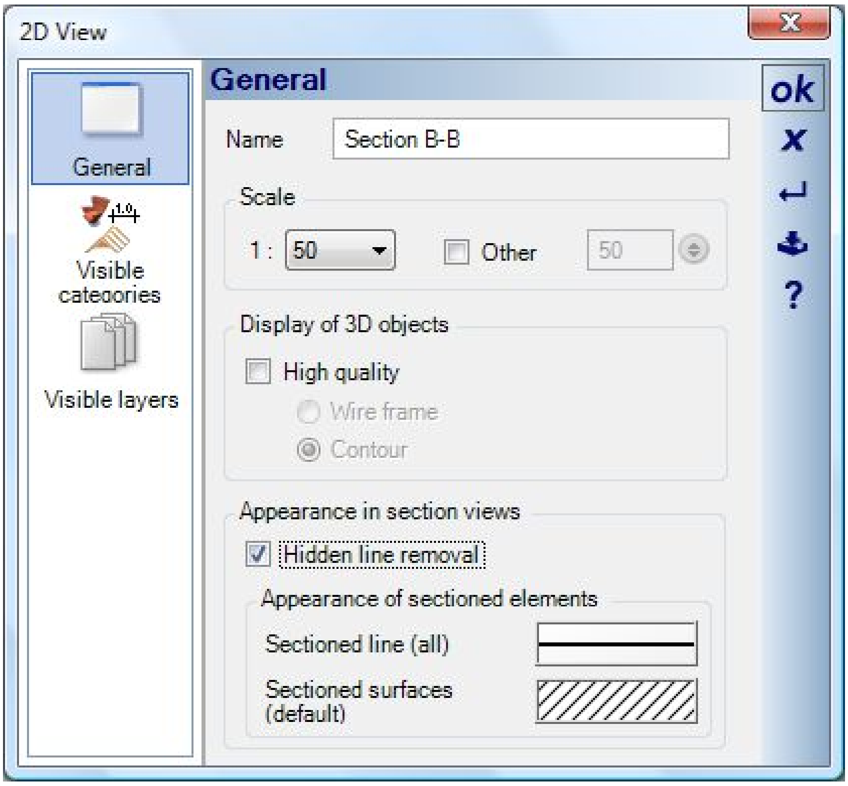
Appearance
Automatic labeling ○ Numbers ● Characters
Symbol color Black
Line style

At both ends of the cross-section symbol, text is generated that can be edited with standard functions, and that can have, instead of letters or numbers, any content and be freely positioned.



4.10.3 *Exterior Views, Representation with concealed Edges*

You can create exterior views, or a representation that contains no concealed edges, with an option in the ‘Properties’ dialog of the cross-section view.


2D View

General

Name: Section B-B

Scale
1 : 50 ☐ Other 50

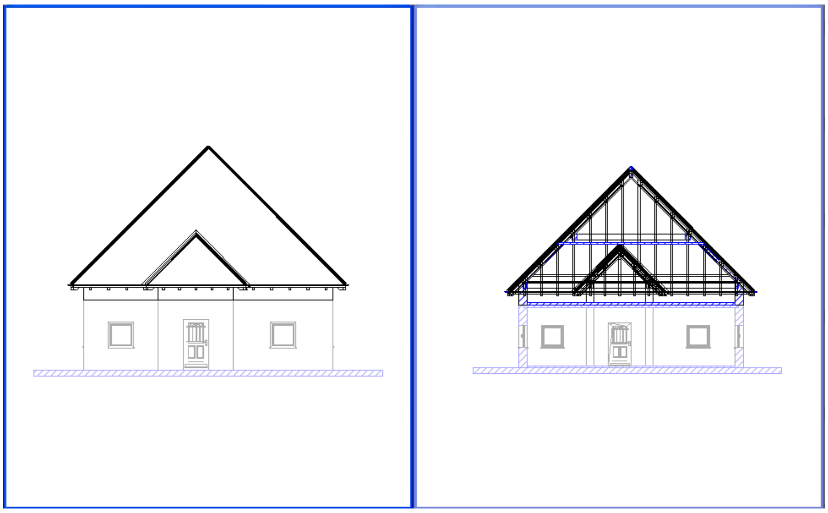
Display of 3D objects
☐ High quality
○ Wire frame
● Contour

Appearance in section views
☑ Hidden line removal

Appearance of sectioned elements
Sectioned line (all)
Sectioned surfaces (default)

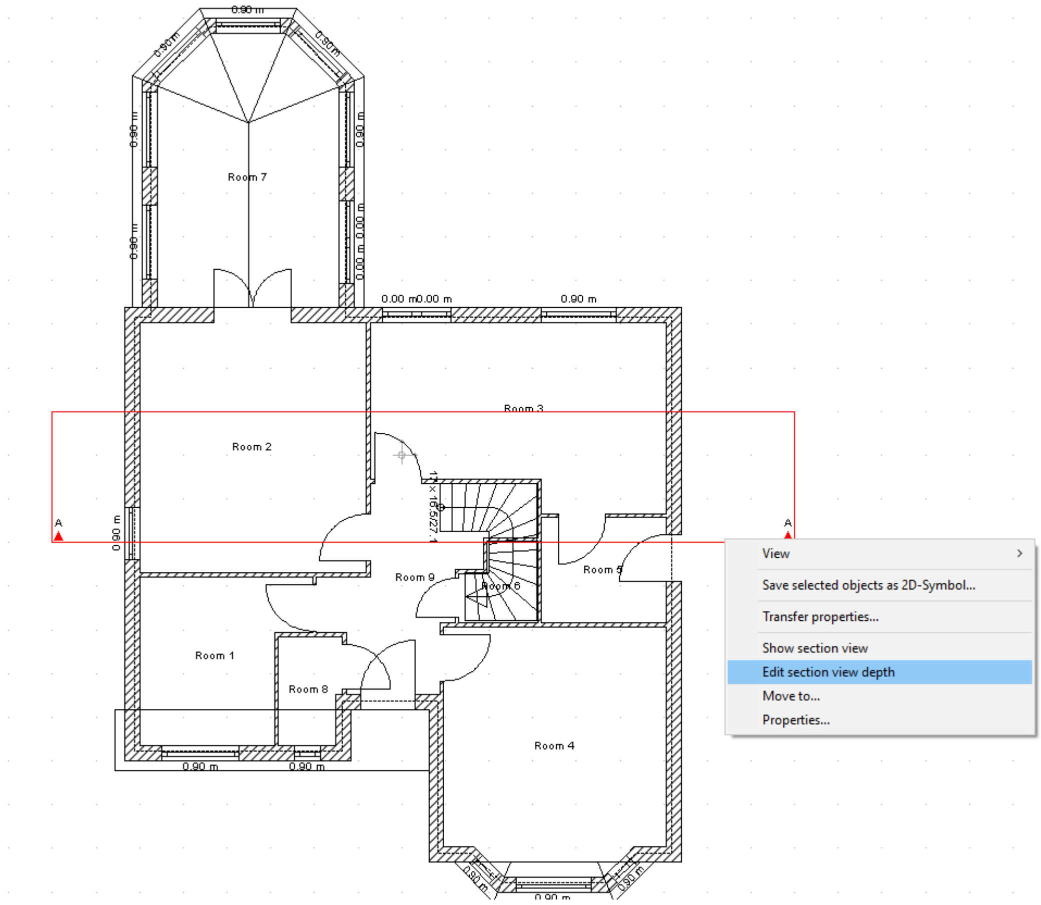
As soon as the dialog is terminated with ‘OK’ the view is recalculated, which can take several minutes depending on the elements contained in the view. For the same reason it is not recommended to have views open with this option, when planning or making modifications to the project. A basic concept of the software is that a view is updated after every change, which can have a considerable negative effect on performance for views without concealed lines.

The effect of this option is shown in the following example; on the left the view without concealed lines, and on the right the normal cross-section view with the same position and depth.

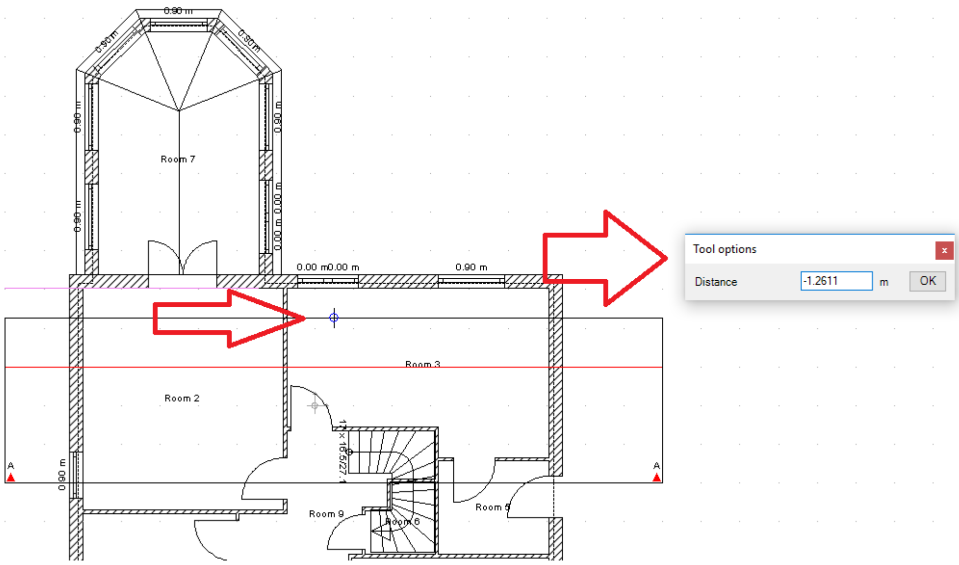


4.10.4 Editing a cross-section view depth

The depth of cross-section view has so far only been defined when inserting the cross-section symbol to create a new view and could not be changed later. This was particularly impractical when the cross-section view had already been edited, e.g. 2D drawing additions or dimensions had been added, etc. If a change of the visible area was required, only the creation of a completely new view remained.
Now you can change the cross-section depth using the selected symbol and the context menu.



After selecting the context menu "Edit section view depth", the line opposite to the cross-section symbol and defining the depth can be repositioned with the mouse. The cross-section view including all existing elements is only recalculated.



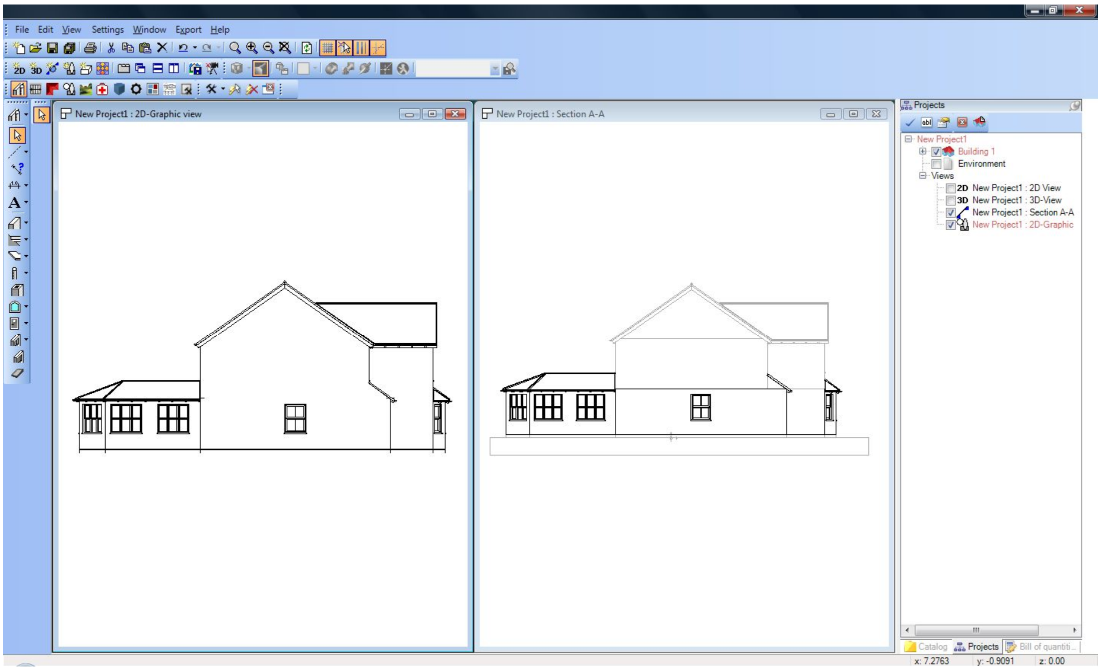
Distance -1.2611 m

4.10.5 Saving Images from 2D Views

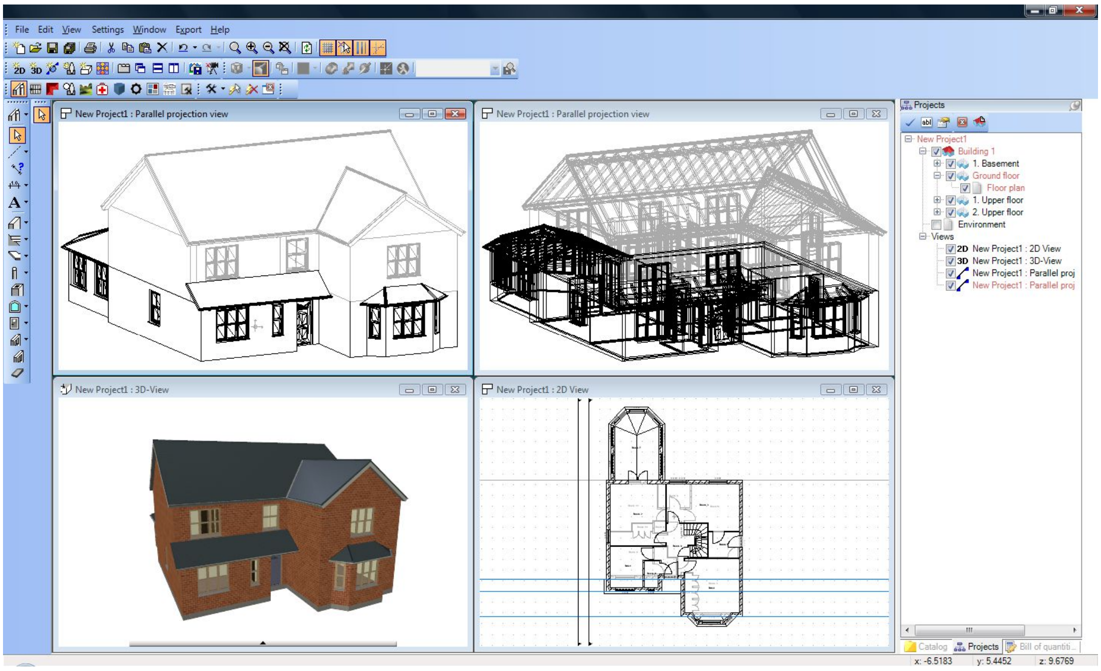
Images from 2D views can be saved in any supported format. The format together with the file name can be specified in the 'Save' dialog. The content displayed for the active 2D view will be saved. With the aid of the settings for visibility it is possible to specify precisely the image content.

4.11 2D GRAPHIC VIEWS AND PARALLEL PERSPECTIVES

With the button a 2D graphic view can be created from an active 2D view and its content. This view no longer contains construction components. All content is converted into the 2D graphic elements, i.e. lines, polygons etc., with which the construction components were originally defined. These 2D elements are no longer linked to the current project. The advantage of a 2D graphic view is that all 2D elements can be edited and, if required, deleted separately. This makes it possible to perform detailed editing on certain elements of your drawing and then save them as 2D Symbols for later use. Alternatively, you can delete unwanted elements, such as the line between floors shown in the example which originates from the walls, before printing the plan.
When creating a 2D graphic view, depending on the settings for visibility and resolution, several tens of thousands of graphic elements may be generated, which can seriously affect the performance of the software. Therefore, 2D graphic views should only be created when really necessary and closed as soon as possible.


File
Edit
View
Settings
Window
Export
Help
New Project1 : 2D-Graphic view
New Project1 : Section A-A
Projects
New Project1
Building 1
Environment
Views
2D New Project1 : 2D View
3D New Project1 : 3D-View
New Project1 : Section A-A
New Project1 : 2D-Graphic
Catalog
Projects
Bill of quantiti...
x: 7.2763
y: -0.9091
z: 0.00

A parallel perspective can be easily created from an active 3D view, by positioning the the 3D view as required, and subsequently opening the new view. You will then be asked if you would like to maintain the angle of view. These views are still linked to the construction model and behave similar to cross-sections. You can thus modify visibility settings and if required affect the representation by activating hidden line processing. On the top left of the following illustration a perspective is shown, which was created from the 3D view beneath it. To the right of it you can see a further perspective with activated hidden line processing. Representations using hidden lines require a great deal of processing, in particular when changes are made to the model. It is therefore recommended that this function only be used when really necessary, or that visibility for these views is disabled in the project viewer. Non-visible views are not constantly updated and therefore do not affect software performance when planning.


File Edit View Settings Window Export Help
New Project1 : Parallel projection view
New Project1 : Parallel projection view
New Project1 : 3D-View
New Project1 : 2D View
Projects
New Project1
Building 1
1. Basement
Ground floor
Floor plan
1. Upper floor
2. Upper floor
Environment
Views
2D New Project1 : 2D View
3D New Project1 : 3D-View
New Project1 : Parallel proj
New Project1 : Parallel proj
Catalog
Projects
Bill of quantiti...
x: -6.5183
y: 5.4452
z: 9.6769

4.12 3D VIEWS

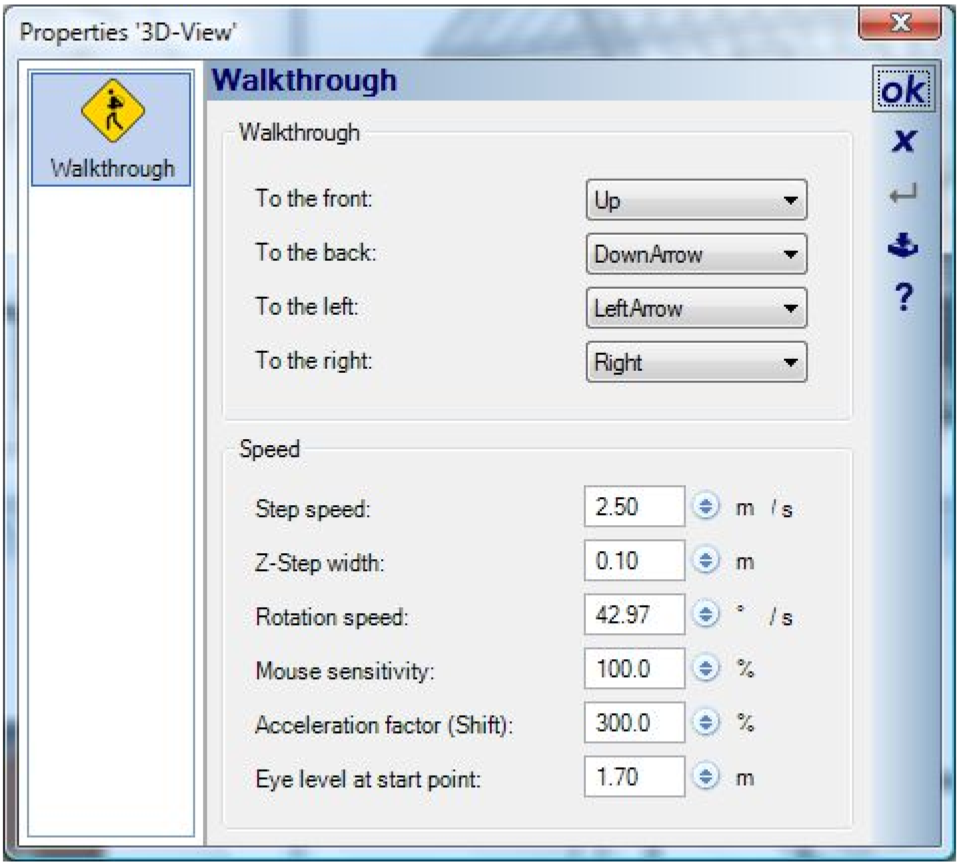
4.12.1 General Settings

General default options for creating **new** 3D views can be specified over the ‘Options>3D View’ menu. The options specified here do not affect existing views. You can change the properties of existing views over ‘Properties’ in the context menu, which is activated with a right mouse click.

For each 3D view, all properties, such as presentation mode, background, position of the sun etc., can be specified individually.

4.12.2 Walkthrough

In an active 3D view the 'walkthrough' mode can be activated with the button. In this mode direction and inclination are controlled by moving the mouse. Using the mouse wheel the height of the viewing position can be altered. Forward and sideways movement are controlled by default with the arrow keys. Other key combinations and further options can be specified in the 'walkthrough' dialog. The dialog is activated by a right mouse-click on the button, or as a properties box in the 3D view.
The movement can be accelerated by a specified factor by pressing the SHIFT key when moving.



Walkthrough

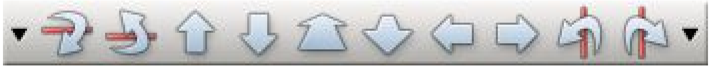
Walkthrough

To the front: Up
To the back: DownArrow
To the left: LeftArrow
To the right: Right

Speed

Step speed: 2.50 m /s
Z-Step width: 0.10 m
Rotation speed: 42.97 ° /s
Mouse sensitivity: 100.0 %
Acceleration factor (Shift): 300.0 %
Eye level at start point: 1.70 m

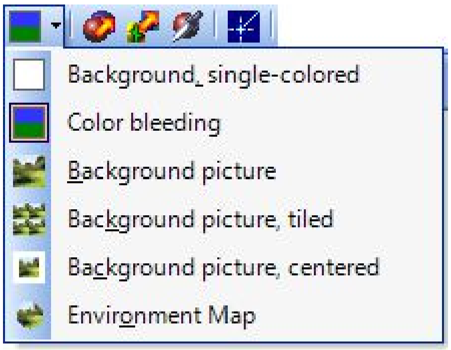
Each 3D view offers a panel at the bottom with which you can walk through the current window.



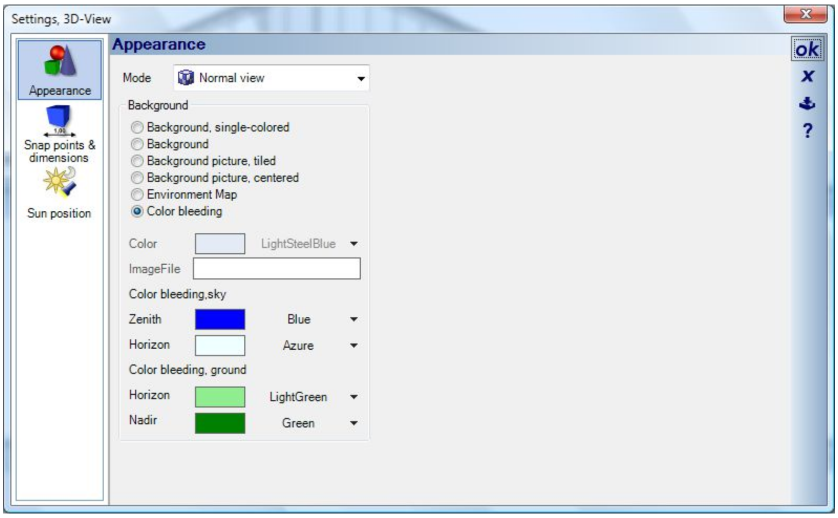
The functions in the panel differ slightly from those for rotating and zooming with the mouse. The two buttons on the right rotate the scene about the current observation point and not about the origin of the scene, and the 'Move forward' button moves the view point past the centre based on the geographical coordinates, whereas zooming with the mouse stops here.

4.12.3 Background

For the background in views, the software offers the option of monochrome, colour bleeding and background image. Each of these options can also be displayed in one of several variations. These settings can be specified over the 'Background mode' button.


Background, single-colored
Color bleeding
Background picture
Background picture, tiled
Background picture, centered
Environment Map

Each button activates the appropriate background mode based on the settings for the properties of the view. Therefore, if no image has been selected for the 'Background image' option, no change in the view will be seen if this option is selected.



Appearance

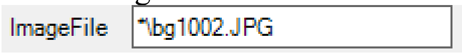
Mode: Normal view

Background
○ Background, single-colored
○ Background
○ Background picture, tiled
○ Background picture, centered
○ Environment Map
● Color bleeding

Color: LightSteelBlue
ImageFile:

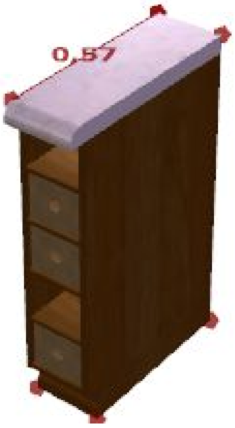
Color bleeding,sky
Zenith: Blue
Horizon: Azure

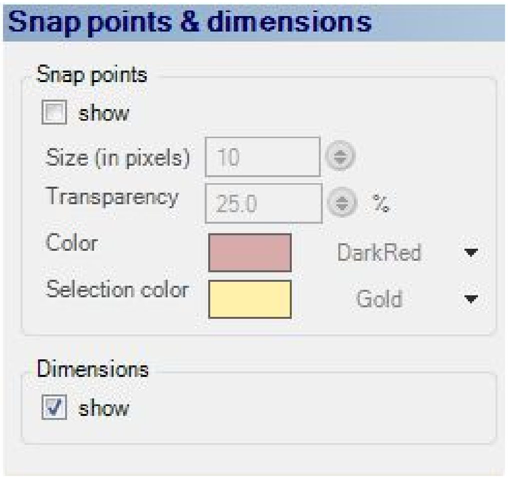
Color bleeding, ground
Horizon: LightGreen
Nadir: Green

For each background option shown under 'appearance, only the appropriate settings are active. If one of the background image options is set, the 'open image file' dialog can be activated over the field to the right of 'Image file', which then automatically shows the contents of the directory ‘your software-installation\Backgrounds’. Only the links to background images are stored in the project library. If you create a project with a background image and the project is passed to another user, then the recipient’s system must have the image stored in exactly the same place, otherwise it will not be found when the project is loaded. The software differentiates here between relative and absolute paths. If you select an image from the directory ‘Backgrounds’, which is the default for ‘open image file’, then the path to the background image is stored relative to this, indicated by an asterisk before the file name  ImageFile *\bg1002.JPG. If you select a different directory, then the absolute path is entered here. The recipient of a project must then not only have the image, but also the corresponding path, on his system, whereas in the case of the relative path for the directory ‘Backgrounds’, it is sufficient to supply him with the image, which he can then copy into the directory ‘Backgrounds’.

4.12.4 *Snap Points and Dimensions*

Our 3D-objects can contain snap points, which depending on the settings for the snap function, can be used to place them in 3D views. By default snap points are invisible, but as for dimensions, can be shown to enable better monitoring of objects that have several points relatively close together. In addition, 3D dimensions can be switched on and off using the general visibility function.





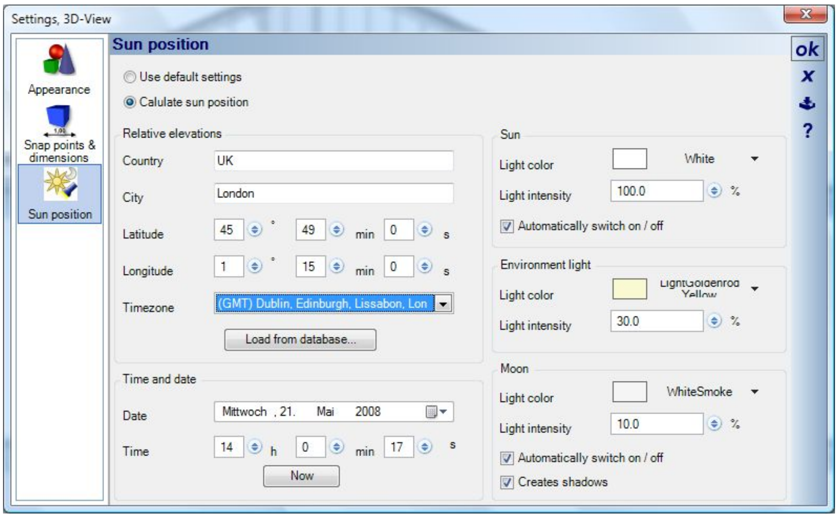
Snap points & dimensions

Snap points
☐ show
Size (in pixels) 10
Transparency 25.0 %
Color DarkRed
Selection color Gold

Dimensions
☑ show

4.12.5 *Position of the Sun*

To illuminate 3D scenes, the software uses internal light sources, with default settings that can be switched on and off with the button. Furthermore, for each 3D view, individual settings for geographical position, date and time of day can be specified under ‘Position of the Sun’, and for the light sources simulating the sun and moon, the colour and intensity of the light. Thus the software makes it possible, with appropriate settings for the project, to check in the various views the effects of shade on the building at different times of the day.



Sun position

○ Use default settings
● Calulate sun position

Relative elevations

Country: UK
City: London
Latitude: 45 ° 49 min 0 s
Longitude: 1 ° 15 min 0 s
Timezone: (GMT) Dublin, Edinburgh, Lissabon, Lon

Time and date

Date: Mittwoch , 21. Mai 2008
Time: 14 h 0 min 17 s

Sun

Light color: White
Light intensity: 100.0 %
☑ Automatically switch on / off

Environment light

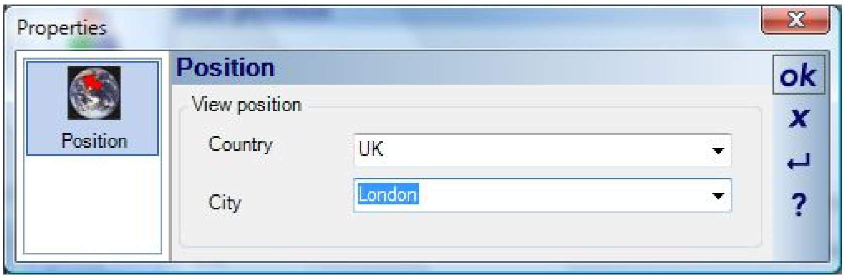
Light color: LightGoldenrod Yellow
Light intensity: 30.0 %

Moon

Light color: WhiteSmoke
Light intensity: 10.0 %
☑ Automatically switch on / off
☑ Creates shadows

4.12.5.1 Geographical Location

With the aid of ‘Geographical Location’ you can define your location, or to be exact the location of your property with longitude and latitude, if the values are known.
Alternatively you can load predefined locations for your country from a database which is stored as a XML-file in the directory ‘\Program’. The name of the XML-file is ‘Citydata.xml’, and as long as the structure and hierarchy of the file are observed, you can extend the file yourself by adding further countries or places.
The desired location can be selected from a list of place names in the ‘Geographical Location’ dialog. To avoid having to make a choice of location by scrolling through thousands of place names, the drop down menu is automatically modified as soon as you start to enter a name. Therefore if you enter ‘LON’ in the field, only place names beginning with these three letters are shown.



Position

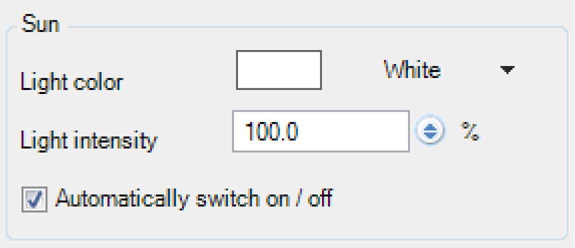
View position

Country: UK
City: London

4.12.5.2 Time and Date

In this area the date and time are automatically provided at which the software was last started. To update the time, click on the button marked ‘Now’.

4.12.5.3 Sun



Sun

Light color White

Light intensity 100.0 %

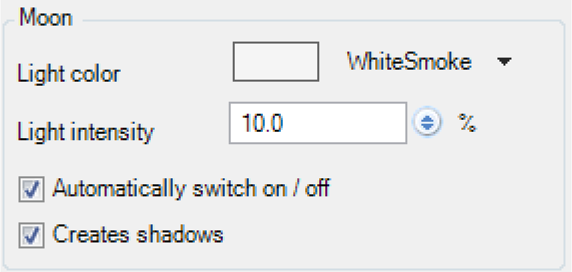
☑ Automatically switch on / off

The colour and intensity of sunlight have to be set manually if required. The software does not attempt here an automatic adjustment based on the position of the sun. The light source is just as bright shortly after sunrise, as at midday. The option to ‘Switch on and off automatically’ comes into effect when the position of the light source drops below zero height (z-coordinate), representing more or less a precise sunset. If this option is activated, the light source is then switched off, otherwise it continues to illuminate the scene, and shines from below the ground so to speak.

4.12.5.4 Environment light

Background lighting is provided by an ambient light source which is used to achieve a more uniform illumination of the scene. Ambient light on its own can be seen if the colours for the light sources for ‘Sun’ and ‘Moon’ are set to black. Generally however, the default settings can be left unchanged.

4.12.5.5 Moon



Moon

Light color WhiteSmoke

Light intensity 10.0 %

☑ Automatically switch on / off

☑ Creates shadows

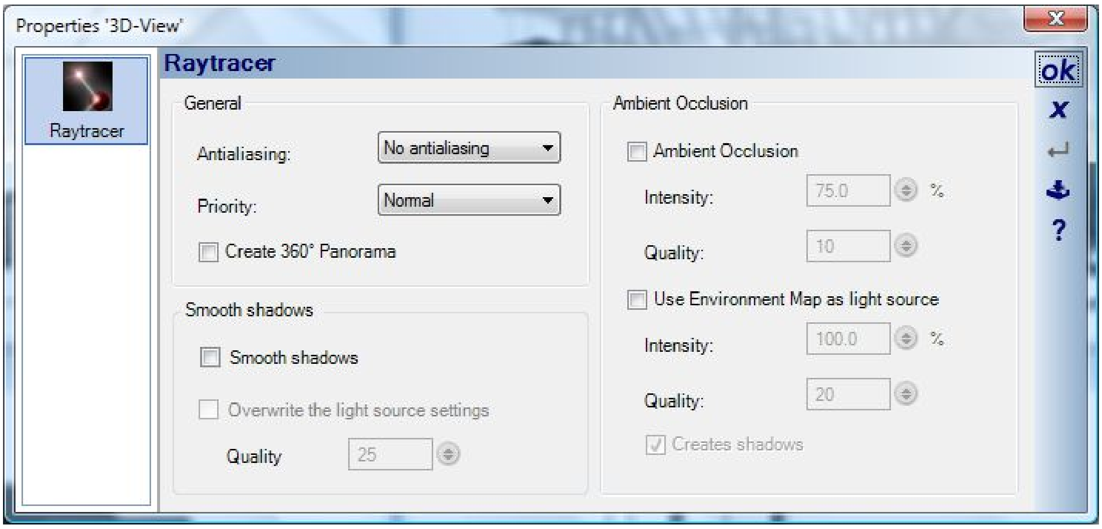
As for the sun, the colour and intensity of the light source for ‘Moon’ must also be set manually if required. Additionally, the moon has the property to cast shadows, which however may not always be desired. If the sun and moon are both above the horizon during the day, and this option is activated, the moonlight would result in a double shadow, which in reality would not occur due to a lack brightness. As a simple rule, the option to ‘creates shadows’ should be deactivated during the day.

4.12.6 Copying and Editing Materials and Textures

The first step after clicking on one of the buttons to copy materials or textures, is to choose the source material or texture. To do this, a 3D cursor is displayed over which the selection is performed with a mouse click. Subsequently, with further mouse clicks on the chosen targets, the copying process is begun, and can be continued until terminated with ‘Esc’ or over the context menu item for ‘Cancel with ESC’.
The ‘Edit Material’ button opens the ‘Properties’ dialog after the material has been selected for copying.
Tip: To copy the texture coordinates hold down the ‘Shift’ key.

4.12.7 Raytracing

Raytracing is always performed in the current 3D view, with its current resolution / window size. The smaller the window, the faster the process is completed. Further, all visible elements in the scene are considered in the process, including the 100 x 100 m plot created by default. In order to speed up processing, it is recommended that non-visible elements are really deactivated using the ‘Visibilities’ dialog, or in the case of the plot over the environment layer in the project viewer, before raytracing is started.
After raytracing is started, the software first performs certain internal processing, which depending on the contents of the 3D view, can take some time. Only when this is completed is the current state of the calculations really visible.
The settings for antialiasing have a considerable affect on the quality of the representation and can be specified, before raytracing is started, over the context menu which is activated with a right mouse click on the button.



Raytracer

General

Antialiasing: No antialiasing
Priority: Normal
☐ Create 360° Panorama

Smooth shadows

☐ Smooth shadows
☐ Overwrite the light source settings
Quality 25

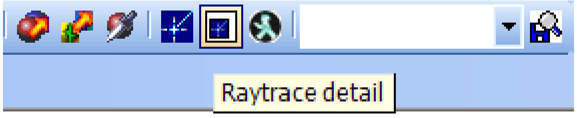
Ambient Occlusion

☐ Ambient Occlusion
Intensity: 75.0 %
Quality: 10
☐ Use Environment Map as light source
Intensity: 100.0 %
Quality: 20
☑ Creates shadows

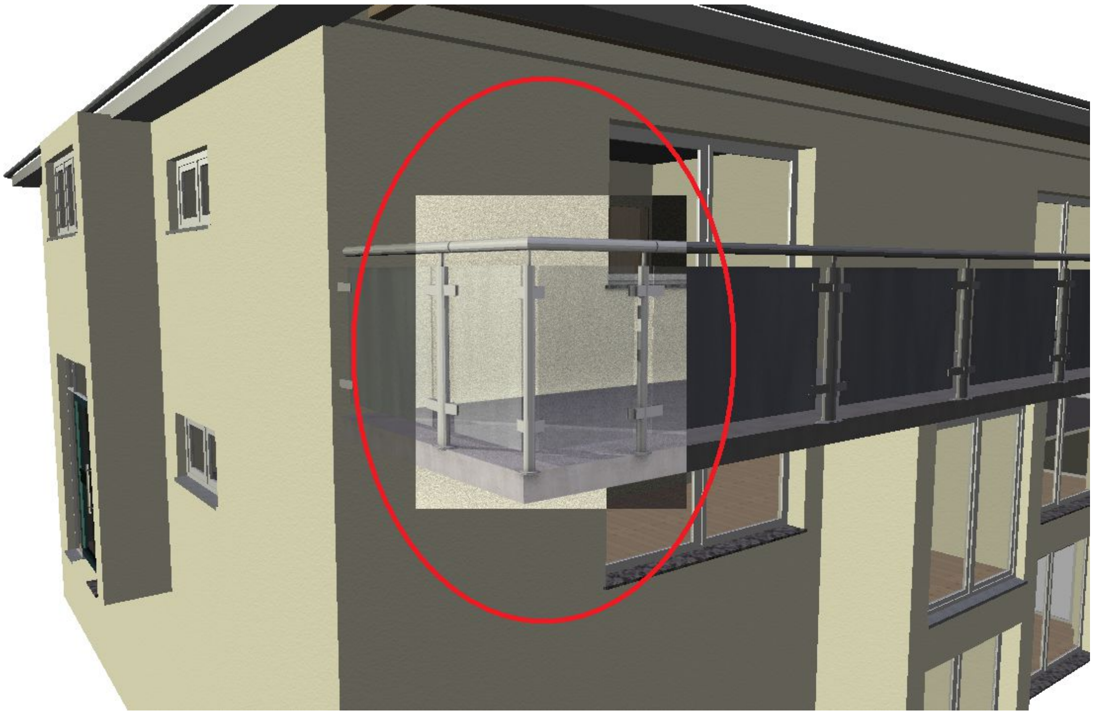
On the other hand. antialiasing also has a considerable negative affect on performance, and should be used no more than necessary.
Raytracing can be terminated or interrupted with ‘Esc’.

4.12.8 Raytracing Details

In the design phase and while materials, the position of the sun and raytracing settings for the scene are still being modified, it can be helpful to only process certain parts of the 3D view to check the results of raytracing. Otherwise, the whole scene would have to be processed, which according to settings could take some time, to only then find that certain details are perhaps too bright or too dark. To achieve this use the “Raytrace detail” function provided in the 3D view tool bar.



After clicking on the appropriate button the function requires a rectangle to be entered in the 3D view. Once a rectangle has been defined, processing starts automatically for the detail using the current settings for raytracing.



4.12.9 Shadows, ambient occlusion and smooth shadows

Raytracing provides options for different kinds of shadows.

4.12.9.1 Ambient Occlusion

This function is used mainly to create a particular lighting atmosphere, by using a combination of interior light sources and ambient lighting. With conventional rendering, without ambient shadows, the results corresponds to a summer day with a clear sky. However, rendering with ambient shadows alone would correspond to a hazy and very cloudy day with a lack of sunlight. Since both extremes are relatively unimpressive, the aim is to find a reasonable compromise.

First the amount of ambient light from interior light sources should be removed (settings under 'Position of the Sun'). This will be replaced later by ambient shadows. The moon should also be deactivated. Next the brightness of the sun should first be reduced to a value between 50% and 75%, so that the final image will not appear to bright.

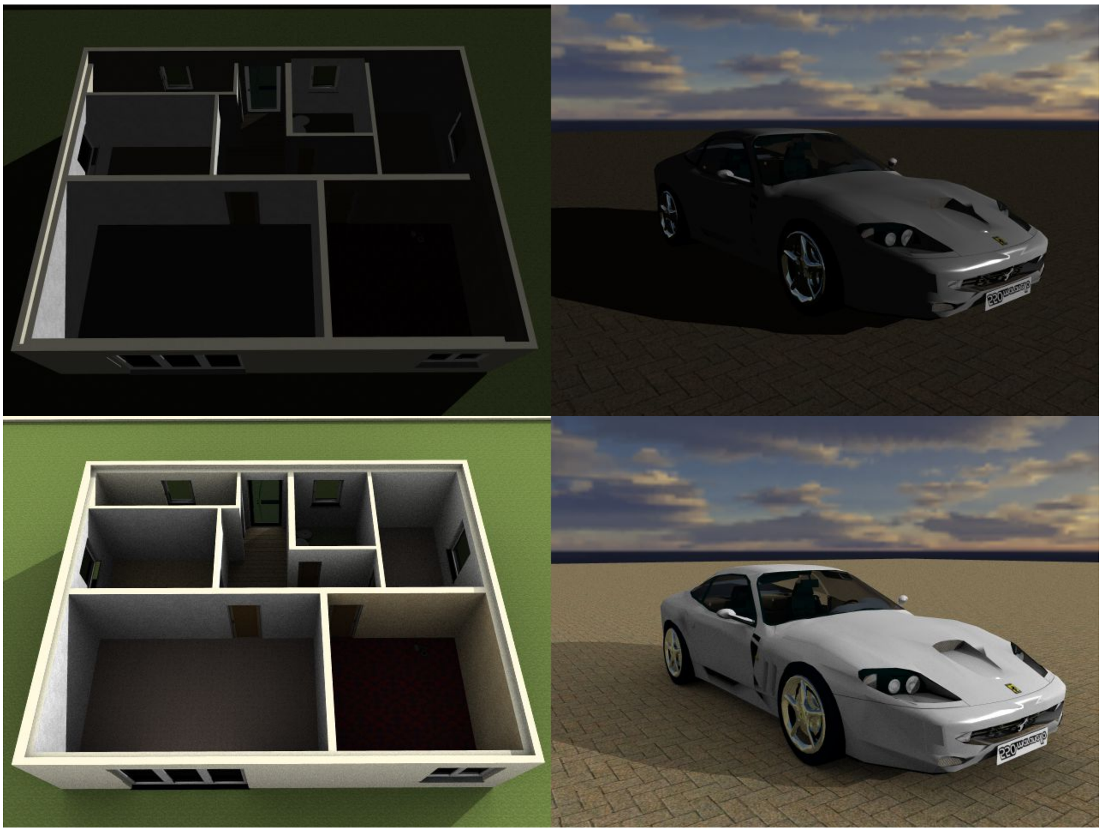
The user can now check whether the shadows are suitable and if necessary readjust the position of the sun.

Now activate ambient shadows. The default values (75%, 10) are a good initial setting. If the shaded areas appear to dark, the brightness for ambient shadows can be increased. If the lighter areas are to bright reduce the brightness of the sun. Once the overall settings are satisfactory, one can also try using high antialiasing and a higher value for quality of ambient shade (15-20). After a few attempts the user should soon get a feeling for the optimal settings.

Additional tips: The environment map is the best choice of background. Here the perspective is always correct and reflexions in windows automatically appear realistic. With ambient light sources there should always be an object (e.g. terrain, pedestal etc.) beneath the house or planned object. Otherwise light can reach the supposedly shaded areas from below.

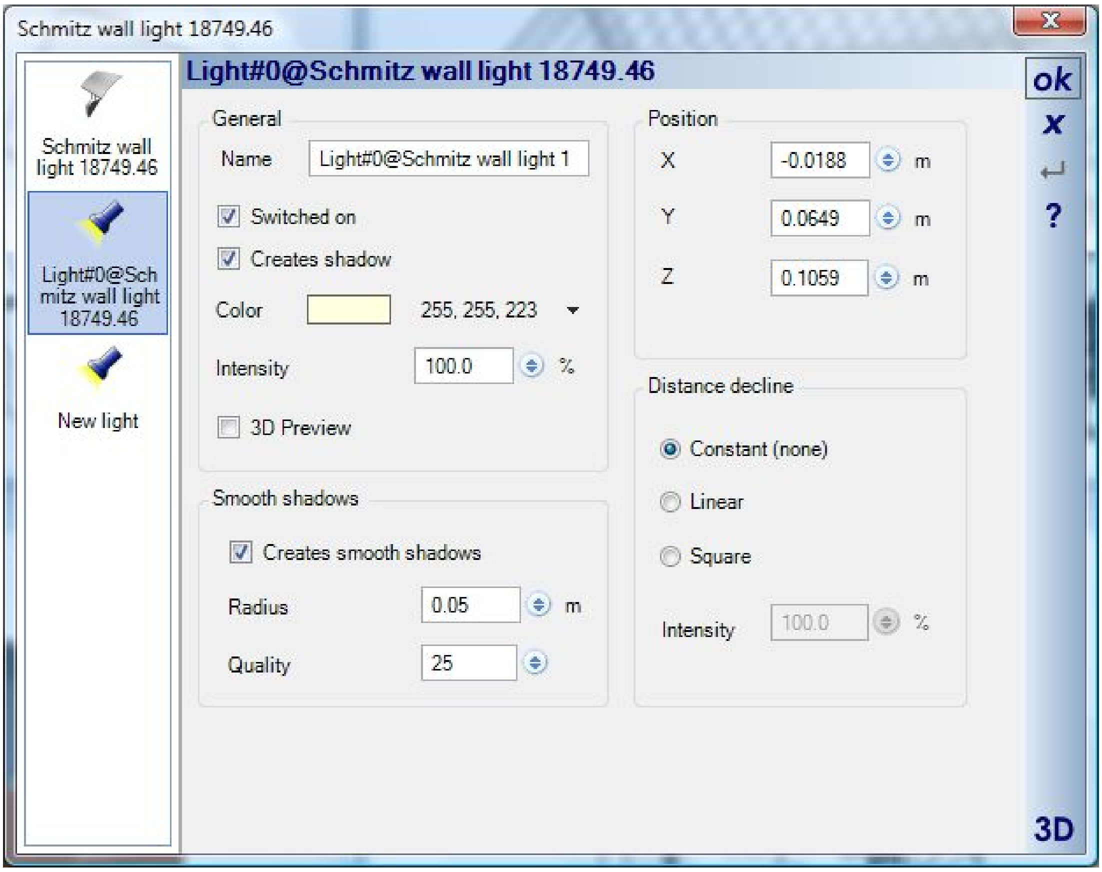
Special effects should not be used for the materials. Luminous material only make sense for objects that actually glow (neon lights, lampschades etc.). It should never be used to make objects brighter than they really are.

Here two examples of the effect of ambient shadows. The following illustration also shows a comparison of the objects calculated with and without ambient shadows (top).



4.12.9.2 Smooth Schadows

Smooth shadows can be realised in two steps. First, the size of the light source in the 3D object, for example a lamp, must be specified realistically. A light bulb, for instance, measures about 3 cm, whereas larger frosted glass lamps can measure from 20 to 30 cm. Low-voltage ceiling spots, however, generate hard shadows since their surface is very small (punctual). It all depends on the individual light source, so there is no general rule that can be recommended here.


Schmitz wall light 18749.46
Schmitz wall light 18749.46
Light#0@Schmitz wall light 18749.46
New light
ok
x
?
3D

Light#0@Schmitz wall light 18749.46

General

Name: Light#0@Schmitz wall light 1

☑ Switched on

☑ Creates shadow

Color: 255, 255, 223

Intensity: 100.0 %

☐ 3D Preview

Smooth shadows

☑ Creates smooth shadows

Radius: 0.05 m

Quality: 25

Position

X: -0.0188 m

Y: 0.0649 m

Z: 0.1059 m

Distance decline

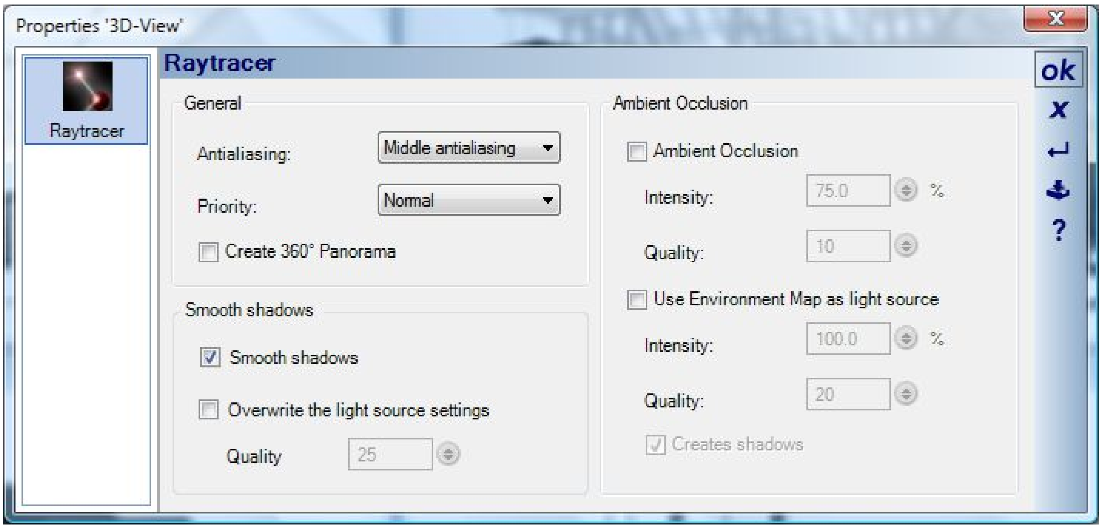
● Constant (none)

○ Linear

○ Square

Intensity: 100.0 %

Subsequently, the option for smooth shadows must be selected in the ‘Raytracer’ dialog.



Raytracer

General

Antialiasing: Middle antialiasing

Priority: Normal

☐ Create 360° Panorama

Smooth shadows

☑ Smooth shadows

☐ Overwrite the light source settings

Quality: 25

Ambient Occlusion

☐ Ambient Occlusion

Intensity: 75.0 %

Quality: 10

☐ Use Environment Map as light source

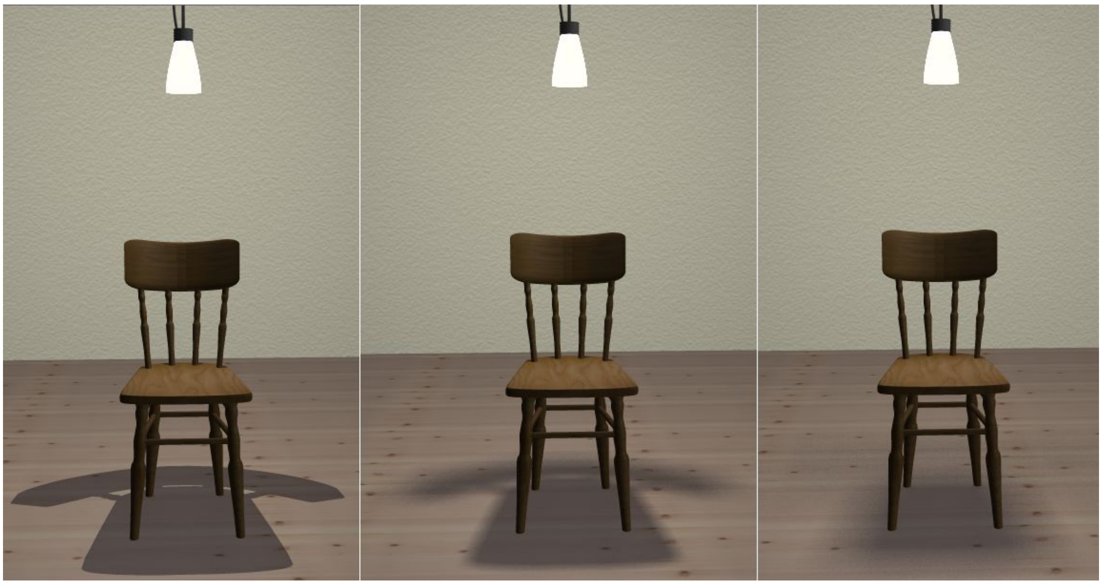
Intensity: 100.0 %

Quality: 20

☑ Creates shadows

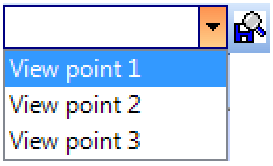
The setting for quality functions in the same way as for ambient shadows and ambient lighting. The higher the setting the less ‘noise’ there is. In this case larger light sources require a higher quality setting. The size of the light source is limited to

1 m to ensure a reasonable range of adjustment. This should be adequate since 2 m (2*R) light sources are not very common.
Here a basic example. In the following illustration we see a chair and a light source, without soft shadows, with soft shadows and a 5 cm light source, and finally with soft shadows and a 20 cm light source (from left to right). The larger the light source the softer the shadows appear. All examples were calculated with medium antialiasing.



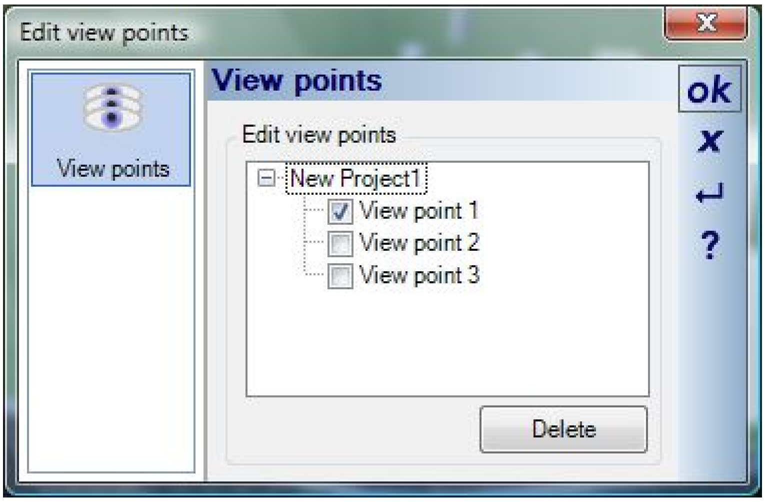
4.12.10 View Points

A view point defines a position in a 3D scene which can be saved under a given name and used again at any time. You can access the view points defined in the project over the list displayed on the left of the 'Save view point' button.



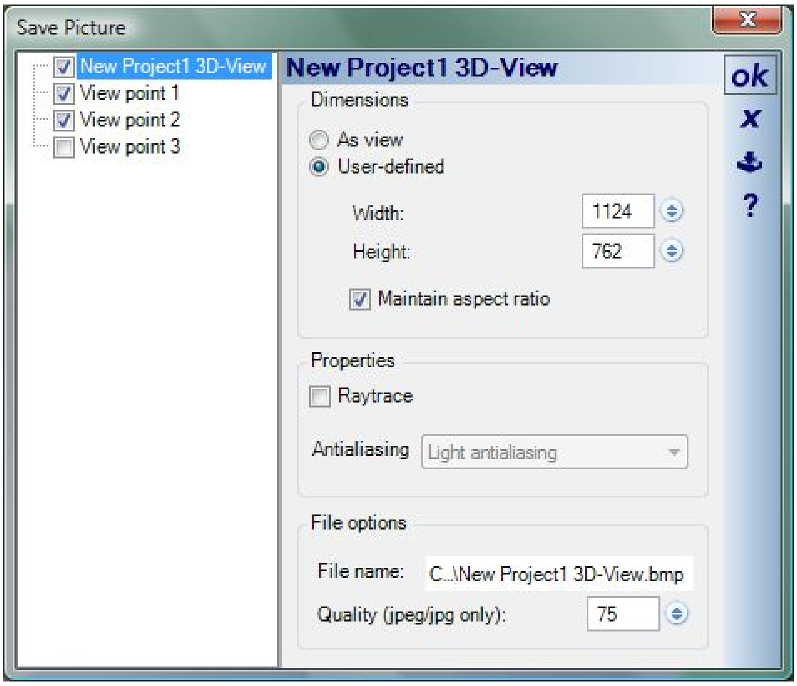
A click on the desired view point changes the 3D view to reflect the chosen position. View points are, as opposed to other properties of 3D views, common to a project, which means their positions apply to all 3D views of a project, and not only for the view in which they were created.
When a view is saved, you can allocate it a name and save options. The save options apply when images are saved and specify in advance the desired settings. You can find more details about this feature in the chapter 'Saving Images'.

You can delete existing view points over the dialog which is opened with a right mouse click on the button. You can remove the positions which are checked in the tree structure with a click on the ‘delete’ button, before you exit the dialog with ‘OK’.



4.12.11 *Saving Images*

It is possible to save several images with different settings in one operation. The positions of the images can be specified in all available views, and additionally over the view points of the current project, for which the image options can be specified when the points are created. The images are saved over the dialog that is opened with a click on the button.



☑ New Project1 3D-View
☑ View point 1
☑ View point 2
☐ View point 3

New Project1 3D-View

Dimensions
○ As view
● User-defined
Width: 1124
Height: 762
☑ Maintain aspect ratio

Properties
☐ Raytrace
Antialiasing: Light antialiasing

File options
File name: C:..\New Project1 3D-View.bmp
Quality (jpeg/jpg only): 75

On the left-hand side you can select the views and view points for which images are to be saved. On the right-hand side, you can specify for each image the resolution, antialiasing, the file name and the image format. The images are saved when the dialog is terminated with ‘OK’.

The processing and storing of images with the ray tracer is performed in parallel, i.e. after a click on ‘OK’ the operation is started independent of the planning function. Therefore, while the images are being produced, you can continue working quite normally with the software, although the saving of images is of course an additional load on the system. While images are being saved you are not allowed to terminate the software or to close the project.

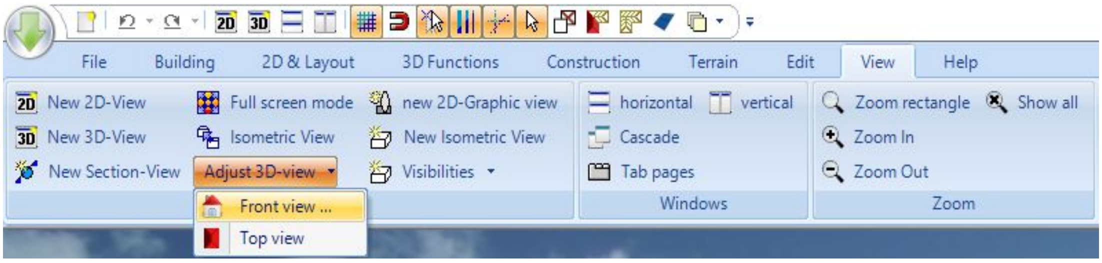
The progress of the save operation is shown by a progress bar.

4.13 3D FULL SCREEN MODE

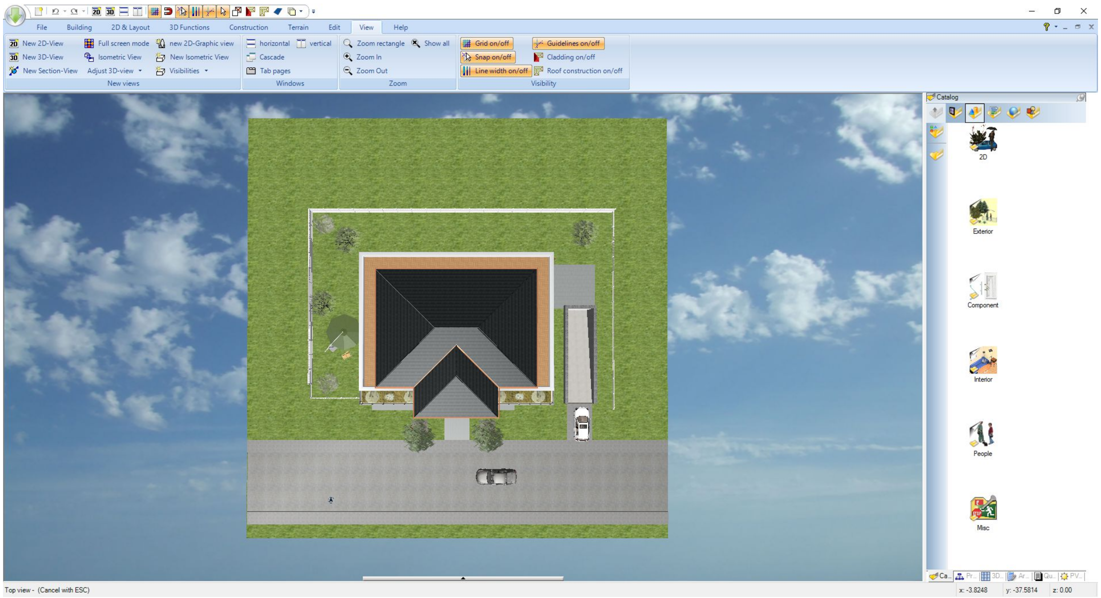
The button creates a new 3D view in full screen mode. In this view you can also open the properties dialog or edit an object, e.g. a window, with a double click. But unlike normal 3D views, the selection of an object is not cancelled with ‘Esc’, since ‘Esc’, just like the button, is used to terminate full screen mode. In this case, if you want to cancel the selection of an object, you have to click in an empty area of the scene.

4.14 ADJUSTING 3D VIEWS

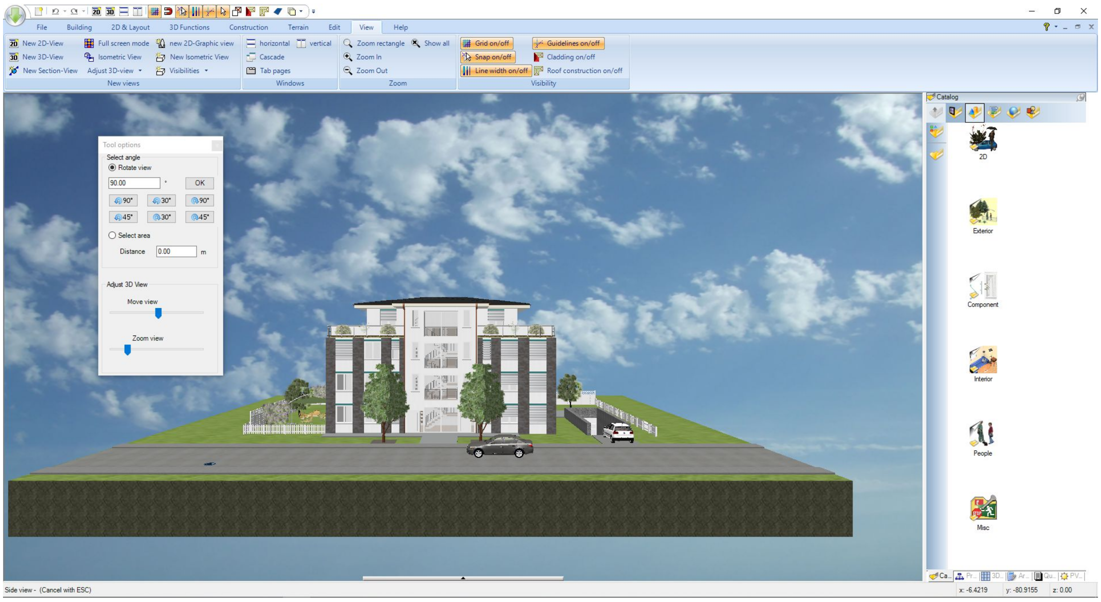
The adjust 3D view buttons offer two options that allow you to set your viewer's position in the active 3D view. Both options change the 3D view to another mode in which you only have the permissible functions for the navigation, in the view from the top you can then rotate and zoom around the z-axis only, with the arrow keys or the mouse. Views from the front only allow navigation left / right or up / down, no rotation. This view mode can be canceled with ESC.



The top view option automatically generates such a representation.



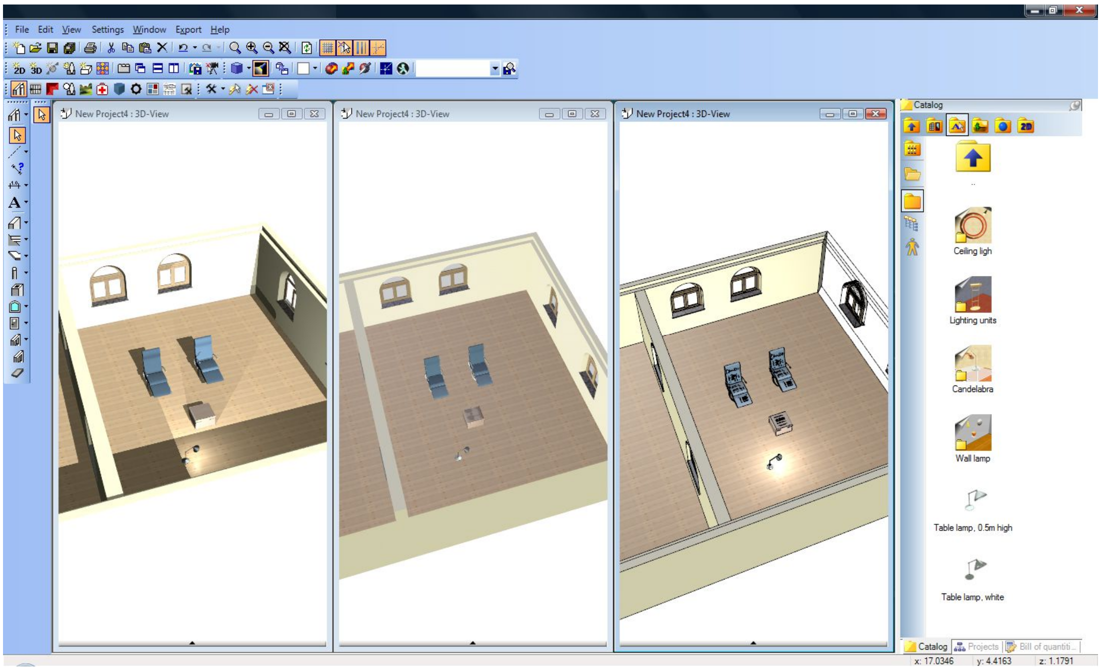
With the option "Front view" you get a dialog with predefined options for turning the view step by step, similar to how you already know it from other places in the software, e.g. rotate objects.
With each click you walk around the building in the appropriate angle. Using the sliders you can still change the position, as well as with the familiar keyboard shortcuts for navigation in 3D.
The option "Select area" first requires "picking" a surface in the 3D view. So you have to click on any surface in 3D and the view then positions itself accordingly, but remains in the front view, so does not turn in the direction of the previously picked plane.



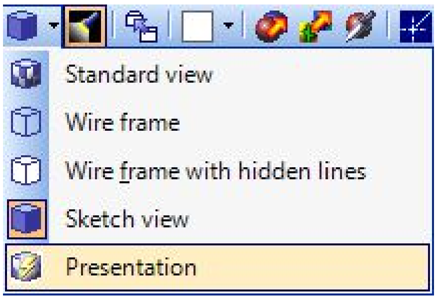
4.15 PRESENTATION AND SKETCH VIEWS

Apart from the normal 3D view there are two other view modes available, which however depend on the capabilities of the graphics card of the computer being used. Since not all graphics cards support the required functions, it is possible that neither of these views can be activated. For certain planning functions at the moment, working with these views may be considerably slower, for instance editing timber constructions or surface elements. In this case it is recommended to work with the normal view and to activate the presentation and sketch views only if you wish to create images in these formats.

The following illustration shows the basic differences between the three display formats. From left to right it shows a presentation view, a normal view and a sketch view. The presentation mode supports real time shadows, real time light sources and Normal Maps. Overall the results are clearly more vivid than with the alternative method of calculation.



The various 3D display formats can be activated over the option button with the same name.

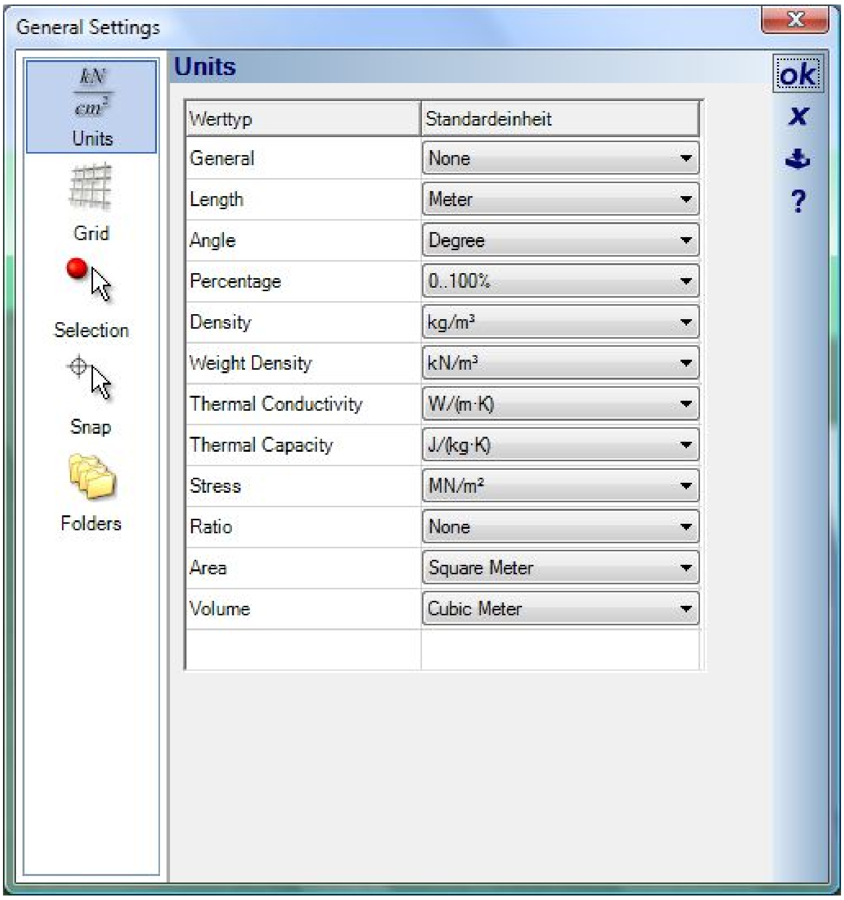


5 GENERAL SETTINGS

You can specify default values and general settings for your work with the software over the ‘Settings>General..’ menu. The settings for each page of a dialog can be saved in your UserConfig file with the ⭳ button, and are then available again the next time the software is started. This means that the ⭳ button has to be pressed once for each category, e.g. Units or Grid, as the settings are only saved for the current category.

5.1 UNITS

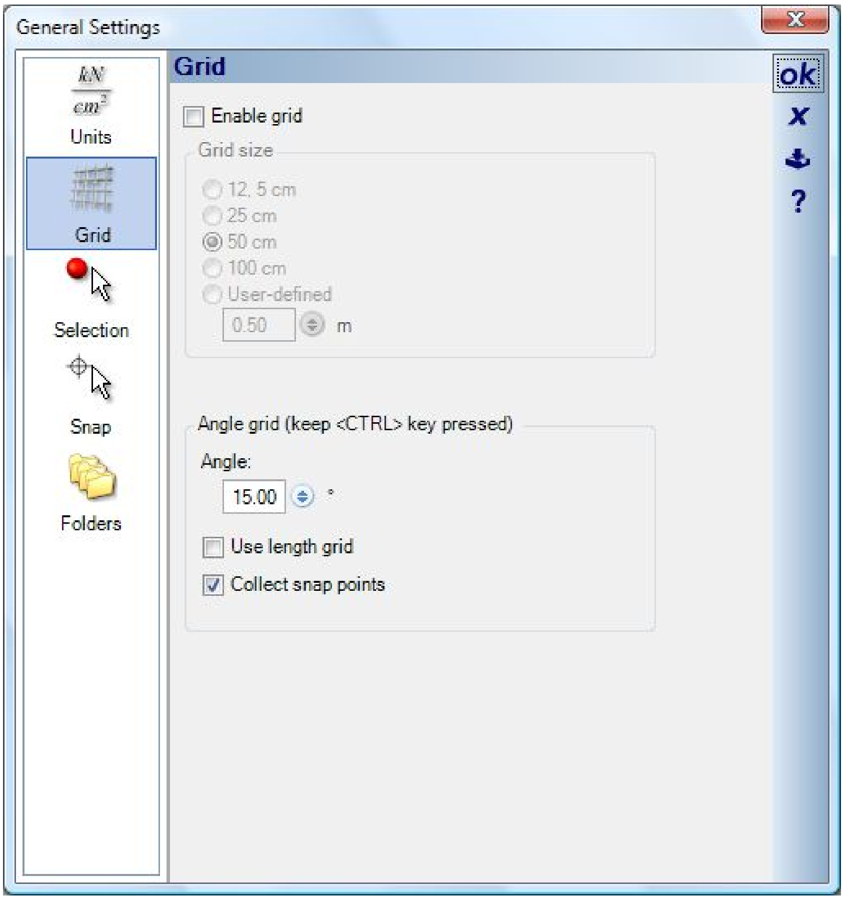
The default units for all numeric input fields can be specified here.



Werttyp	Standardeinheit
General	None
Length	Meter
Angle	Degree
Percentage	0..100%
Density	kg/m³
Weight Density	kN/m³
Thermal Conductivity	W/(m·K)
Thermal Capacity	J/(kg·K)
Stress	MN/m²
Ratio	None
Area	Square Meter
Volume	Cubic Meter

5.2 THE GRID

The settings for the grid always apply to all 2D plan views and are immediately active after the dialog has been terminated with ‘OK’. If the grid is deactivated here, then it is removed from all views. If you wish to work in a specific view without a grid, then set the grid in that view as invisible over ‘Visibilities>visible categories> .



Grid

☐ Enable grid

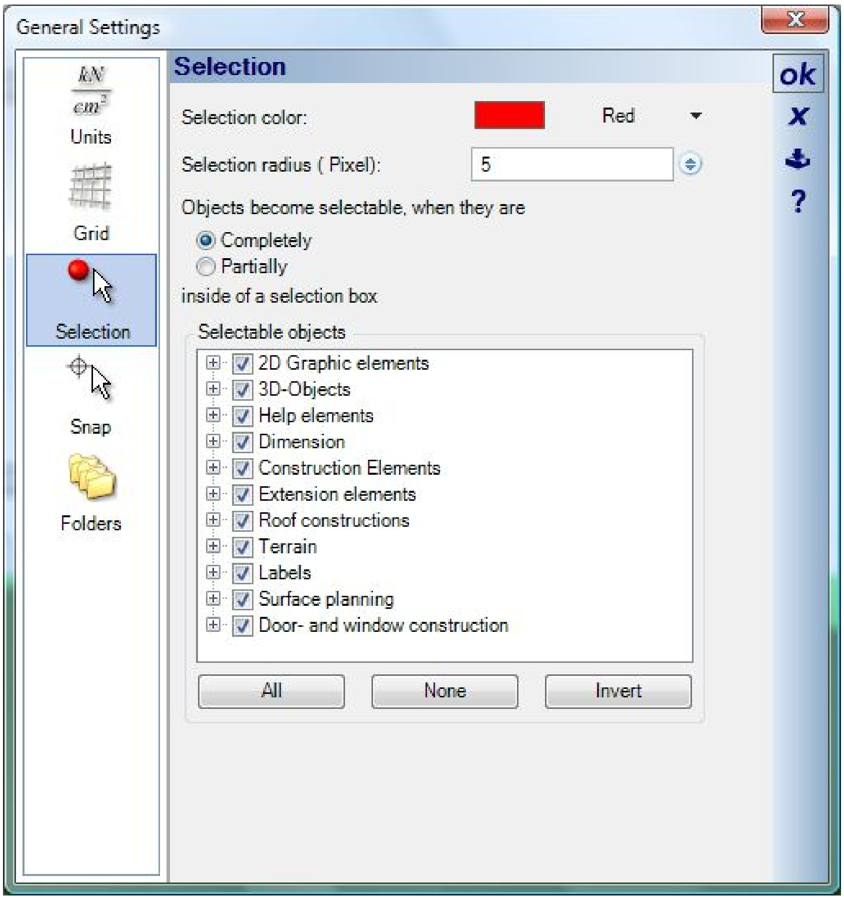
Grid size
○ 12, 5 cm
○ 25 cm
● 50 cm
○ 100 cm
○ User-defined
0.50 m

Angle grid (keep <CTRL> key pressed)
Angle:
15.00 °
☐ Use length grid
☑ Collect snap points

5.3 SELECTION

Settings for ‘Selection’ always apply globally, i.e. in all views. Changes are active as soon as you terminate the dialog with ‘OK’. The selection colour defines how selected objects are to be displayed in 2D views. The settings do not apply to 3D views, where selected elements and objects are identifiable by the material turning red.
The ‘Selection radius in pixel’ determines how close to an element you have to click, in order to select it. This is mainly of interest for narrow objects such as lines, dimensions, etc, since normally objects are selected simply by clicking on them.
When the selected tool is active, a selection rectangle can be created by dragging out the rectangle while pressing the left mouse button. All selectable objects are then,

dependant on the settings specified here, selected, if they lie totally or partly within the rectangle.



Selection

Selection color: 🟥 Red

Selection radius (Pixel): 5

Objects become selectable, when they are

● Completely
○ Partially

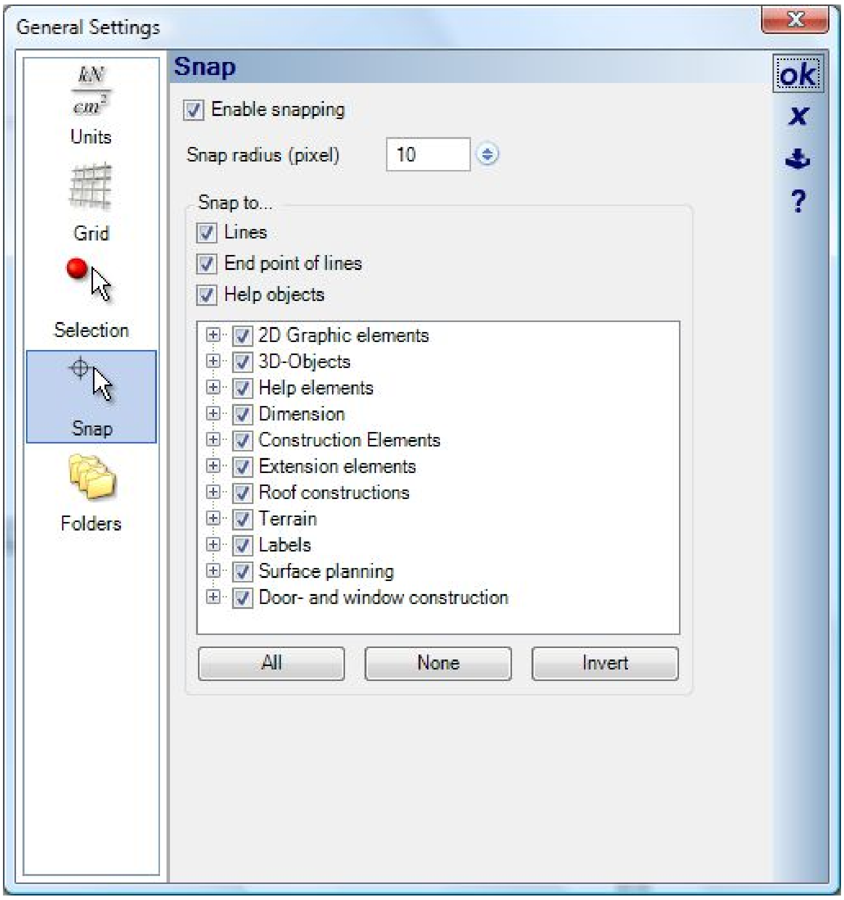
inside of a selection box

Selectable objects

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension
- ☑ Construction Elements
- ☑ Extension elements
- ☑ Roof constructions
- ☑ Terrain
- ☑ Labels
- ☑ Surface planning
- ☑ Door- and window construction

5.4 THE SNAP FUNCTION

The snap function provides assistance when inserting objects with the mouse. The function detects objects within a certain radius of the cursor and automatically positions the cursor at or on the object. In this dialog you can specify for all views whether the snap function should be active, to which objects it should apply and within which radius of the cursor. The radius should not be too large, otherwise it is likely that a number of objects will be found within the radius and the snap function is then no longer practical, or the cursor jumps back and forth between objects.



Snap

☑ Enable snapping

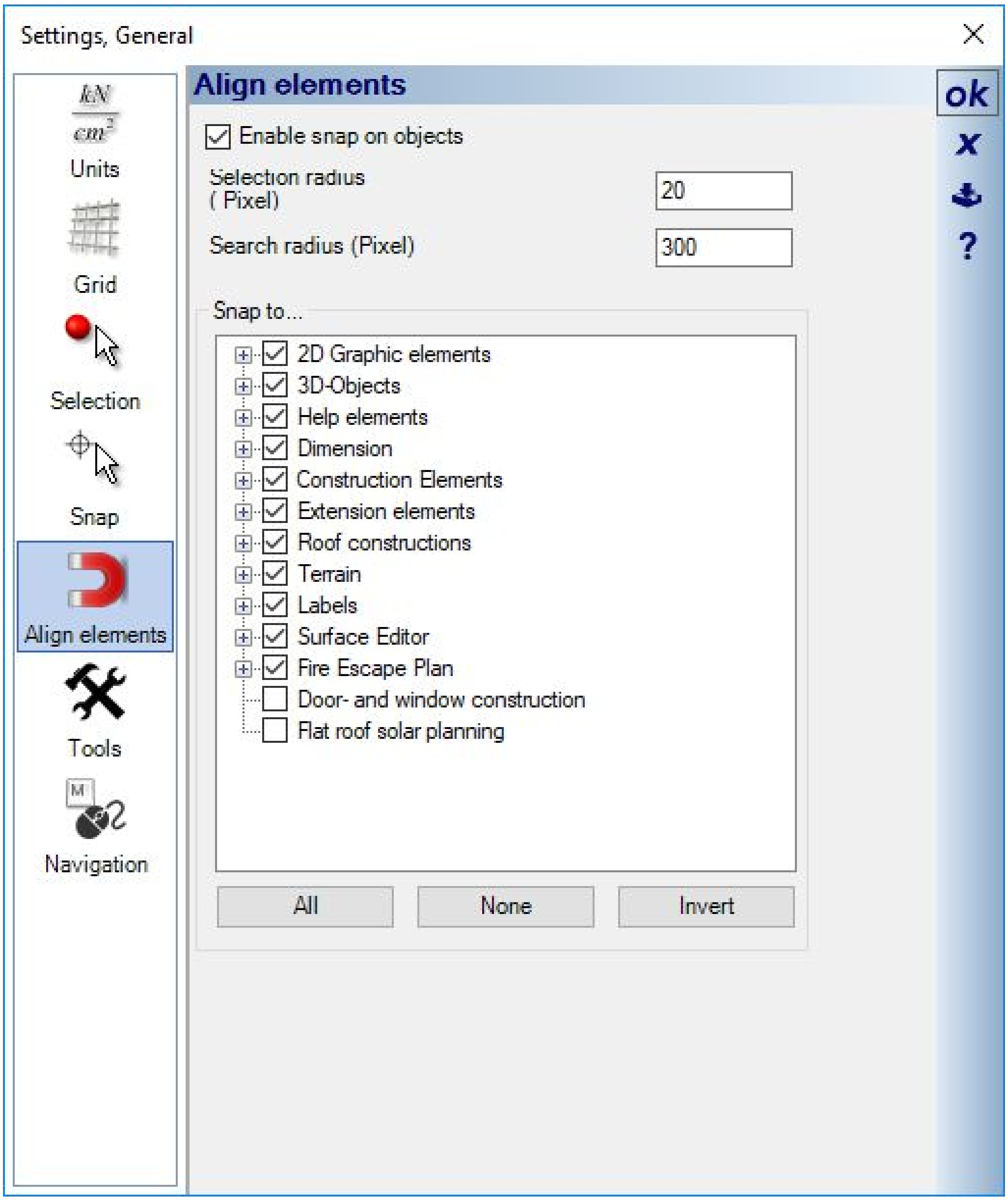
Snap radius (pixel) 10

Snap to...
☑ Lines
☑ End point of lines
☑ Help objects

☑ 2D Graphic elements
☑ 3D-Objects
☑ Help elements
☑ Dimension
☑ Construction Elements
☑ Extension elements
☑ Roof constructions
☑ Terrain
☑ Labels
☑ Surface planning
☑ Door- and window construction

5.5 THE ALIGN FUNCTION

Just like for the snap function, you can select the elements to be taken into account when aligning. In addition, you can influence the behaviour of the tool with a radius, entered in pixels. Which values are reasonable here depends on the mode of operation and the project itself. If you consider that the values are affected by zooming in the 2D view, a search radius of 300 pixels can be appropriate if you edit the view from "some distance", but elements might disappear from this radius and the align function when you zoom in to the scene. In this case you should increase the search radius values.



Align elements

☑ Enable snap on objects

Selection radius (Pixel): 20

Search radius (Pixel): 300

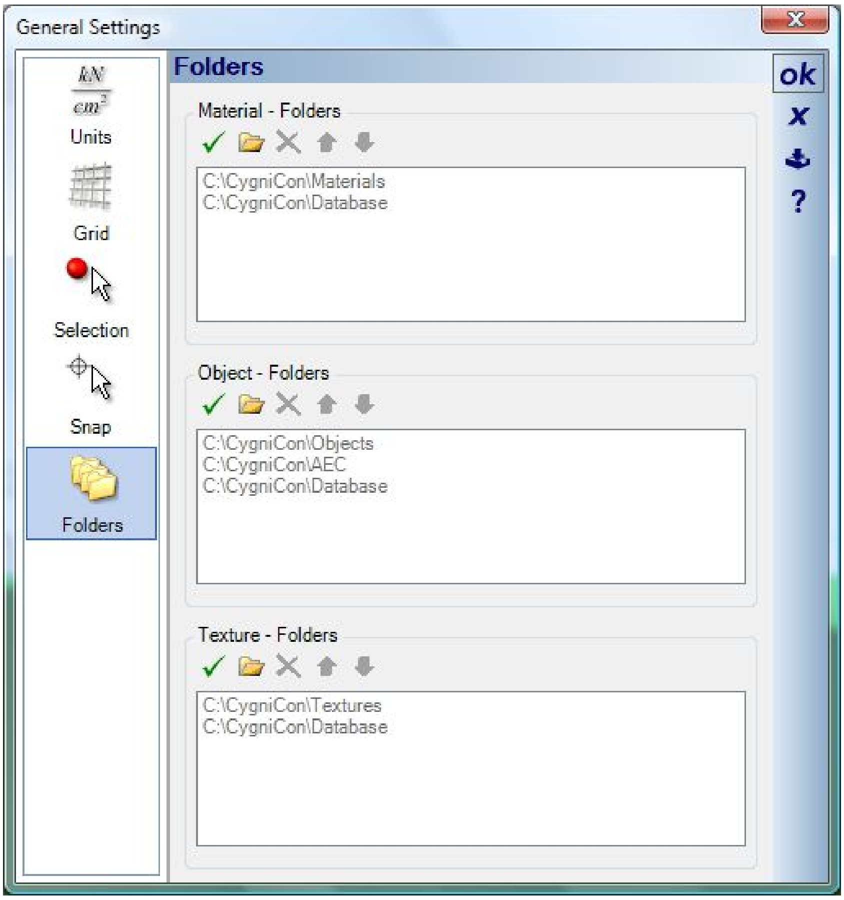
Snap to...

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension
- ☑ Construction Elements
- ☑ Extension elements
- ☑ Roof constructions
- ☑ Terrain
- ☑ Labels
- ☑ Surface Editor
- ☑ Fire Escape Plan
- ☐ Door- and window construction
- ☐ Flat roof solar planning

5.6 FOLDERS

The settings for ‘Folders’ serve to resolve relative paths for the access to files. The software saves relative paths in projects, and also the 3D formats supported by the 3D converter sometimes have relative paths to textures, i.e. the textures are not a part of the object, but are loaded from directories when the object is loaded. If you use this format, and you wish to convert the 3D object with the converter, then the base

path for the textures must be added in the ‘folders’ dialog, otherwise the files will not be found.
Another example is when you receive a project that was created on another system, with objects and textures that are not available locally on your system. In this case, a network path to the directory structure of the other system could be added, so that when the project is loaded the missing files would be searched for over this path.



Folders

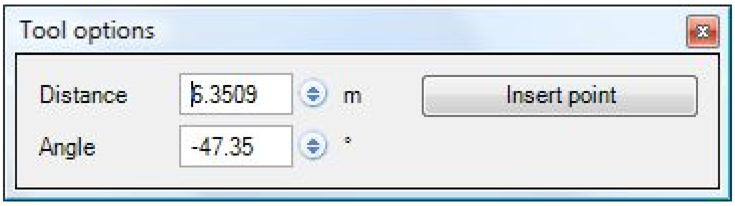
Material - Folders
C:\CygniCon\Materials
C:\CygniCon\Database

Object - Folders
C:\CygniCon\Objects
C:\CygniCon\AEC
C:\CygniCon\Database

Texture - Folders
C:\CygniCon\Textures
C:\CygniCon\Database

5.7 TOOLS

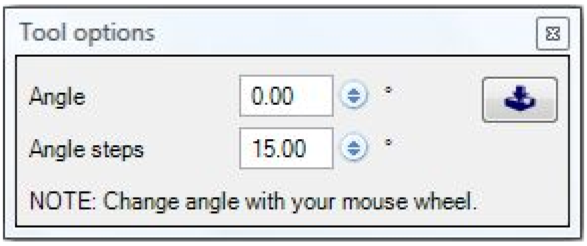
During input of certain elements such as walls and lines, and also when positioning elements from the catalog, the user is assisted by tool option dialogs. With the aid of these dialogs the user can specify input with numerical precision instead of using the mouse, or when positioning an element from the catalog, it can be rotated using the mouse wheel before insertion. The tool option dialog appears while the input tool is active, and disappears automatically once input is aborted or terminated. Here are two examples of tool option dialogs:
Inputing walls and lines:


Tool options

Distance 6.3509 m

Angle -47.35 °

Positioning 3D objects or 2D symbols from the catalog:


Tool options

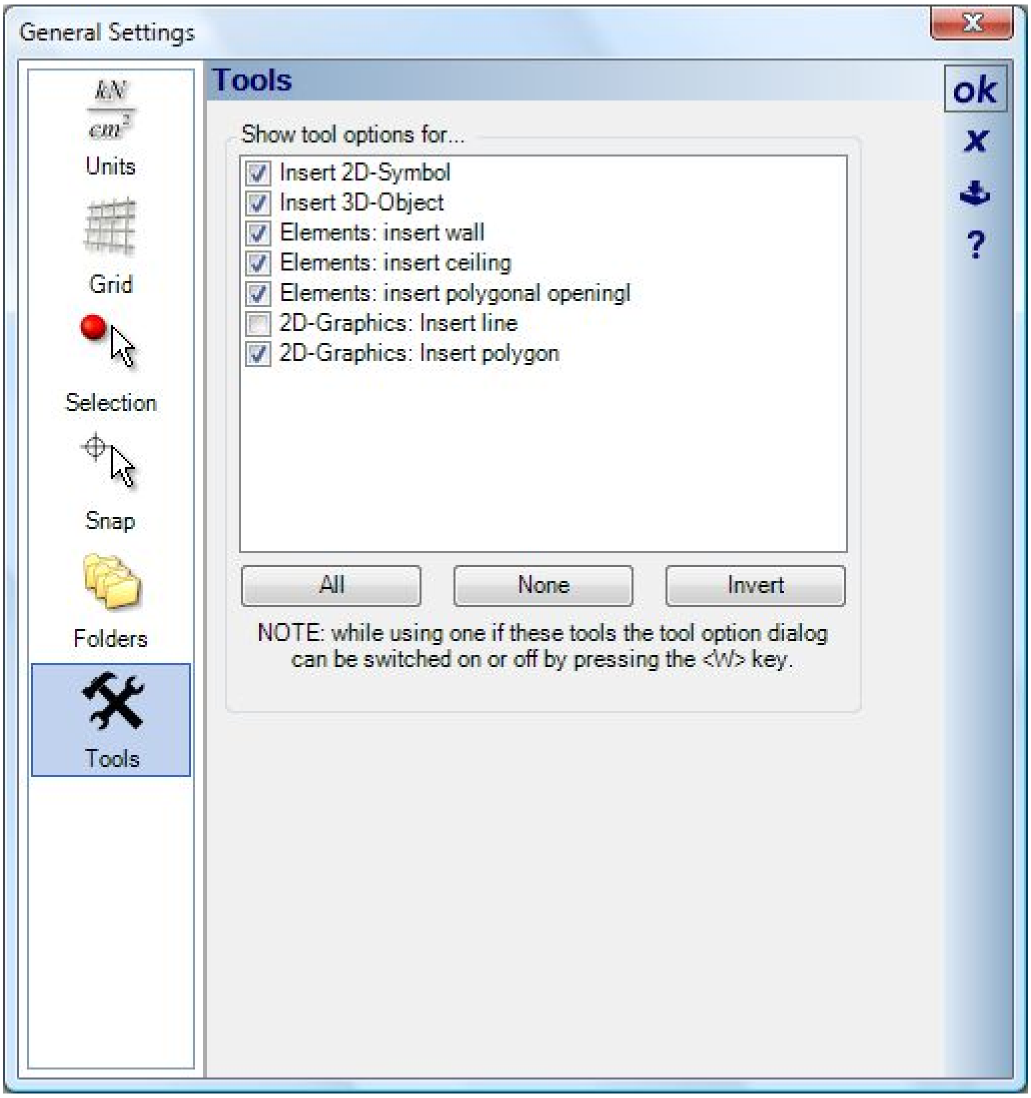
Angle 0.00 °

Angle steps 15.00 °

NOTE: Change angle with your mouse wheel.

Over the ‘General’>‘Tools’ dialog these assistants can be permanently disabled when not needed. This is achieved by deactivating one or more of the tools not required and saving the setting as default .

As described in the dialog, the tools can be activated or deactivated as required during planning using the 'W' key.



Tools

Show tool options for...

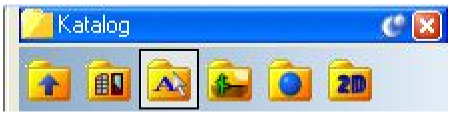
- ☑ Insert 2D-Symbol
- ☑ Insert 3D-Object
- ☑ Elements: insert wall
- ☑ Elements: insert ceiling
- ☑ Elements: insert polygonal openingl
- ☐ 2D-Graphics: Insert line
- ☑ 2D-Graphics: Insert polygon

NOTE: while using one if these tools the tool option dialog can be switched on or off by pressing the <W> key.

6 THE CATALOG

6.1 THE CONTENTS

The toolbar at the top of the 'Catalog' dialog provides access to the various categories available in the catalog.



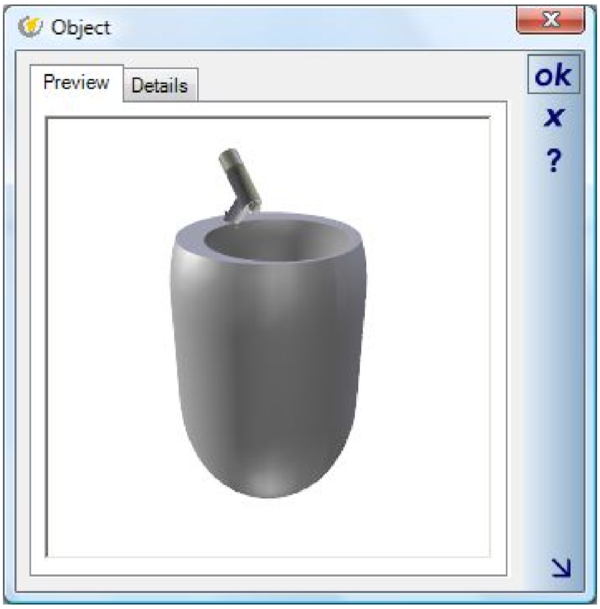
- **Construction Elements**: References the directory 'Installation\AEC\' and allows access to such elements as windows, doors, skylights and walls, which are located in subdirectories of '\AEC\'.
- **3D Objects**: References the directory 'Installation\Objects\'
- **Textures**: References the directory 'Installation\Textures\'
- **Materials**: References the directory 'Installation\Materials\'
- **2D Symbols**: References the directory 'Installation\Graphics2D\'

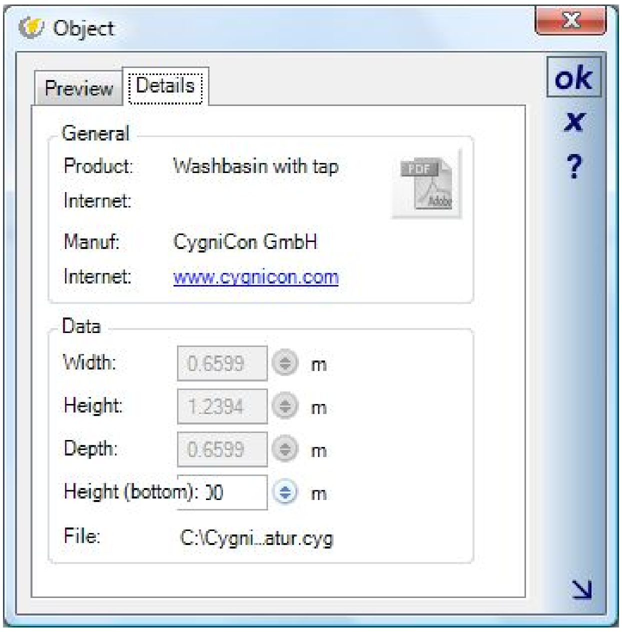
6.1.1 Windows/Doors/Skylights/Walls

Windows, doors and skylights are objects which possess additional information, known as 'Chunks'. These properties are defined in the 'Edit Chunks' dialog, in which 'openings' (chunks that describe the opening created, for example by a window in a wall), alternative 2D representations and numerous other options can be specified.

6.1.2 3D Objects

A double click on the 3D object selected from the catalog opens the 'Object' dialog, which contains two tabs for '3D Preview' and 'Details'.





General

Product: Washbasin with tap

Internet:

Manuf: CygniCon GmbH

Internet: www.cygnicon.com

Data

Width: 0.6599 m

Height: 1.2394 m

Depth: 0.6599 m

Height (bottom):)0 m

File: C:\Cygni..atur.cyg

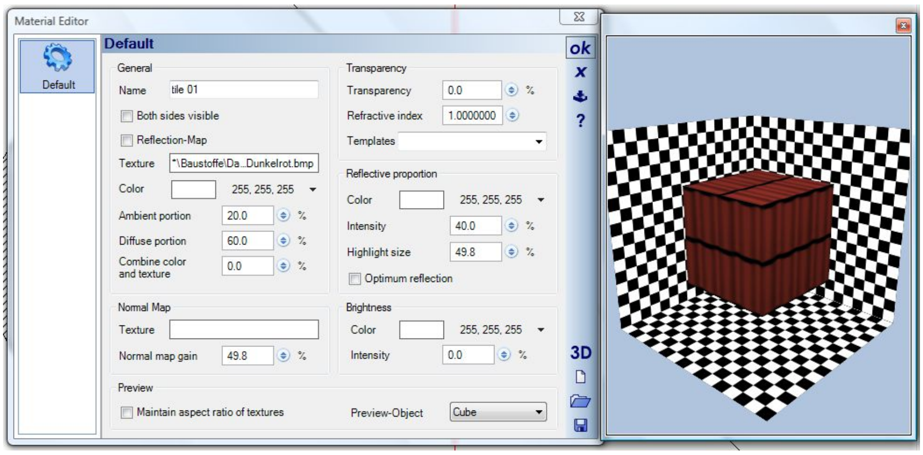
The ‘Details’ tab provides data for the dimensions of the object, and if possible, details of the manufacturer, an article description and internet links, as well as optional information such as technical data or catalogue pages in PDF-format. If this information was specified by the creator of the object in the 3D-Converter, then it can be accessed directly with a double click on the appropriate entry.
The arrow in the bottom left-hand corner indicates that you can change the size of the dialog window if necessary.

6.1.3 Textures

The ‘Textures’ dialog differs solely from the ‘Object’ dialog in that it does not contain a 3D preview, but instead shows an image of the normal representation of the texture. No dimensions are shown, as these are dependent on the texture coordinates of the element that uses the texture.

6.1.4 Materials

The ‘Material Editor’ is opened with a double click on the selected material or, after a right mouse click, over ‘Properties’ in the context menu.



General
Name: tile 01
☐ Both sides visible
☐ Reflection-Map
Texture: *\Baustoffe\Da...Dunkelrot.bmp
Color: 255, 255, 255
Ambient portion: 20.0 %
Diffuse portion: 60.0 %
Combine color and texture: 0.0 %

Transparency
Transparency: 0.0 %
Refractive index: 1.0000000
Templates:

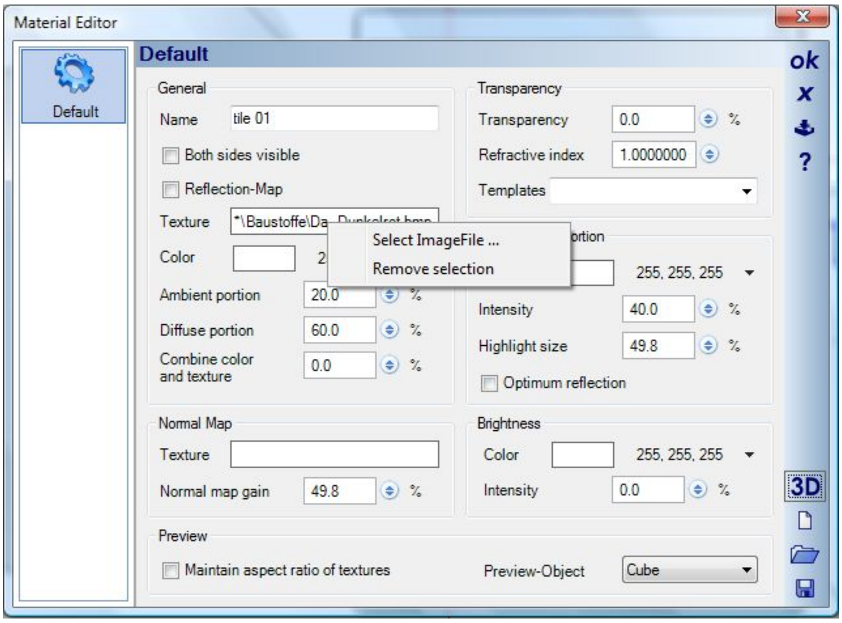
Reflective proportion
Color: 255, 255, 255
Intensity: 40.0 %
Highlight size: 49.8 %
☐ Optimum reflection

Normal Map
Texture:
Normal map gain: 49.8 %

Brightness
Color: 255, 255, 255
Intensity: 0.0 %

Preview
☐ Maintain aspect ratio of textures
Preview-Object: Cube

Here we find all the settings needed to modify an existing material, or to create a new material and save it in the catalog. The software uses its own file format for materials, with the suffix *.mat. The material files can contain, in addition to the material properties, textures and normal maps, since these files for different image formats are included directly in the *.mat file. If you wish to change the texture or normal map for a material, right click on the field with the title ‘Texture’, under ‘General’ or ‘Normal map’. Over the context menu, you can activate the ‘Open image file’ dialog or delete the image directly. A left mouse-click on one of the two images activates the ’Open image file’ dialog directly.



Name: tile 01
☐ Both sides visible
☐ Reflection-Map
Texture: *\Baustoffe\Da
Ambient portion: 20.0 %
Diffuse portion: 60.0 %
Combine color and texture: 0.0 %
Transparency: 0.0 %
Refractive index: 1.0000000
Templates:
255, 255, 255
Intensity: 40.0 %
Highlight size: 49.8 %
☐ Optimum reflection
Normal Map – Texture:
Normal map gain: 49.8 %
Brightness – Color: 255, 255, 255
Intensity: 0.0 %
☐ Maintain aspect ratio of textures
Preview-Object: Cube

6.1.5 *2D Symbols*

The ‘2D symbols’ dialog accesses graphic symbols in our own file format *.cys. A double click on the selected graphic symbol shows a preview, the dimensions of the file, and the file name including details of the path.

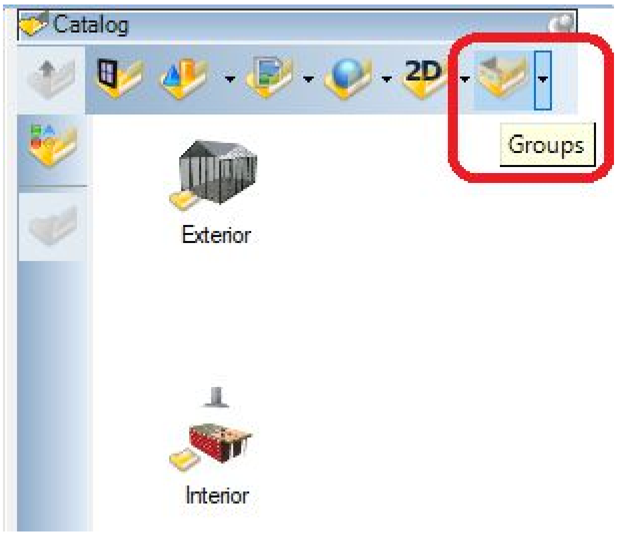
6.2 GROUPS, ALIAS MINI-PROJECTS

Contrary to what is likely expected, groups are not just a combination of already existing 3D objects from the catalog, but mini-projects that can contain almost all constructive elements, but of course also combined with 3D objects.
Groups are inserted in your project as usual via drag and drop from the catalog.
And you can easily add your own new groups in the catalog by selecting various elements with a mouse frame and saving them as a group via the right mouse button context menu.

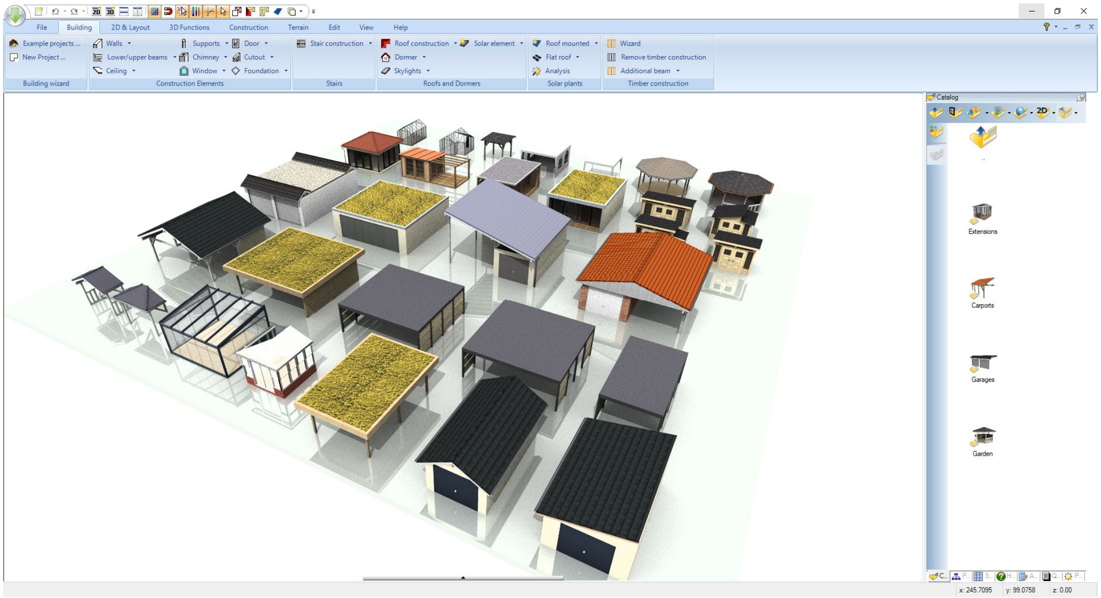
The special thing about it is that groups can be separated into their previous elements once added to your current project. That means walls, roofs, 3D constructions, etc., simply all parts of a group become the original elements again and can be edited and changed as usual.
With this function, you can save all components of a planning, whether it be a garage, balcony, kitchenette, seating groups, or even completely furnished rooms to the catalog and use them in future projects, simply by drag and drop.

6.3 NEW GROUP CATALOG

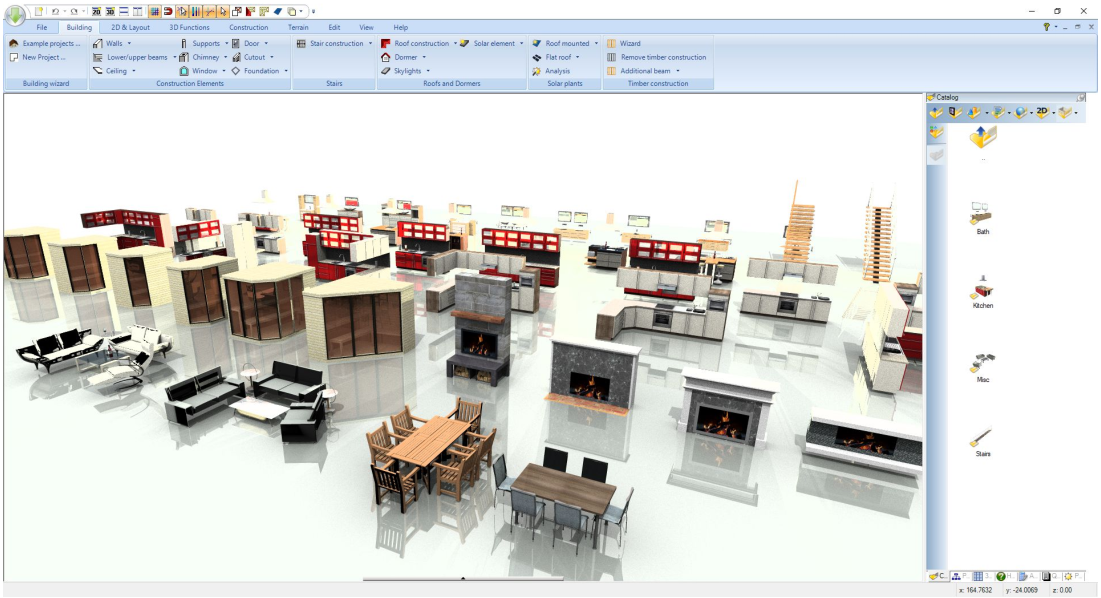
We have provided a separate category for groups in our catalog.



In this catalog we have already added numerous sample groups (approx. 250), partly to show the various options, but also very practical examples that cannot be used as simple 3D objects, e.g. Garages, carports, saunas, garden houses etc..



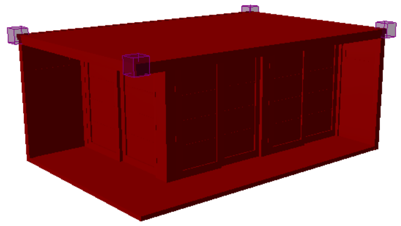
Some examples for the interior, fireplaces, kitchenettes and kitchen islands, bathrooms, saunas, seating groups, etc.

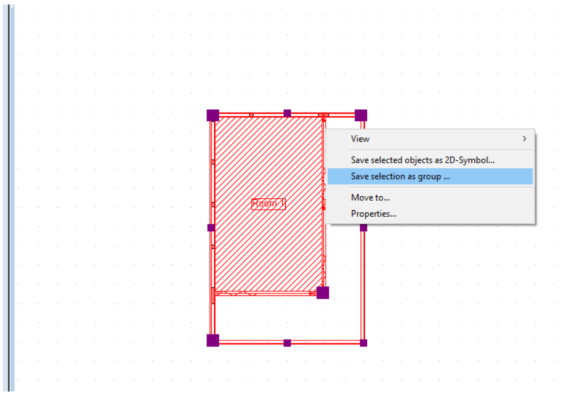


6.3.1 Saving your own groups to the catalog

To save a group, you must select the components together, which is usually easiest by drawing a frame in a 2D view, simply by keeping the left mouse button pressed. Just as you may be used to saving 2D symbols.
With the context menu of the right mouse button you get the option "Save selection as group ...".

It is important to understand that you only get this context menu in an active 2D view. So even if you select elements in a 3D or sectional view, you have to activate a 2D top view afterwards.
The reason is that exactly the current 2D representation of the active view is saved as a 2D symbol to the group and later also serves as a 2D replacement representation for inserted groups.
As a result groups in your floor plans look exactly as if they were part of the drawing and not, as with 3D objects, from a calculated representation of the surface of the 3D model.




View
Save selected objects as 2D-Symbol...
Save selection as group ...
Move to...
Properties...
Room 1

The situation is similar with the 3D object representing a group. Only what is visible in your current 3D view is saved as a 3D model to your group. You have to take this into account in certain cases.

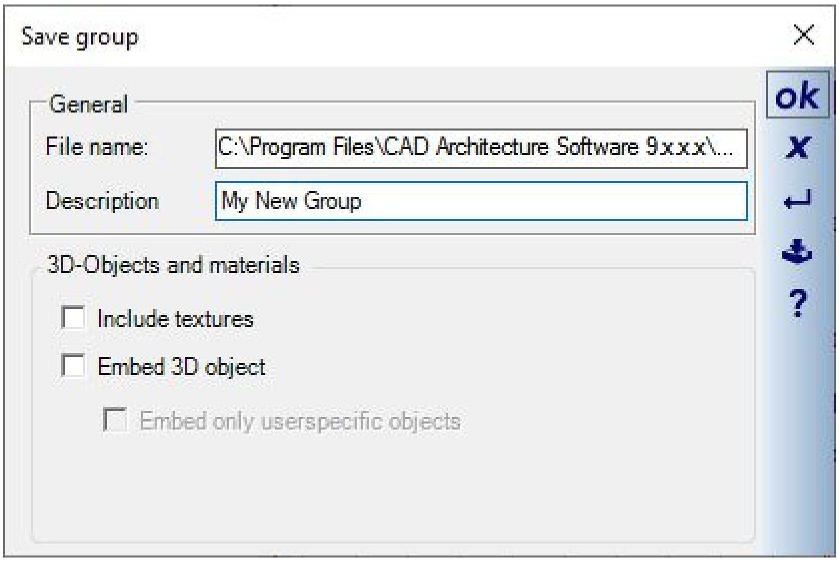
An example: You create a conservatory that is open on the side adjoining the building, but should nevertheless initially contain a room with a floor.
In the event that you do not want to separate the conservatory group in your project, the open side is therefore closed with a room boundary wall and a room with a floor is created within.
The room boundary wall must therefore be visible in the 2D view, because otherwise it cannot be selected and therefore does not become part of the group.
However, the room boundary wall should not be visible in the 3D view otherwise the group will look accordingly.
Therefore, in 3D you have to hide all elements with our visibility function that you do not want to see as a 3D object of the group.

6.3.2 What is saved to a group?

As already mentioned, all selected and thus visible elements from a 2D top view with their original building element properties are saved to a group.
These properties are used when the group is separated later to reconstruct the components, so that walls become real walls, roofs become real roofs, etc.
In addition, a 2D symbol is generated and saved from the top view for the 2D representation in floor plans and a 3D object for the display in 3D views.
When the group is separated these two elements are deleted from the project and replaced with the correct components.
The visibility of a 3D view is used for the 3D object in the group. This means that at the time of saving a group, there should only be a 3D view in the project, otherwise there will be a random result.
In any case, there should be a 3D view.
The selection method also means that groups can only contain elements that are on the same layer. You could save a floor of a building as a group, but not an entire building.

Possibly you would have to create the ground floor and the attic as individual groups and insert them again on different layers in a later project.

When saving a group, you will first get a standard "Save as..." dialog in which you determine the target directory and the file name. Groups have their own file format and therefore also their own file extension (* .cyo).
The following dialog appears as a next step.



Save group

General

File name: C:\Program Files\CAD Architecture Software 9.x.x.x\...

Description My New Group

3D-Objects and materials

☐ Include textures

☐ Embed 3D object

☐ Embed only userspecific objects

The description is used to enter a logical name, i.e. the name under which the group is displayed in the catalog.
3D objects and materials are special cases in the event that you have used textures or 3D objects that are not included in our standard catalogs.
These options would save all of these files directly into the group, but this may result in a group file becoming very, very large.
So these options should only be used in a special case, namely that you want to pass the group on to someone whose computer does not have these "user-defined files". Otherwise the group elements could not be reconstructed when the group is separated.

6.3.3 Loading and inserting groups from the catalog

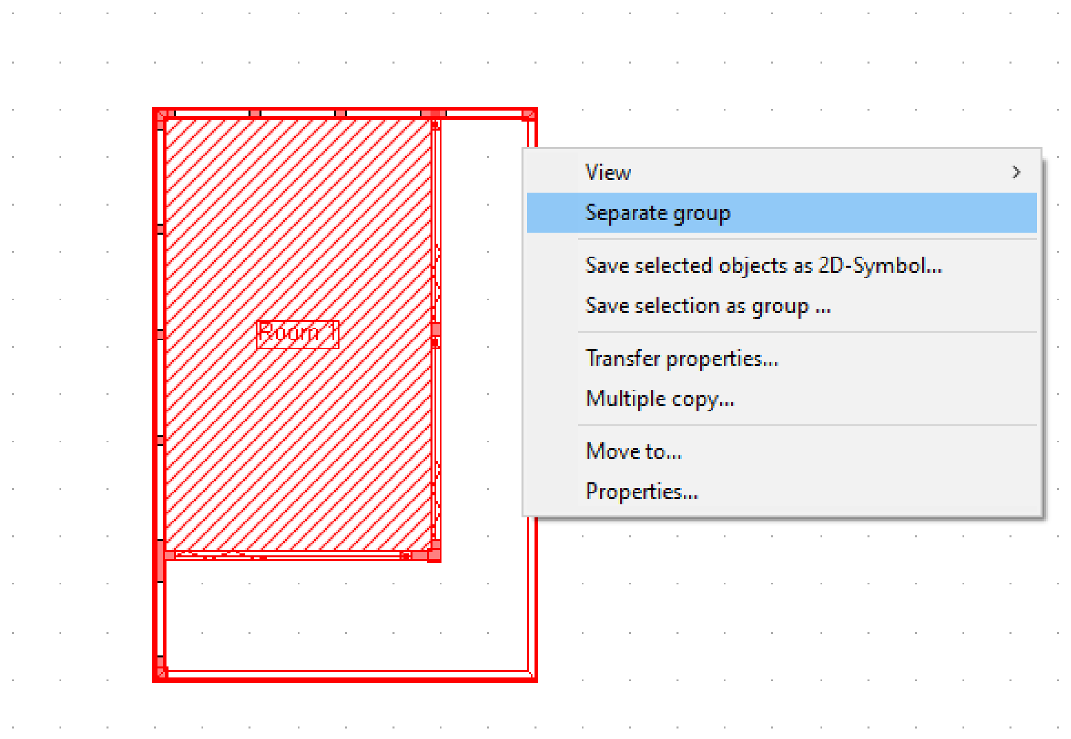
Groups are loaded as usual via drag and drop from the catalog and inserted into your planning with a left mouse click.
There are differences to the placement of 3D objects. Groups cannot be rotated with the mouse wheel while being inserted and you cannot change the reference point with CTRL + W during insertion.

To place or rotate groups, use the normal tools, rotate around a reference point or move with a reference point from the selection toolbar when you have selected the group.

6.3.4 Editing, changing, separating groups

Unlike 3D objects or 2D symbols, groups cannot be changed in size, i.e. they cannot be scaled, since they basically consist of "real building components".

You can't texture parts of a group or change materials in it. If you want to do this, you must first separate the group into its individual parts and then edit the resulting elements as usual.
A group is separated via the right mouse button context menu when a group is selected.



Separating a group cannot be undone. If necessary, you would have to delete the separated parts and insert the group again from the catalog.

6.3.5 Notes on groups with building components

Since groups can also contain construction elements such as walls, roofs, etc., these elements behave normally again after they have been separated from the group.
Walls are always inserted at the zero level of the layer on which they are located for example. Some parts of a group react to other properties of the project, depending on where they are in the building structure.
When inserting a group with building elements, you would have to take into account what should happen to it when the group will be separated.
Example 1: You created a garage in a project with a rough floor height of 2.2 m. To do this, you had set the height of the floor where the garage was located to 2.2 m and left the height property of the walls to "automatic".
"Automatic" means that the walls are always as high as the floor in which they are located.
You have saved this garage as a group and are now inserting it into a new project, on a floor with a default height of 2.8 m.
As long as the group is not separated the group looks as before. Once the group is separated the walls would change their height and become 2.8 m high.
So you can either insert the group beforehand on your new layer with a suitable floor height or you would have to adjust the height of the walls manually afterwards.
Example 2: the garage mentioned is to be built in a new project at a different level, e.g. 50 cm above the level of the ground floor. In this case you would have to create a separate building with the appropriate floor level for the group first, insert the group, and then separated it.

6.3.6 Groups with walls or room boundaries

Groups can include walls or room boundaries. Some of those are also included in our catalog examples, e.g. entire bathrooms or conservatories. As long as the group is not separated, that's not a problem.
When separated, "real" walls are created again and the entire floor plan is recalculated and new rooms might result.
You have to take into account that walls of the previous group may now lie edge to edge with other walls, e.g. in the case of a conservatory that has been moved onto the outer wall, or walls stuck directly in other walls, e.g. in a bathroom.
Both cases, wall to wall or walls in other walls, are bad for our automatic wall intersection and room creation.

Such walls should or must be deleted manually after the group has been separated.

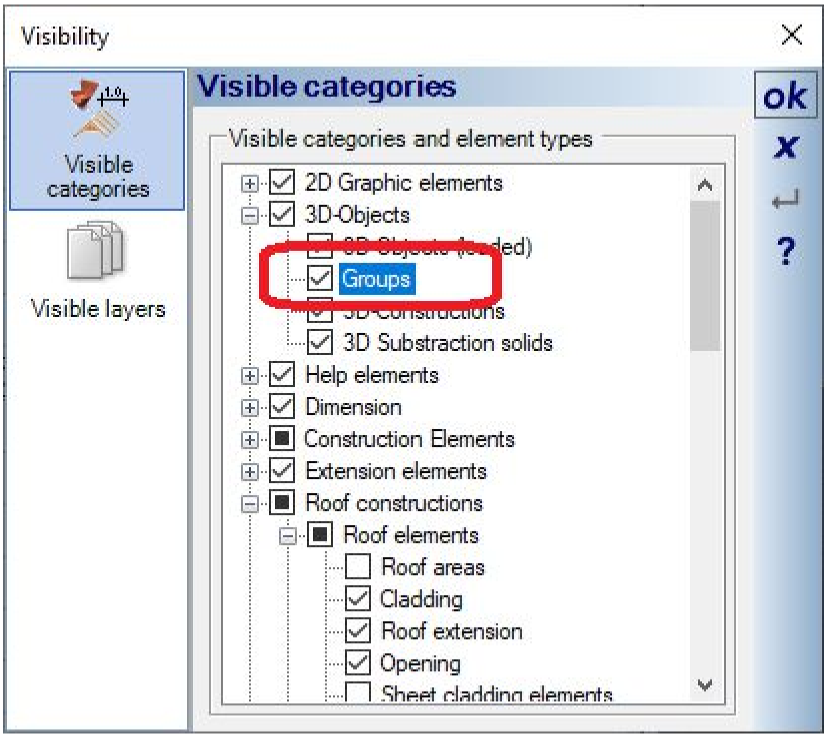
Groups made of entire rooms should also not be used to simply put together floor plans from “room groups”.

Remember that it is not good practice to split walls running in the same direction into several wall sections (e.g. an outer wall over the entire length of the building).

In such cases, it would be better or necessary to delete the individual wall parts and extend one along the entire length using the "extend wall" tool.

6.3.7 *Visibilities of groups, visibilities when separating a group*

As usual, there is a separate visibility category for groups below "3D objects". This can be used to make groups visible or invisible in our 2D and 3D views.



If you separate a group into their previous elements, the components are reconstructed and, of course, are subsequently subject to the visibility of the respective views in your project.
As a result this can show some unexpected effects, ceilings that were previously visible as part of the group apparently disappear when they are separated from the group, just because ceiling elements are set invisible in your current view.
Other elements could suddenly appear because they were set invisible when the group's 3D object was created and are now visible in your view by default, roof panelling for example.

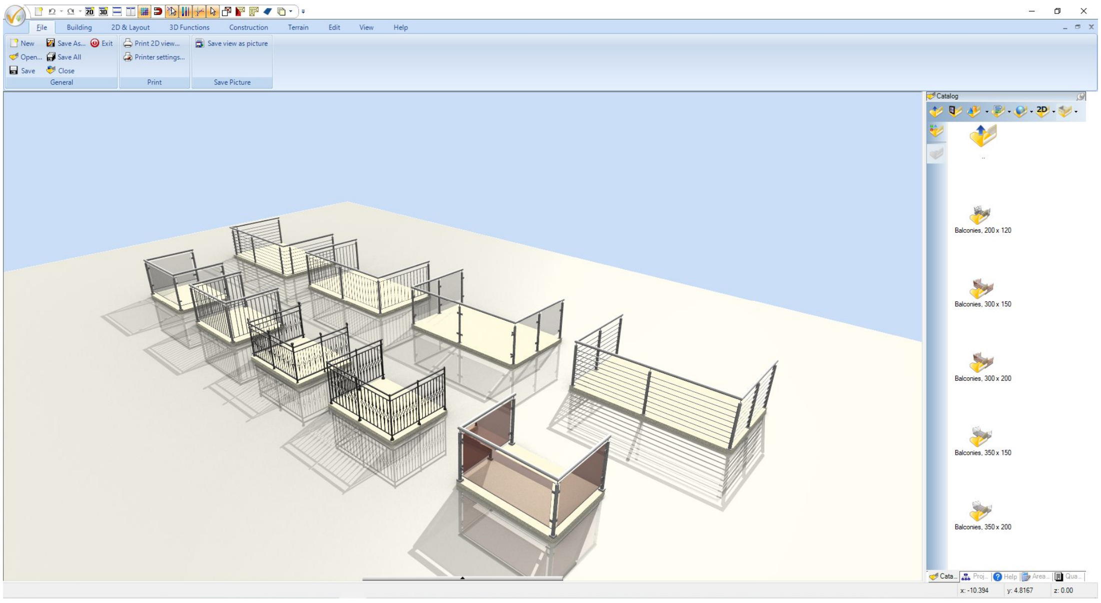
6.3.8 Components of a group, elements which are not available in your software version

Not all components are available in every software variant. This applies in particular to 3D Construction elements such as base solids, extrude and sweep solids.
So it may be that a group contains 3D constructions, but your current software version does not provide these functions and elements.
This does not matter when inserting a group, the groups look correct.

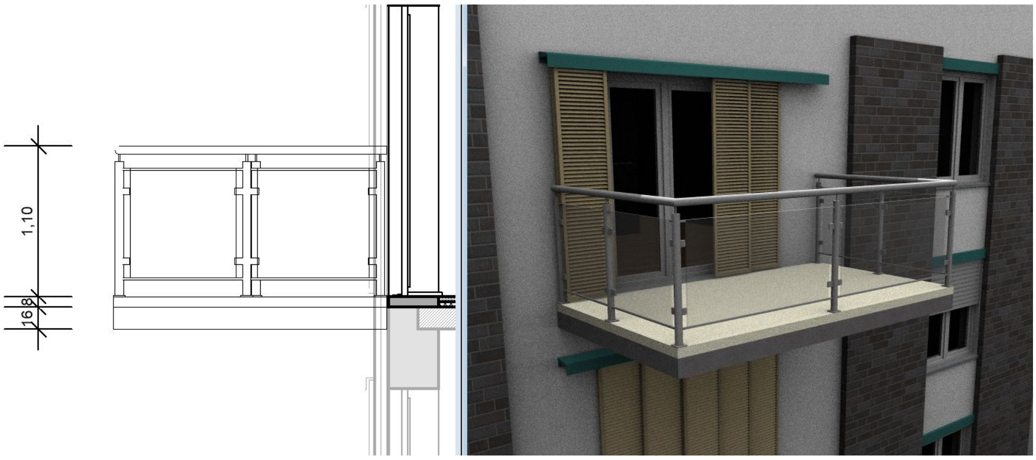
Separating a group will also work, but you won't be able to edit and change the unknown elements in your version.
This applies in particular to 3D construction solids, which are only included in our higher-quality versions, but were often used in the groups in our sample catalog.

6.4 BALCONIES, AS GROUPS IN OUR CATALOG

With our new railing functions, we have pre-constructed several balconies in standard dimensions and added them in the group catalog.



These balconies consist of three parts, two extrude solids for the floor slabs, one as a "replacement" for the ceiling and one as a covering. The railing is mounted on it.
The construction of the balconies is 16 cm thick for the ceiling solid which corresponds to our standard thickness for ceilings, 8 cm covering and railing height 1.10 m.
The level of the ceiling solid is – 16 cm relative to the floor level. So if you insert one of the finished balconies in a 2D plan view, ideally it will automatically position itself correctly.



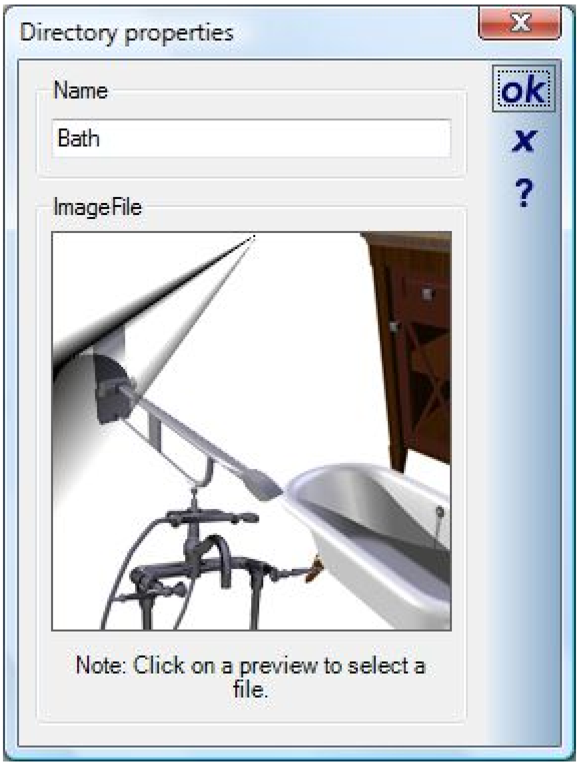
6.4.1 Editing balcony groups

If there is a need for changes, you must first separate the group into its individual parts. This also applies if you only want to change the material of one of the components. To do this, select the balcony and choose "Separate group" from the right mouse button context menu.
Now you can edit all individual parts as usual, change materials and size. If you have already prepared a floor slab for the balcony, simply delete the lower 3D solids coming from the group.

In a building with several identical balconies, it could make sense to adjust only one and then save it as a new balcony in your group catalog. To do this, select all components and choose "Save selection as group..." from the context menu. Now you can simply insert all other balconies of your project as a group.
Since both the 3D and the 2D representation correspond exactly to the original, you do not need to separate the other balcony groups either.

6.5 CREATING YOUR OWN DIRECTORIES, MODIFING PREVIEW IMAGES

Since the catalog can be expanded at any time, it is also possible to modify the name and the preview image of a directory.
To do this, right-click on the directory using the mouse and select ‘Properties’ from the context menu. Now choose an appropriate name for the directory, and for the image which is shown in the catalog instead of the folder symbol. The name entered does not rename the directory itself.



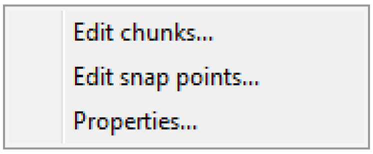
Bath

Note: Click on a preview to select a file.

6.6 ADDITIONAL FUNCTIONS

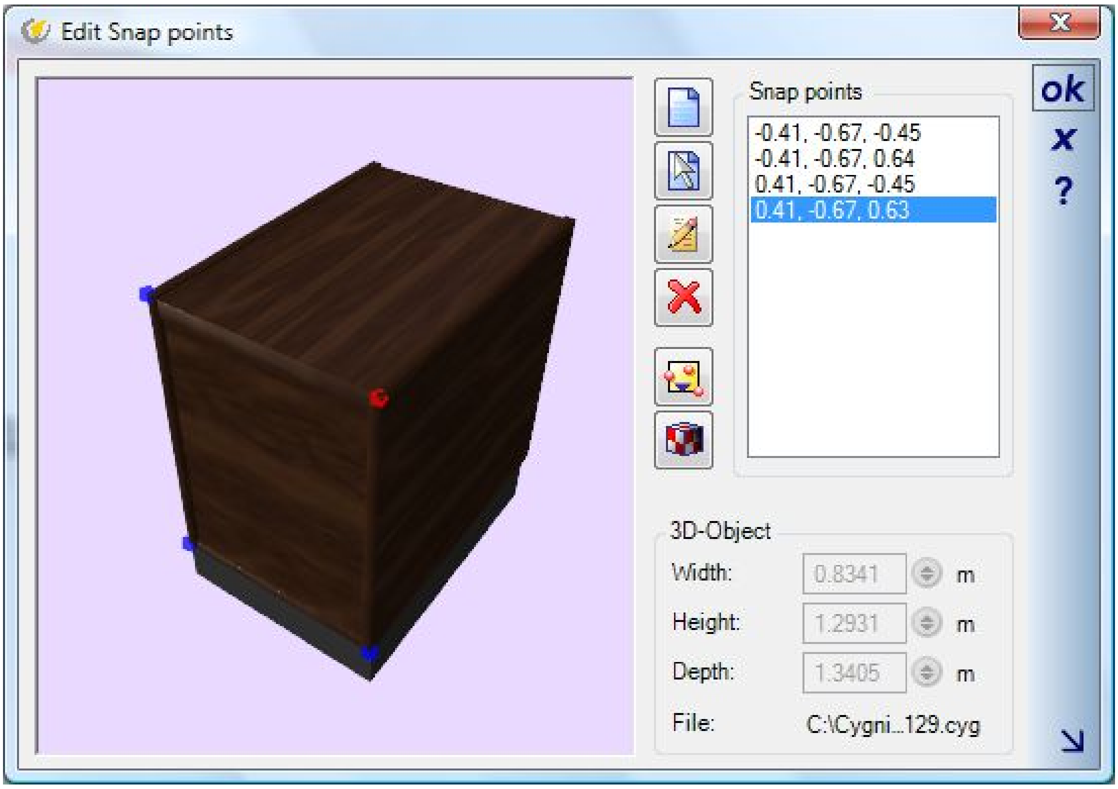
6.6.1 Snap Points for 3D Objects

A right mouse click on a 3D object which has been selected in the catalog, opens the following context menu:



A click on the entry for ‘Edit snap points’ opens the snap point editor, in which snap points can be defined for an object using the mouse, or be specified numerically. Snap points are not shown in 3D views and are used exclusively for positioning 3D objects.

When defining snap points with the mouse, you have the option of snapping to edges and/or corners. For the sake of clarity, the representation can be changed for complex objects. Selected snap points can be edited or deleted from the list. On exiting the dialog with ‘OK’, the snap points are stored permanently in the *.cyg file.



Snap points
-0.41, -0.67, -0.45
-0.41, -0.67, 0.64
0.41, -0.67, -0.45
0.41, -0.67, 0.63

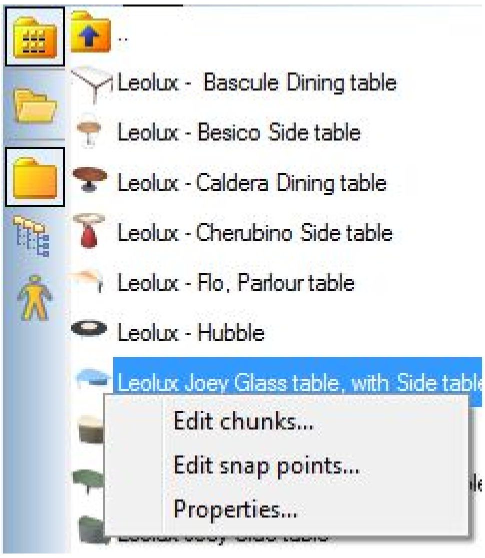
3D-Object
Width: 0.8341 m
Height: 1.2931 m
Depth: 1.3405 m
File: C:\Cygni...129.cyg

6.6.2 Effect of Snap Points when Positioning 3D Objects

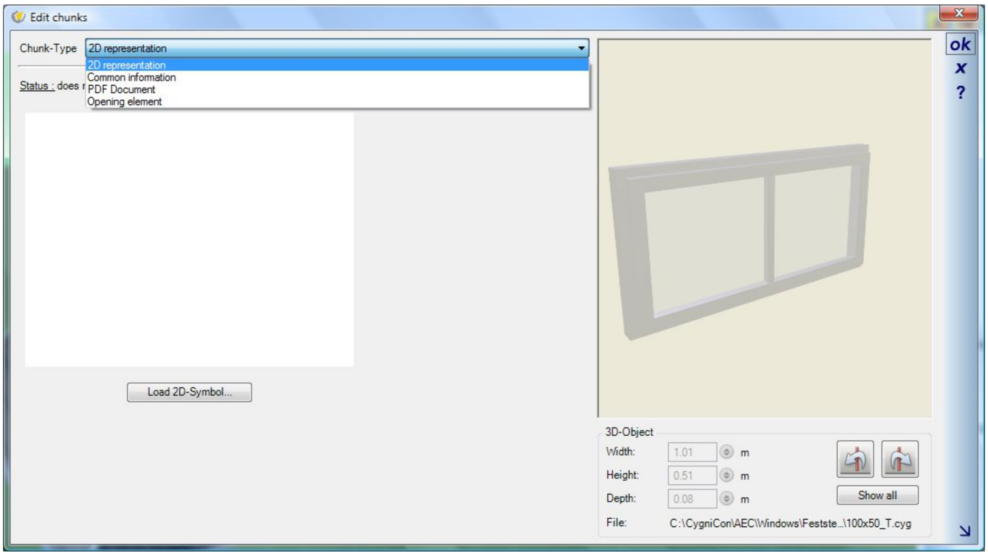
When a selected object is being positioned with the mouse, snap points are detected within a specified radius (in cm) of the cursor. If the snap points of two objects are detected within the snap radius, then a preview is automatically created which shows the user how the objects would be positioned, were the mouse button to be released.

6.6.3 Additional Information and Properties for 3D Objects

If one of the 3D objects for windows, doors or skylights, is selected from the catalog, a right mouse click opens the following context menu.


..
Leolux - Bascule Dining table
Leolux - Besico Side table
Leolux - Caldera Dining table
Leolux - Cherubino Side table
Leolux - Flo, Parlour table
Leolux - Hubble
Leolux Joey Glass table, with Side tabl
Edit chunks...
Edit snap points...
Properties...

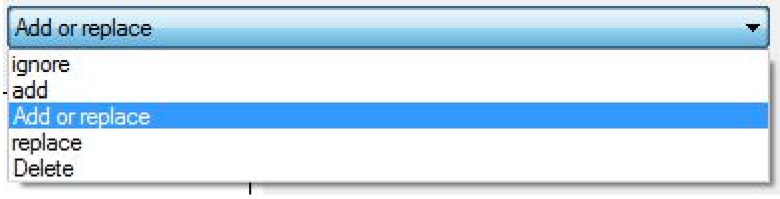
The ‘Chunk editor’ is opened over the menu item for ‘Edit Chunks’, and is the tool in your software which is used to allocate certain additional information to objects. The Chunk editor is opened together with a 3D preview of the selected object. You can select what kind of additional information is to be edited or added, under ‘Chunk type’.



Chunk-Type: 2D representation

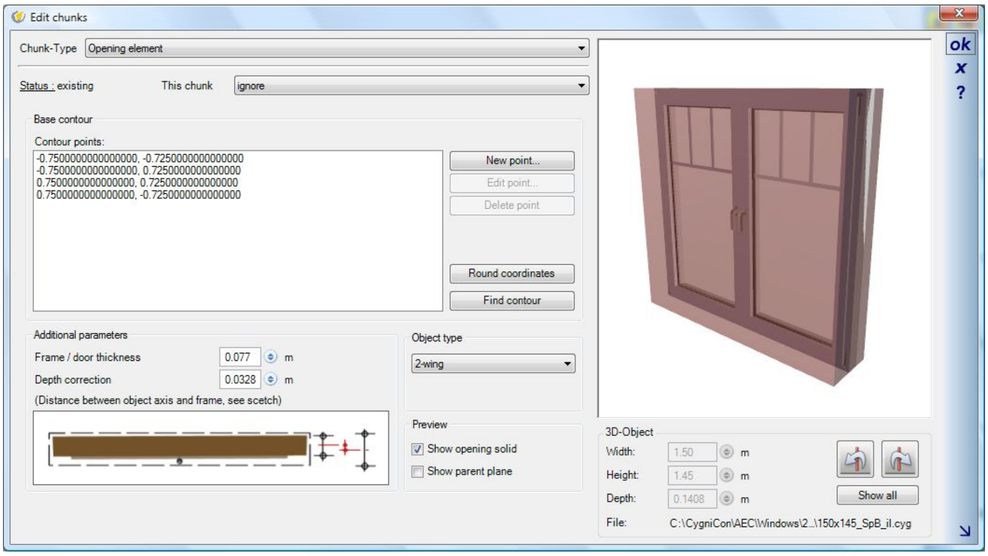
Width: 1.01 m
Height: 0.51 m
Depth: 0.08 m
File: C:\CygniCon\AEC\Windows\Festste...\100x50_T.cyg

You then specify how the additional information is to be processed when the ‘Chunk editor’ is terminated with ‘OK’.



6.6.3.1 Creating your own Windows and Doors, Chunk Type ‘Opening’

The Chunk type for ‘Opening’ specifies all the properties that windows and doors require in order to be used as construction elements. The most important information is for the ‘opening solid’, which creates the corresponding opening when the object is inserted in a wall. The contour of the ‘opening solid’ is normally recognised automatically with the ‘Find Contour’ button. Depending on the modelling of the 3D object, the automatic contour may however contain a unnecessarily large number of contour points, for example if the model contains finely modelled curves. Each of the contour points generated can be selected in the list and edited or deleted. If the ‘Show ‘opening solid’ option is active, the effect on the ‘opening solid’ can be seen directly in the object preview.



Chunk-Type: Opening element

Status : existing

This chunk: ignore

Contour points:

```
-0.750000000000000, -0.725000000000000
-0.750000000000000, 0.725000000000000
0.750000000000000, 0.725000000000000
0.750000000000000, -0.725000000000000
```

Frame / door thickness: 0.077 m

Depth correction: 0.0328 m

(Distance between object axis and frame, see scetch)

Object type: 2-wing

☑ Show opening solid

☐ Show parent plane

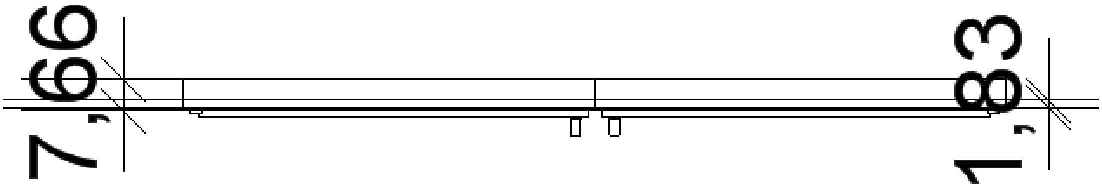
Width: 1.50 m

Height: 1.45 m

Depth: 0.1408 m

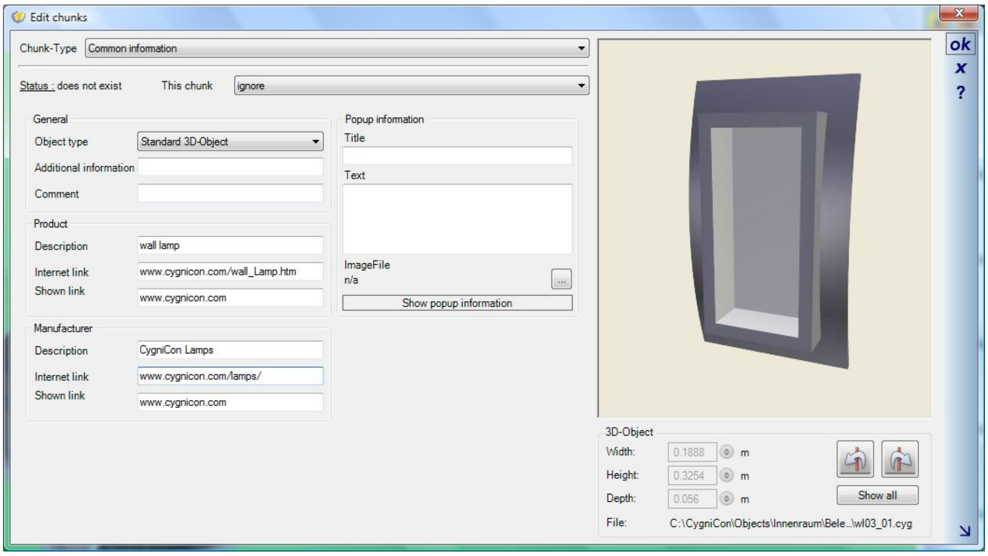
File: C:\CygniCon\AEC\Windows\2...\150x145_SpB_il.cyg

If the object is later to be inserted correctly in a wall, a depth correction must be specified. This correction is necessary, especially with rabbets, since only the frame is of interest when positioning the window, and not the casements and their fittings or other elements contained in the 3D model. The simplest method to obtain the required values, is to drag the 3D object into a 2D plan view, and to measure it there accurately with the aid of guidelines, the ‘Center guideline’ option delivers the required axes directly. The values obtained can then be entered with the chunk editor.



6.6.3.2 Manufacturers’ Data in 3D Objects, Chunk Type for General Information

3D objects can contain information about the product and its manufacturer. This data can be edited in the catalog under the chunk type for ‘General Information’.



Chunk-Type: Common information
Status : does not exist
This chunk: ignore

General
Object type: Standard 3D-Object
Additional information:
Comment:

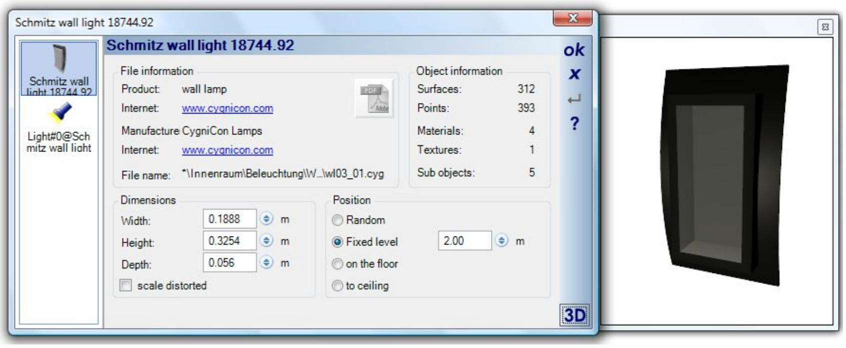
Product
Description: wall lamp
Internet link: www.cygnicon.com/wall_Lamp.htm
Shown link: www.cygnicon.com

Manufacturer
Description: CygniCon Lamps
Internet link: www.cygnicon.com/lamps/
Shown link: www.cygnicon.com

Popup information
Title:
Text:
ImageFile: n/a

3D-Object
Width: 0.1888 m
Height: 0.3254 m
Depth: 0.056 m
File: C:\CygniCon\Objects\Innenraum\Bele...\wl03_01.cyg

The objects can also contain separate internet addresses for the product and the manufacturer respectively. The program differentiates between the internet address shown, and the one that is actually used as soon as the user requests further information from the pages of the manufacturer during construction. The reason for this is that the link to a product can be of any length, depending on the range of products of the supplier, and is therefore not always suitable for display in a dialog. The full addresses are shown as a tooltip in the object properties dialog. A click on the internet address automatically opens the default browser, and the page is shown if the system is connected to the internet.


Schmitz wall light 18744.92
Schmitz wall light 18744.92
Light#0@Schmitz wall light
ok
x
?
3D

Schmitz wall light 18744.92

File information
Product: wall lamp
Internet: www.cygnicon.com
Manufacture: CygniCon Lamps
Internet: www.cygnicon.com
File name: *\Innenraum\Beleuchtung\W...\wl03_01.cyg

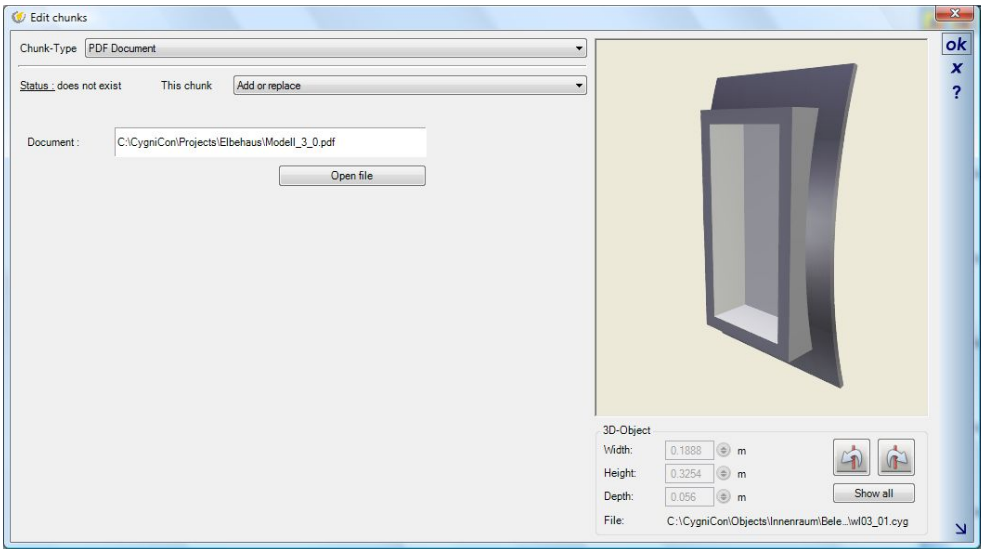
Object information
Surfaces: 312
Points: 393
Materials: 4
Textures: 1
Sub objects: 5

Dimensions
Width: 0.1888 m
Height: 0.3254 m
Depth: 0.056 m
☐ scale distorted

Position
○ Random
● Fixed level 2.00 m
○ on the floor
○ to ceiling

6.6.3.3 Manufacturers’ Data in 3D Objects, Chunk Type for PDF Document

Apart from their names and internet links, 3D objects can optionally contain further information about the product in PDF format. The PDF files are integrated in the 3D objects and are therefore always available, irrespective of where the object is used.



Chunk-Type: PDF Document

Status : does not exist

This chunk: Add or replace

Document : C:\CygniCon\Projects\Elbehaus\Modell_3_0.pdf

3D-Object

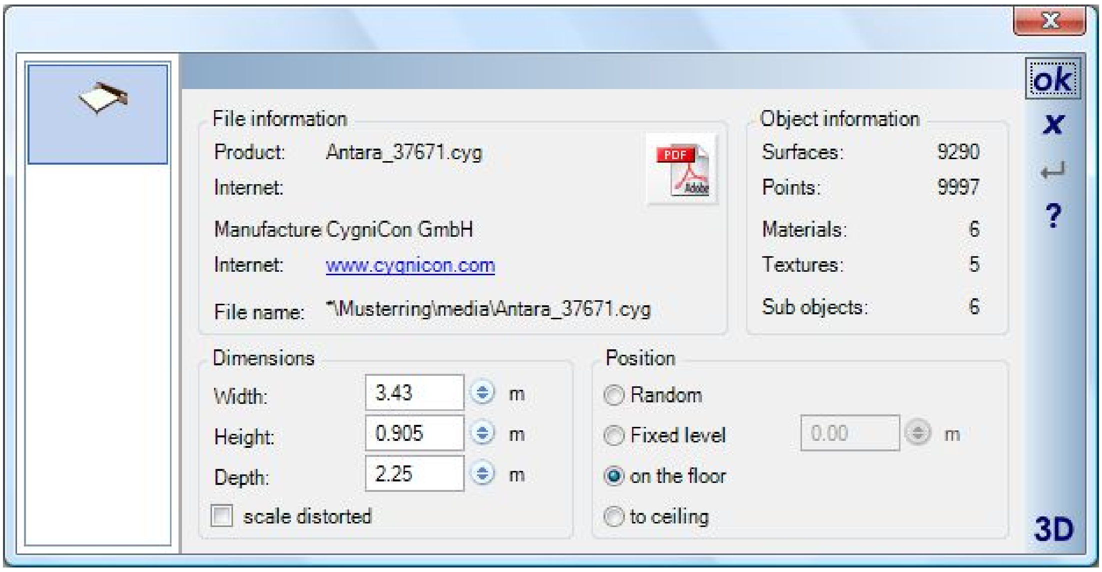
Width: 0.1888 m

Height: 0.3254 m

Depth: 0.056 m

File: C:\CygniCon\Objects\Innenraum\Bele...\wl03_01.cyg

The PDF document is selected with a click on the PDF button, and can then be opened using the ‘display file’ button.
For objects which contain PDF files, the PDF button is active in the object properties dialog, otherwise the PDF button is inactive and appears grey.



File information

Product: Antara_37671.cyg

Internet:

Manufacture CygniCon GmbH

Internet: www.cygnicon.com

File name: *\Musterring\media\Antara_37671.cyg

Object information

Surfaces: 9290

Points: 9997

Materials: 6

Textures: 5

Sub objects: 6

Dimensions

Width: 3.43 m

Height: 0.905 m

Depth: 2.25 m

☐ scale distorted

Position

○ Random

○ Fixed level 0.00 m

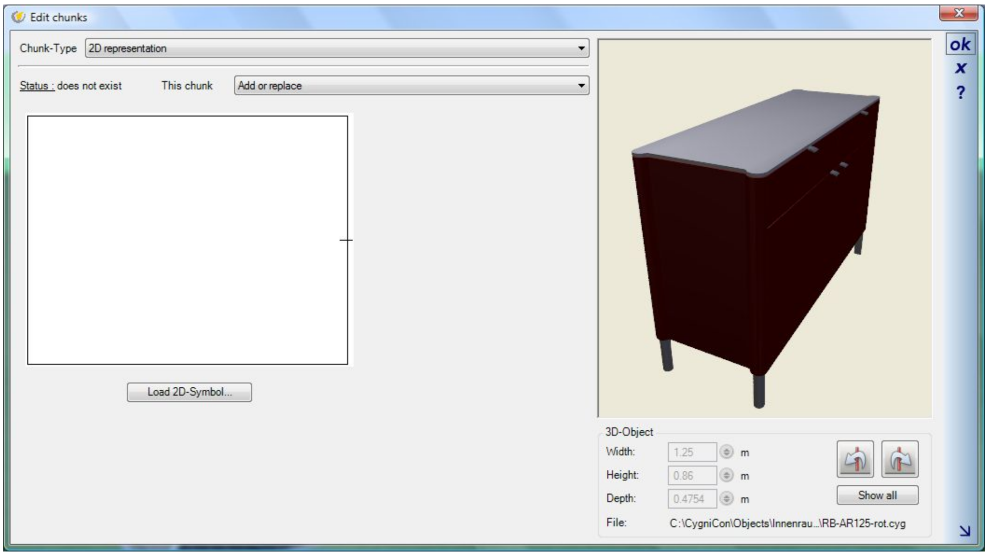
● on the floor

○ to ceiling

A click on the PDF button automatically opens the document with the default program for PDF files. With this function, manufacturers have the possibility your software to provide, together with their 3D construction elements, catalogue items with photos, technical data or any other information which might be of interest to customers and planners.

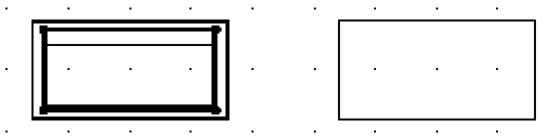
6.6.3.4 Alternative 2D Representation of 3D Objects, Chunk Type for 2D Alternative Representation

The representation of 3D objects in 2D plan views, is generated by default from the 3D model and its defined edges when the object is loaded i.e. when it is inserted from the catalog. Alternatively, objects can have fixed representations defined in the form of 2D-symbols (*cys files). This fixed representation is allocated to the object over the ‘Alternative 2D representation’ chunk. Objects which contain a chunk for alternative 2D representation, are always automatically represented by this symbol. Working with fixed representations can considerably improve the graphic quality and speed up the loading of 3D elements which contain a lot of edges, as the 2D representation no longer has to be generated.



Edit chunks
Chunk-Type: 2D representation
Status : does not exist
This chunk: Add or replace
3D-Object
Width: 1.25 m
Height: 0.86 m
Depth: 0.4754 m
File: C:\CygniCon\Objects\Innenrau...\RB-AR125-rot.cyg

When using alternative representations of objects, it should be noted that they are automatically scaled according to the exterior dimensions of the 3D object. Therefore, the proportions of the symbol should correspond to those of the 3D object. If the scale of an object with an alternative representation, is later distorted, then the 2D representation is distorted to the same extent. The following illustration shows a table with its automatic alternative representation on the left, and on the right its representation by a symbol added later.

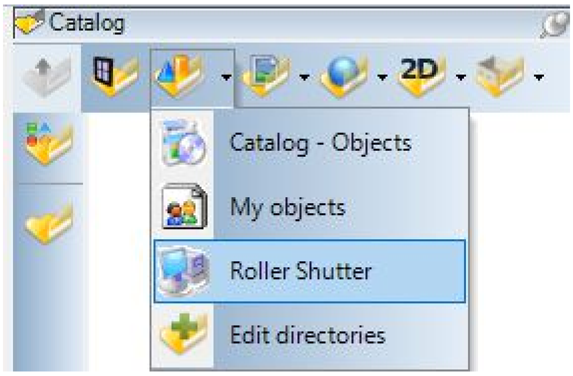


6.6.4 Open File, Selecting Files Locally

3D objects which are not stored in the Installation\Objects directory are not visible in the catalog and can therefore not be used in planning. However these objects can be accessed with the function 'Open file' on the left side of the catalog. Then select the required object in the 'Open file' dialog. When the dialog is terminated with 'OK', the object is loaded and is available to be positioned using the normal drag and drop procedure.
The paths of objects loaded in this way are always absolute paths on your system. This means that subsequent changes in the directory structure, or if the object file is moved or deleted, will result in the object no longer being available to the project.
Valid files such as objects, textures and materials can also be directly imported over the Windows Explorer and used in planning. In this case the absolute paths of the files also apply for the project.

6.7 CHANGES TO THE CATALOG FOR 3D OBJECTS, TEXTURES, MATERIALS, 2D-SYMBOLS AND GROUPS

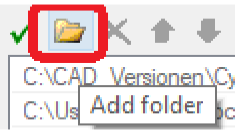
So far, the catalogs for 3D objects, textures, materials, 2D symbols and recently also for groups only pointed to specified main directories in your installation path. Loading and managing your own files in your own directories was a bit complicated and only possible via a "Open file ..." dialog.
Now you can integrate separate directories for each category and then navigate within these directories as usual in your catalog.
Both, the buttons for the main categories and the dialog for managing the directories have been revised.



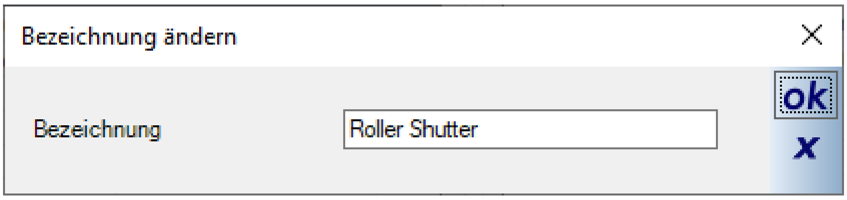
The buttons now offer a menu via the small black arrow on the right-hand side, which contains the previous main directories, the standard alternative in your user directory as "My Objects" and an entry for opening the directory dialog. If you define your own directories, these are added as additional menu entries. With one click on the menu entry, the catalog display changes to this directory.
If you click directly on the button the catalog behaves as before and switches between the main categories.

6.7.1 Creating and managing your own directories

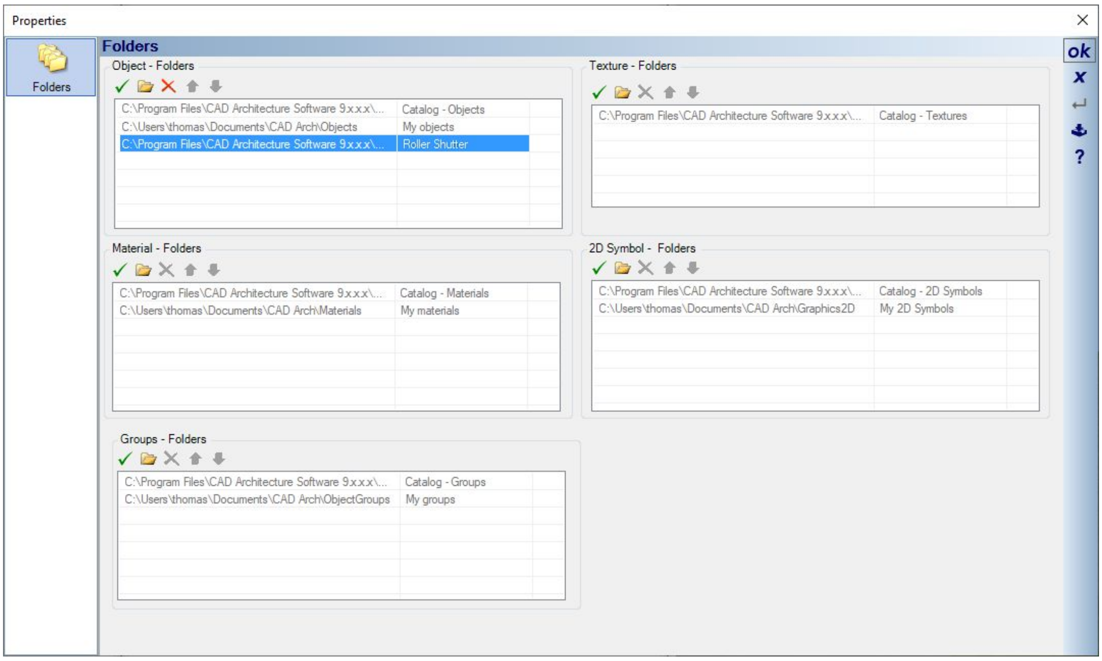
You open this dialog either via the catalog with the menu "Edit directories ..." or via the menu File - Settings - Program.
It offers the option to specify your own catalog directories for each category. The standard catalogs and the alternative in the "My Documents" directory are created automatically here and cannot be changed.
To add a new directory, click on the "Add folder" button above the respective category.



Everything else are Windows standard functions. The newly created directory then shows its path and the logical name is by default the name of the directory.
This name is also used on the menu button in the catalog and can therefore be changed. Double-click in the column with the name and change it if necessary.



Bezeichnung: Roller Shutter



Object - Folders

C:\Program Files\CAD Architecture Software 9.x.x.x\...	Catalog - Objects
C:\Users\thomas\Documents\CAD Arch\Objects	My objects
C:\Program Files\CAD Architecture Software 9.x.x.x\...	Roller Shutter

Texture - Folders

C:\Program Files\CAD Architecture Software 9.x.x.x\...	Catalog - Textures

Material - Folders

C:\Program Files\CAD Architecture Software 9.x.x.x\...	Catalog - Materials
C:\Users\thomas\Documents\CAD Arch\Materials	My materials

2D Symbol - Folders

C:\Program Files\CAD Architecture Software 9.x.x.x\...	Catalog - 2D Symbols
C:\Users\thomas\Documents\CAD Arch\Graphics2D	My 2D Symbols

Groups - Folders

C:\Program Files\CAD Architecture Software 9.x.x.x\...	Catalog - Groups
C:\Users\thomas\Documents\CAD Arch\ObjectGroups	My groups

The settings for your directories are stored in a separate XML file in your user directory. File name is "UserPaths.xml".
With future updates, this file can be copied into the new user directory and you do not have to make new settings every time.
Our installation program tries to automatically copy user files in future updates, but depending on the computer and user access rights, this may not always work.

7 THE PROJECT VIEWER / PROJECTS

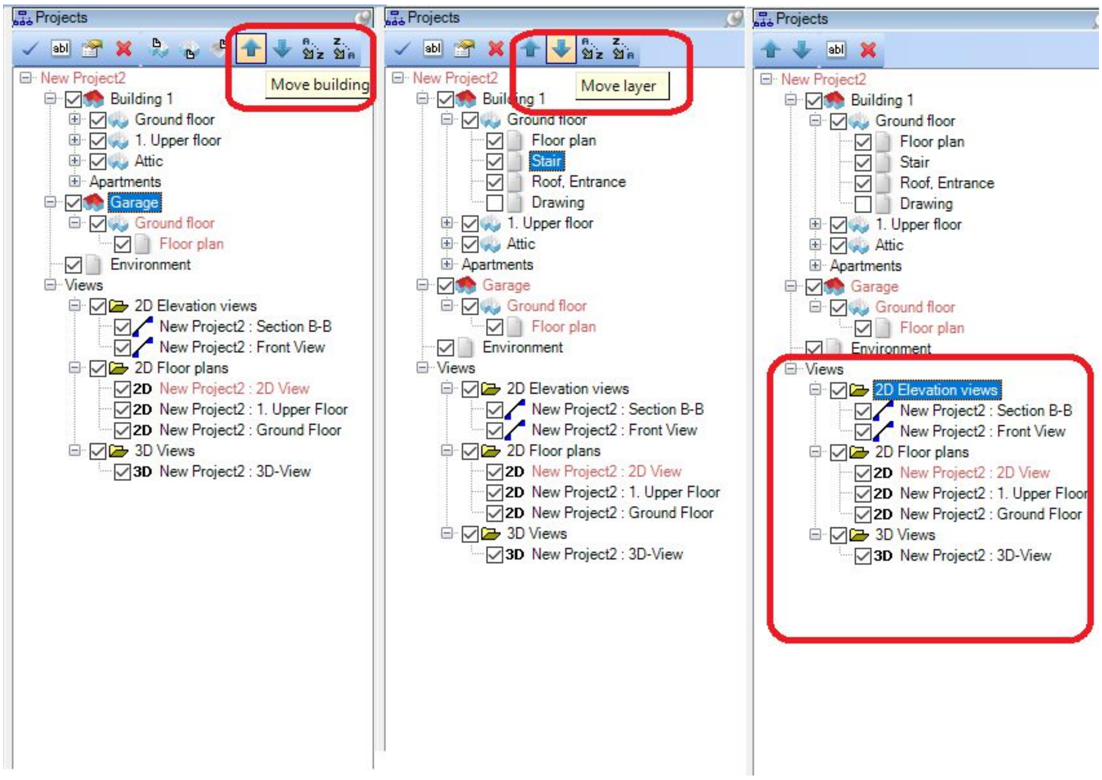
7.1 GENERAL

The toolbox on the right-hand side of the software window contains, as well as the catalog and possible extensions for special plug-ins, also the project viewer, which is the central place in your software for maintaining projects and their hierarchy, and for creating buildings, floors and layers. The project viewer is activated with a click on the ‘Projects’ tab, which is located by default at the bottom of the toolbox.

When a new project is created, a basic structure is automatically provided. This consists of a new project, a ‘Building 1’, a ‘Ground floor’ and the associated ‘Floor plan’ layer.

Furthermore, the projects contains ‘Environment’ layer, which in turn contains such elements as ‘Plot’ and the ‘North arrow’ - elements which only occur once in a project. A new project also opens a new 2D plan view, which is listed under ‘Views’.

The current layers and their associated hierarchy are shown in red in the tree, to improve clarity. Elements, e.g. walls, are always inserted in the current layer, i.e. in the example shown in the ‘Floor plan’ layer.



The visibility of the structure in existing views can be set individually for each view with the check boxes ☑ in the tree.
Depending on where you are currently positioned in the project hierarchy, the project viewer provides various buttons, with which the functions valid for this level or the information contained there, can be accessed. The functions which are provided for all levels, and can be accessed over the context menu opened with a right-click, or alternatively over the 🔄 ✓ abl 📋 buttons, are from left to right:

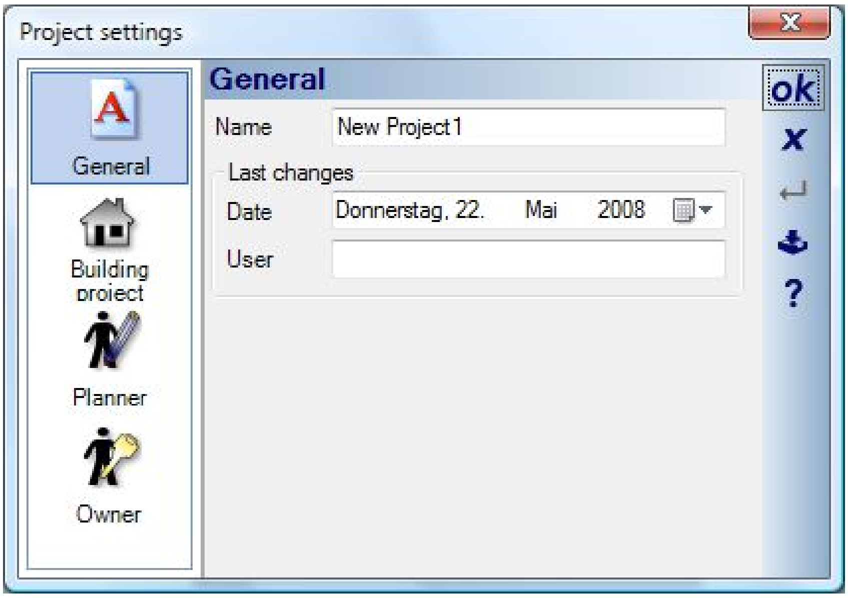
- Refresh
- Set as current element
- Rename
- Properties

In the project viewer, the sequence of buildings and layers within floors can be changed in the "project tree". Buildings as well as layers can be sorted in single steps or alphabetically ascending or descending.

⬆ ⬇ A↘Z Z↘A

You can create your own view categories using the context menu and assign the existing views to these categories. Activating and deactivating categories automatically also ensures that the view in it becomes visible or invisible. Especially with larger projects and many views a clear simplification.

7.2 PROJECT PROPERTIES


Project settings

General

Name New Project1

Last changes

Date Donnerstag, 22. Mai 2008

User

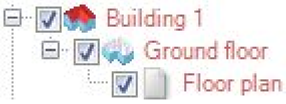
The project properties comprise of project name, data concerning changes, as well as the name and address of the planned building, the planner and the owner. There is no connection between the project name and the name of the project file.

7.3 BUILDINGS

You can create new buildings for the active ‘Project’ level ⊟ Mein Projekt in the tree structure. With the button for ‘New Building’, or from the context menu of the same name, you can open a dialog, in which a name can be specified for the building.

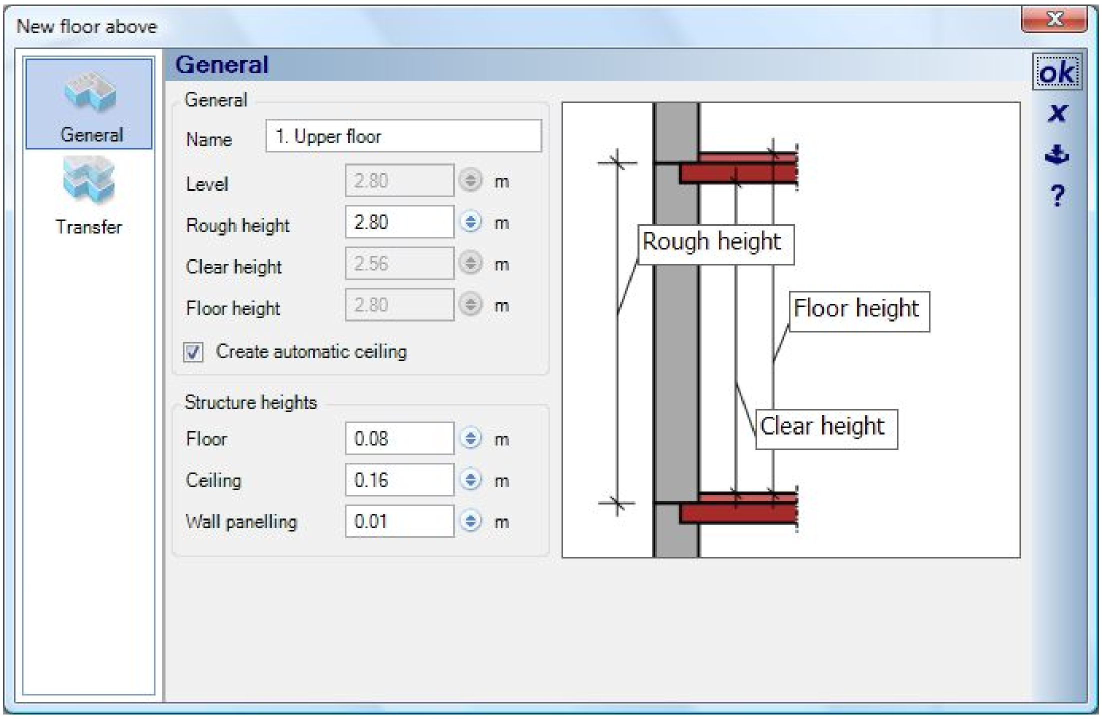
7.4 FLOORS / CREATING NEW FLOORS

You can create new floors and apartments for the active ‘Building’ level in the tree structure.



⊟ ☑ Building 1
  ⊟ ☑ Ground floor
    ☑ Floor plan

A new floor is created either above or below the current floor i.e. the one shown in red in the tree, depending on the option chosen, and begins with the ‘New floor above’ dialog.



New floor above

General

General

Name: 1. Upper floor

Level: 2.80 m

Rough height: 2.80 m

Clear height: 2.56 m

Floor height: 2.80 m

☑ Create automatic ceiling

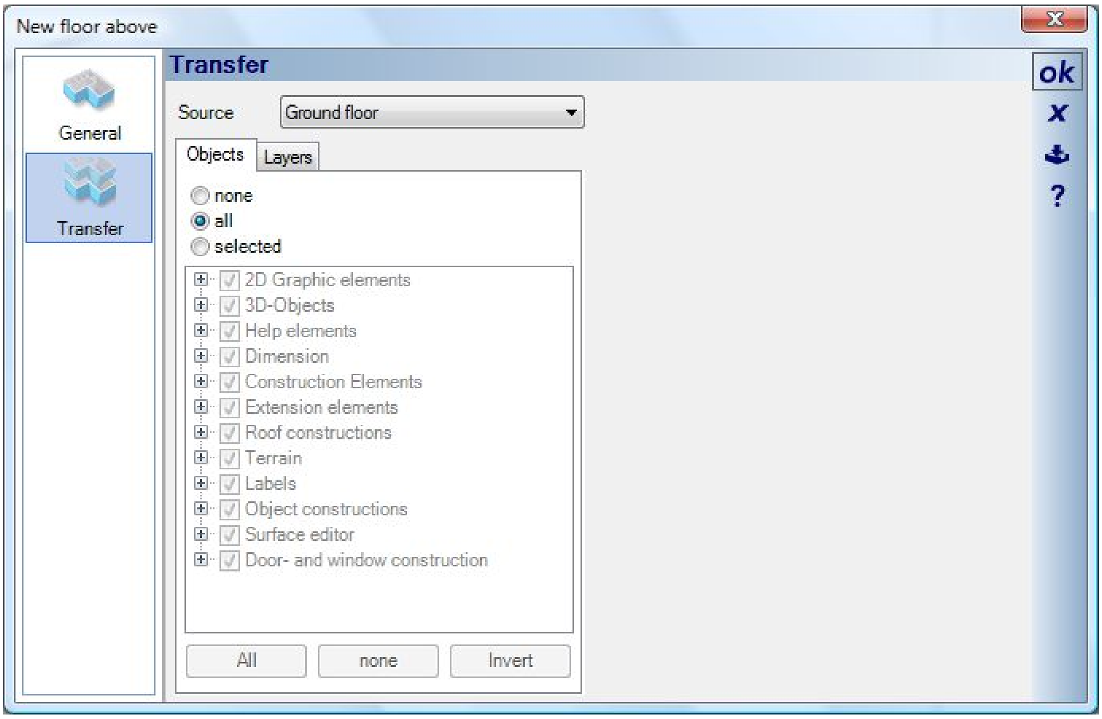
Structure heights

Floor: 0.08 m

Ceiling: 0.16 m

Wall panelling: 0.01 m

The name of the new floor, its height, as well as the thickness of the flooring and the ceiling structure are specified in the first part of the dialog.
The setting for ‘Wall Panelling’ has no visible effect in the plan. However, it is taken into account in the calculation of areas and for project reports. The default value entered here can be changed later in the wall properties for each wall.
The ‘Transfer’ part of the dialog defines which elements of the original floor should be copied or ignored. In the ‘Objects’ area, you can specify in detail the objects that are to be copied. The options ‘all’ or ‘none’ can be used, apart from their obvious usage, to assist object selection. If you only want to copy a small number of objects, first select the option ‘none’, which deactivates all the objects listed in the tree. Only four mouse-clicks are then needed to copy walls, flooring and ceilings, and all other objects do not have to be excluded first.



New floor above

Transfer

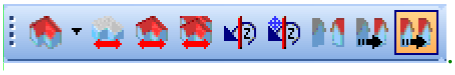
Source: Ground floor

○ none
● all
○ selected

☑ 2D Graphic elements
☑ 3D-Objects
☑ Help elements
☑ Dimension
☑ Construction Elements
☑ Extension elements
☑ Roof constructions
☑ Terrain
☑ Labels
☑ Object constructions
☑ Surface editor
☑ Door- and window construction

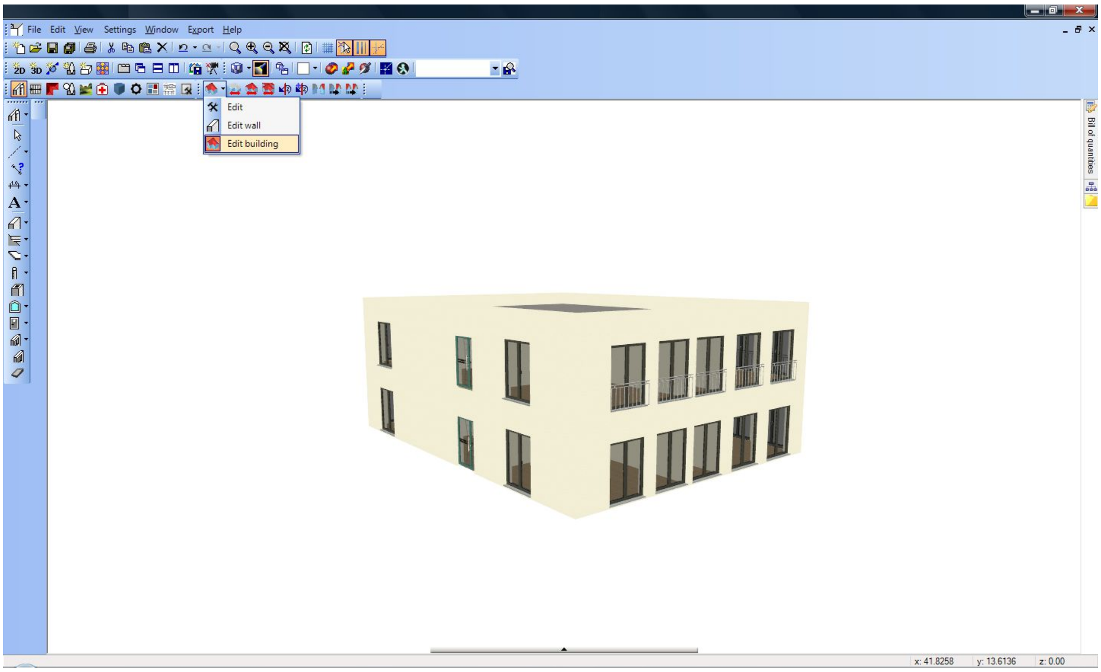
7.4.1 *Lengthen, Rotate, Mirror, Copy Buildings*

The ‘Edit’ toolbar also contains a category with various tools for editing buildings and floors. From left to right:



- Lengthen current floor
- Lengthen current building
- Lengthen all buildings

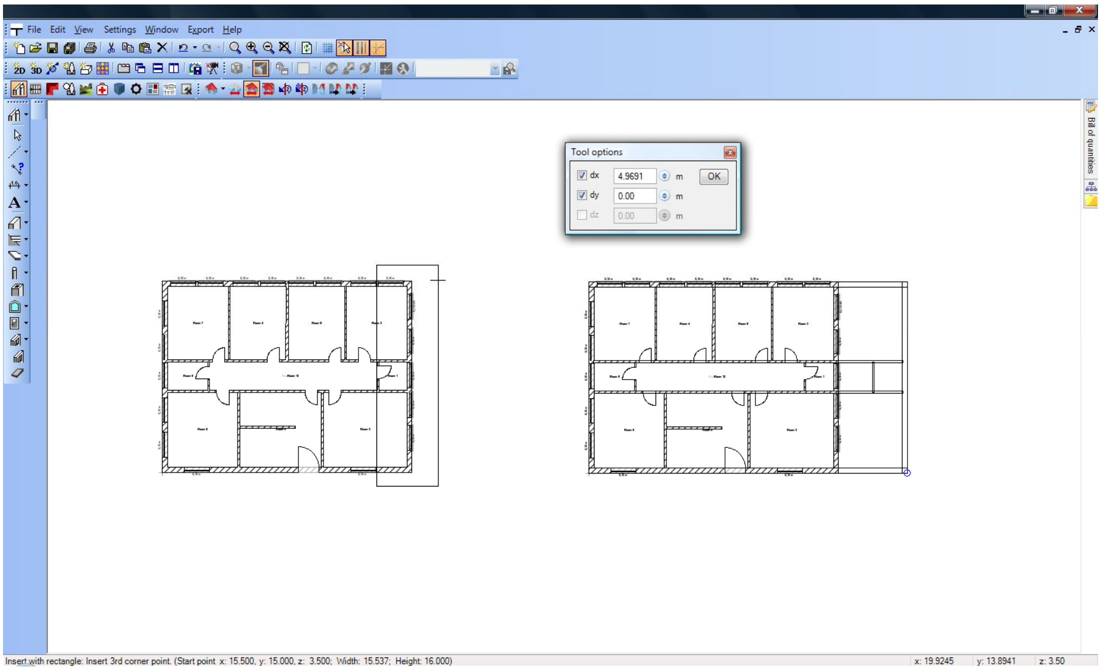
- Rotate current building
- Rotate current building about a reference point
- Mirror building
- Move building
- Copy building



After activation, some operations require various steps on input. To lengthen a building for instance, the area whose contents are to be lengthened must first be defined, or for rotation a reference point must be entered. The necessary steps are described in the status bar at the bottom of the window and in the following sections.

7.4.1.1 Lengthen Buildings/Floors

To lengthen a floor or building the first step is to define the area to be modified, by entering a rectangle. Next, a reference point is defined with a further mouse click. All elements or points of elements (e.g the ends of walls), which are located within the rectangle are now moved. First of all a preview is shown and the action can then be terminated with the mouse or numerically in the tool options dialog. In the following illustration the main steps are shown one after the other to demonstrate input.



Tool options

☑ dx 4.9691 m

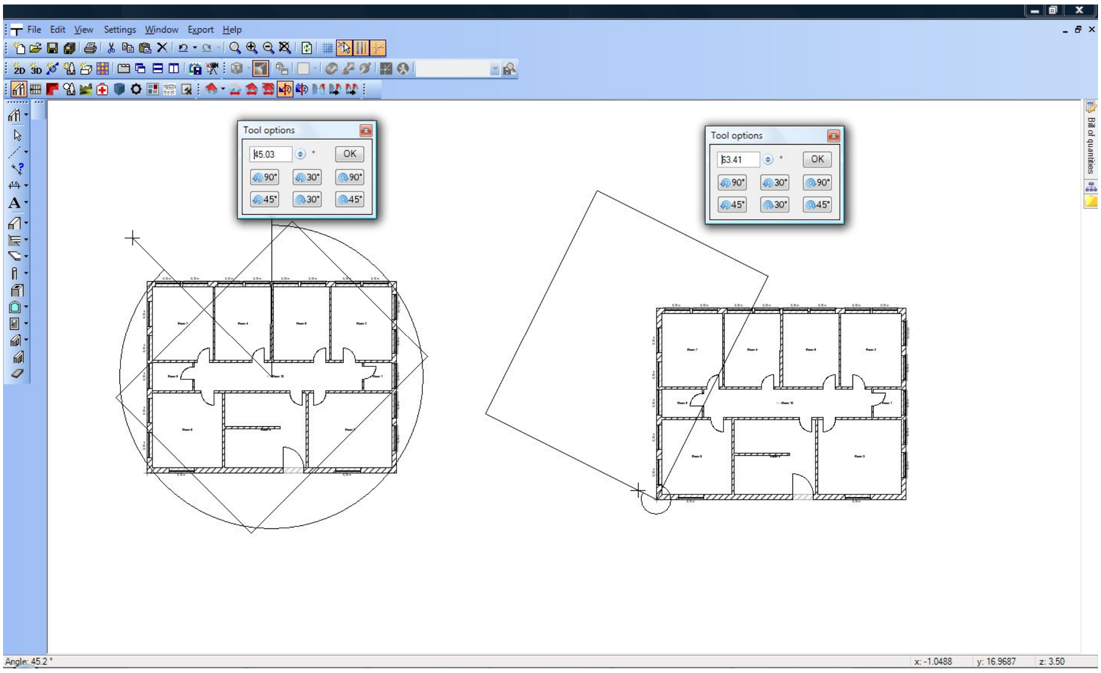
☑ dy 0.00 m

☐ dz 0.00 m

Insert with rectangle: Insert 3rd corner point. (Start point x: 15.500, y: 15.000, z: 3.500; Width: 15.537; Height: 16.000) x: 19.9245 y: 13.8941 z: 3.50

7.4.1.2 Rotate Buildings

Two functions are provided to rotate buildings, a general function, that rotates about the centre of the building, and a version using a reference point.
In both cases a preview is shown, and the angle of rotation can be specified with the mouse or numerically.
Tip: The angle grid function can also be used here with the ‘Cntl’ key held pressed.
The following illustration shows general rotation and rotation about a reference point as an example next to each other:

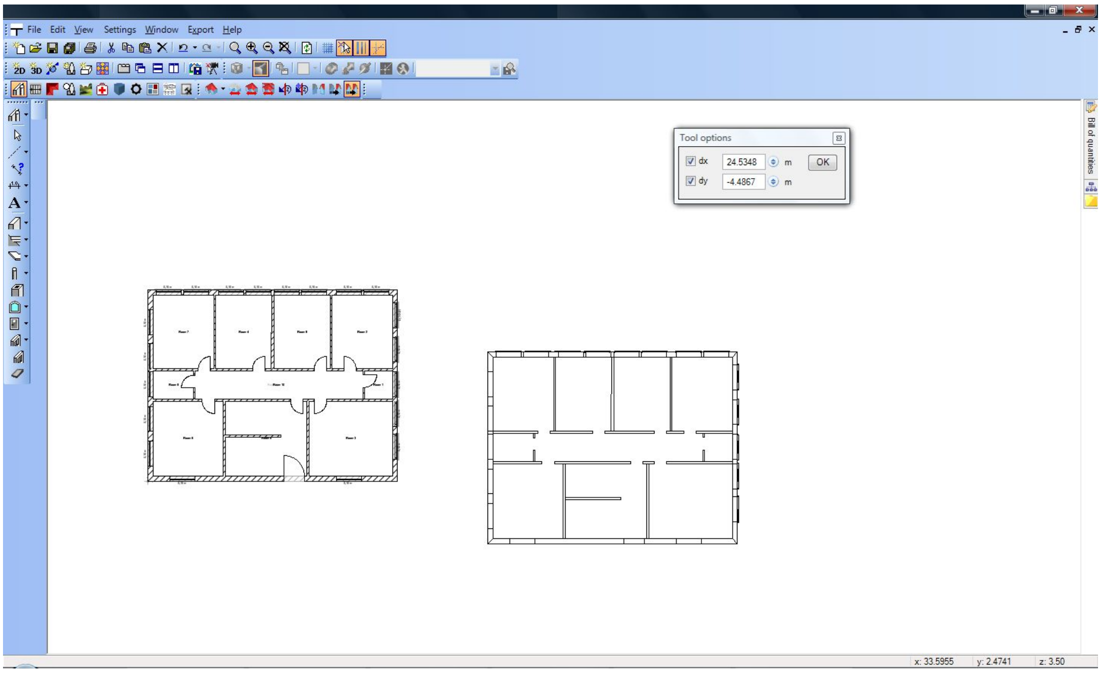


7.4.1.3 Mirror Buildings

To mirror a building the mirror axis must be entered with the mouse. As soon as this has been defined the action is carried out immediately.
It should be noted that when a building is mirrored, roofs are not mirrored. Therefore to construct a semi-detached house by entering one half and then mirroring it, first a copy of the building must be created and this then mirrored.

7.4.1.4 Move or Copy Buildings

A building is always moved using a reference point, which must first be entered with the mouse. Next, a preview of the building is shown with the reference point attached to the mouse. A further mouse-click concludes the operation.



Tool options

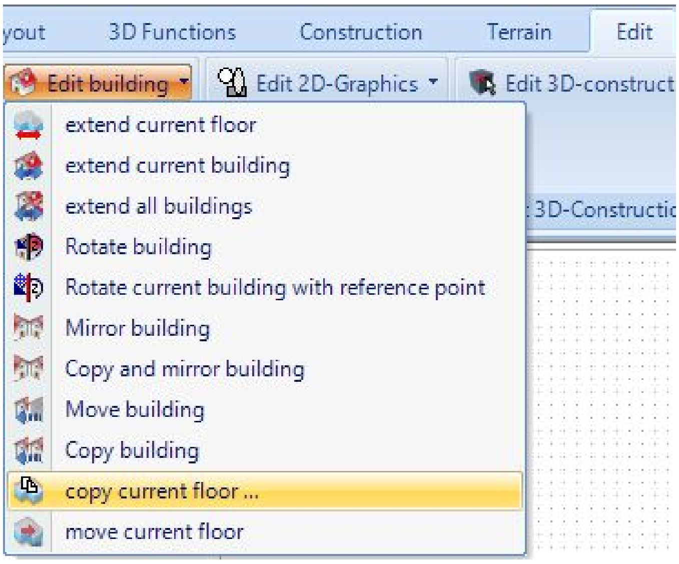
☑ dx 24.5348 m

☑ dy -4.4867 m

x: 33.5955 y: 2.4741 z: 3.50

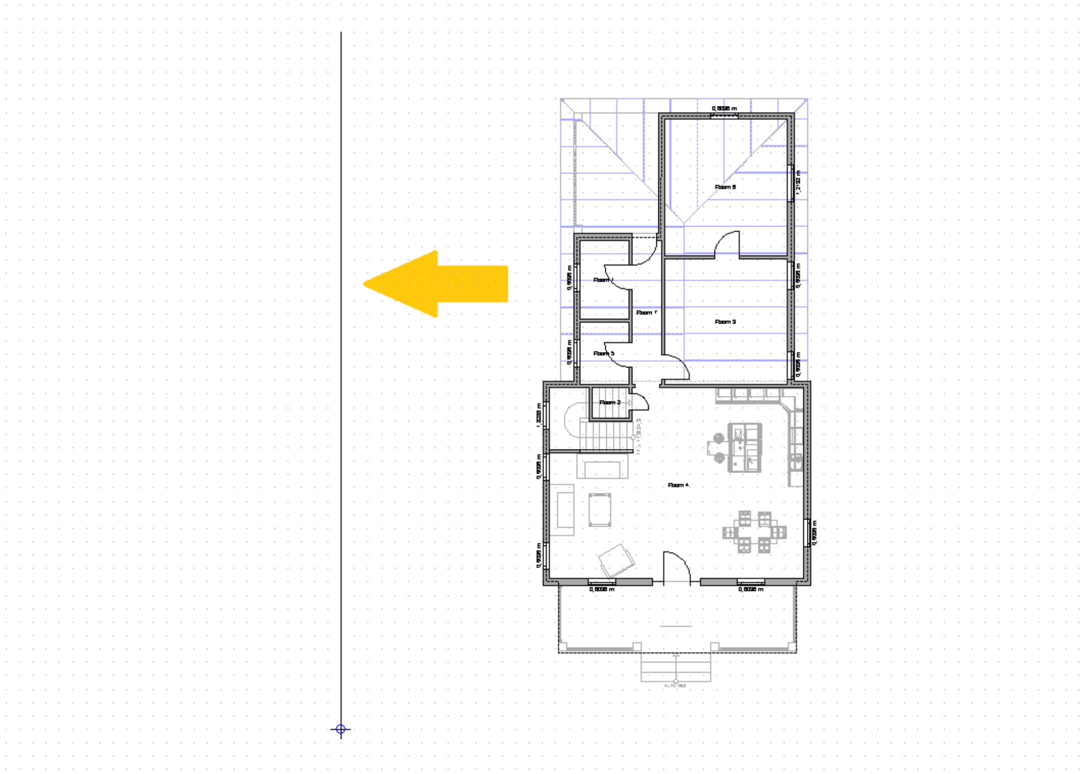
7.5 COPYING BUILDINGS AND FLOORS, MIRROR WITH COPY,…

The Edit Building menu on the EDIT ribbon has been enhanced with some features. In this context, we have also revised the mirroring of buildings.

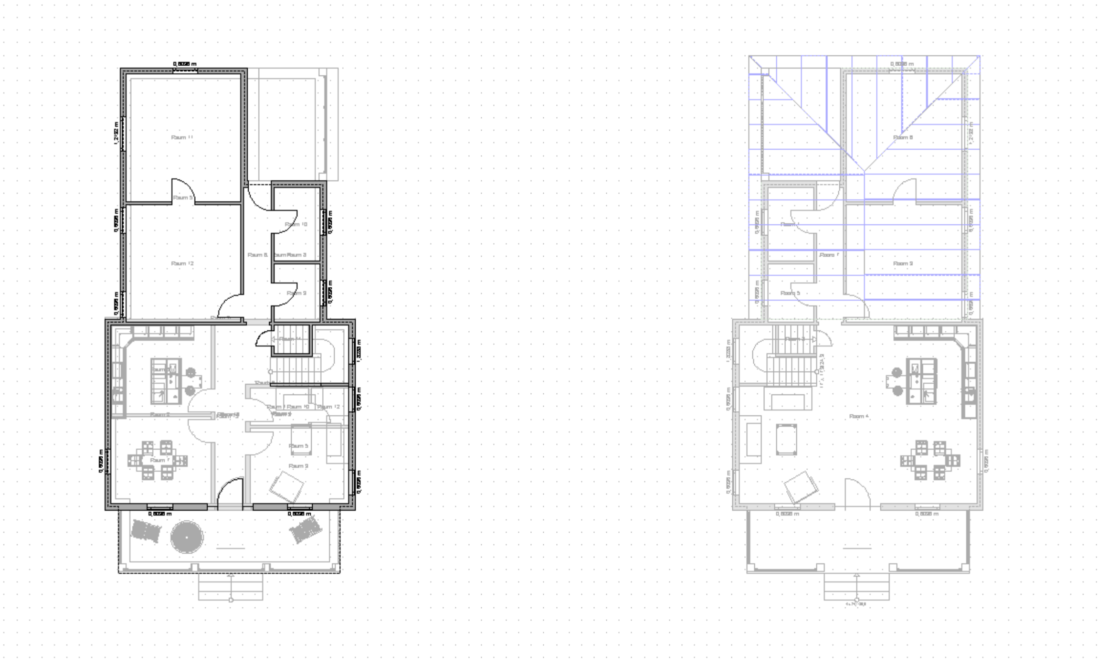


7.5.1 Copying and mirroring a building

Copying a mirrored version of a building starts immediately after you call the function and insert the mirror axis.
When inserting the mirror axis with two mouse clicks, we recommend holding down the CTRL key to ensure an exact vertical or horizontal course of the axis with the internal angle grid.
The mirror axis is marked with the arrow in the screenshot below.



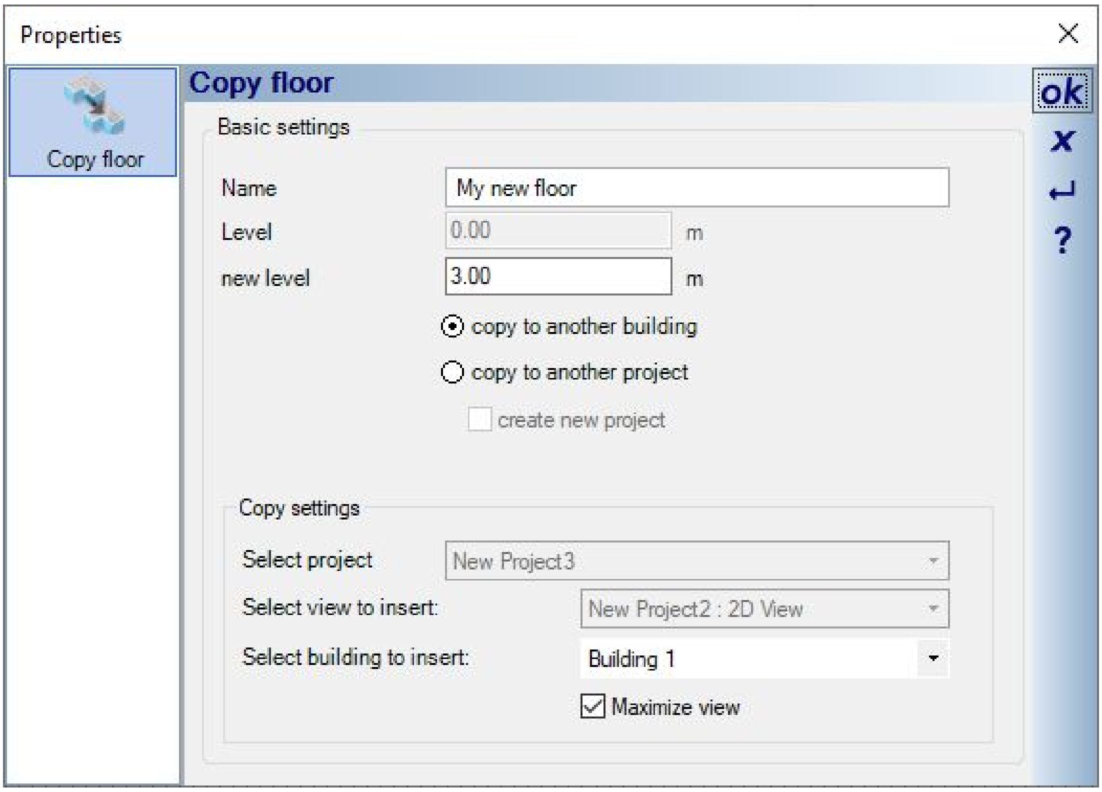
The mirrored result:



Note that not all elements are mirrored and copied. This includes roofs and dimensions. This would have to be recreated or re-entered after mirroring.

7.5.2 Copying your current floor to new building or new project

You can copy the active floor of a building to a new building or to a new building in another project. All layers that exist below the active floor are also copied.
In the copy dialog you can assign a name to the future floor. The level of the new floor after copying can also be specified if necessary.
If you copy to a new building, you will see the following options in the dialog.



Copy floor

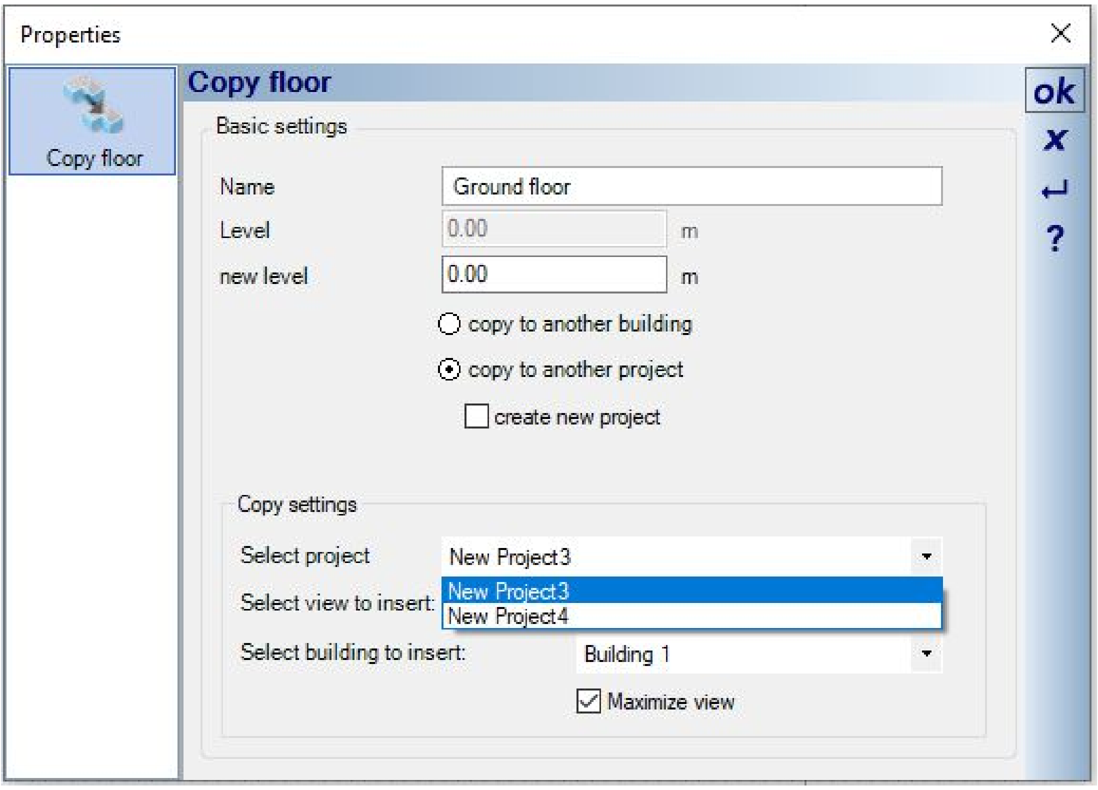
Basic settings

Name: My new floor
Level: 0.00 m
new level: 3.00 m
● copy to another building
○ copy to another project
☐ create new project

Copy settings

Select project: New Project3
Select view to insert: New Project2 : 2D View
Select building to insert: Building 1
☑ Maximize view

If you have already opened a second project, the dialog looks like this. You can choose the project to copy the floor to and also the view you want to use when copying.
The reason is that the floor needs to be positioned before inserting it.
And for that you need a view to place it. In most cases, you also need other parts of the building in the project for orientation in this view, so that you can, for example, position the new floor exactly on top of another.



Copy floor

Basic settings

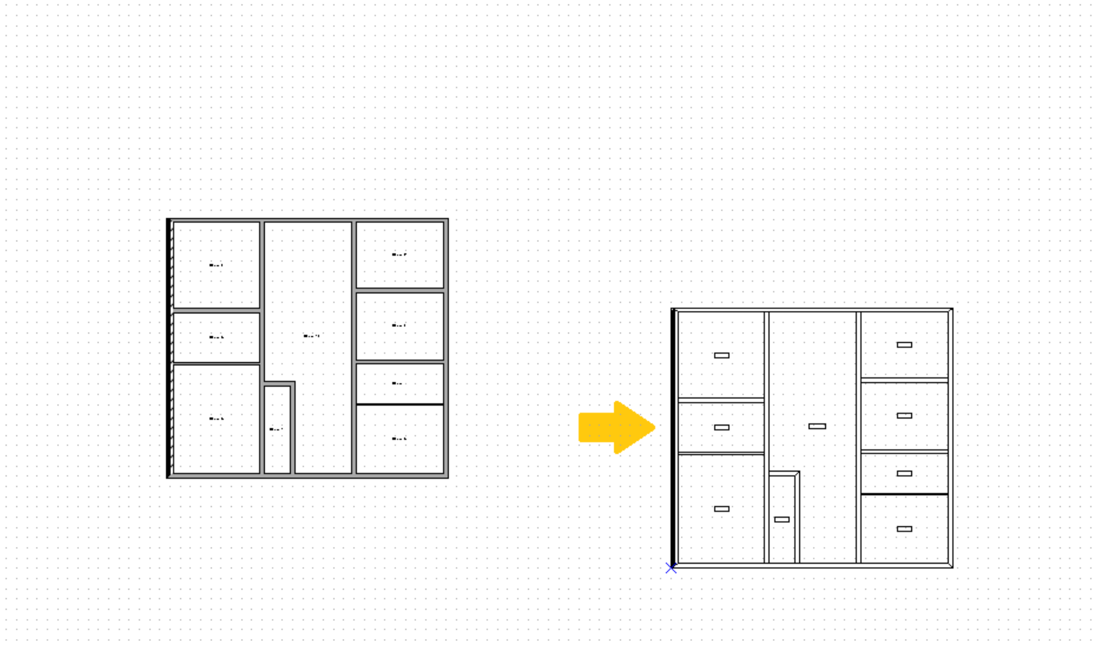
Name: Ground floor
Level: 0.00 m
new level: 0.00 m
○ copy to another building
● copy to another project
☐ create new project

Copy settings

Select project: New Project3
New Project3
New Project4
Select view to insert:
Select building to insert: Building 1
☑ Maximize view

If you leave the dialog with OK, the copied floor is “added” to your mouse cursor. At this time you only see a preview.
As long as the preview cursor is still active, you can use your CTRL + W keys to toggle through the corners of the floor plan until you have reached the correct corner for positioning.

A left mouse click inserts the floor.



Note: after such a copying process, you should save the project with the newly inserted floor under a new name and reload it. When loading, all constructive elements are newly created or constructed based on their parameters.

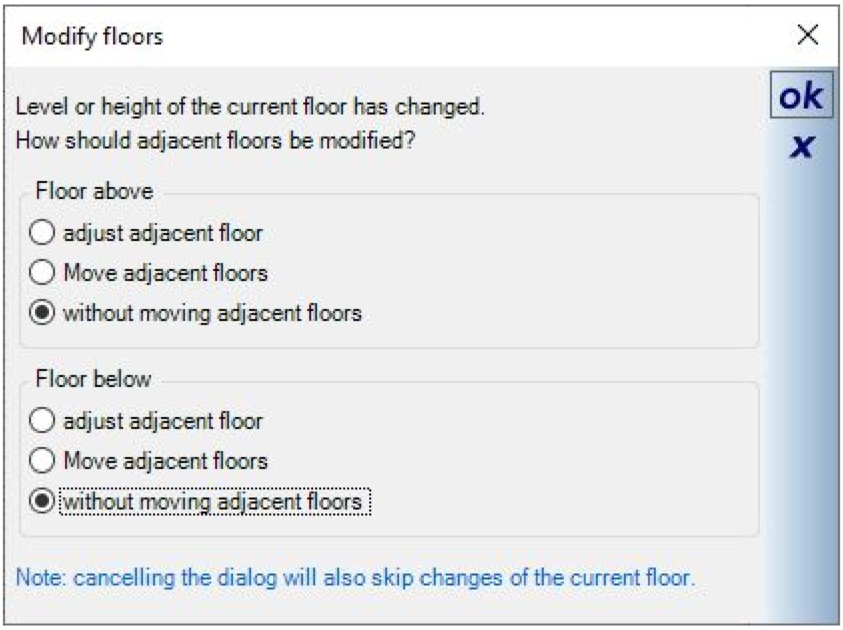
7.5.2.1 Adjusting floors in "copied" buildings.

In a normal planning, the software manages the floors of a building as a unit, in terms of their levels and heights. This is one of the reasons why the building is made by copying floors up or down.

If you "copy" a building together from several projects or individual floors, you may have to manage the levels and heights of the floors yourself and control the building individually.

If you subsequently change the height of a floor in a "normal" building, you will be asked how the other floors should react.

In this special case, you should activate the options "without moving adjacent floors". And if necessary, adjust the other floors manually afterwards, so that the building fits together.



Level or height of the current floor has changed.
How should adjacent floors be modified?

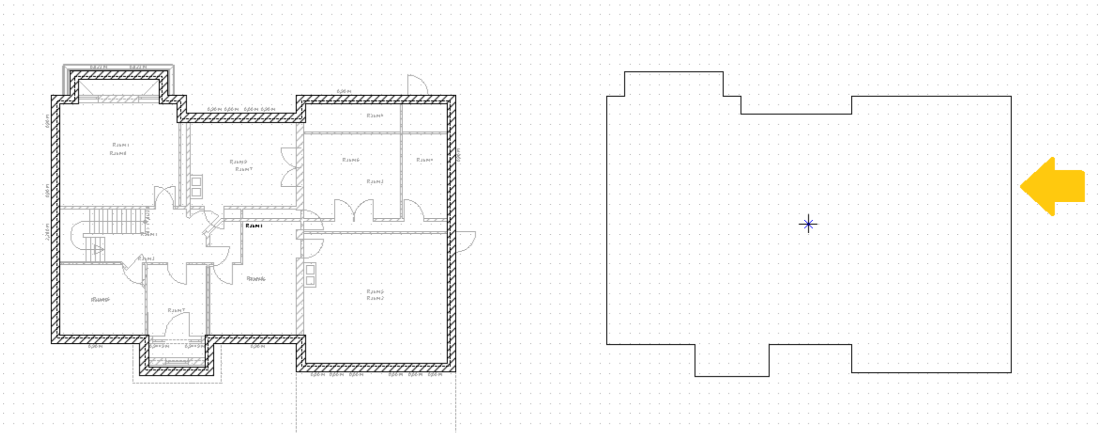
Floor above
○ adjust adjacent floor
○ Move adjacent floors
● without moving adjacent floors

Floor below
○ adjust adjacent floor
○ Move adjacent floors
● without moving adjacent floors

Note: cancelling the dialog will also skip changes of the current floor.

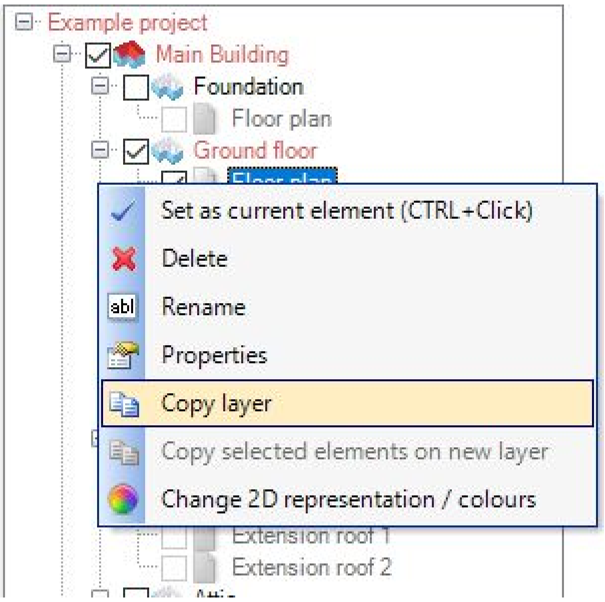
7.5.3 Moving your current floor

If you call up the "Move current floor" function from the menu, the software tries to summarize the outer contours of the walls and "add" them to your mouse cursor.
You will then see the outline of your floor plan, with the calculated center being transferred to the mouse.
However, it would be difficult if not impossible to place a specific point, usually a corner of the building, exactly on top of the other floors.
You can now use the familiar key combination CTRL + W to toggle the corners of the contour under your mouse. If you press CTRL + W multiple times, the corner points will toggle along the mouse until you reach the correct one for placement. With a left mouse click you insert the floor at this position.
In the following figure you can see the current floor on the left and the mentioned contour as your mouse cursor on the right.



7.6 COPYING LAYERS, COPYING SELECTED ELEMENTS ONTO A NEW LAYER

Usually, when creating the building, layers are duplicated by copying them together with the floors in which they were created.
However, there may be cases where you don't want to copy the entire floor but just a layer inside of it. For example, this could be a layer with interior design objects that was created at a later time.
Copying layers can also be useful when planning new building elements or construction elements that are intended for demolition.
You find the copying functions in a right mouse button context menu when you click on a layer in our project viewer.

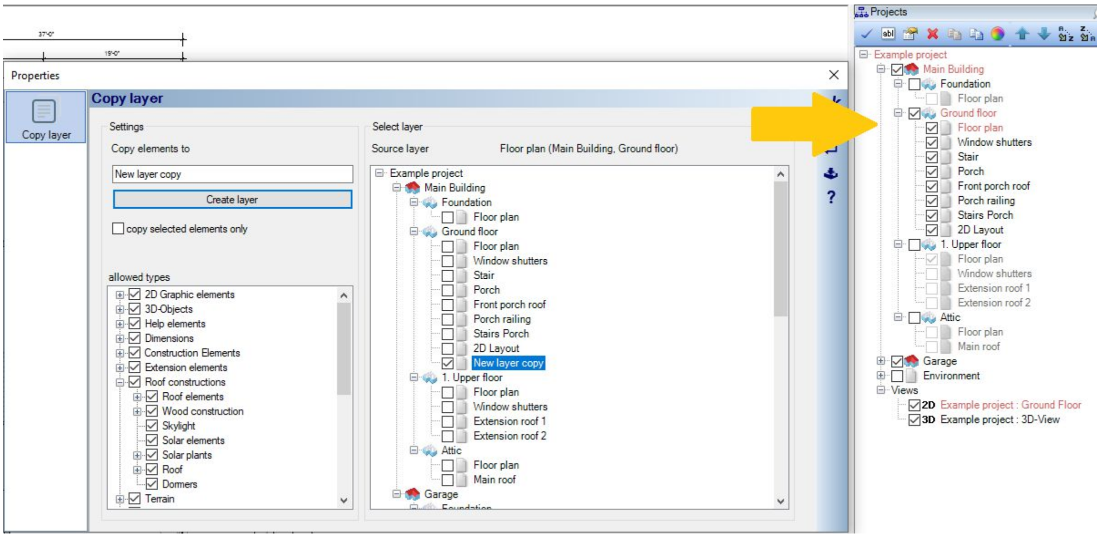


7.6.1 Copying layers

When you start the functions "Copy layer" or “Copy selected element on new layer”, the following dialog appears:

The function always uses the currently active layer in our project viewer as the source layer for copying. The source layer name appears above the project tree.

In the left pane, you can specify which elements of the source layer you want to copy.



Copy layer

Settings

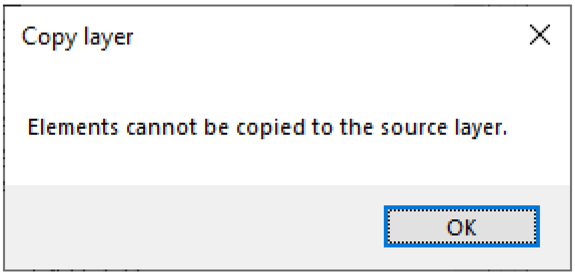
Copy elements to: New layer copy

☐ copy selected elements only

Select layer

Source layer: Floor plan (Main Building, Ground floor)

In the tree structure "Select layer", you determine the target layer for the copying process.
You could create the target layer before calling the function from our project viewer and then select it using the checkbox.
If you accidentally select the source layer as your target layer, you get the following message.

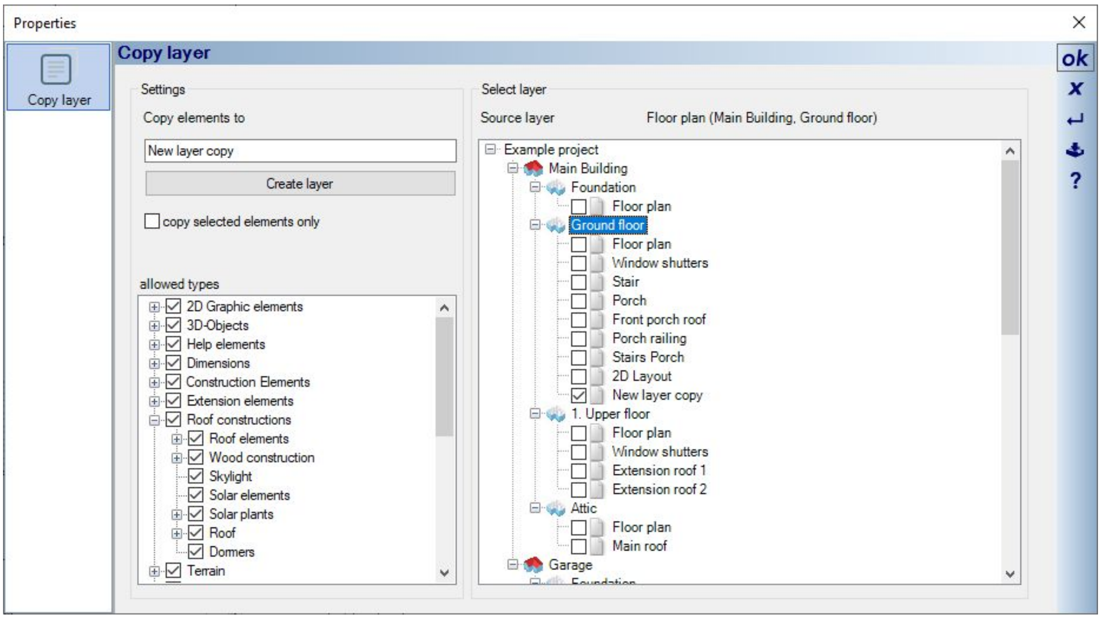


Copy layer

Elements cannot be copied to the source layer.

If there is no existing target layer, you can create one using the "Create layer" button.

The new layer must first be assigned to a floor. Therefore, first click on the floor in our project tree.
Otherwise, the software assumes that you want to create a copy on the same floor as the source layer.



Settings

Copy elements to: New layer copy

Create layer

☐ copy selected elements only

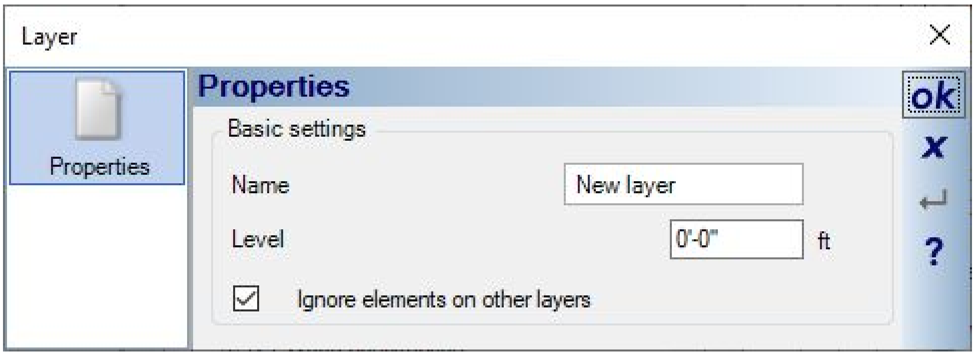
allowed types
- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimensions
- ☑ Construction Elements
- ☑ Extension elements
- ☑ Roof constructions
  - ☑ Roof elements
  - ☑ Wood construction
  - ☑ Skylight
  - ☑ Solar elements
  - ☑ Solar plants
  - ☑ Roof
  - ☑ Dormers
- ☑ Terrain

Select layer

Source layer: Floor plan (Main Building, Ground floor)

- Example project
  - Main Building
    - Foundation
      - ☐ Floor plan
    - Ground floor
      - ☐ Floor plan
      - ☐ Window shutters
      - ☐ Stair
      - ☐ Porch
      - ☐ Front porch roof
      - ☐ Porch railing
      - ☐ Stairs Porch
      - ☐ 2D Layout
      - ☑ New layer copy
    - 1. Upper floor
      - ☐ Floor plan
      - ☐ Window shutters
      - ☐ Extension roof 1
      - ☐ Extension roof 2
    - Attic
      - ☐ Floor plan
      - ☐ Main roof
  - Garage

Then click on “Create layer”. The standard dialog opens, in which you can specify a name and a level for the layer. The level is always relative to the floor level and in most cases remains at zero.



Basic settings

Name: New layer

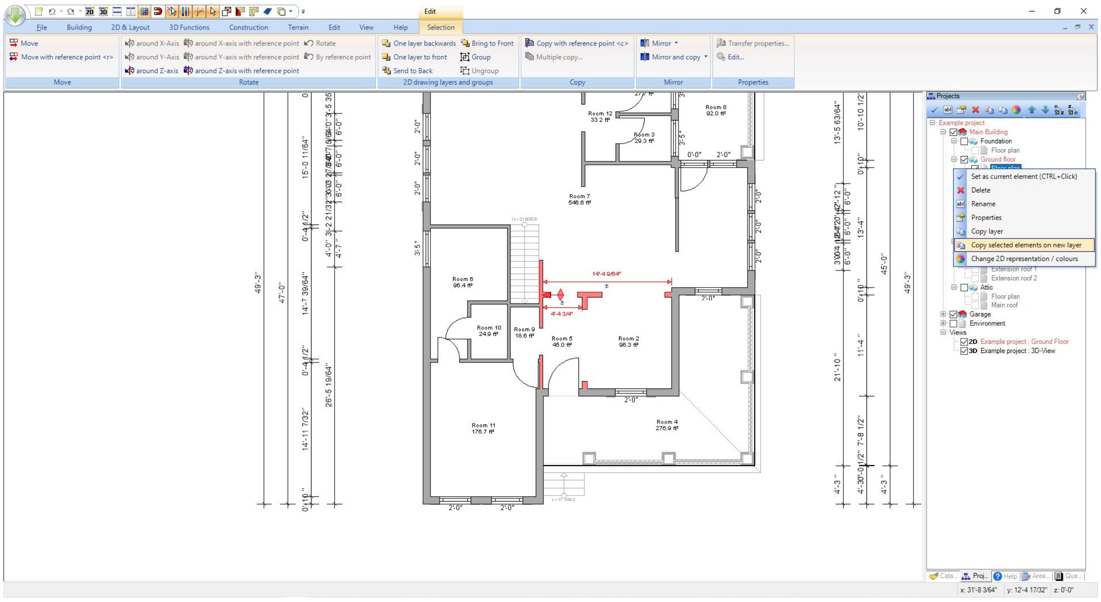
Level: 0'-0" ft

☑ Ignore elements on other layers

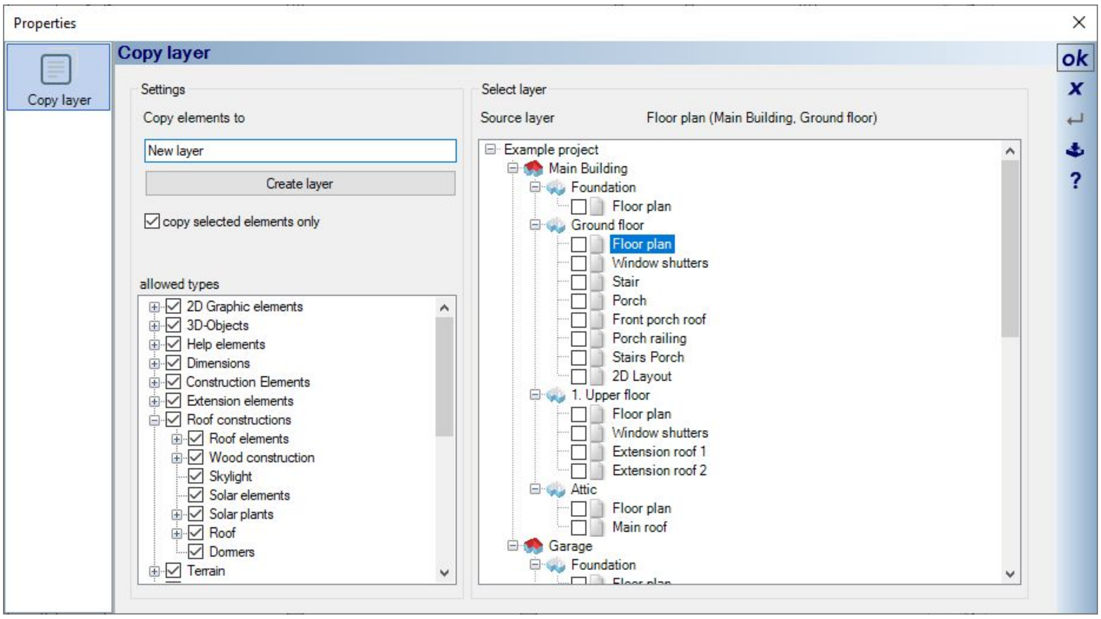
When you have made your selection for elements and target layer, close the dialog with OK and the copying process begins.
The elements are created at the same position on the new as they were on the source layer.

7.6.2 Copying selected elements to a new layer

A special case of copying layers is copying only elements previously selected in your planning.
A typical use case for this would be to copy just few of the walls from a floor plan layer to a "demolition layer", just to show them differently on your final plans.
In particular, if you only want to remove parts of a wall, create a copy on a new layer and change the length of the copied wall with our standard wall editing tools.
Shorten the copied wall so that only the part to be removed remains and then colour that part of the wall yellow or whatever marking is required locally.
Note: if you keep the SHIFT key pressed when selecting elements, you can select several elements one after the other with further left mouse clicks and select them for the copying process.



In our Copy layer dialog, the option "Copy selected elements only" is activated.



Settings

Copy elements to: New layer

Create layer

☑ copy selected elements only

allowed types

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimensions
- ☑ Construction Elements
- ☑ Extension elements
- ☑ Roof constructions
  - ☑ Roof elements
  - ☑ Wood construction
  - ☑ Skylight
  - ☑ Solar elements
  - ☑ Solar plants
  - ☑ Roof
  - ☑ Dormers
- ☑ Terrain

Select layer

Source layer: Floor plan (Main Building, Ground floor)

- Example project
  - Main Building
    - Foundation
      - ☐ Floor plan
    - Ground floor
      - ☐ Floor plan
      - ☐ Window shutters
      - ☐ Stair
      - ☐ Porch
      - ☐ Front porch roof
      - ☐ Porch railing
      - ☐ Stairs Porch
      - ☐ 2D Layout
    - 1. Upper floor
      - ☐ Floor plan
      - ☐ Window shutters
      - ☐ Extension roof 1
      - ☐ Extension roof 2
    - Attic
      - ☐ Floor plan
      - ☐ Main roof
  - Garage
    - Foundation

7.7 CONVERSION, NEW CONSTRUCTION, DEMOLITION - 2D REPRESENTATION OF LAYERS

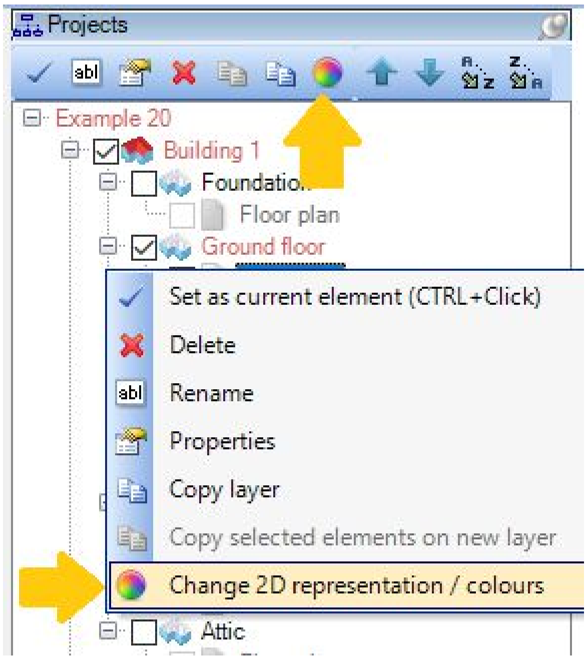
For certain elements on a layer, the 2D representation colour in 2D plan views can be easily adjusted using the "Change 2D representation colour" dialog.

The advantage here is that this function does not change the actual properties of the elements, but paints a new colour representation over them. The original properties are therefore retained. As a consequence, the changed colour or display can also be removed later using the same dialog. This allows you to create a different display at any time without great effort, e.g. even for a single printout. If you want to remove the alternative 2D representation, just open the dialog again, deactivate the checkboxes in front of the elements and you get the original display back.

Note: Walls are always completely coloured, regardless of their layer structure. If you really want to change the display of the layer structure, use the functions for walls on the EDIT ribbon, change 2D representation or change layered structure.

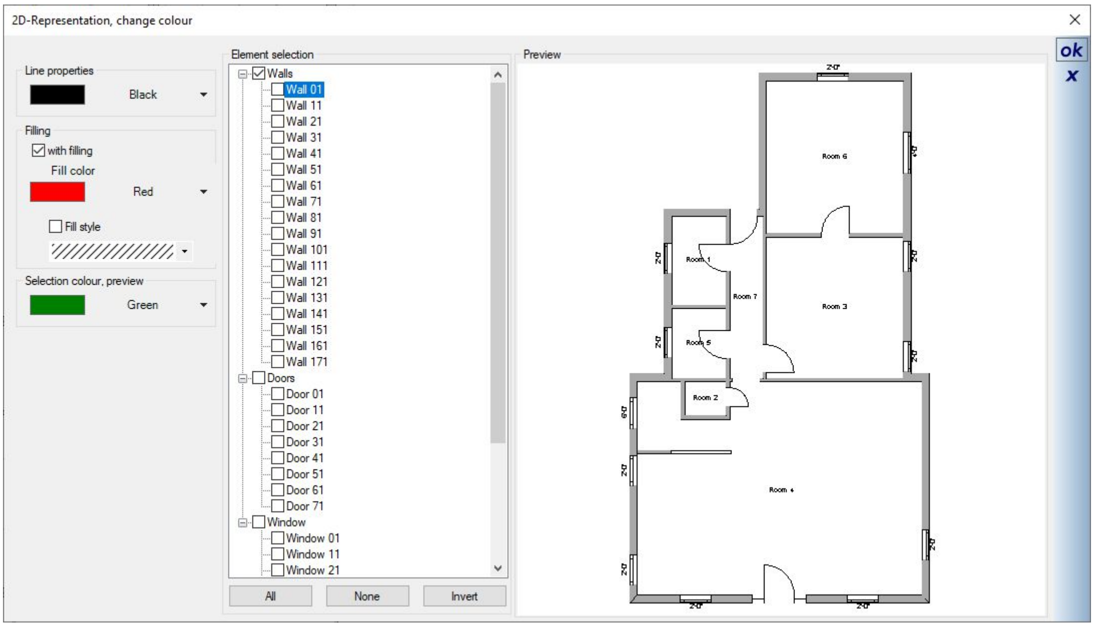
7.7.1 Changing the 2D representation of elements on a layer (demolition - new construction)

Open the dialog for changing the colour of a layer in our project viewer via the context menu or via the button in our project viewer toolbar.


Projects
Example 20
Building 1
Foundation
Floor plan
Ground floor
Set as current element (CTRL+Click)
Delete
Rename
Properties
Copy layer
Copy selected elements on new layer
Change 2D representation / colours
Attic

The dialog shows you a reduced preview of the layer content. Reduced in such a way that only the elements whose display can be changed are displayed, plus dimensions for a better orientation.

Note: in our preview, you can navigate like in a 2D view, i.e. zoom, scroll, etc. You can also select specific elements with left mouse clicks, to which the currently active display properties are then assigned. This avoids a search for the right element in our tree structure, especially if you only want to display some few components differently.


2D-Representation, change colour

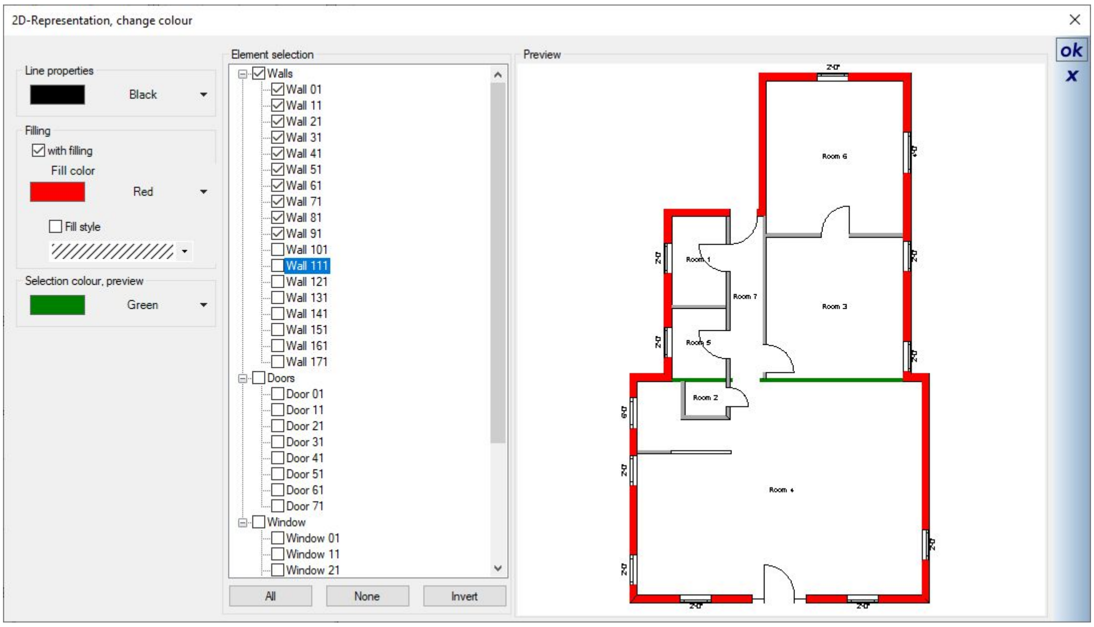
Line properties: Black

Filling
☑ with filling
Fill color: Red
☐ Fill style

Selection colour, preview: Green

To change the display, first select the line and fill properties on the left of the dialog.

Then activate the elements in our tree structure to which this display is to be applied. Or you can click on the items in the preview instead, as mentioned before.
The selection colour for the preview is used to mark components when you click on an entry in the element selection without activating the checkbox. This representation is only temporary and can only be seen in the preview. See the following screenshot at wall 111.



2D-Representation, change colour

Line properties: ■ Black

Filling
☑ with filling
Fill color: 🟥 Red
☐ Fill style

Selection colour, preview: 🟩 Green

Element selection
- ☑ Walls
  - ☑ Wall 01
  - ☑ Wall 11
  - ☑ Wall 21
  - ☑ Wall 31
  - ☑ Wall 41
  - ☑ Wall 51
  - ☑ Wall 61
  - ☑ Wall 71
  - ☑ Wall 81
  - ☑ Wall 91
  - ☐ Wall 101
  - ☐ Wall 111
  - ☐ Wall 121
  - ☐ Wall 131
  - ☐ Wall 141
  - ☐ Wall 151
  - ☐ Wall 161
  - ☐ Wall 171
- ☐ Doors
  - ☐ Door 01
  - ☐ Door 11
  - ☐ Door 21
  - ☐ Door 31
  - ☐ Door 41
  - ☐ Door 51
  - ☐ Door 61
  - ☐ Door 71
- ☐ Window
  - ☐ Window 01
  - ☐ Window 11
  - ☐ Window 21

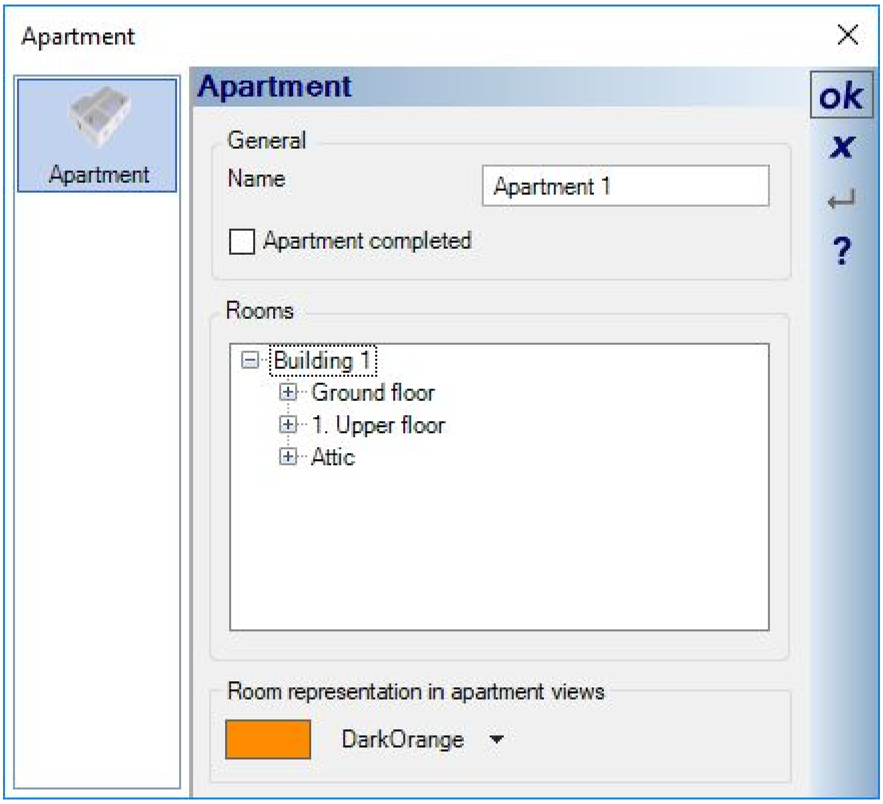
If you want to reset the display to its original state or to the actual drawing properties, open the dialog again and remove the selection in the tree structure. Then close the dialog with OK and everything looks the same as before.

Note: this function completely paints over the components. If you only want to highlight parts of a wall with a representation for new construction or demolition, copy the wall onto its own layer using the "Copy layer" or "Copy selection to new layer" functions.
Then change the length of the wall or its position and adjust the display for the new layer only.

7.8 APARTMENTS

For the subsequent calculation of areas, the software provides the grouping of rooms to form apartments. Apartments are not really layers as such, so they can not be set to visible or invisible over the project viewer, although the tree structure appears to allow such functions. Apartments can consist of rooms from different floors but not from different buildings. The properties dialog for apartments can be activated when a building is selected in the tree structure in the same way as for creating new floors.

The dialog presents all rooms in the current building, with their names and the floor they belong to, and they can then be assigned to an existing apartment or used to create a new one. Newly created rooms can also be assigned to an existing apartment over the ‘Room’ dialog.



General
Name: Apartment 1
☐ Apartment completed

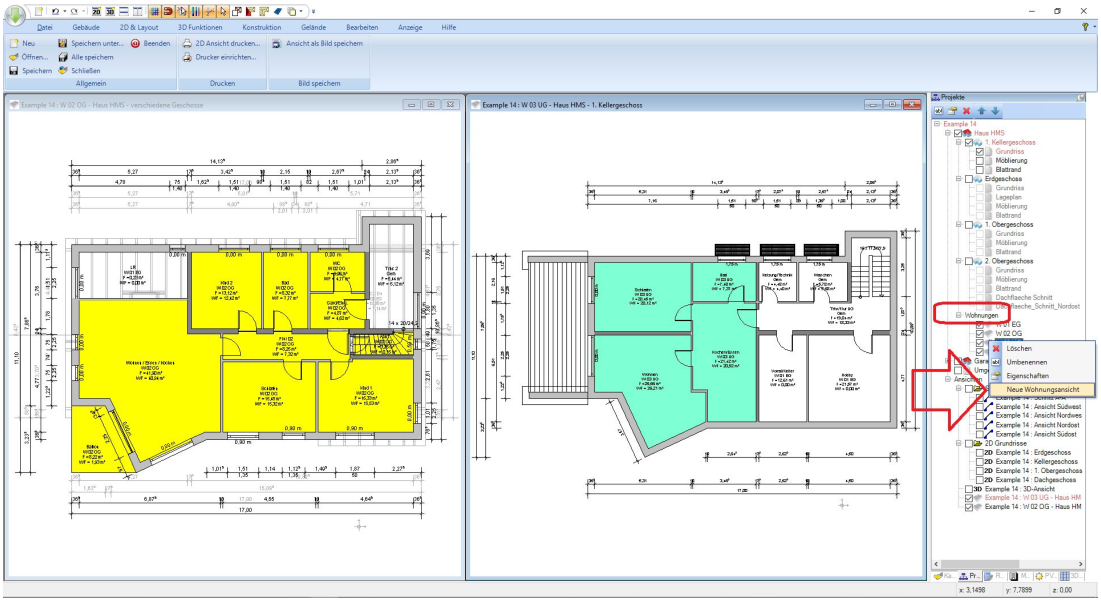
Rooms
⊟ Building 1
 ⊞ Ground floor
 ⊞ 1. Upper floor
 ⊞ Attic

Room representation in apartment views
🟧 DarkOrange

Apartments are automatically sorted into a separate hierarchy level within the project viewer.

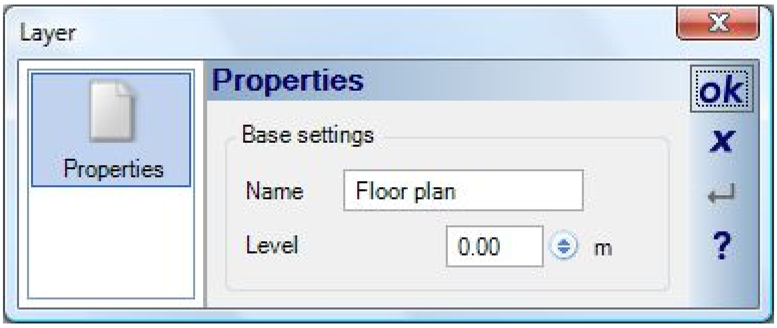
7.8.1 Apartment Views

There is a separate "Apartment View" view type, which gives you an overview of which rooms are assigned to which apartments. Or maybe a room was overlooked and the area evaluation would be wrong.
In the apartment view, room surfaces are displayed coloured so that you can see whether the assignment corresponds to your ideas. You can set the colour of the room display in the properties dialog of the respective apartment.
In the apartment view, only the floors and layers, which contain the rooms assigned to the apartment, are automatically displayed. If the rooms of the apartment are distributed over several floors, you will see a note "different floors" in the title of the apartment view and in our project viewer the visibility shows in which floors the rooms of the apartment are located.



7.9 LAYERS

Layers are a vital feature for grouping objects. They not only have an affect on visibility and selection, but also serve to structure projects. As a user you can create new layers at the floor level. The properties of layers are restricted to the name and the level.



Properties

Base settings

Name: Floor plan

Level: 0.00 m

7.9.1 *Levels of Layers*

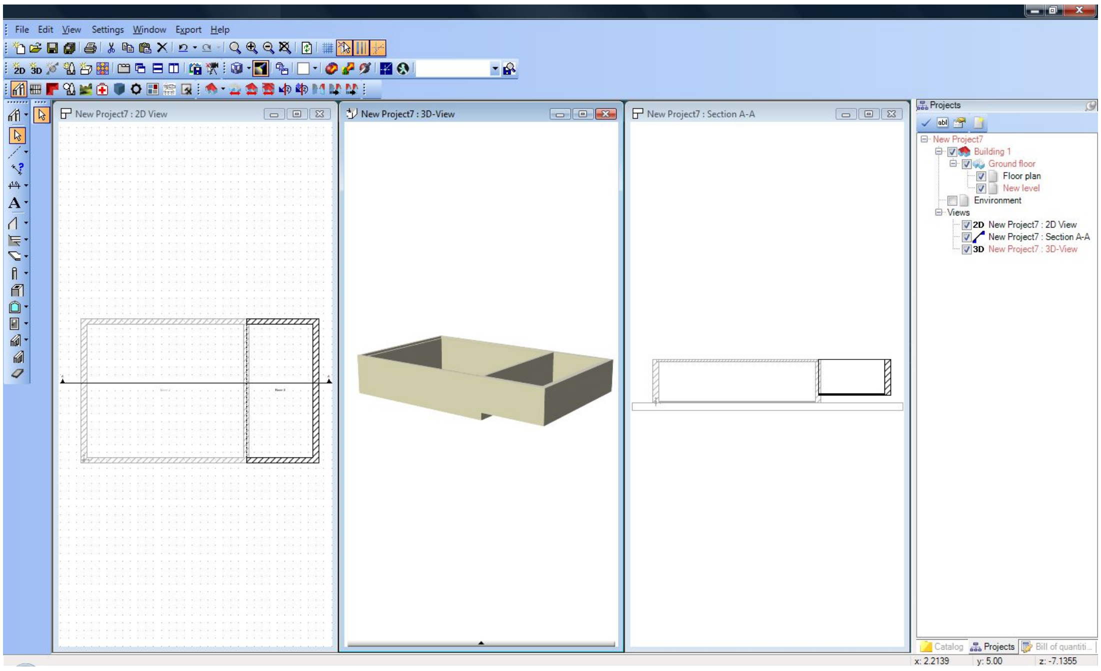
The ‘Level’ of a layer is relative to the level of the floor in which the layer is created, and can deviate positively or negatively from the floor level. If you change the level to 0.50 m when creating a new layer in the first upper floor, all elements inserted on this layer, such as walls, supports, furniture and fittings etc., are inserted 0.50 m

above the floor. For elements such as walls, which automatically adjust their height to the height of the floor, the result is that the walls assume a height given by: Height of floor – Level of layer = Height of element.
For example, if the upper floor is 2.8 m high and the level of the layer 0.5 m, the walls are created with a height of 2.3 m.

7.9.2 Floors/Rooms with Split Levels

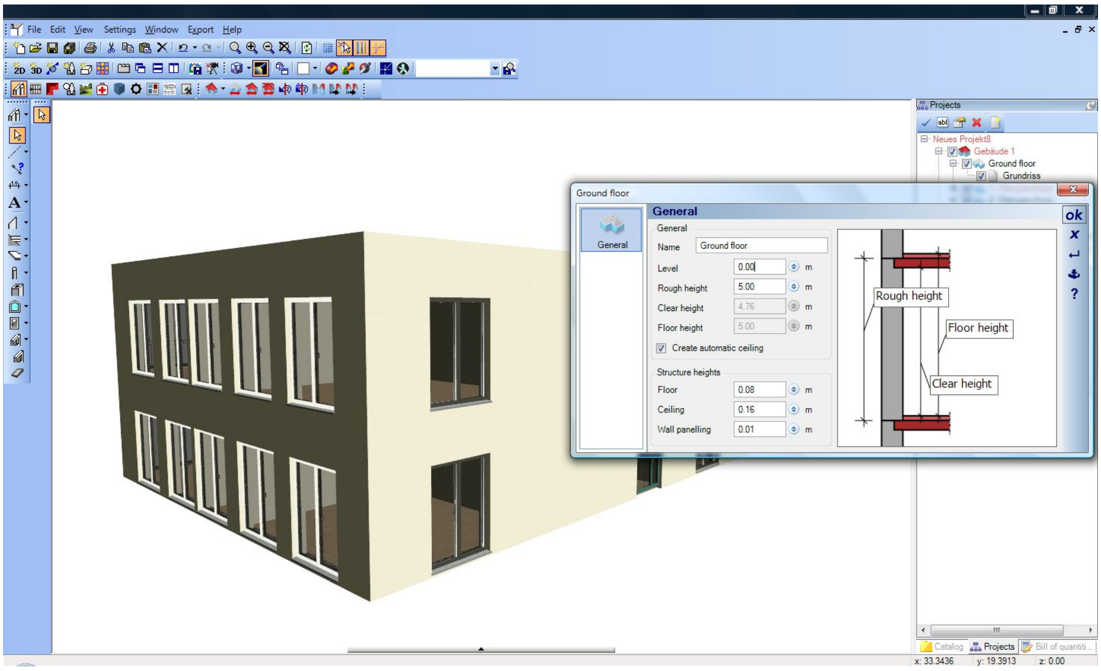
The characteristics of layers as described above also form the basis for creating floors whose rooms are on different levels.
Whenever a floor is created, a ‘Floor plan’ layer with a level 0 relative to the level of the floor is generated. If you wish to create a room within this floor which is not at level 0, proceed as follows:

- create a new layer in the floor
- in the dialog that appears set the level that is required
- now enter on the new layer (see project viewer) the walls for the new room
- it is important that walls on different layers do not connect to form new rooms. To close the room use the ‘Room boundary’ wall type, which does not represent a ‘Floor plan’ wall but only serves to close a room. Without a closed room no floor would be generated for the room.
- As a rule the ceiling must now be input manually, since the automatic ceiling does cover the new room.. However, first the automatic ceilings option must be deactivated in the properties dialog for the floor.



7.9.3 Changing the Height or Level of Floors

If the height of a floor has to be subsequently changed, it naturally has affects on the other levels of the building. Shown here are examples, in which exaggerated values are used for clarity, of the various options available.
In the example, the height of the ground floor is changed from 2.80 m to 5.0 m



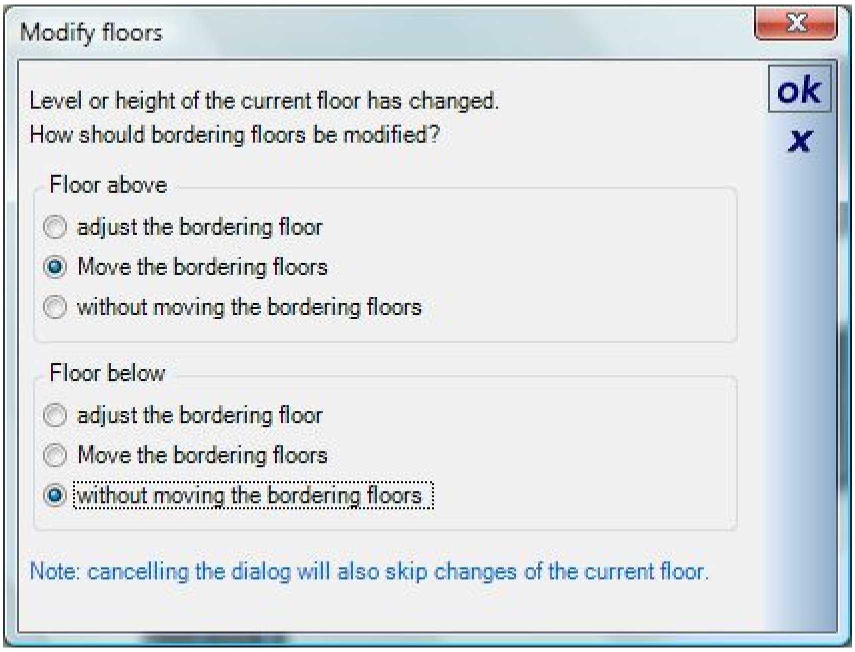
Ground floor

General

Name: Ground floor
Level: 0.00 m
Rough height: 5.00 m
Clear height: 4.76 m
Floor height: 5.00 m
☑ Create automatic ceiling

Structure heights
Floor: 0.08 m
Ceiling: 0.16 m
Wall panelling: 0.01 m

After the dialog has been terminated with ‘OK’, the following options are presented to the user:



Modify floors

Level or height of the current floor has changed.
How should bordering floors be modified?

Floor above
○ adjust the bordering floor
● Move the bordering floors
○ without moving the bordering floors

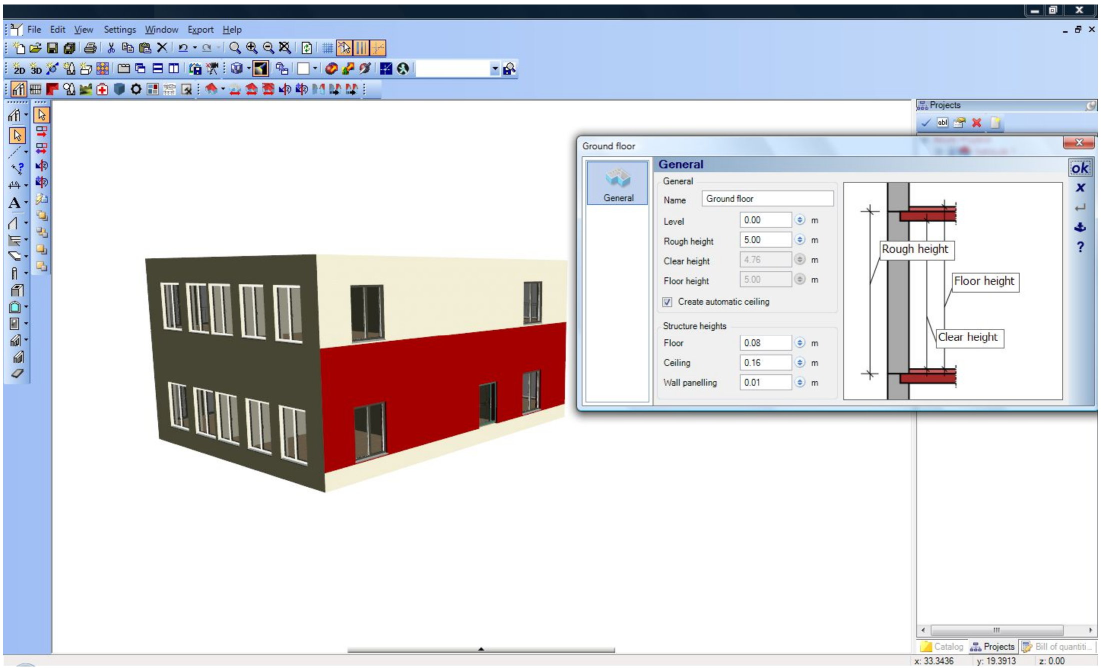
Floor below
○ adjust the bordering floor
○ Move the bordering floors
● without moving the bordering floors

Note: cancelling the dialog will also skip changes of the current floor.

First, the dialog differentiates between floors which are situated above or below the current floor. The options available have the following effects:

- **Adjust the bordering floor:** changes the height of the floor. In the example shown this would have the following effect: The ground floor and the upper floor were both 2.80 m high, therefore together 5.60 m. The ground floor is changed to have a height of 5.0 m. When the upper floor has been adjusted it has a height of only 0.6 m.
- **Move the bordering floors:** moves the upper floors and changes their level. The level of the of the first floor was previously 2.80 m. After the adjustment the level of the floor is changed to 5.0 m, the new height of the ground floor, but retains its original height of 2.80 m.
- **No adjustment::** the bordering floors are not changed. In the example this would result in the ground floor penetrating the upper floor, not a good idea. Nevertheless, there are certain applications for this option.

We select the following options:
Above: Move the bordering floors.
Below: No adjustment. This would only make sense if the level of the ground floor had been changed downwards.
Here the results:



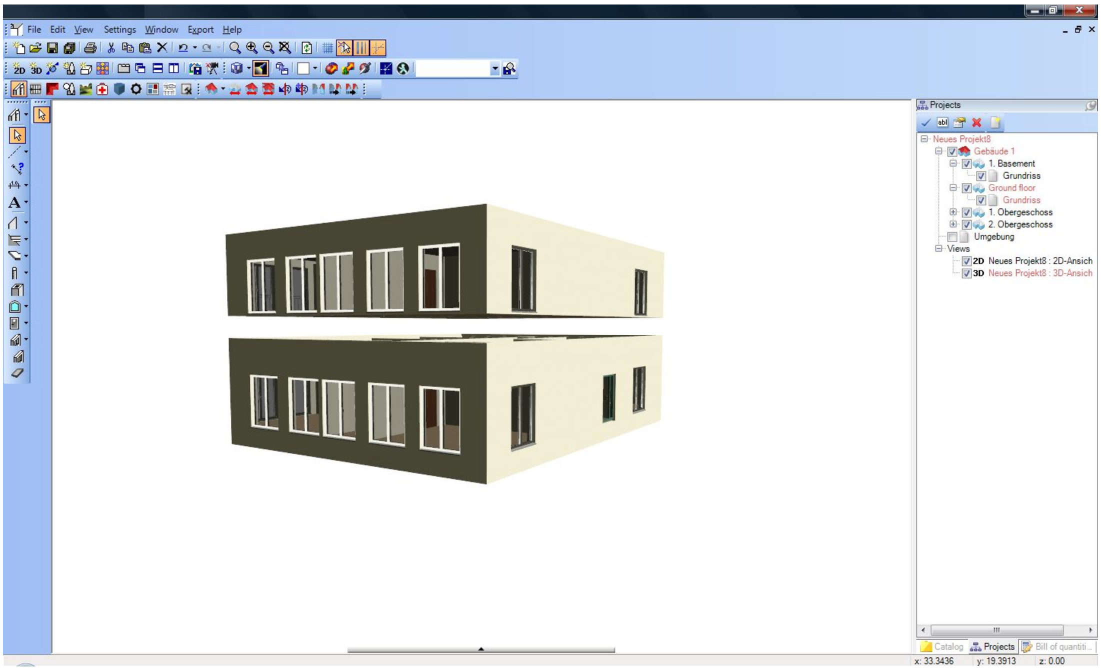
Ground floor

General

General
Name: Ground floor
Level: 0.00 m
Rough height: 5.00 m
Clear height: 4.76 m
Floor height: 5.00 m
☑ Create automatic ceiling

Structure heights
Floor: 0.08 m
Ceiling: 0.16 m
Wall panelling: 0.01 m

A further example:
We reduce the height of the ground floor from 5.0 m to 4.0 m, and select the following options:
Above: No adjustment
Below: No adjustment



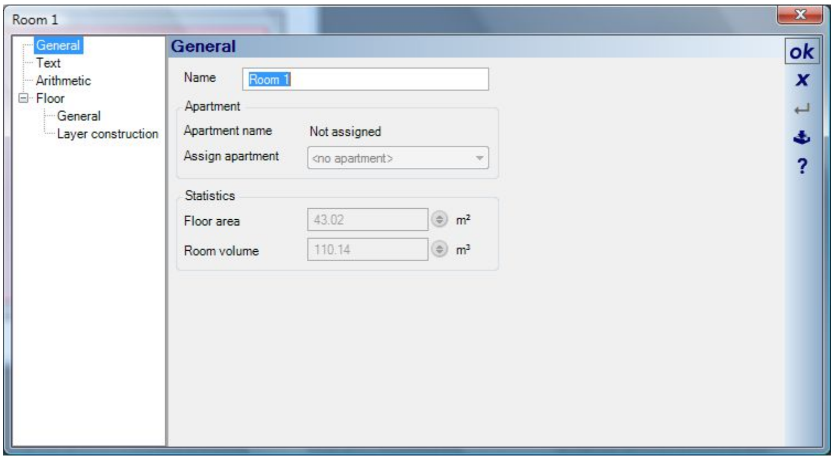
This results in a gap of 1.0 m between the upper floor and the ground floor, since neither the height nor the level of upper floor has changed. To close this gap the level of the upper floor would have to be subsequently adjusted.

7.10 ROOMS

Rooms are automatically created with a default text, a numbered room name and a floor, as soon as the walls form a closed object. Rooms are selected by clicking on the flooring in 2D, 3D or cross-section views.

7.10.1 Properties of Rooms

You can open the room properties dialog with a double click on the selected room or over the corresponding context menu.



General

Name: Room 1

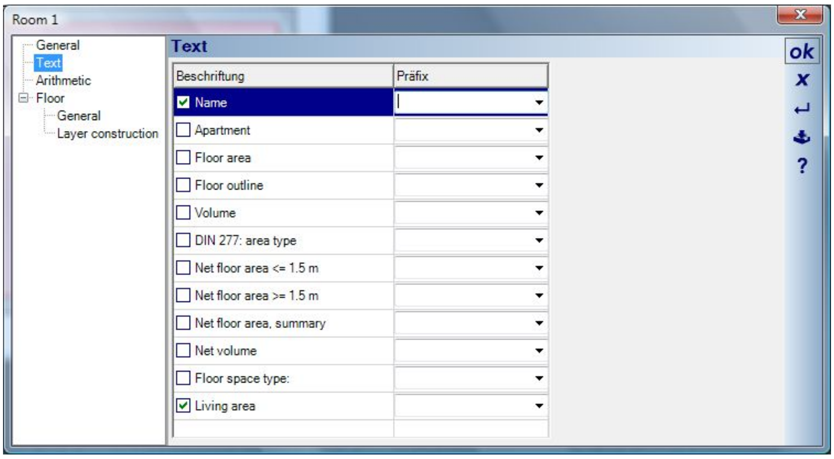
Apartment
Apartment name: Not assigned
Assign apartment: <no apartment>

Statistics
Floor area: 43.02 m²
Room volume: 110.14 m³

Under ‘General’ you can specify a name for room. Allocating rooms to an apartment can be done either directly when an apartment is created in the project viewer, or here in the room dialog, where an apartment must already exist, otherwise the corresponding area is deactivated.

7.10.2 *Labelling Rooms*

A special text can be generated separately for each room. The contents of the text are defined in the dialog under ‘Text’. Predefined terms and values are provided, which correspond to the procedures supported for calculating areas. The text which is to be displayed can be activated over a check box. Additionally, you can assign each value a predefined prefix, a text preceding the value, or enter your own text in the field provided. The text may be associated with a room, i.e. it is removed when the room no longer exists, but it can be formatted and positioned independently. If you double click on the selected text of a room, not to be confused with a selected room, the properties dialog for text is opened and you can change the properties defined there as required.

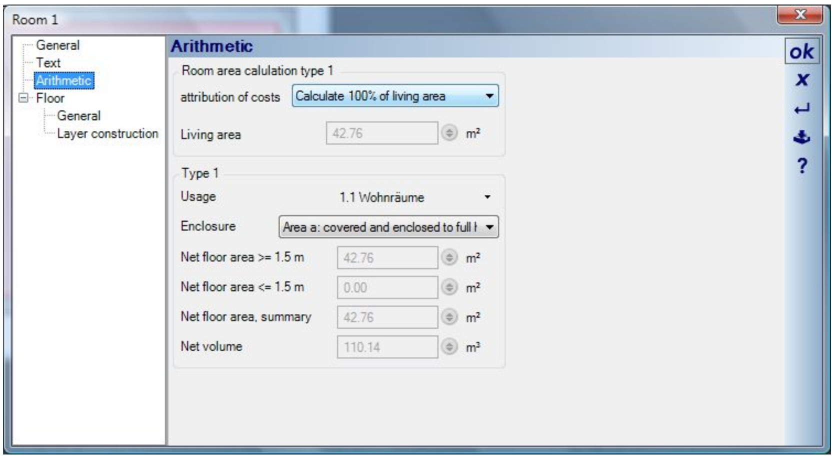


Text

Beschriftung	Präfix
☑ Name	
☐ Apartment	
☐ Floor area	
☐ Floor outline	
☐ Volume	
☐ DIN 277: area type	
☐ Net floor area <= 1.5 m	
☐ Net floor area >= 1.5 m	
☐ Net floor area, summary	
☐ Net volume	
☐ Floor space type:	
☑ Living area	

7.10.3 Calculating Areas

Under ‘Arithmetic’ in the dialog, you can specify the desired settings for an analysis of the rooms according to DIN 277 and the living space ordinance. The values, which are calculated using the specified settings, are available on the one hand for labelling rooms, and on the other as output for other plug-ins, such as Quantities. An attribution of costs of the resultant values is not made automatically based on the defined usage. If you define a usage over the tree structure, which should result in a attribution of costs, you have to make the required setting manually.

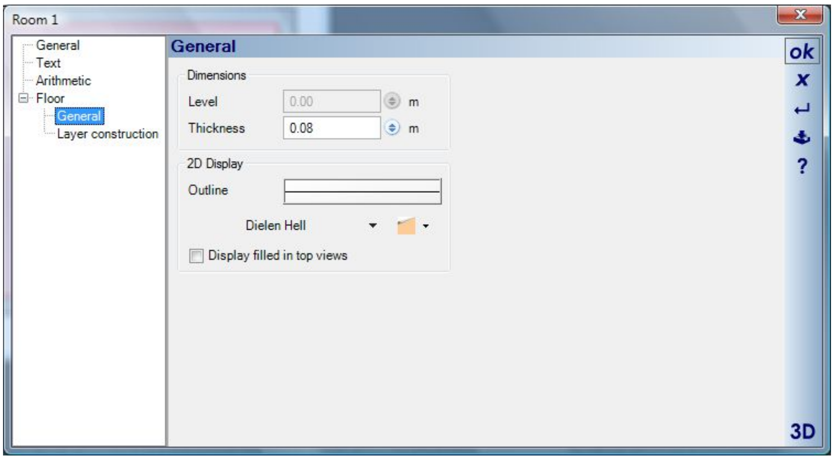


Room area calulation type 1
attribution of costs: Calculate 100% of living area
Living area: 42.76 m²

Type 1
Usage: 1.1 Wohnräume
Enclosure: Area a: covered and enclosed to full l
Net floor area >= 1.5 m: 42.76 m²
Net floor area <= 1.5 m: 0.00 m²
Net floor area, summary: 42.76 m²
Net volume: 110.14 m³

7.10.4 The Floor, Material and structural Layers

As with other elements, the floor consists of a building material, which also affects the way it is represented in views. Changes to visualization materials and texture coordinates can be made under ‘Room>General’. The 2D representation of the building material in 2D plan views is deactivated by default, but can be set for each room over the option for ‘Filled in representation in plan views’.



Dimensions
Level: 0.00 m
Thickness: 0.08 m

2D Display
Outline
Dielen Hell
☐ Display filled in top views

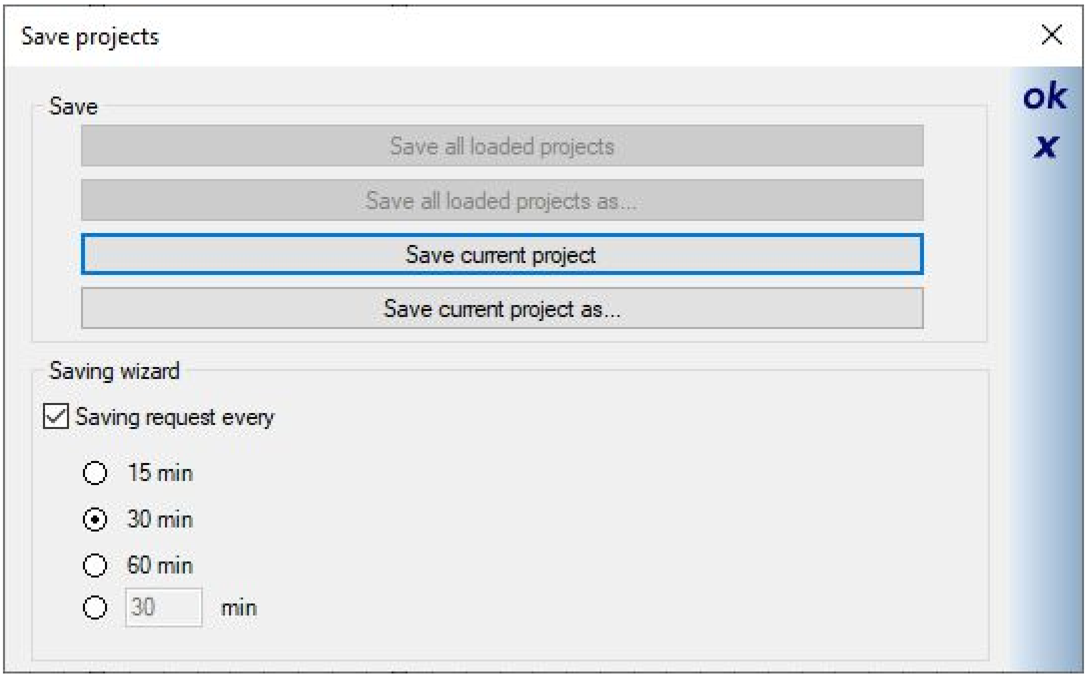
8 GENERAL FUNCTIONS

8.1 AUTOMATICALLY SAVING PROJECTS, SAVING REMINDER

Automatic saving is not always advantageous, especially not with very large plans and short periods of time.
Instead, we added a reminder function which displays the following dialog with buttons for saving at the desired time.
You can decide for yourself whether you want to save now or whether you close the dialog. The function checks whether another dialog is open at the defined time or whether an input tool is being used right now. This prevents you, for example, from carrying out extensive work in the roof dialog or having a complex polygonal input in progress and suddenly the save dialog appears in between. If one of the two conditions prevents the opening of the saving reminder dialog at the preset time, the dialog will appear immediately afterwards instead. The timer for the period of time is then also reset.

Buttons are shown with the following variants:
- Save current project: saves the project with the same file name
- Save current project as: opens the Save as... dialog so that you can give the project a new name, i.e. basically create a copy of the project, which is highly recommended.

If several projects are loaded at the same time, the two additional buttons become active, but offer the same functions as previously described.

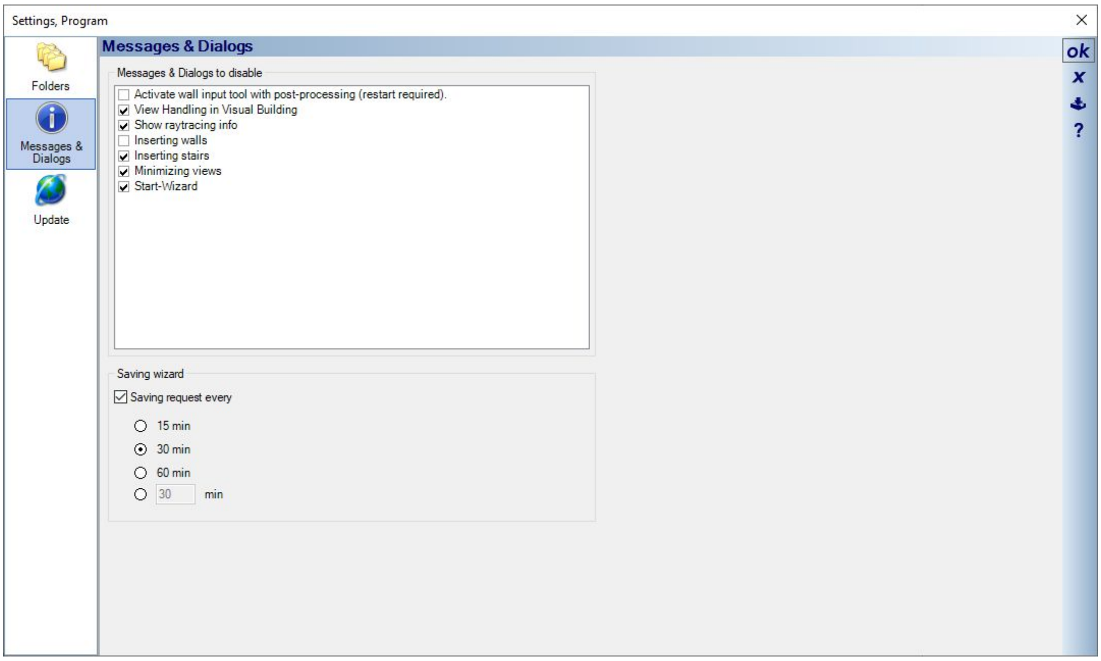


Saving wizard

☑ Saving request every

○ 15 min
● 30 min
○ 60 min
○ 30 min

The settings for the reminder dialog can also be found in the SETTINGS – PROGRAM menu on the Messages & dialogs page. (in a ribbon version via the menu behind the button with the green arrow at the top left)



Messages & Dialogs

Messages & Dialogs to disable

☐ Activate wall input tool with post-processing (restart required).
☑ View Handling in Visual Building
☑ Show raytracing info
☐ Inserting walls
☑ Inserting stairs
☑ Minimizing views
☑ Start-Wizard

Saving wizard

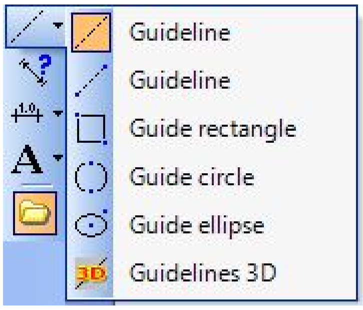
☑ Saving request every

○ 15 min
● 30 min
○ 60 min
○ 30 min

8.2 GUIDELINES

8.2.1 2D Guidelines

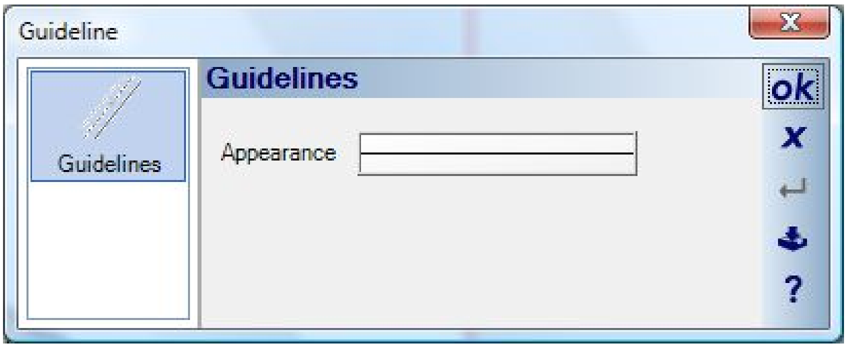
Different types of guidelines, and methods of creating them, are provided for 2D plan views and 2D elevations/cross-sections. The main difference in the types of views is that guidelines, as with several other 2D elements, are present in all plan views, but in cross-sections are only present in the view in which they were entered. The reason for this is that cross-section views do in fact also represent the model, but from different angles depending on the placement of the symbol for the line of cut of the cross-section. Therefore, there is no point in showing 2D elements, such as guidelines, in all views.



With lines there is a difference between a straight line and a straight length. Straight lines are ‘infinite’, whereas a straight length has a start and end point, which is noticeable in the different methods for entering them.

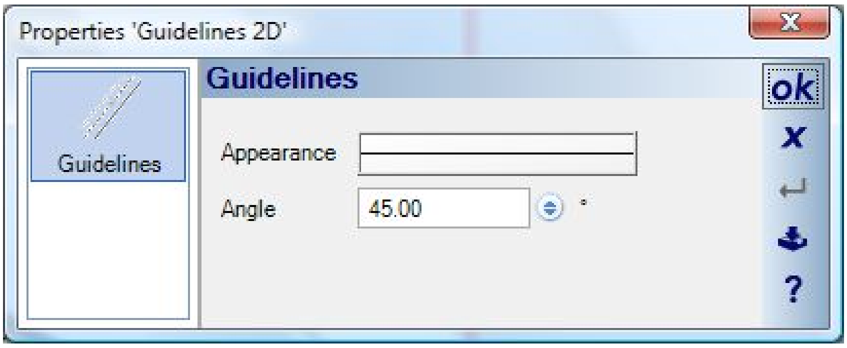
All types of guidelines can be suppressed for each view over the visibility option for the construction aids category.

The properties for colour and style, can be set for all types of guidelines. These properties can be changed later, and can also be specified when the guidelines are being created in the properties dialog, which is activated over the context menu opened with a right mouse click. The advantage of doing this when they are being created, is that the guidelines then have the right properties immediately, and do not have to be modified later.



8.2.1.1 Angled Guidelines

For angled guidelines, the software assumes by default an angle of 45 degrees. You can specify other values **when guidelines are being created** in the properties dialog, which is activated over the context menu, opened with a right mouse click. Once the guideline has been created, it is not possible to change the angle.

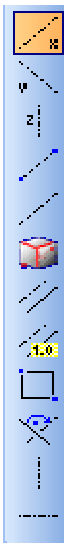


Appearance

Angle 45.00 °

8.2.2 *3D Guidelines*

For 3D views, the software provides 3D guidelines of various types, which can be selected with the button.

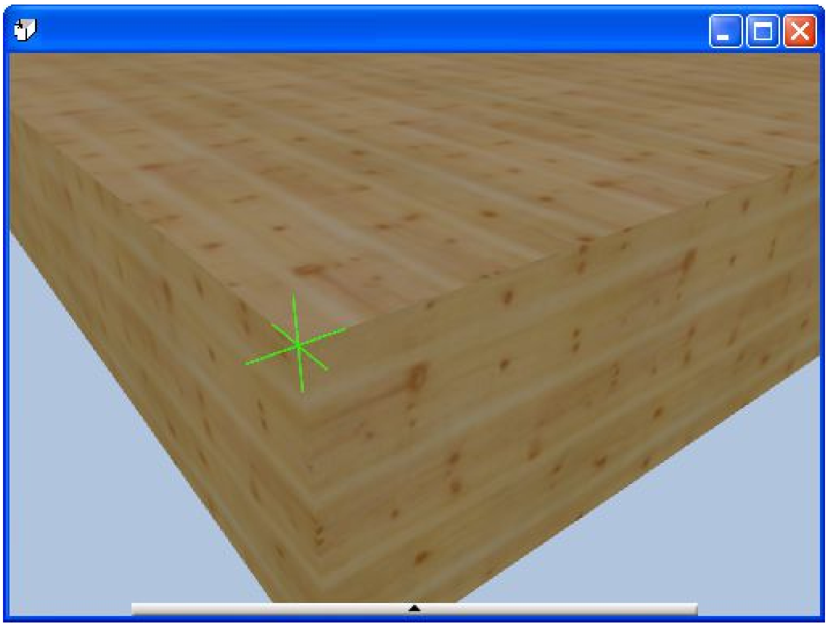


The various types of 3D guidelines are from top to bottom:

- Guideline parallel to the x-axis
- Guideline parallel to the y-axis
- Guideline parallel to the z-axis
- Any straight length
- Any straight line

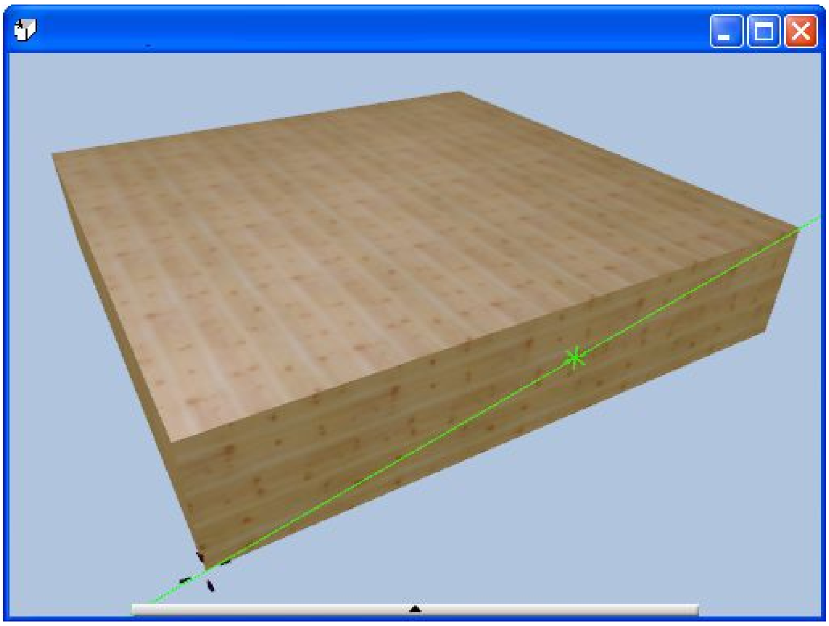
- Edge guideline
- Guideline parallel in a plane
- Guideline parallel in a plane at a distance
- Any guideline (2 points) in a plane
- Perpendicular guideline in a plane
- Vertical guideline in a plane
- Horizontal guideline in a plane

When creating 3D guidelines, the current position is shown by a 3D cursor, which snaps to surfaces/faces, edges and corners. To help in creating guidelines relative to axes and all straight guidelines, the line itself is shown. The edge guideline and guidelines in a plane are explained further in the following sections.

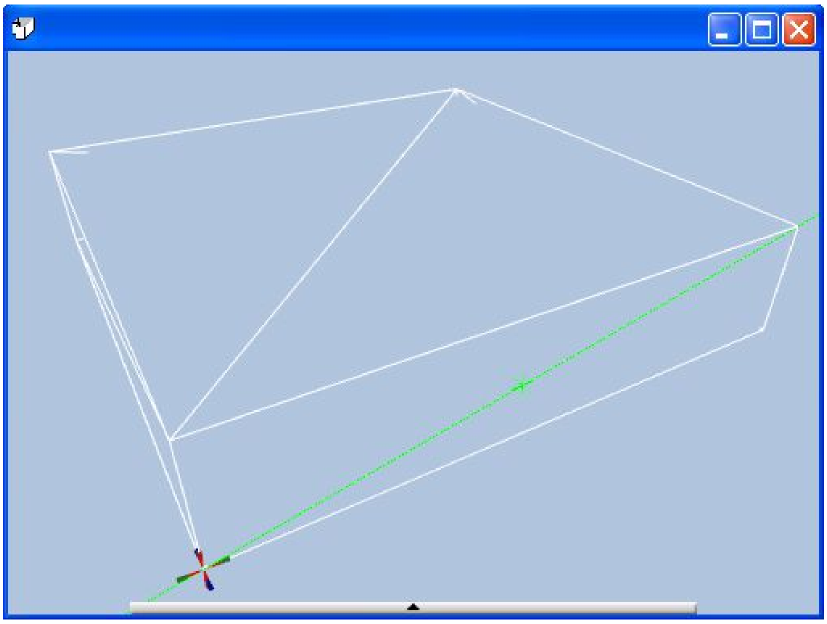


8.2.2.1 Edge Guideline

The edge guideline aids construction by automatically determining the edges present in a 3D view, and shows a preview of the guideline as soon as the 3D cursor comes within snap radius of one of the edges. A left mouse click then creates the guideline. Edges are not only the ‘proper’ edges of a 3D solid, but also the edges of the triangles, which define a 3D solid in a visualization. An exact rectangular surface is made up of two triangles, which means that with the edge guideline you can also automatically enter a diagonal guideline.

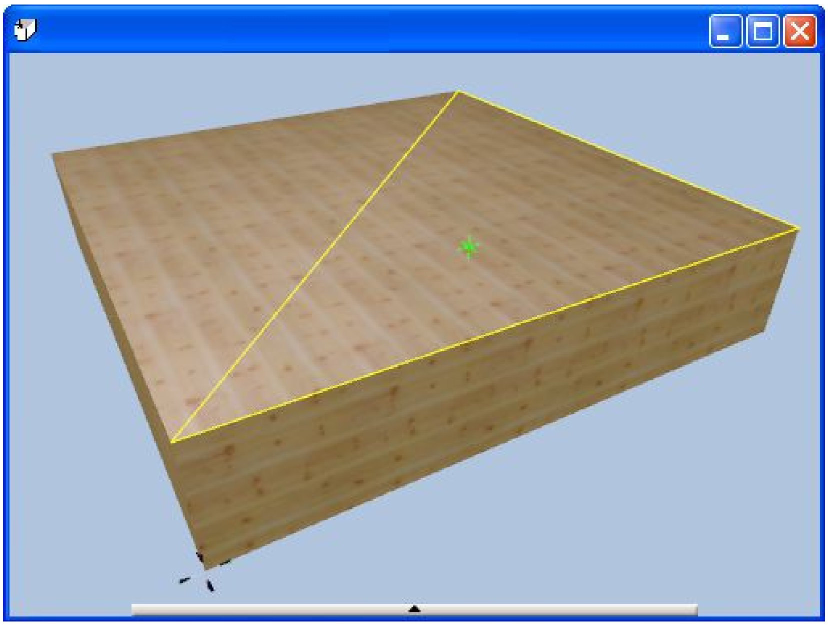


You can work with the edge guideline much more accurately, especially with complex bodies, if you switch the representation mode of the 3D view to wire frame.

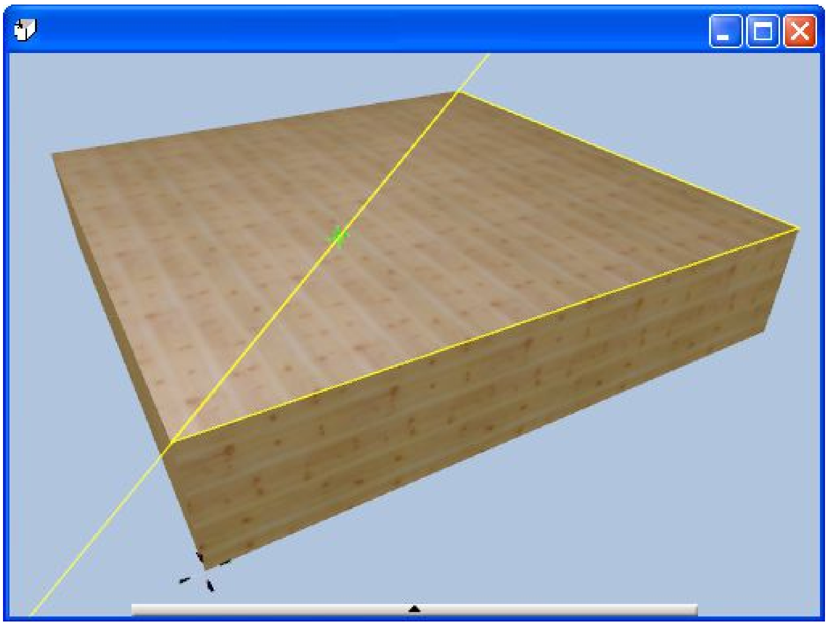


8.2.2.2 3D Guidelines in Planes

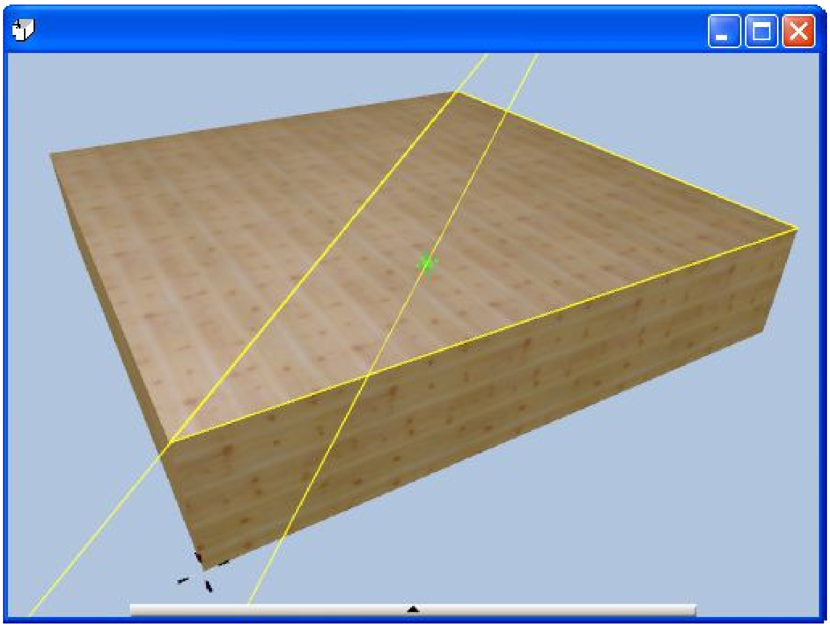
Working with 3D guidelines within a referenced plane is particularly important for bodies and their surfaces whose slope could not, or not easily, be determined without these aids. When you have activated one of these construction aids, in our example 'Guideline parallel in a plane at distance', and you move the cursor over the 3D view, the software detects any triangles which are located under the cursor and outlines them in yellow. A left mouse click then sets the reference plane defined by the triangle.



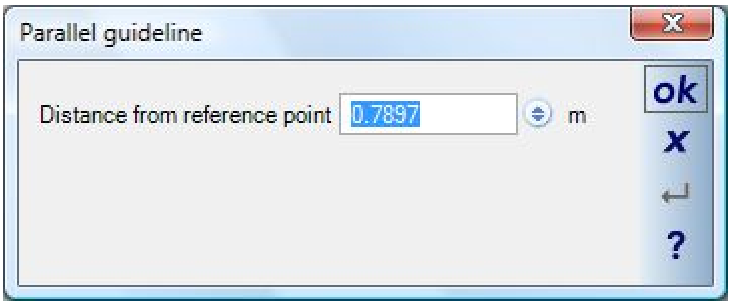
The next step is to select one of the three sides of the triangle as a reference side, parallel to which the guideline can then be positioned. The reference side is highlighted in yellow when it is within the snap radius.



Another left mouse click sets the side detected as the reference line, and the actual guideline can now be positioned parallel to the reference line.



With the final mouse click a dialog is opened, in which a value for the distance from the object can be specified for this type of guideline. For other types of guidelines the 3D guideline would be created immediately and the process terminated.



Parallel guideline

Distance from reference point 0.7897 m

8.3 MEASUREMENT

There are several kinds of measuring functions.

Distance: User-defined value

Distance between a straight line and a point: Perpendicular measurement from a selected component e.g. the side of a wall.

During input the current values, such as angle and distance, are continuously updated on the measurement line. A left mouse click terminates the measurement process and the result is shown in the plan, until another measurement is carried out, or the measurement function is terminated with ‘Esc’ or over the context menu.

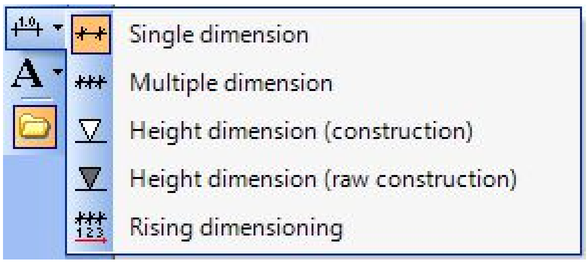
Measure over polygon: For when you have several lengths over polygon points fixed in one step. On exiting the tool, the overall size is displayed. So for example you can quickly determine the dimensions of a property or other polygonal body.

Angle measurement:

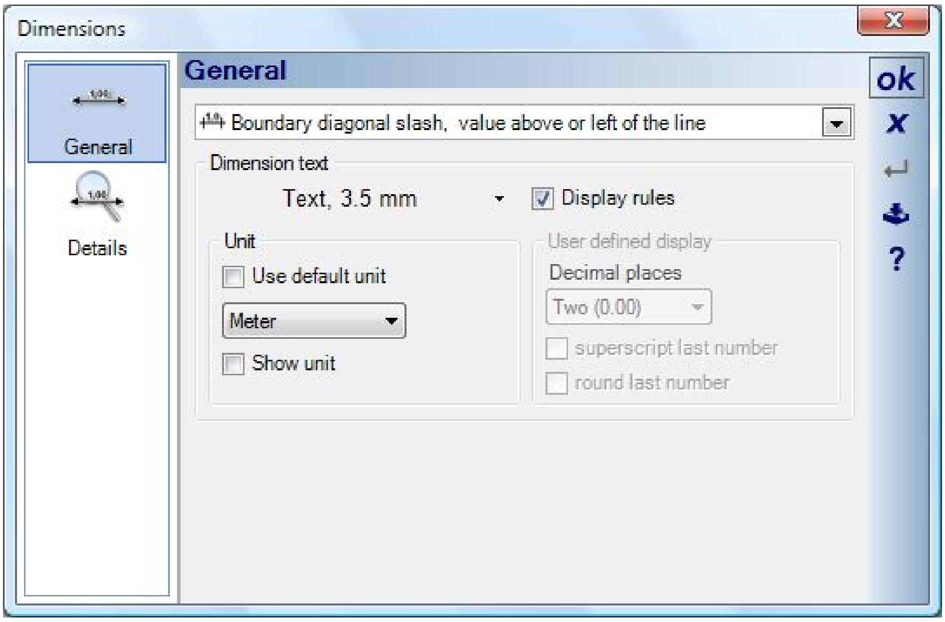
8.4 DIMENSIONS

8.4.1 General

Basically, the software differentiates between single, multiple and height dimensions (for cross-sections and views). The type selected determines the way it can be entered.


Single dimension
Multiple dimension
Height dimension (construction)
Height dimension (raw construction)
Rising dimensioning

The settings for a dimension, as regards type, style and text, can be changed for an existing dimension, or for all dimensions which are entered subsequently, in the properties dialog for ‘Dimensions’, which is opened over the context menu activated with a right mouse click.



Dimensions

General

Boundary diagonal slash, value above or left of the line

Dimension text

Text, 3.5 mm

☑ Display rules

Unit

☐ Use default unit

Meter

☐ Show unit

User defined display

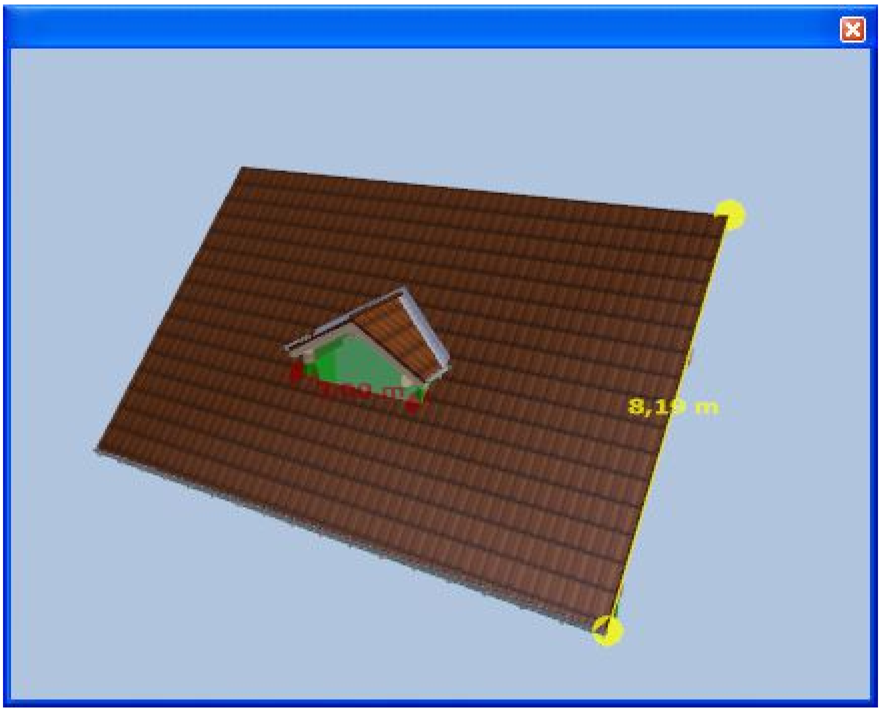
Decimal places

Two (0.00)

☐ superscript last number

☐ round last number

The 3D dimension types are available, over the context menu opened with a right mouse click, in all 3D previews shown in dialogs. However, here they have more of a measuring function, since the dimension is lost when the preview or the dialog is closed.

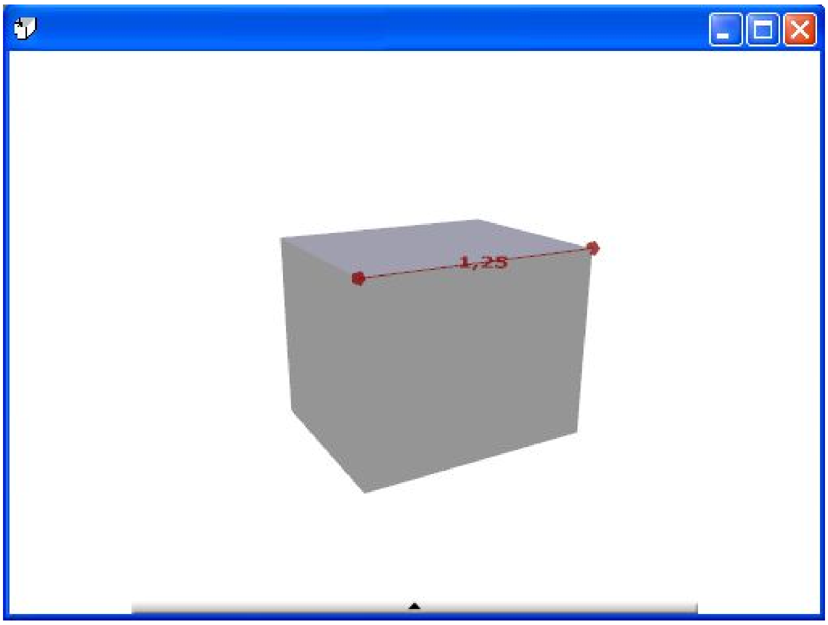


8.4.2 2D and 3D Single Dimensions

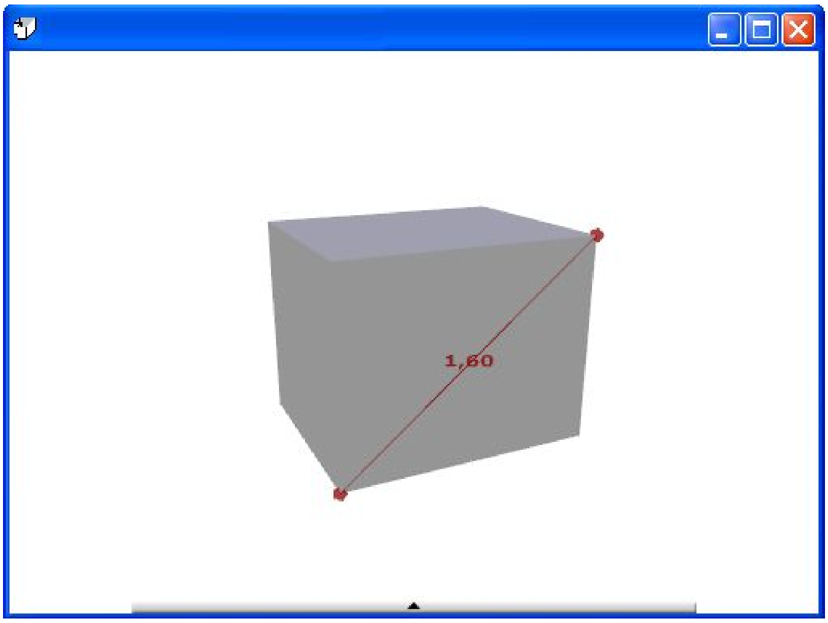
Single dimensions can be entered for 2D and 3D views in the following ways:

Single Dimension 2D: Input is over a start and end point, which determine the length and direction of the dimension line. Subsequently, the dimension line can be placed in its final position with the mouse, using drag and drop.

Single Dimension 3D: Input is over a start and end point, which are highlighted in red in the 3D views. The current distance between the points is displayed directly on input. Input is aided by the snap function for edges and corners.



Edge Dimension: Input is with a mouse click, since the edges of triangles contained in the view, are automatically calculated, and their dimensions previewed. Edges of triangles also means in the example shown, that the two triangles of which the rectangle is comprised, are automatically recognized, so that the dimension for the diagonal can also be set with a mouse click. For more complex bodies, more accurate input is possible in the wire frame mode for 3D views.



8.4.3 2D and 3D Multiple Dimensions

Automatic Multiple Dimensions: Input is over a start and end point, which determine the length and direction of the chained dimensions. Subsequently, the chained dimensions can be placed in their final position with the mouse, using drag and drop. Dimensions are created for all elements which are located under the measurement line during input, and for which automatic dimensioning is provided. For standard elements such as wall, supports, windows etc., this is generally the case, but depending on the plug-in and its objects, the object itself determines whether automatic dimensioning is possible or not.
There is a link between the dimensioned elements and their dimensions in the chain, i.e. the chained dimensions react to changes to the elements to which they apply. If you change the position or the size of an object with automatic dimensioning, there is an overall change in the chained dimensions. However, this does not apply to components inserted later, even if they are located under the original measurement line. If you create dimensions automatically for a wall with several windows, and then subsequently insert a new window in the wall, this has no effect on the chained dimensions.

Multiple Dimensions over n-Points: With this option, the first dimension of the chain defines the direction for all dimensions which follow. With further mouse clicks you can then create new dimensions, until input is terminated with ‘Enter’. Only then, can the complete chain be positioned.

3D Multiple Dimensions: This option does not create chained dimensions as such, but rather a series of individual dimensions. The end point of the last dimension is always the start point for the next one. Otherwise, they behave on input in the same way as a single 3D dimension.

8.4.4 Height Dimensions

The two different types of dimensions, for finished buildings and for the shell of a building, differ only in their representation. Both provide in views and cross-sections the absolute height relative to the origin of the project.

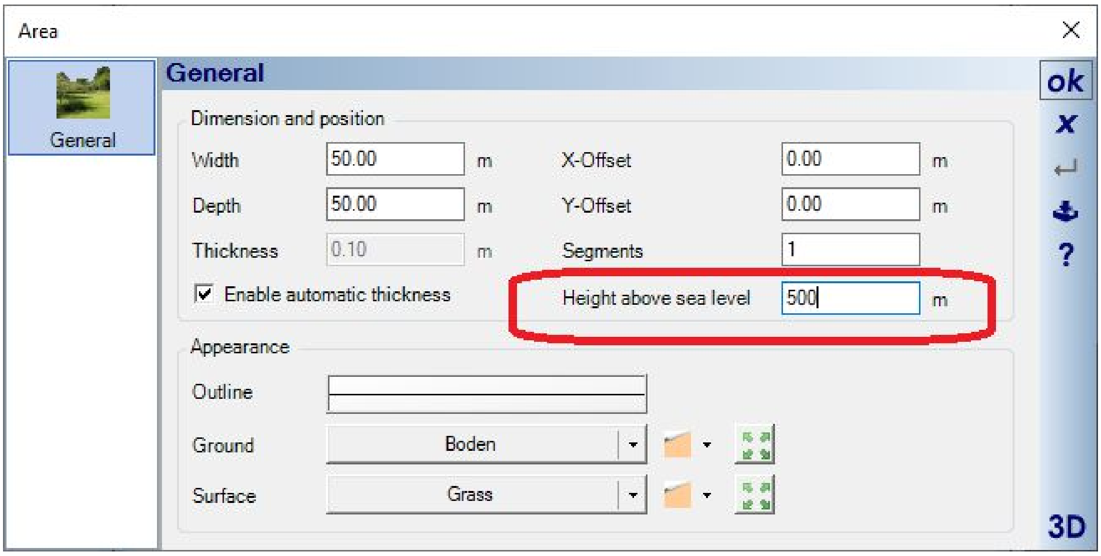
8.4.5 Angle measurement

An angle dimension is defined with three points. First, set the vertex of the angle and then the two lines defining the angle. The angle measured is displayed immediately.

8.5 HEIGHT DIMENSIONS WITH ALTERNATIVE VALUES ABOVE SEA LEVEL IN SECTION AND ELEVATION VIEWS

Height dimensions in 2D-section views and elevations have always referred to the zero level of your planning. And it remains that way. However, you can now specify an internal value that is added to this building level, an internal height above sea level.

You can enter the value in two ways, first in the dialog of the terrain and in your ENVIRONMENT layer properties dialog in our Project Viewer.

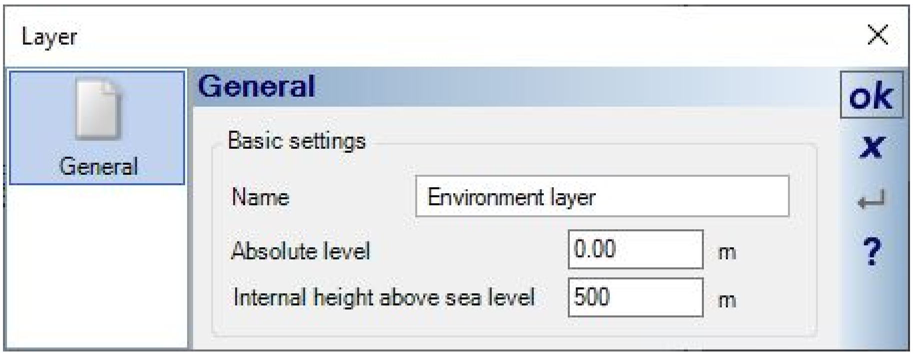


Dimension and position

Width 50.00 m
Depth 50.00 m
Thickness 0.10 m
☑ Enable automatic thickness
X-Offset 0.00 m
Y-Offset 0.00 m
Segments 1
Height above sea level 500 m

Appearance

Outline
Ground Boden
Surface Grass



General

Basic settings

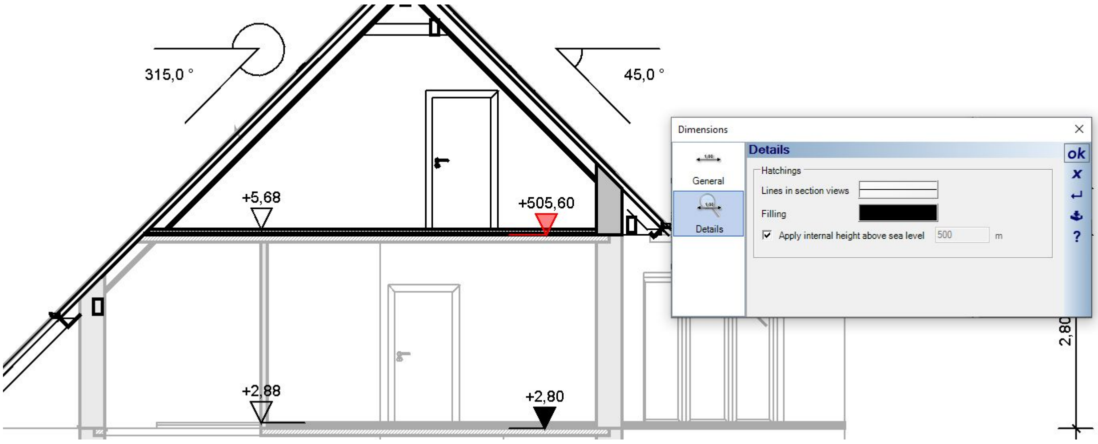
Name: Environment layer

Absolute level: 0.00 m

Internal height above sea level: 500 m

The value alone has no automatic effect. The terrain is not correspondingly high, and the height dimensions are not automatically changed.

To do this, you must activate the corresponding option in the properties dialog of height dimensions on the Details page.



Details

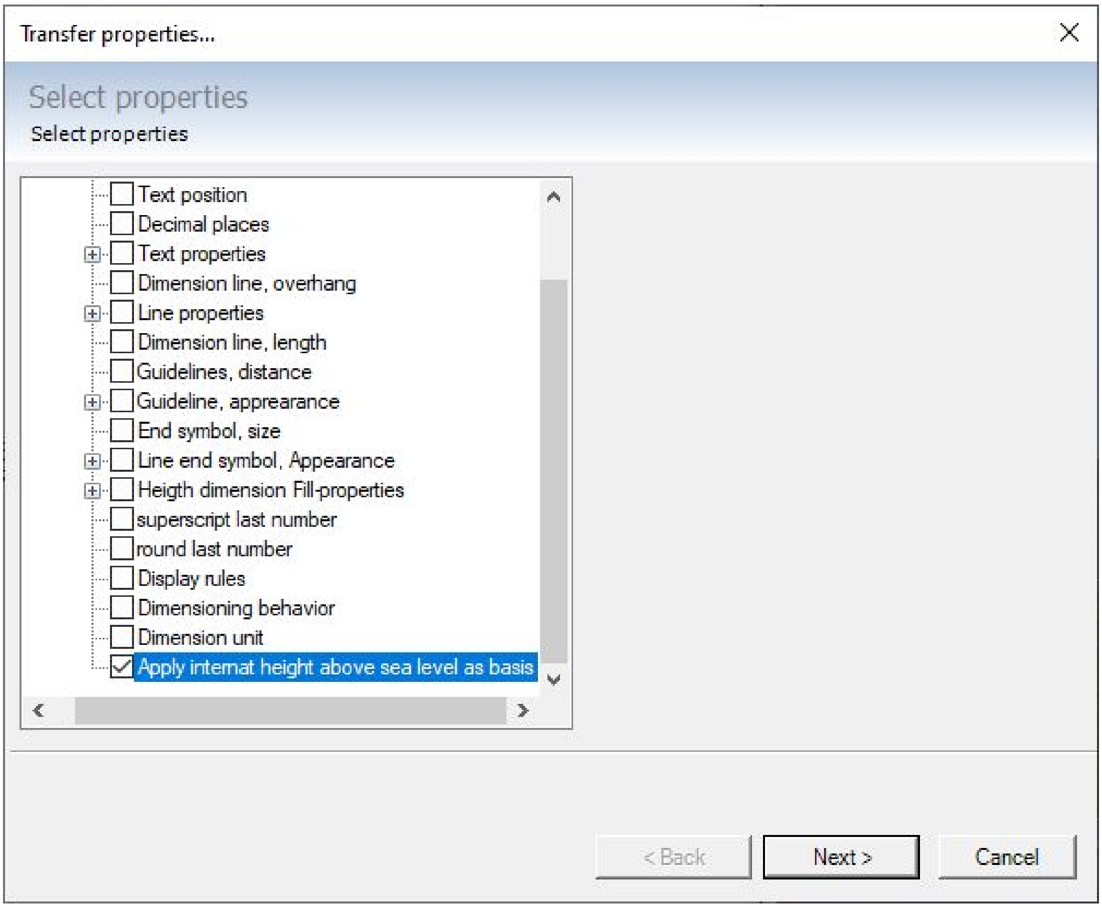
Hatchings

Lines in section views

Filling

☑ Apply internal height above sea level 500 m

To avoid having to set this individually for each height dimension, use the Transfer properties function as usual.



Transfer properties...

Select properties

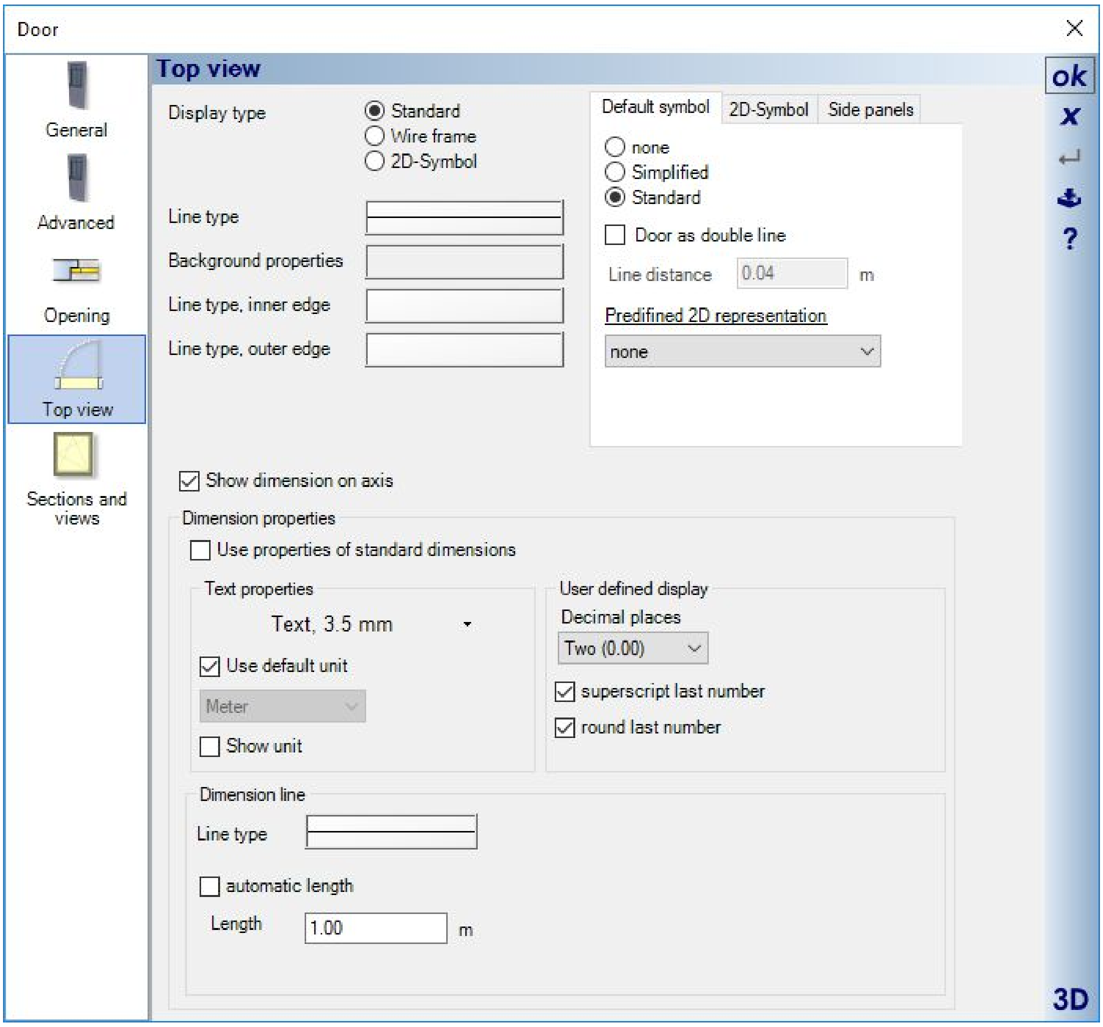
Select properties

- ☐ Text position
- ☐ Decimal places
- ☐ Text properties
- ☐ Dimension line, overhang
- ☐ Line properties
- ☐ Dimension line, length
- ☐ Guidelines, distance
- ☐ Guideline, apprearance
- ☐ End symbol, size
- ☐ Line end symbol, Appearance
- ☐ Heigth dimension Fill-properties
- ☐ superscript last number
- ☐ round last number
- ☐ Display rules
- ☐ Dimensioning behavior
- ☐ Dimension unit
- ☑ Apply internat height above sea level as basis

8.6 DIMENSIONS FOR WINDOWS AND DOORS ON AXIS

Both windows and doors offer in the extended properties dialogs the possibility to show dimensions for the single element in 2D top views.
There are slight differences between the doors and the windows because the dimensions of the door are centered within the element and windows depending on the opening direction (optional).
Essentially, the properties are the same as those of the normal dimension, so you can also apply their properties via the checkbox. This is just in case you have already saved your own default settings for the dimensions.

The door dialog:



Top view

Display type: ● Standard ○ Wire frame ○ 2D-Symbol

Line type

Background properties

Line type, inner edge

Line type, outer edge

Default symbol: ○ none ○ Simplified ● Standard

☐ Door as double line

Line distance: 0.04 m

Predifined 2D representation: none

☑ Show dimension on axis

Dimension properties

☐ Use properties of standard dimensions

Text properties: Text, 3.5 mm

☑ Use default unit

Meter

☐ Show unit

User defined display

Decimal places: Two (0.00)

☑ superscript last number

☑ round last number

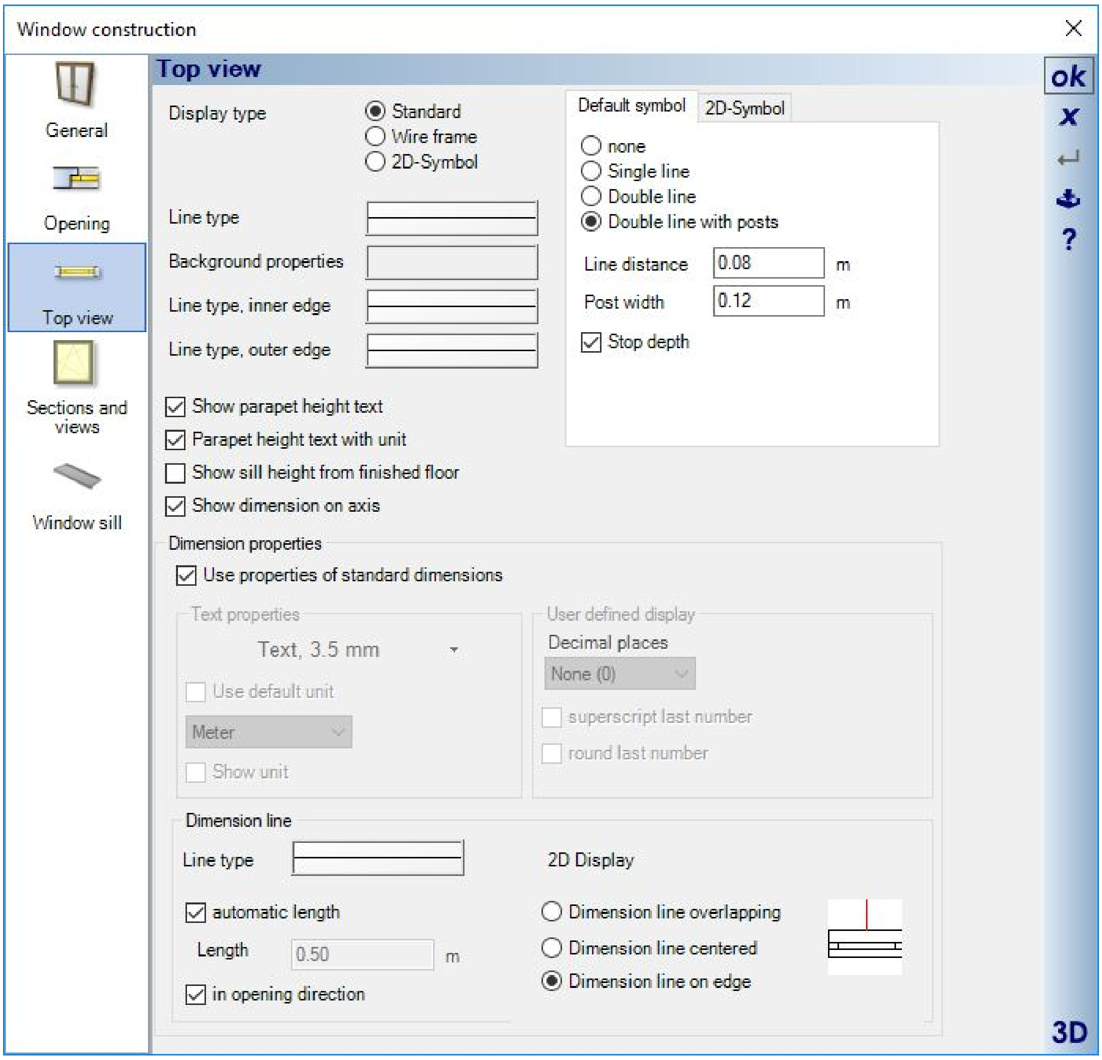
Dimension line

Line type

☐ automatic length

Length: 1.00 m

Dimension options for Window Constructions:



Top view

Display type: ● Standard ○ Wire frame ○ 2D-Symbol

Line type

Background properties

Line type, inner edge

Line type, outer edge

☑ Show parapet height text

☑ Parapet height text with unit

☐ Show sill height from finished floor

☑ Show dimension on axis

Default symbol | 2D-Symbol

○ none
○ Single line
○ Double line
● Double line with posts

Line distance 0.08 m

Post width 0.12 m

☑ Stop depth

Dimension properties

☑ Use properties of standard dimensions

Text properties: Text, 3.5 mm

☐ Use default unit

Meter

☐ Show unit

User defined display

Decimal places: None (0)

☐ superscript last number

☐ round last number

Dimension line

Line type

☑ automatic length

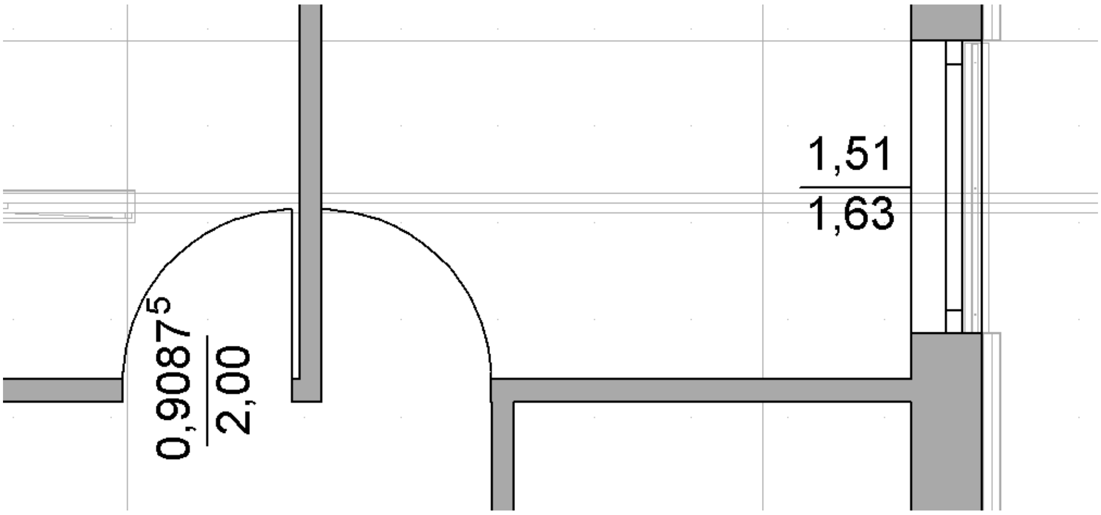
Length 0.50 m

☑ in opening direction

2D Display

○ Dimension line overlapping
○ Dimension line centered
● Dimension line on edge

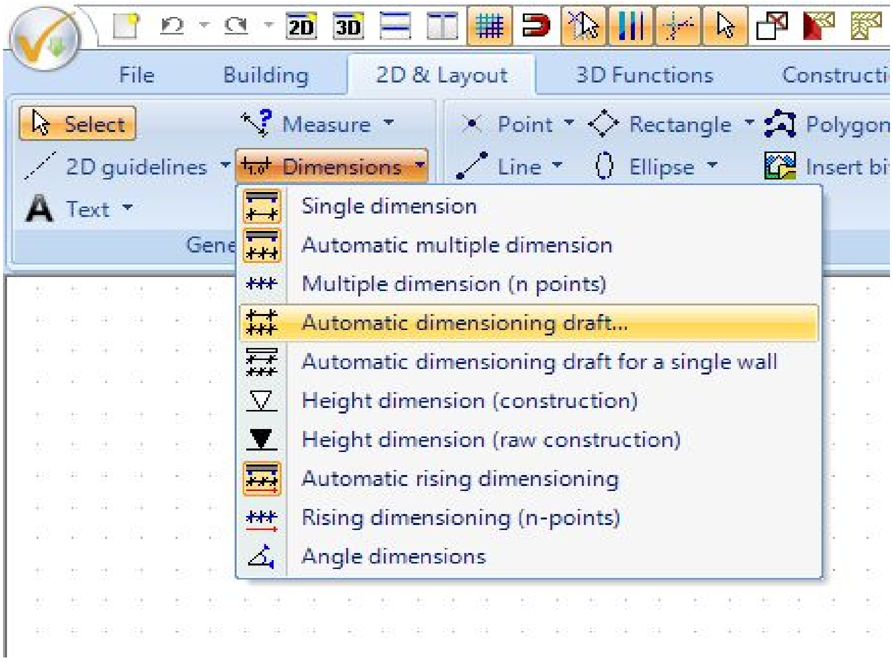
Resulting display in floor plans:



All dimension properties can be transferred to other elements in your project using the „Transfer property“ wizard. This is just to avoid that you have to edit each window or door in your planning.

8.7 AUTOMATIC DIMENSIONING DRAFTS

With two new tools on the dimensioning menu, you can now generate an automatic dimensioning draft. There is a variant that automatically creates dimensions for the active layer and a manual tool for a single wall. The condition is that there are walls to be dimensioned on the active layer.


File
Building
2D & Layout
3D Functions
Constructi
Select
Measure
Point
Rectangle
Polygon
2D guidelines
Dimensions
Line
Ellipse
Insert bi
Text
Gene
Single dimension
Automatic multiple dimension
Multiple dimension (n points)
Automatic dimensioning draft...
Automatic dimensioning draft for a single wall
Height dimension (construction)
Height dimension (raw construction)
Automatic rising dimensioning
Rising dimensioning (n-points)
Angle dimensions

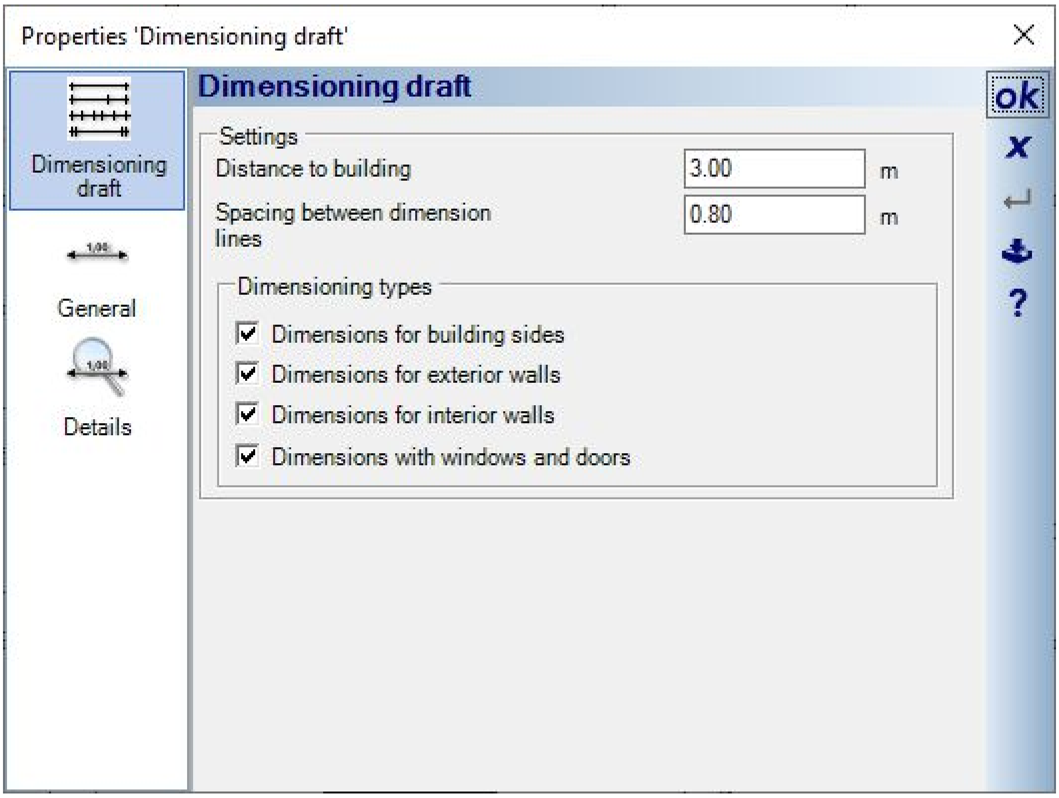
8.7.1 Options and comments for automatic dimensions

In addition to the usual setting options, the dimensioning draft dialog contains another property page on which you can define the distance between the inner dimension and the side of the building as well as the distances between the dimension lines created.

A maximum of four dimension lines are created, which you can define in the dialog.

- Dimension for building side: the overall dimension of the building
- Exterior wall dimensions: if there is an offset in the facade
- Interior wall dimensions: a dimension line that includes the interior walls adjoining the exterior walls

- Dimensions with windows and doors



Settings

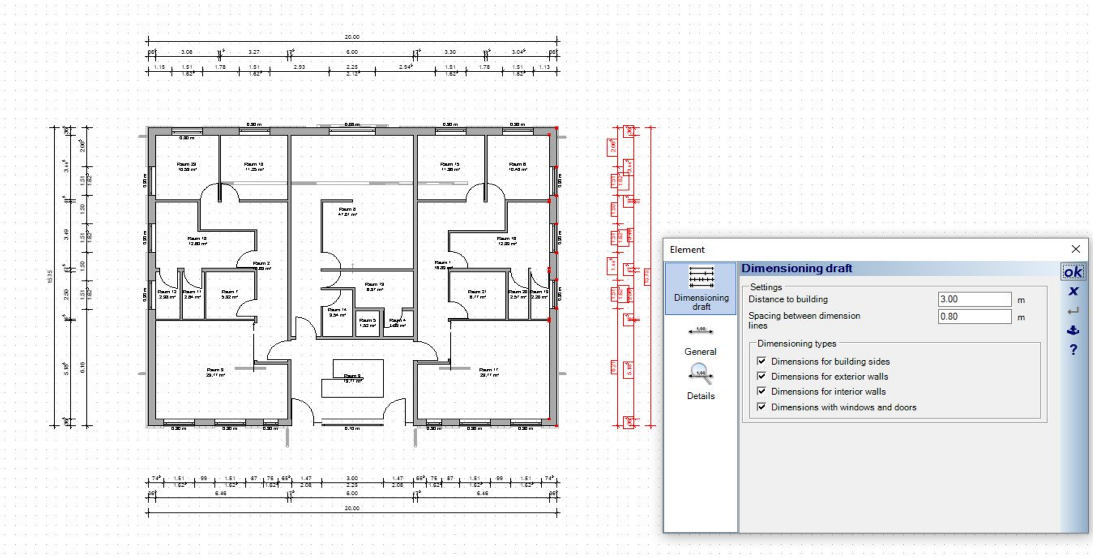
Distance to building: 3.00 m

Spacing between dimension lines: 0.80 m

Dimensioning types

☑ Dimensions for building sides
☑ Dimensions for exterior walls
☑ Dimensions for interior walls
☑ Dimensions with windows and doors

When generating the automatic dimensioning draft, the current floor plan is analyzed and the required dimension lines are generated depending on the floor plan layout. Regardless of the settings in our dialog, it can happen that you do not receive the four activated dimension lines, but only those that make sense. If there are no windows and doors on one side of the building and no offset in the facade, the software creates, for example, only two dimension lines instead of the predefined four.



Dimensioning draft

Settings
Distance to building: 3.00 m
Spacing between dimension lines: 0.80 m

Dimensioning types
☑ Dimensions for building sides
☑ Dimensions for exterior walls
☑ Dimensions for interior walls
☑ Dimensions with windows and doors

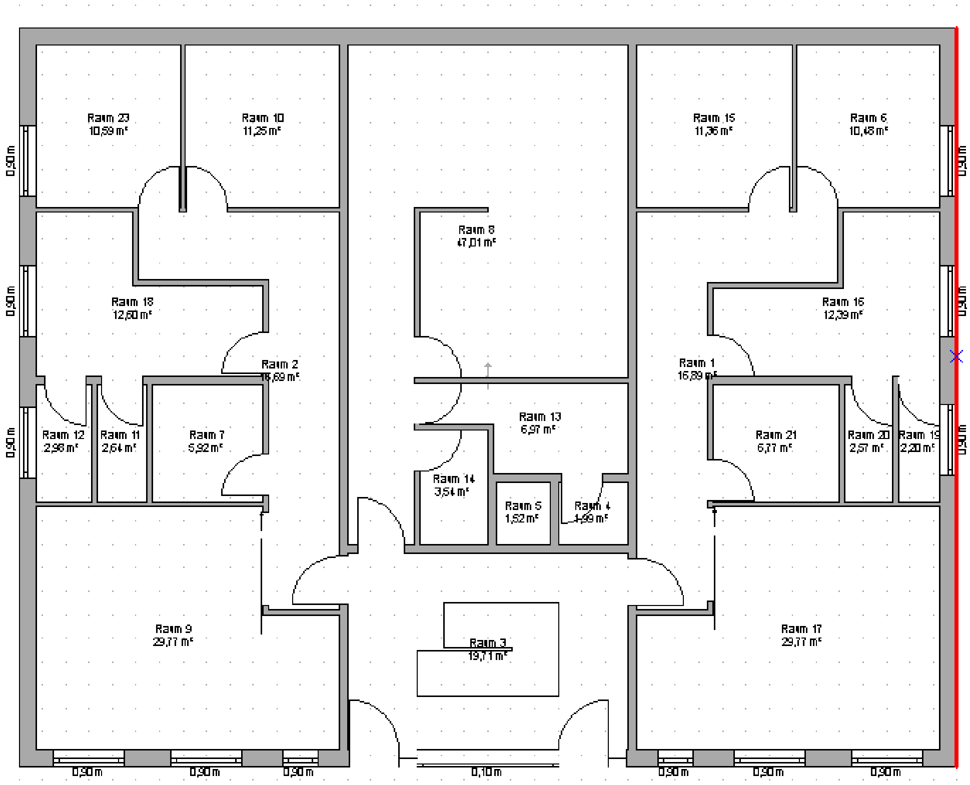
Dimensioning drafts are only generated for 2D plan views, not in section and elevation views.
The dimensioning draft exists as one unit for each side of the building and as an independent object type. They also have their own visibility and selection settings.

8.7.2 Automatic dimensioning draft for the active layer

After starting the tool, the dialog with options appears automatically if there are elements to be dimensioned in the currently active layer.
In this dialog you can specify the distances and, if necessary, the dimension lines to be created. When you close the dialog with OK, the dimension lines are inserted.

8.7.3 Automatic dimensioning draft for a single wall

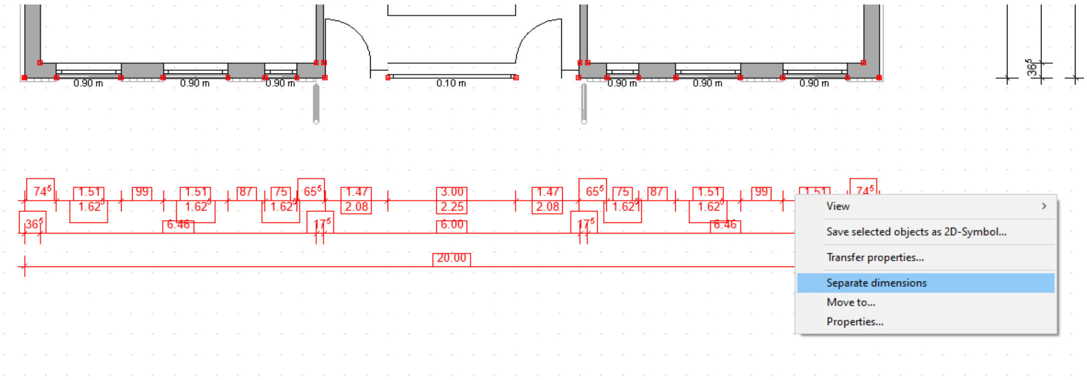
To create a dimensioning draft for a single wall, you first need to choose a wall side. After starting the tool, move the mouse cursor over one side of a wall. As soon as the software recognizes a wall side under your cursor, the wall side is highlighted in red.



Select the wall side with a left mouse click and then move the cursor to the point where the automatic dimensioning should be inserted. So usually away from the building. At this point you will only see a cursor consisting of a single dimension line. This line shows the position of the innermost dimension line, i.e. the distance to the side of the building, which is defined with another left mouse click.
The tool then expects the selection of further walls and may have to be terminated with ESC or via the context menu.

8.7.4 Separate automatic dimensions into individual dimension lines

Automatic dimensioning drafts exist as a common element on each side of the building and are therefore independent objects you can only select and edit in their entirety.
Since not every automatic dimensioning proposal always delivers the desired result, it may be necessary to split up the unit into individual parts in order to delete individual dimension lines as with normal dimensions, to reposition them, or to insert a dimension line that was created manually instead.
In such cases, you can simply separate the selected draft into its individual parts using the context menu.



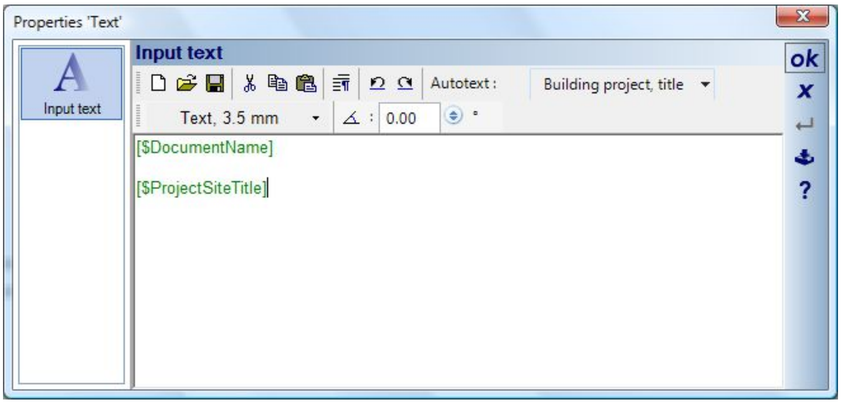
This process is irreversible.

8.7.5 Transfer properties of automatic dimensions

As for almost all other elements, you can transfer properties of an automatic dimensioning draft to all other elements of this type in your project. If you change the text size for example, you do not have to manually adjust all other dimensions. Simply change the properties of one dimensioning draft and then select it in your floor plan. Use the context menu to open the Transfer Properties dialog. In this case, the dialog lists all properties of normal dimensions and also those that only apply to automatic dimensions.

8.8 TEXT

To enter text, begin by defining with the mouse the position for the text in the plan, relative to the top left-hand corner. A dialog to input the text is then opened.



Autotext : Building project, title

Text, 3.5 mm

0.00 °

[$DocumentName]

[$ProjectSiteTitle]

Here you have the possibility to load and save text files, or to enter and format your own text. Formatting functions always apply to the total content of the input area.

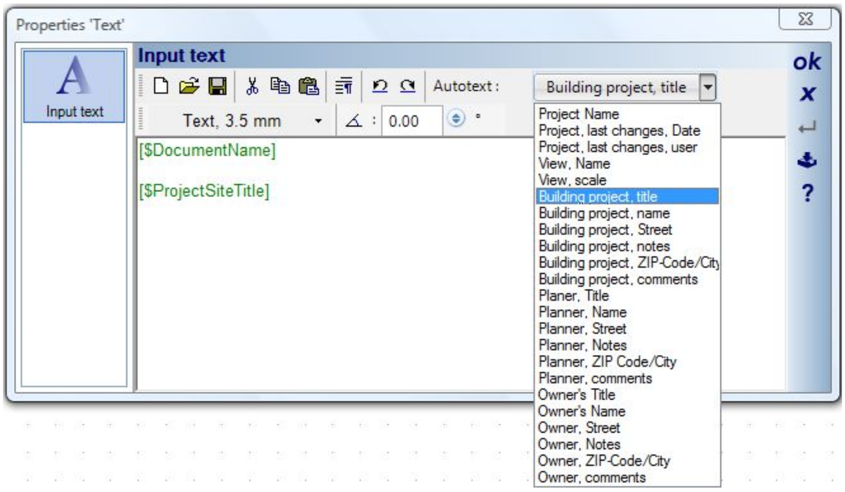
Apart from the frequently used text properties, the ‘Text properties’ dialog also has certain special features.

A line break can be created with the ≡¶ button or with the key combination ‘Ctrl+Enter’.

Also, an angle can be specified for the complete text block. However, the change is only shown in the views after the dialog has been terminated with ‘OK’.

8.8.1 Autotext

Autotext provides placeholders for values which change from project to project, such as project name, name of planner, etc. The placeholder is selected over the tree structure, which is opened with the arrow to the right of the ‘Autotext’ button. Autotext is input in two steps. First, select the placeholder and then, when the cursor is positioned at the appropriate place in the text, click on the ‘Autotext’ button.



Properties 'Text'

Input text

Text, 3.5 mm

∡ : 0.00 °

Autotext : Building project, title

[$DocumentName]

[$ProjectSiteTitle]

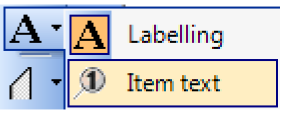
The autotext placeholders provided, are derived from the properties of the views, such as name and scale, and the project properties such as names, addresses and remarks, for the planned building, the planner and the owner. In order for them to be distinguishable from normal text, placeholders are defined with square brackets and a $ sign. Changes to a placeholder, for example deleting a bracket by mistake, can mean it is no longer recognized as such and is displayed as normal text in the plan.

As soon as you insert a placeholder, it is immediately set to a value from the current project or view and is substituted in the actual text. For instance, if the name of the current project is ‘New Project 1’, then this appears instead of ***[$DocumentName].***

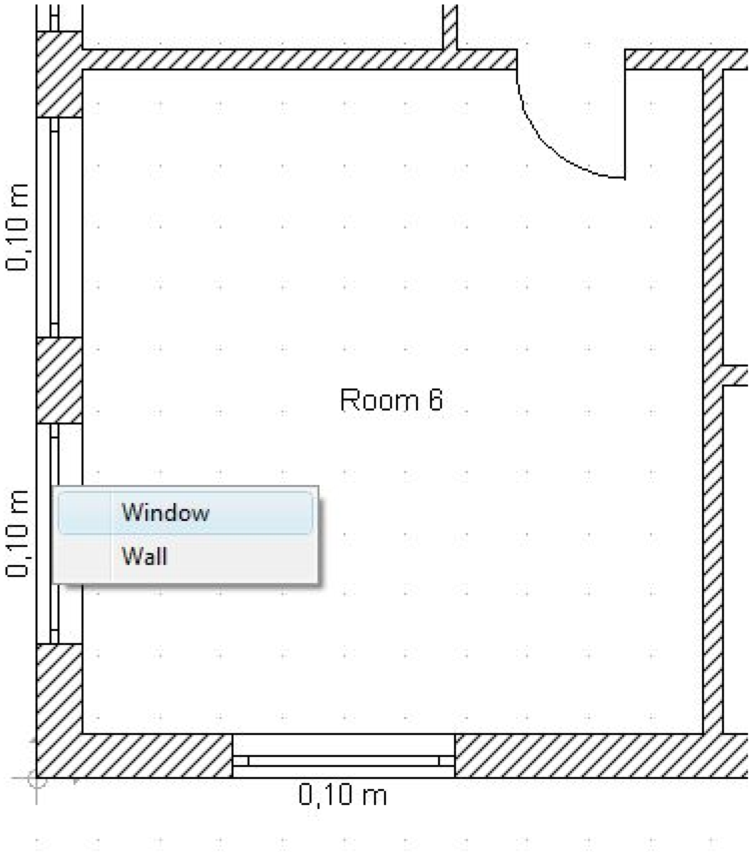
Using the autotext feature and the save text function, you can create text blocks for use in future projects, without having to change project related values manually. Using 2D symbols and the graphic functions, other applications, such as titles and legends, are also possible.

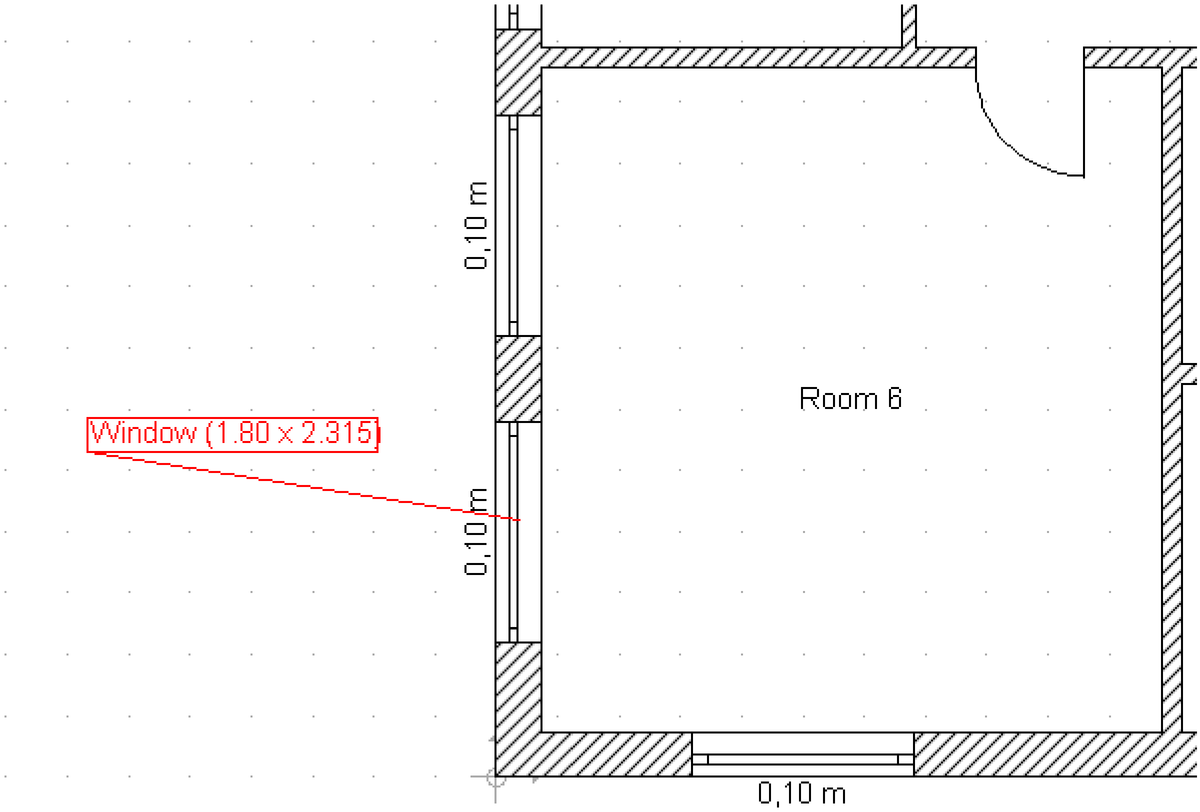
8.9 ITEM TEXT

To create an item text for an element, first select this function using the text type button.

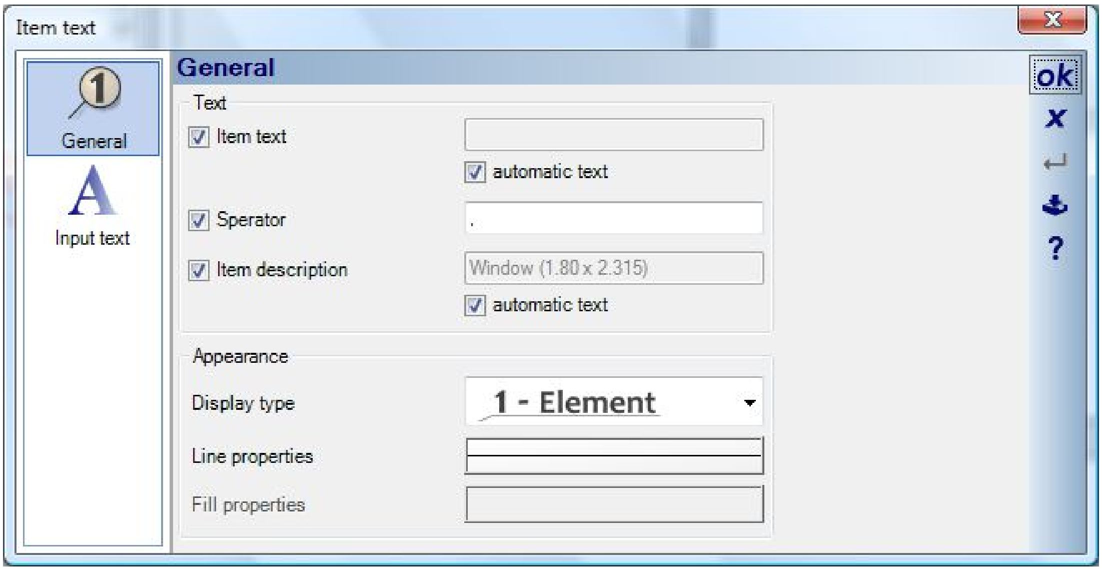


Then position the mouse cursor in a 2D view over the element for which the item text is to be created. A left mouse-click now selects the element and at the same times defines the position of the line connecting the text to the element. If the element can be uniquely identified, for example a support, the text is immediately positioned. If several elements overlap, for instance a window in a wall, a context menu is provided over which the desired element can be selected. The text is positioned only after an element has been selected.





All properties of an item text, such as the content and style of the text, can be changed if necessary in the dialog, which is activated by a double-click on the item text or over the properties context menu available for a selected item text.



General

Text

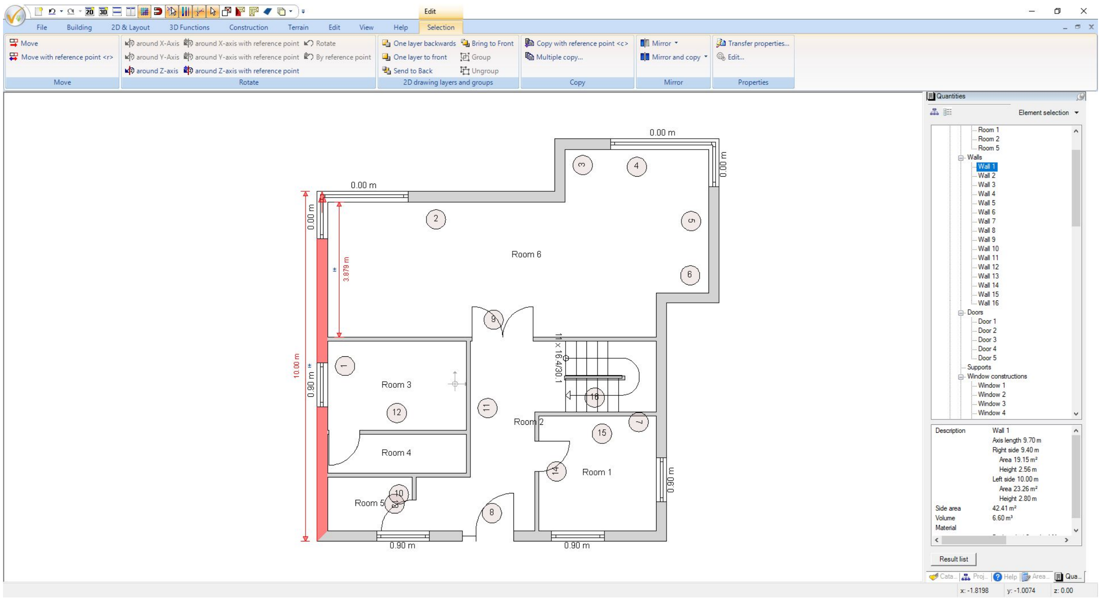
☑ Item text
☑ automatic text
☑ Sperator .
☑ Item description Window (1.80 x 2.315)
☑ automatic text

Appearance

Display type 1 - Element
Line properties
Fill properties

8.9.1 Automatic item texts

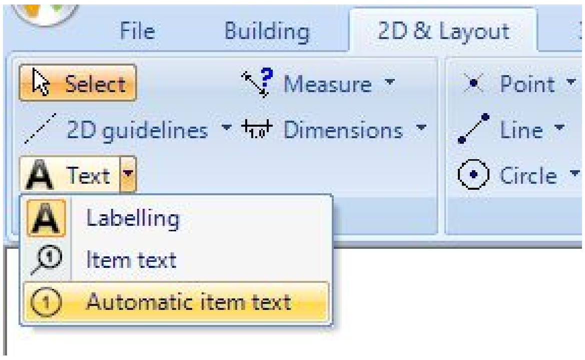
Automatic item texts are used where you want to establish a connection between your drawings and the numbering of building elements in our quantities plugin.
The identification with numbers and description corresponds exactly to that which is also displayed in the tree of our quantities on the right side of the software. This numbering is unique for the project.
So if you need drawings in which you can see in your floor plan which wall is meant by "Wall 1" and where it is, you can simply generate the automatic item texts. Text can also mean the representation of only the number.



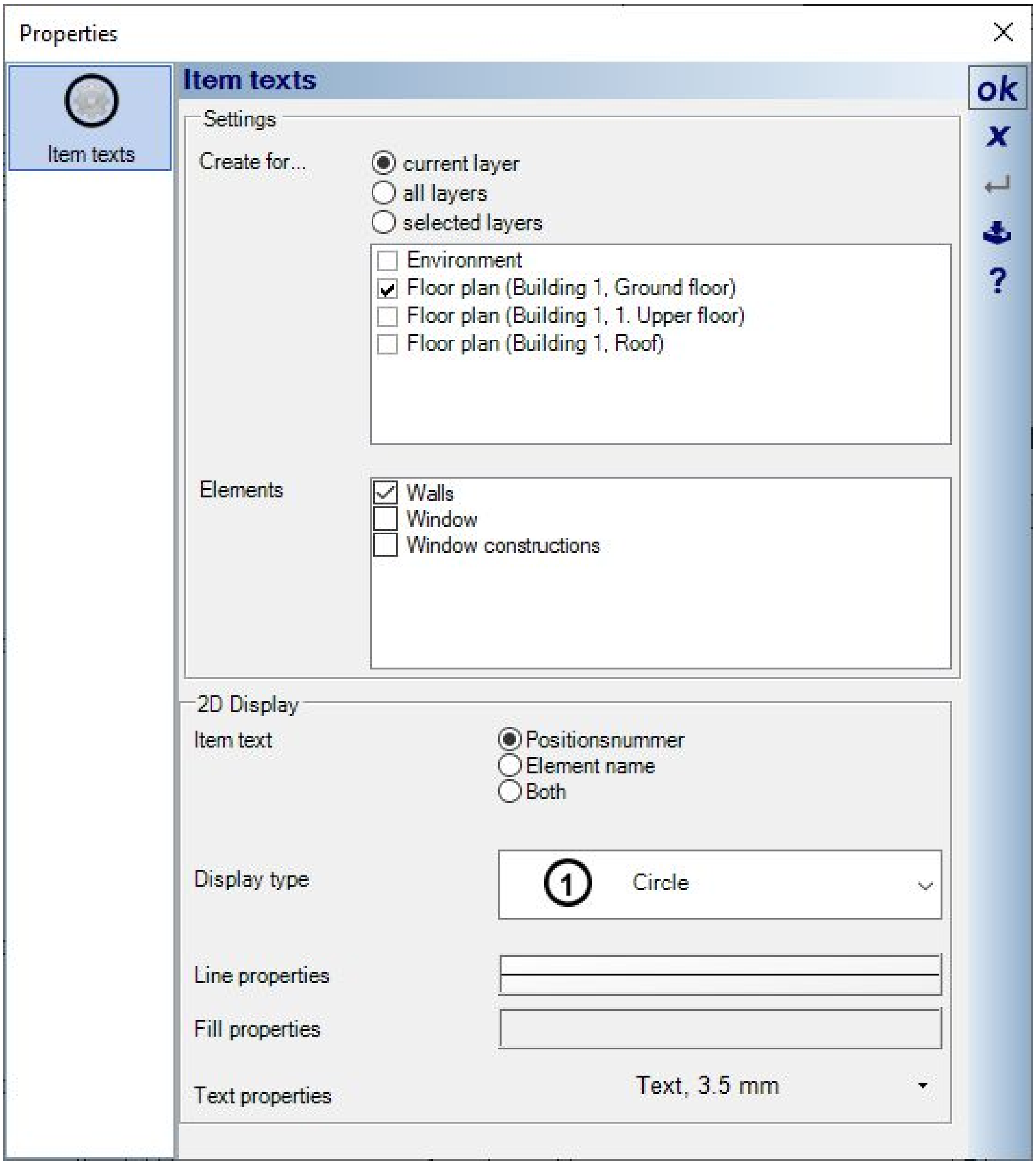
Description Wall 1
Axis length 9.70 m
Right side 9.40 m
Area 19.15 m²
Height 2.56 m
Left side 10.00 m
Area 23.26 m²
Height 2.80 m
Side area 42.41 m²
Volume 6.60 m³
Material

8.9.2 Creating automatic item texts

Create automatic item texts using the TEXT button on our 2D & Layout ribbon.



After the start, the Item Text dialog appears automatically with the selection of layers for which the texts are to be generated as well as the selection of the elements, walls, windows and window constructions.
In our "Display" area, choose from the predefined text types and the shown content, ie whether only the number, only the description, ie "Wall" or both should be displayed, ie "Wall 1".
Below you find the text, line and fill properties, with which you can also highlight your item texts in different colours



Item texts

Settings

Create for...
● current layer
○ all layers
○ selected layers

☐ Environment
☑ Floor plan (Building 1, Ground floor)
☐ Floor plan (Building 1, 1. Upper floor)
☐ Floor plan (Building 1, Roof)

Elements
☑ Walls
☐ Window
☐ Window constructions

2D Display

Item text
● Positionsnummer
○ Element name
○ Both

Display type: Circle

Line properties

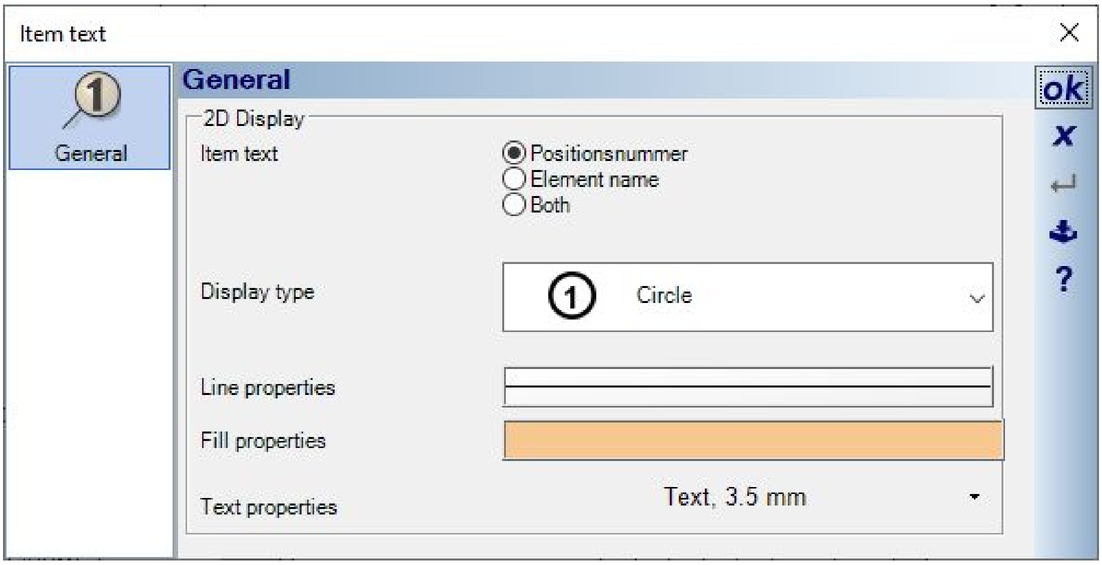
Fill properties

Text properties: Text, 3.5 mm

The item texts only relate to the current planning status and are therefore not updated if you enter additional walls or windows. In such cases, just start the item text process again.
The software automatically recognizes which elements already have this identification and retains their position. Only elements that have not yet been created receive a new item text. However, the 2D representations are overwritten and must first be redefined in the dialog so that no item texts with different contents and different representations arise at this point.

8.9.3 Editing automatic item texts

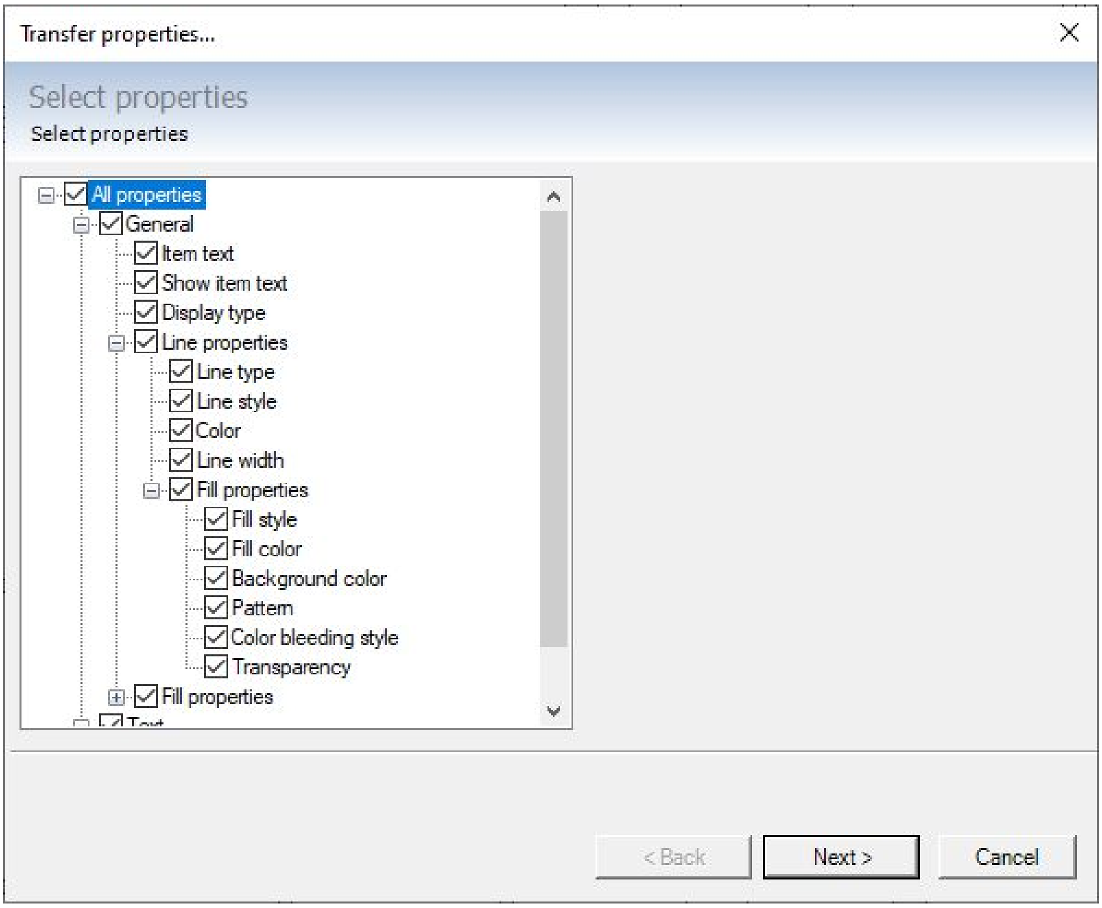
You can select individual item texts and change their 2D representation properties.



2D Display
Item text ● Positionsnummer ○ Element name ○ Both
Display type: Circle
Line properties
Fill properties
Text properties: Text, 3.5 mm

8.9.4 Transferring properties of automatic item texts

As for almost all other elements, you can transfer changed properties of an automatic item text to all other elements of this type in your project. If you change the text size for example, you do not have to adjust all other texts manually.
Simply change the properties of one item text and then select it in your floor plan. Use the context menu to open the Transfer Properties dialog and then choose to which layers these changes are to be transferred.



Transfer properties...

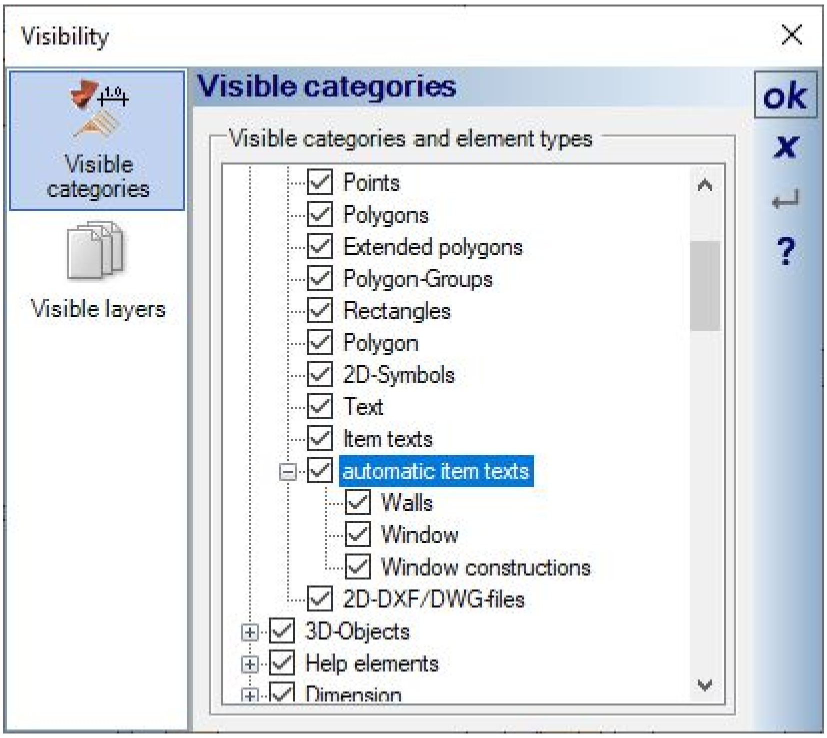
Select properties

Select properties

- ☑ All properties
  - ☑ General
    - ☑ Item text
    - ☑ Show item text
    - ☑ Display type
    - ☑ Line properties
      - ☑ Line type
      - ☑ Line style
      - ☑ Color
      - ☑ Line width
      - ☑ Fill properties
        - ☑ Fill style
        - ☑ Fill color
        - ☑ Background color
        - ☑ Pattern
        - ☑ Color bleeding style
        - ☑ Transparency
    - ☑ Fill properties

8.9.5 *Visibilities of automatic item texts*

Automatic item texts have their own visibilities, to be found in the "2D graphic elements" category, where the normal texts are.



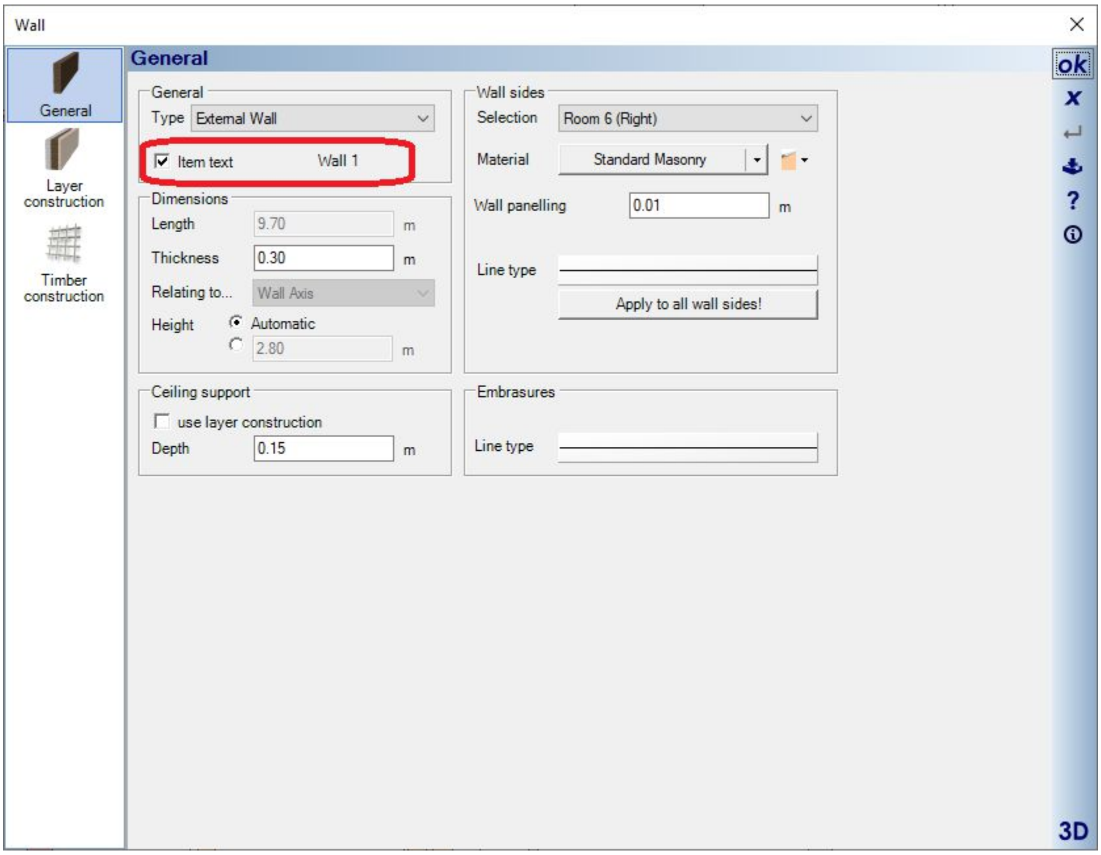
Visible categories and element types

- ☑ Points
- ☑ Polygons
- ☑ Extended polygons
- ☑ Polygon-Groups
- ☑ Rectangles
- ☑ Polygon
- ☑ 2D-Symbols
- ☑ Text
- ☑ Item texts
- ☑ automatic item texts
  - ☑ Walls
  - ☑ Window
  - ☑ Window constructions
- ☑ 2D-DXF/DWG-files

- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension

8.9.6 *Hiding item texts for individual walls*

It can happen that individual walls should not receive an automatic item text for reasons of clarity, e.g. short walls that are close to one another.
You can specifically hide an item text in the properties dialog of a wall.



General

General
Type: External Wall
☑ Item text: Wall 1

Dimensions
Length: 9.70 m
Thickness: 0.30 m
Relating to...: Wall Axis
Height: ● Automatic
○ 2.80 m

Ceiling support
☐ use layer construction
Depth: 0.15 m

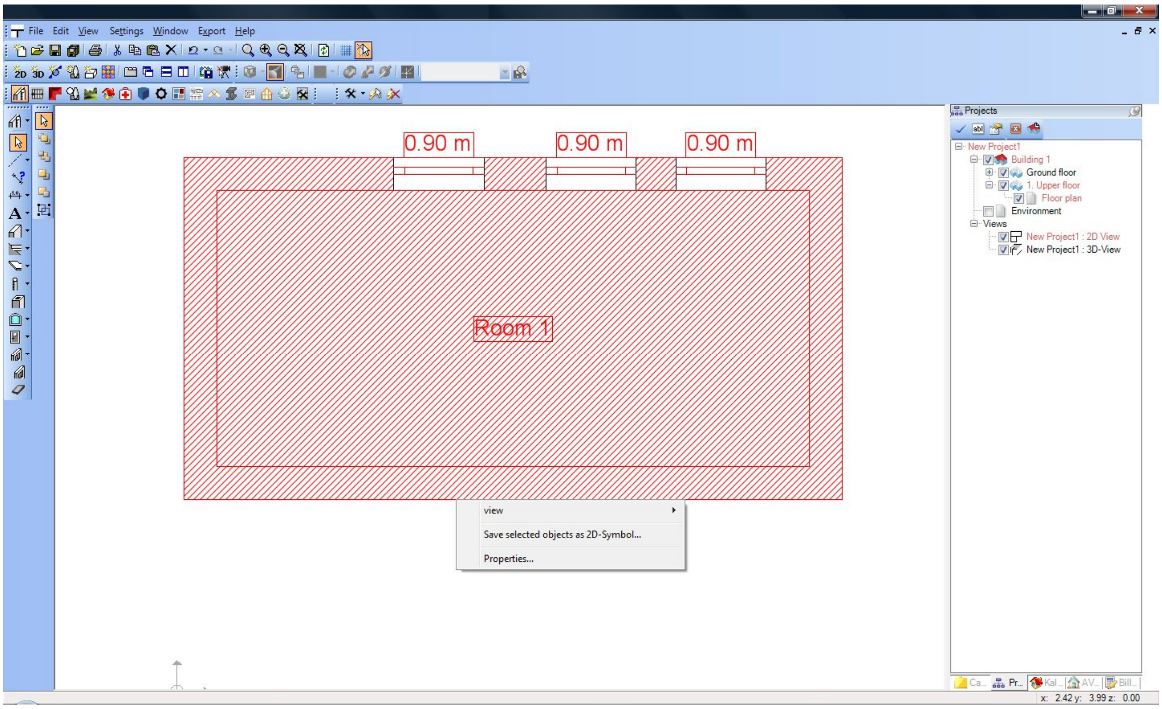
Wall sides
Selection: Room 6 (Right)
Material: Standard Masonry
Wall panelling: 0.01 m
Line type

Embrasures
Line type

8.10 2D SYMBOLS

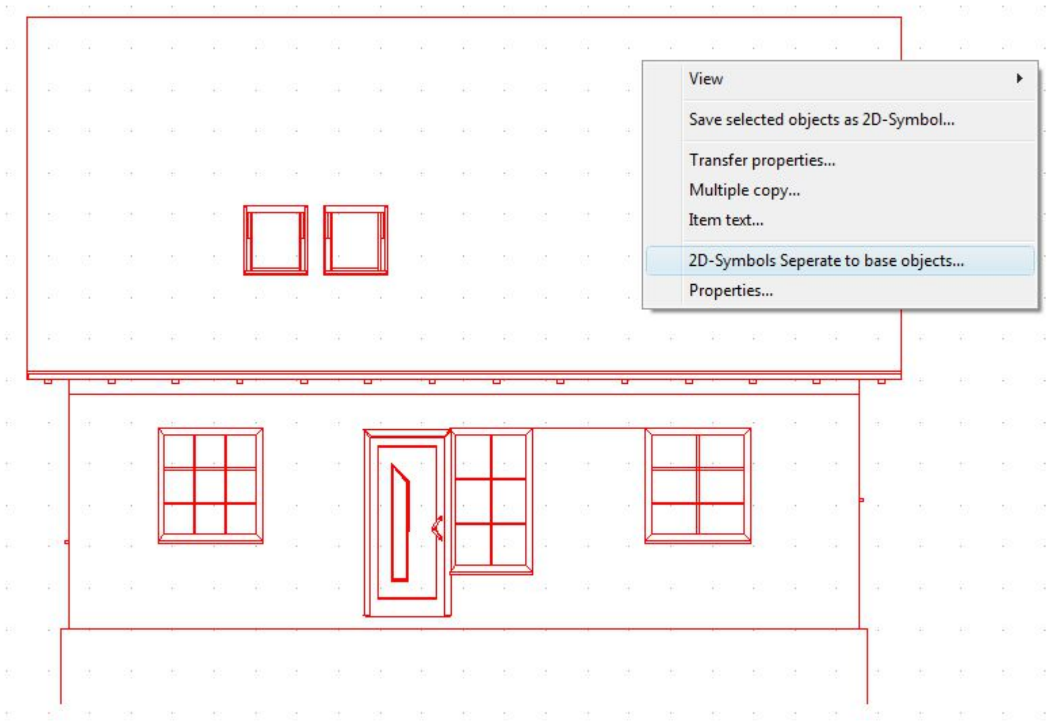
In 2D views you can use and create 2D symbols in our own format (*.cys). Existing symbols can be selected from the 2D category of the catalog and placed in the view using drag and drop.

You can produce and save your own 2D symbols by selecting the desired contents in a 2D view, either with multiple selection by holding down the shift key, or with a selection rectangle. Over the context menu, opened with a right mouse click, you can save your selection with a click on ‘Save selected objects as 2D-symbol’.



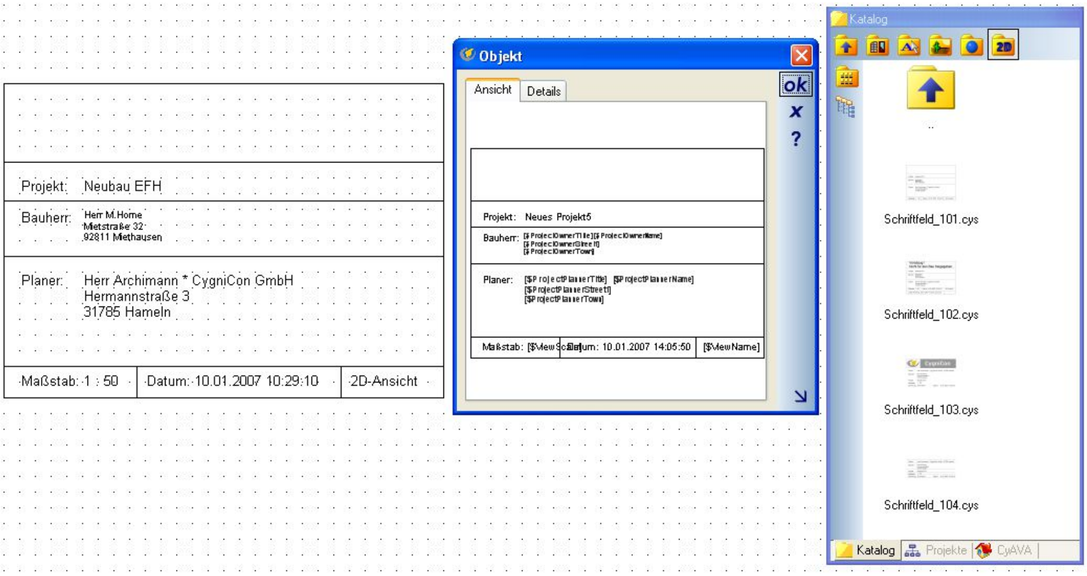
The dialog ‘Save 2D graphic file as’ is opened with the default path ‘Installation\Graphics2D’ and a file name is requested. The symbols in the ‘Graphics2D’ directory are automatically shown in the catalog and can be used directly.

When 2D symbols that are contained in the plan are selected, they can be resolved into their 2D graphic elements using the context menu. They then no longer exist as Symbols, but as the individual elements from which they were created. This allows existing symbols to be dismantled, changed and then saved as a new symbol in the users catalog for further usage.


View
Save selected objects as 2D-Symbol...
Transfer properties...
Multiple copy...
Item text...
2D-Symbols Seperate to base objects...
Properties...

8.11 TITLE BLOCKS, AUTOTEXT IN 2D SYMBOLS

Title blocks and other mixed forms of graphic elements, text and autotext can be created freely and as required. To do this, open a project and draw a frame or lines using the functions of the 2D graphic plug-in. Then enter as you wish, text and autotext in the boxes drawn. When the title block is complete, select all elements with a rectangle, and save it over the context menu as a 2D symbol in the catalog. In order to assist you at the start, we have prepared several examples, both in the form of projects in the directory called ‘Projects’, and as finished symbols in the catalog of 2D symbols in the ‘Title blocks’ directory. In the preview of the 2D symbol you can see how the different types of text have been combined.

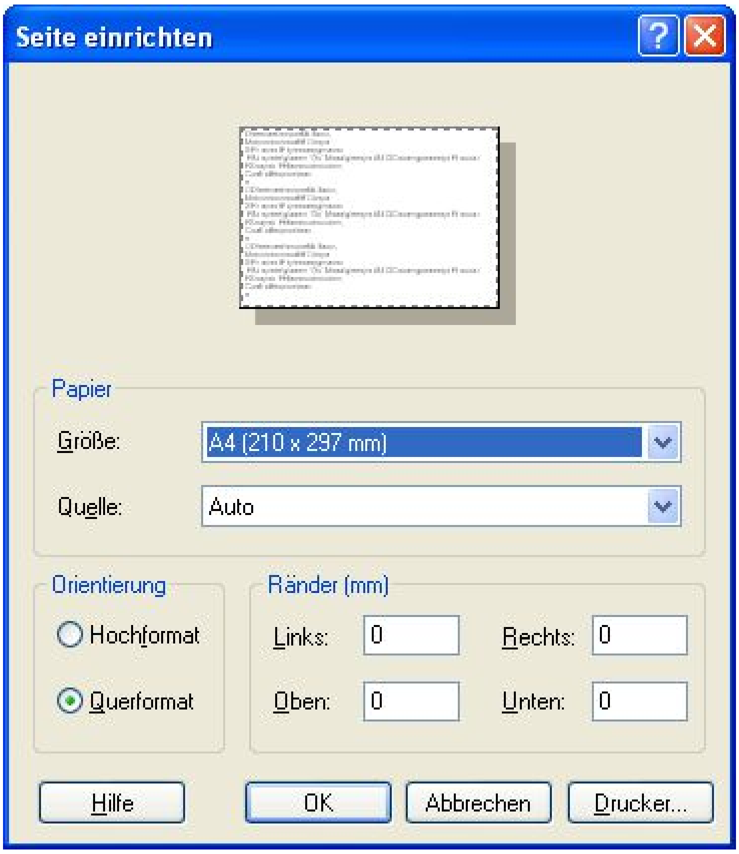


Projekt: Neubau EFH
Bauherr: Herr M.Home
Mietstraße 32
92811 Miethausen
Planer: Herr Archimann * CygniCon GmbH
Hermannstraße 3
31785 Hameln
Maßstab: 1 : 50
Datum: 10.01.2007 10:29:10
2D-Ansicht

Projekt: Neues Projekt5
Bauherr: [$ProjectOwnerTitle][$ProjectOwnerName]
[$ProjectOwnerStreet]
[$ProjectOwnerTown]
Planer: [$ProjectPlannerTitle] [$ProjectPlannerName]
[$ProjectPlannerStreet]
[$ProjectPlannerTown]
Maßstab: [$ViewSc
Datum: 10.01.2007 14:05:50
[$ViewName]

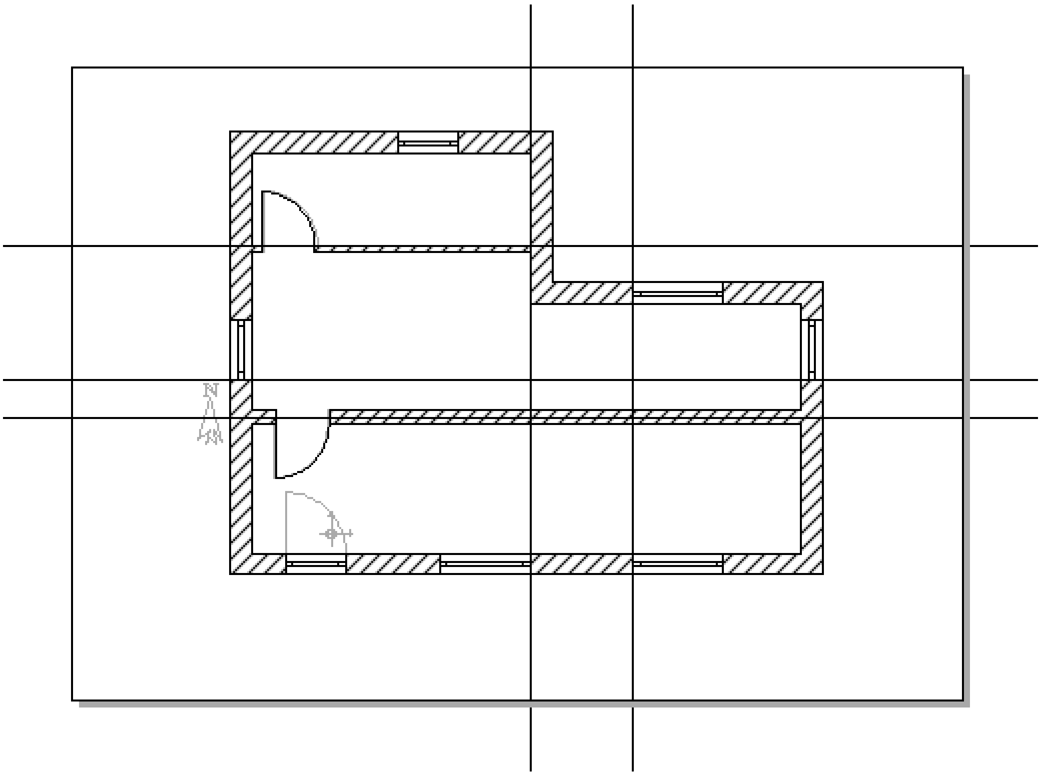
8.12 🖶 PRINTING

A click on the ‘Print’ button or the ‘Print’ menu, first opens the ‘Page setup’ dialog, over which the printer, format and page margins can be specified. The margins are settings which restrict the printable area on a page, in addition to the non-printable area for your printer.

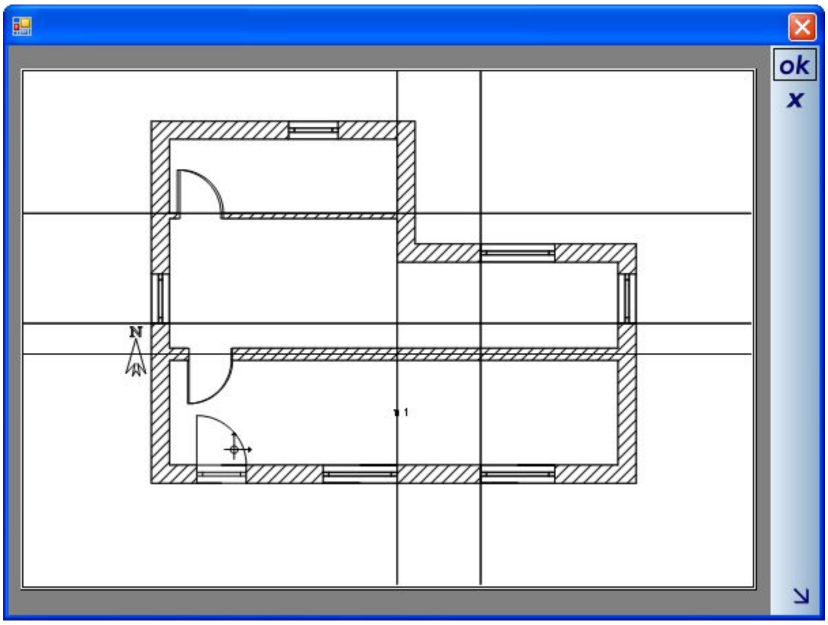


Größe: A4 (210 x 297 mm)
Quelle: Auto
○ Hochformat
● Querformat
Links: 0
Rechts: 0
Oben: 0
Unten: 0

After the dialog has been terminated with ‘OK’, the printable area is attached to the cursor in the form of a page with the specified values, and can be positioned in the active view, whereby the reference point can be changed with ‘Ctrl+w’. The printing process always refers to the view that was active at the start of the process.



The need to position the area to be printed does not apply if all visible elements in the view fit to scale on the page. In this case, the print preview is opened directly.
Note: the software creates an environment layer for each project, with a plot size of 100 x 100 m, which is visible by default in 2D plan views. With a scale of 1:100, a paper format greater than 1 x 1 m would be needed, in order to avoid having to position the area to be printed. Therefore if necessary, first set the plot to invisible.
If you wish to print the complete contents of the view, without regard to scale, you can skip setting the printable area with ‘Esc’, over ‘Cancel with’ in the context menu, or with ‘Enter’. In this case, the print preview is also opened immediately.



8.13 GROUPS

If more than one element is selected, a button is provided in the toolbar with which to form a group. Grouped elements are always selected and edited, e.g. positioned, collectively. A double click on the grouped elements opens the multiple selection dialog.

When grouped elements are selected, a click on the button revokes the grouping.

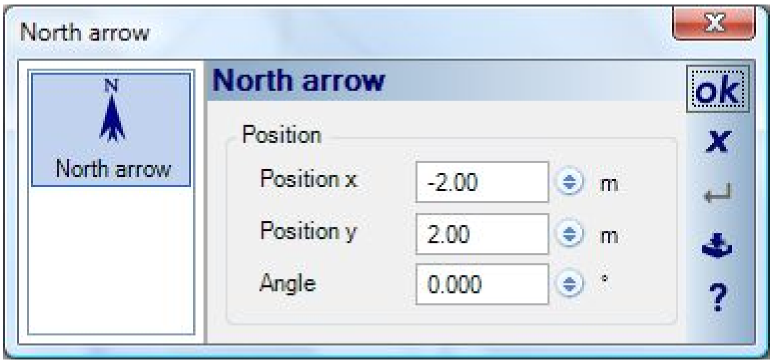
8.14 DISPLAY PRIORITY

Basically, the order in which elements are inserted also determines the order in which they are displayed in your software. For instance a filled rectangle which is drawn over text that was inserted previously, will cover the text, which is then no longer visible. This default can be changed subsequently with the button for display priority, which is always shown in the toolbar when an element is selected. This enables you to specify the order in which elements are displayed to meet the particular requirements, e.g. inserting text over a filled rectangle when creating a title block.

8.15 NORTH ARROW AND ORIGIN

In order to process the North Arrow the ‘environment layer’, in which it is defined, must first be activated in the project viewer.

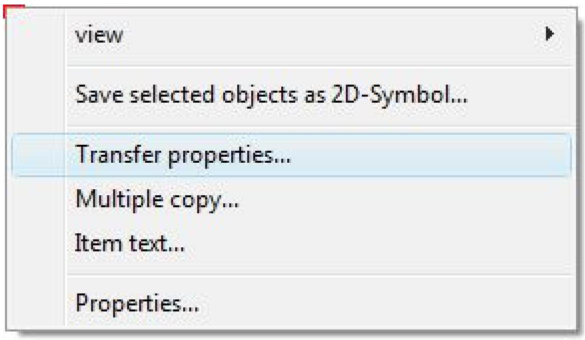
The North Arrow can be set as invisible in each view over ‘Visibilities’. The same applies to the origin of the project, which however can not be repositioned.



Position
Position x -2.00 m
Position y 2.00 m
Angle 0.000 °

8.16 TRANSFER PROPERTIES

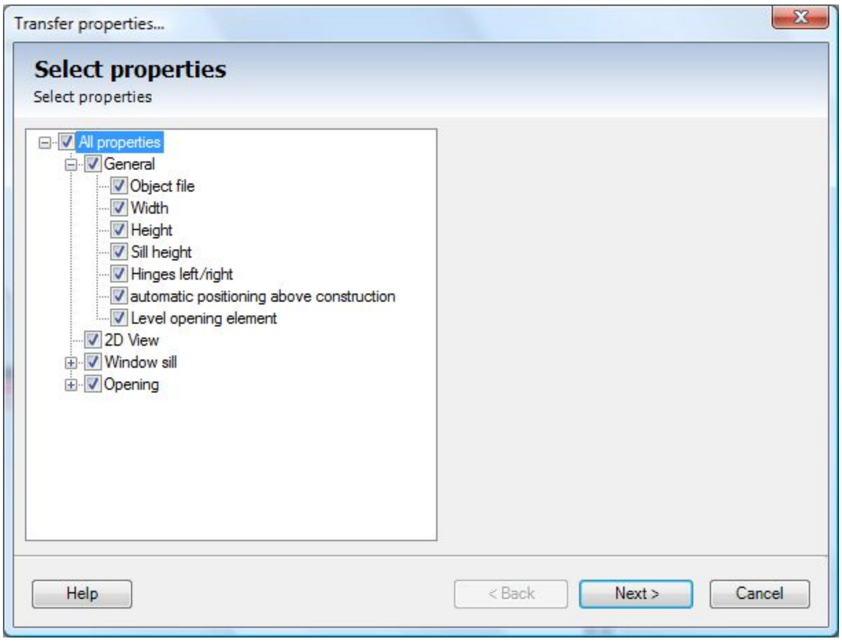
The properties of a selected element can be copied to elements of the same type. The assistent to do this is opened with the button or over the context menu activated with a right mouse click, when an element has been selected in the plan.



Copying properties is performed in two steps. First the properties which are to be copied are selected, and the then the target objects.
Each element defines itself whether it has properties which can be copied, and if so which ones. If there are no properties provided for the selected element, the message ‘The selected object has no properties which can be copied’ appears and the process is terminated.

8.16.1 Selecting Properties

Since each element defines itself which of its properties can be copied, the content of the ‘Select Properties’ dialog varies. The following illustration shows the properties of a window.

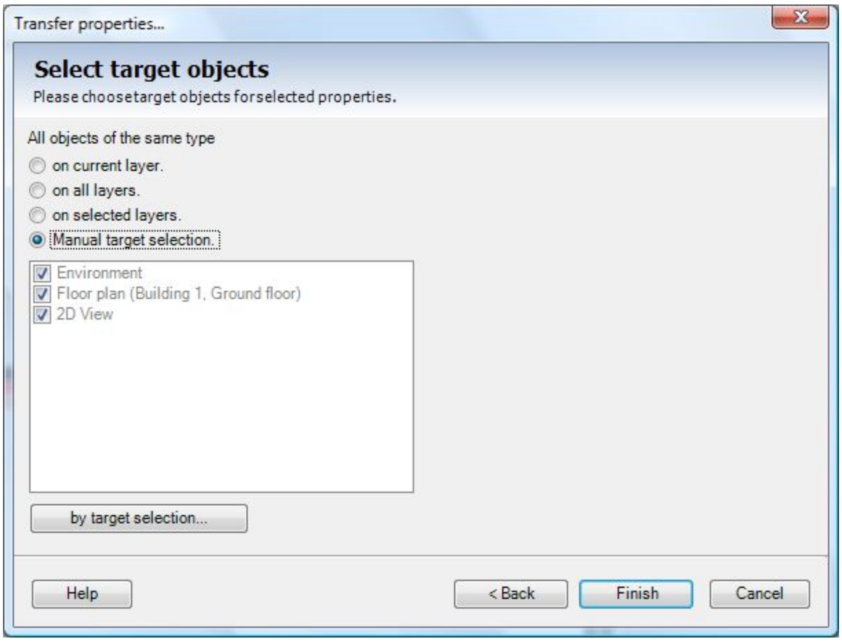


- ☑ All properties
  - ☑ General
    - ☑ Object file
    - ☑ Width
    - ☑ Height
    - ☑ Sill height
    - ☑ Hinges left/right
    - ☑ automatic positioning above construction
    - ☑ Level opening element
  - ☑ 2D View
  - ☑ Window sill
  - ☑ Opening

By default all properties are activated. If you wish make a more precise selection you can make use of the usual characteristics of the tree structure. If you wish to copy only the object file, deactivate first the topmost entry ‘All Properties’, and then subsequently activate only the object file. This way you need only two mouse clicks to select the desired properties, and all other properties do not have to be deactivated individually.
With the ‘Continue’ button you can proceed to the next step.

8.16.2 Selecting target Objects.

The choice of objects which are to receive the selected properties, is performed either with reference to one or more layers, or by selecting an individual object manually, if this option is activated, over the ‘Manual target selection’ button.



Transfer properties...

Select target objects

Please choose target objects for selected properties.

All objects of the same type

○ on current layer.

○ on all layers.

○ on selected layers.

● Manual target selection.

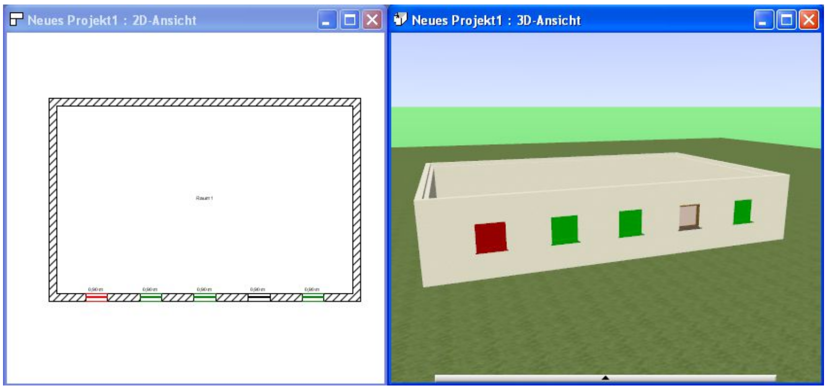
☑ Environment

☑ Floor plan (Building 1, Ground floor)

☑ 2D View

8.16.3 *Selecting Objects manually*

A click on the 'by target selection' button first closes the 'Select target Objects' dialog, in order to show the plan again and to allow access to the individual objects. The objects are then selected with a mouse click. 'Target objects' are highlighted in green in all views. A further mouse click on a selected object revokes its selection.



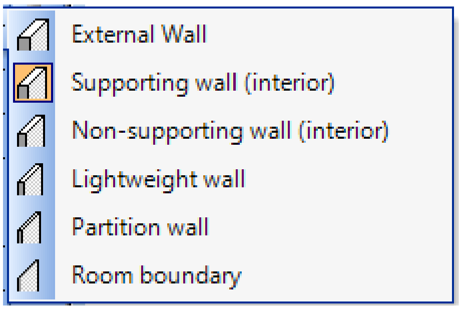
Manual selection must be terminated with 'Enter'. The previous dialog 'Select target objects' then reappears. The process is terminated with the 'Finish' button and the properties are copied

9 PLUG-IN BUILDING COMPONENTS

9.1 WALLS

9.1.1 *Wall Types*

The software offers six predefined types of wall, which can be selected for insertion with the respective button.



Basically, walls only differ in the properties assigned to them, generally the thickness. By default, the following values are defined for the thickness of walls:

- External wall: 36.5 cm
- Supporting wall (interior): 17.5 cm
- Non Supporting wall (interior: 11.5 cm
- Lightweight wall: 10 cm
- Partition wall: 10 cm
- Room boundary (without a thickness)

9.1.2 *Insertion Modes*

There are different ways to insert walls:

Multiple insertion between two points: The input forms a polygon, whereby the end point of one wall represents the start point for the next wall. The tool also allows multiple insertion of individual walls without having to restart it. After creating a wall over a start and end point, you can return with ‘Esc’ to enter a new start point, which does not necessarily have to coincide with the end point of the last wall. Only when ‘Esc’ is pressed twice is the tool finally terminated.

Insertion between two points: Creates a single wall using a start and end point:

Insertion of a parallel wall: Creates a wall parallel to the face of an existing wall, which must first be selected.

You can create other walls, which differ from the standard types, if you change the properties over the context menu opened with a right mouse click, before the wall is inserted. This saves having to edit the individual elements later.

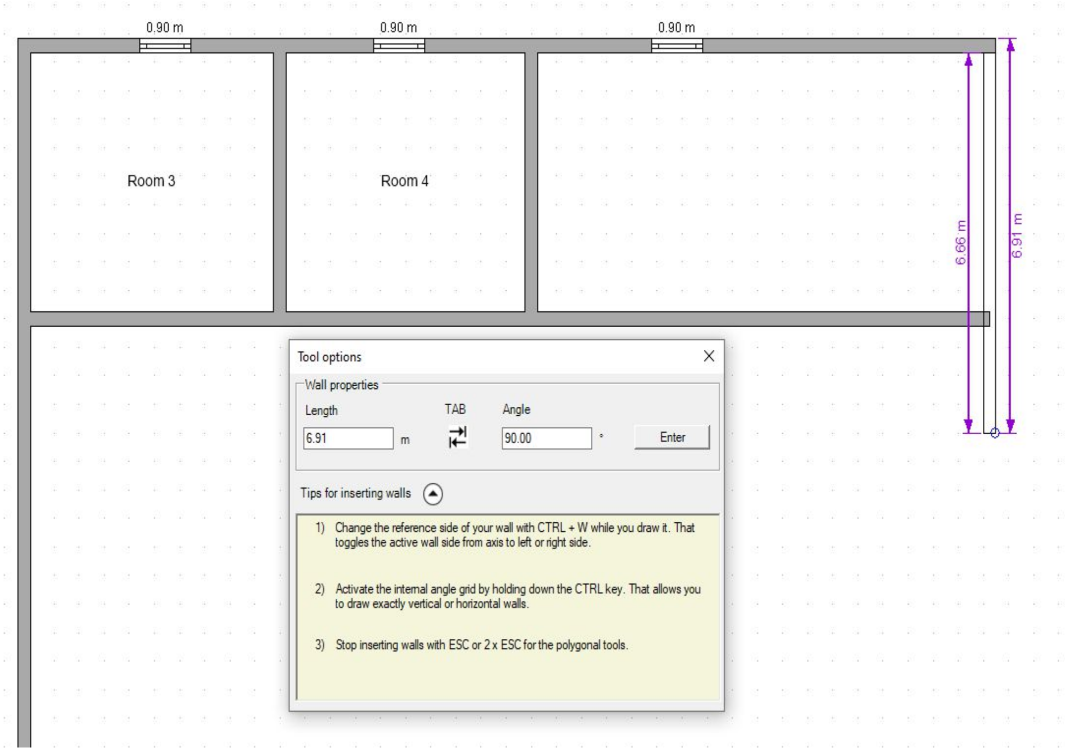
9.1.3 Numeric input variants for walls

First of all, while you are inserting walls, dimensions are shown in parallel. Depending on how you work, these dimensions provide the exact length in our standard polygonal input tool, e.g. when you are working on grid dimensions. However, if this is not the case our new numeric input variant is used.

In our new numeric input tool, the real time dimensions are also shown, but more for your orientation. The actual length is only specified with the second mouse click, which so far has always inserted the wall directly you're your project. Now, a dialog appears in which you set the length and, if necessary, the angle and complete the step directly with ENTER. Mistakes by unintentional movements with your mouse are impossible. And you can, but don't have to, click the button with the mouse or just work with your keyboard Enter key.

The dimension always refers to the currently active wall side, which you define with the key combination CTRL + W while inserting. As a reminder, the dialog contains the most important tips for inserting walls such as CTRL + W, holding down the CTRL key to activate the angle grid and ESC to end the input.

The following screenshot shows such a scenario after the second mouse click:



Length 6.91 m

Angle 90.00 °

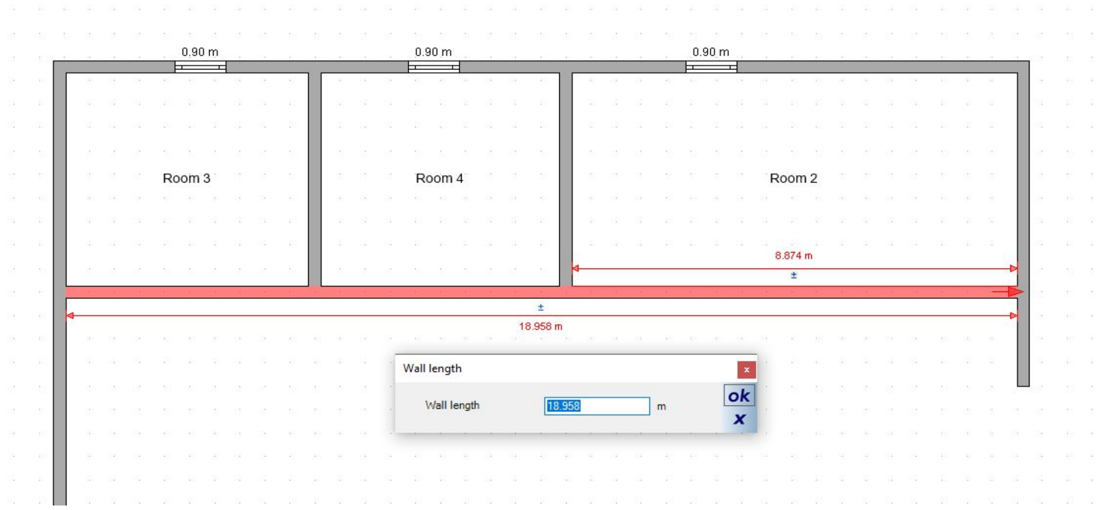
1) Change the reference side of your wall with CTRL + W while you draw it. That toggles the active wall side from axis to left or right side.

2) Activate the internal angle grid by holding down the CTRL key. That allows you to draw exactly vertical or horizontal walls.

3) Stop inserting walls with ESC or 2 x ESC for the polygonal tools.

9.1.4 Adjusting a wall length numerically

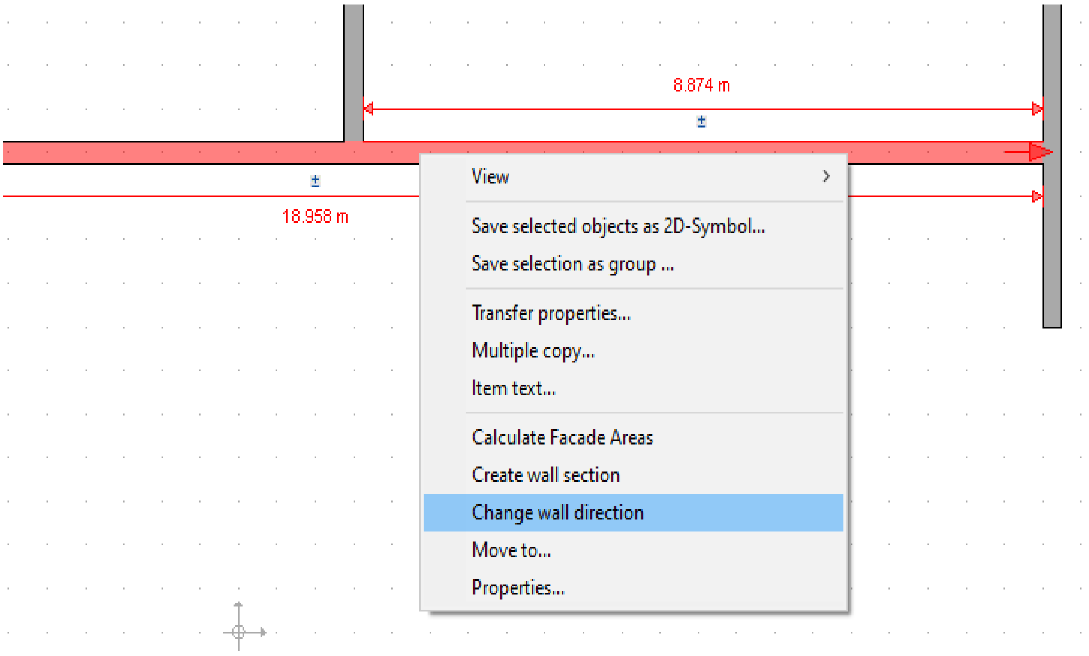
If you select an existing wall, two dimensions and two “buttons” +/- with which you receive an input dialog for specifying an exact length appear. Changing a wall length always applies to the input direction of the wall and is marked by an arrow at the end of the wall.
The previous tool with the V key or via the corresponding tool on our edit wall menu is still available as an alternative and can also be started by clicking on the end of the wall.



Wall length: 18.958 m

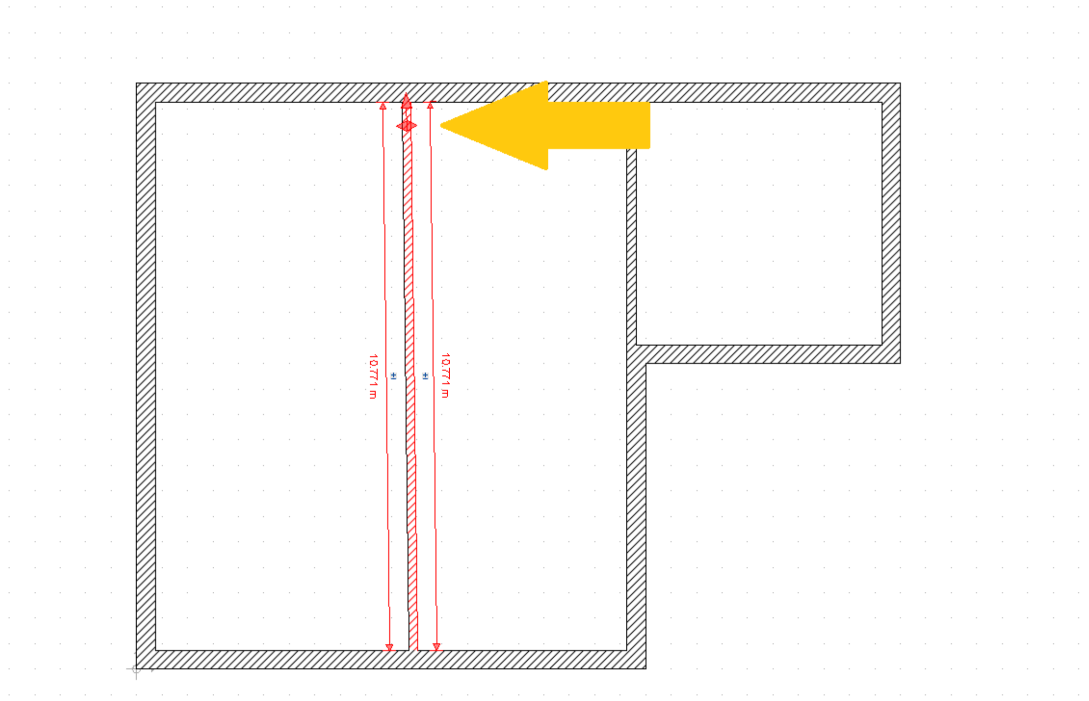
9.1.5 Changing the direction of walls via context menu

As already mentioned, the numerical lengthening or shortening of walls always applies in the direction in which the wall has been inserted. If necessary, you can still change this input direction via the Edit wall menu or, and this is new, via the context menu of the right mouse button.

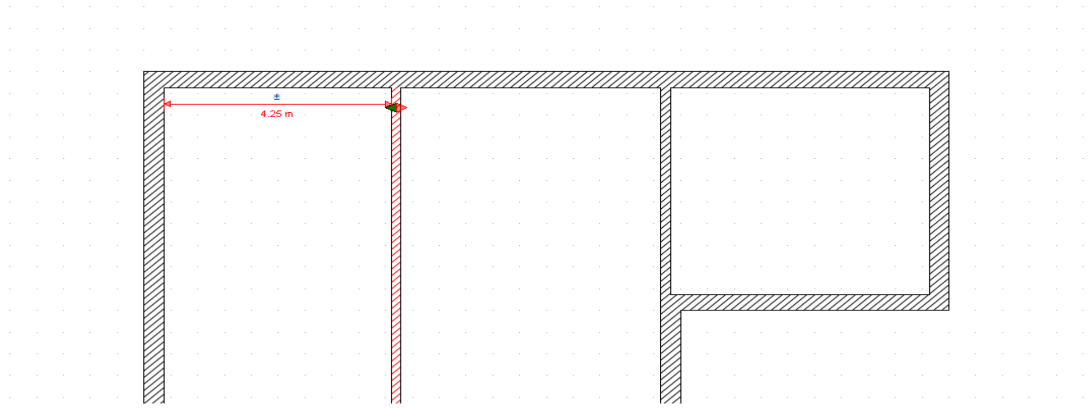


9.2 MOVING AND POSITIONING WALLS NUMERICALLY

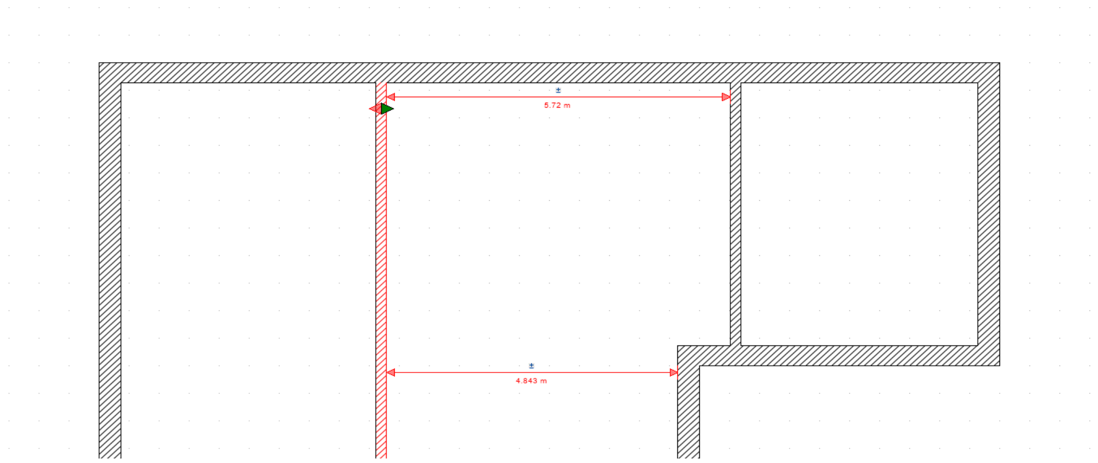
If you select a wall, version 10 already gave you dimension lines with a button for numerically lengthening or shortening the selected wall. Now the wall also shows a button as a double arrow on its axis.



This button works alternately in the direction of the active arrow. If you click on the button, the dimensions for entering the length will be hidden and dimensions in the direction of the green arrow will appear instead.



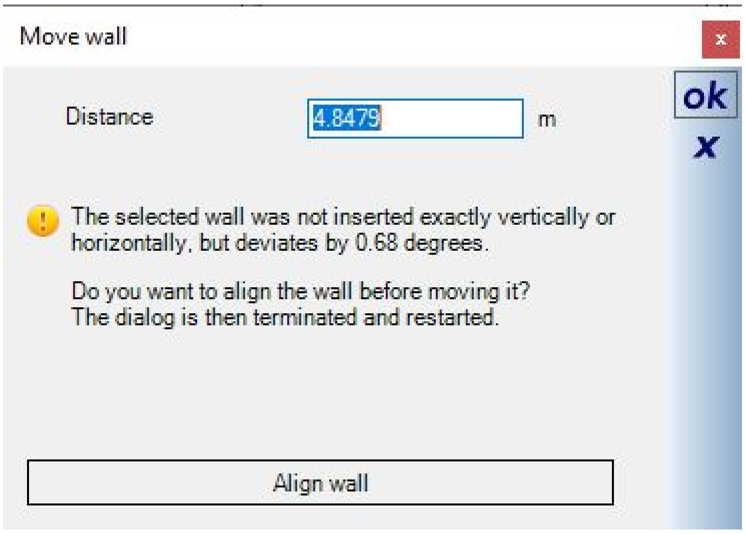
Depending on the current constellation of the floor plan, there can also be several dimensions if they meet other walls with different distances in the selected direction.



In this editing mode, you can change the direction by clicking on the respective part of the double arrow.
A second click on the same part of the double arrow or on another part of the wall hides the moving dimensions and shows the usual dimension lines for the lengths again.

9.2.1 *Moving not exactly vertical or horizontal walls*

If you do not work directly on the grid when inserting the walls or without the internal angle grid while keeping the CTRL key pressed, it can easily happen that walls are inserted slightly out of the vertical or horizontal direction.
The new function takes the orientation of the wall into account and if this vertical or horizontal deviation is at an angle of less than 3 degrees, you will receive a dialog informing you of this when you click on the numerical button. And at the same time offers the possibility of aligning the wall before moving it.


Move wall

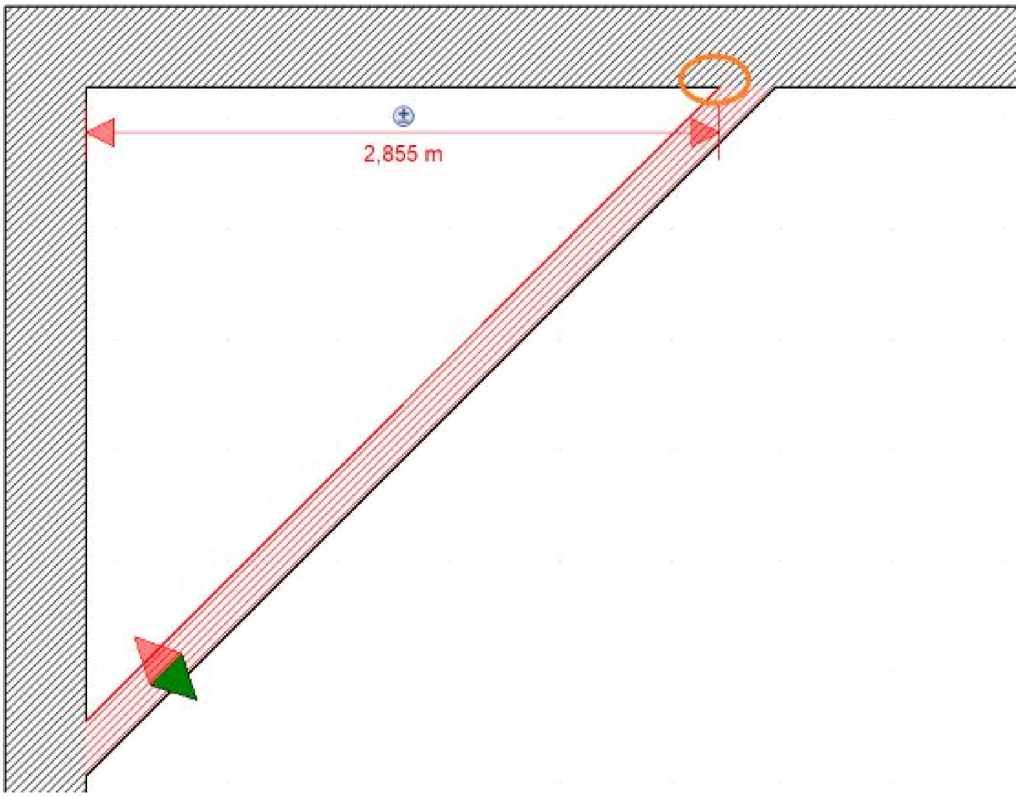
Distance 4.8479 m

The selected wall was not inserted exactly vertically or horizontally, but deviates by 0.68 degrees.

Do you want to align the wall before moving it?
The dialog is then terminated and restarted.

It is also important to mention that the displayed distance does not refer to the point at which the dimension line is displayed, but to the point at which the wall is intersected with another.

An example to illustrate the position:



9.2.2 Notes on changing the wall situation

If a wall is moved, shortened or lengthened, other walls in the floor plan are not automatically changed, including adjacent walls. It is therefore possible that the connections between the walls are lost as a result of the changes or that walls initially overlap.

As a result, the room situation may also change, i.e. rooms can be lost or new ones can be created.

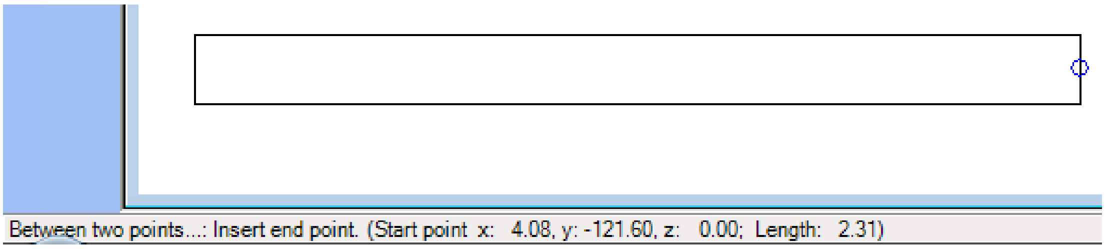
In general, rooms should only be edited, i.e. rooms should only be given names, when the work on the floor plan has been completed.

To rework the wall situation after moving or extending a wall, use the "Edit Walls" tools on the Edit Ribbon, or even easier by starting the lengthening tool by pressing the V key and then adjusting the walls one by one .

9.2.3 Input Aids

As with all elements, construction aids are available at any time over the context menu.

Tips for each tool and the current insertion values, such as length of the wall, are shown in the status bar. Using this information together with ‘Crl+w’ to change the reference points of elements, and aided by the grid or other construction aids, you can for example define exact values for the interior or exterior measurements of the contour of the building.

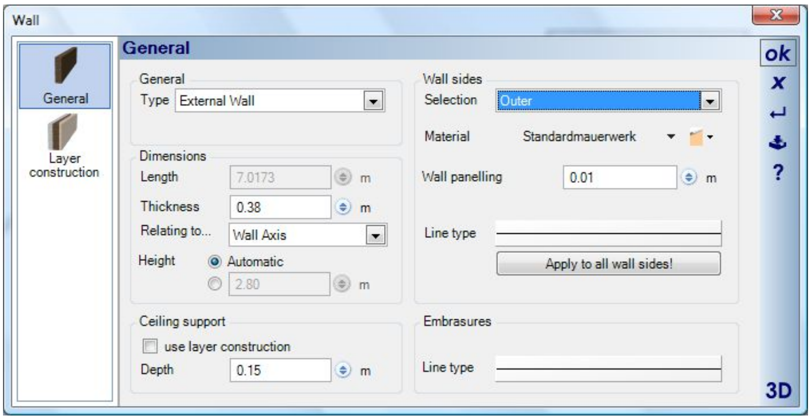


Between two points...: Insert end point. (Start point x: 4.08, y: -121.60, z: 0.00; Length: 2.31)

9.2.4 Wall Properties

Walls are by default as high as the floor of the building in which they are inserted. A different value can be specified in the ‘Dimensions’ part of the dialog.

Each wall has a default value for the depth of the ceiling support, that is used when creating ceilings automatically with the exterior contours of the building. The depth of the ceiling support can be manually specified for each wall, or be made dependant on the structure of the wall. With the option for ‘use layer construction’, the ceiling is generated such that it completely rests on the layer of the wall marked as load-bearing. To generate the ceiling support for multi-layered walls, the thickness of all layers up to the top load-bearing layer are added from bottom to top, in the order defined in the ‘Layer construction’ dialog.



Wall

General

General
Type: External Wall

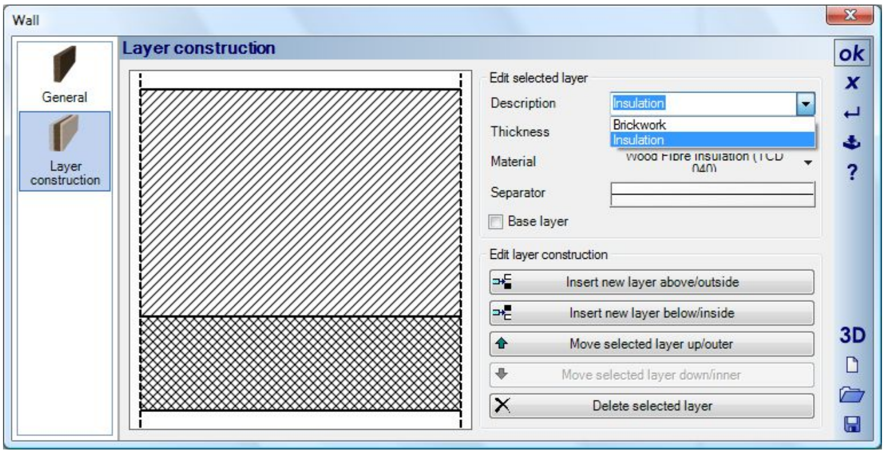
Dimensions
Length: 7.0173 m
Thickness: 0.38 m
Relating to...: Wall Axis
Height: ● Automatic
○ 2.80 m

Ceiling support
☐ use layer construction
Depth: 0.15 m

Wall sides
Selection: Outer
Material: Standardmauerwerk
Wall panelling: 0.01 m
Line type

Embrasures
Line type

9.2.5 *Layer construction / Multi-layer walls*

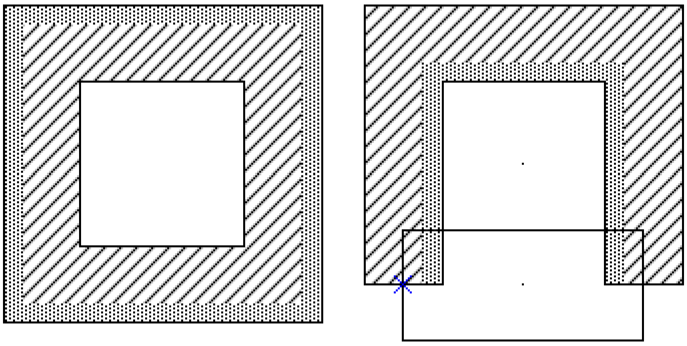


Description: Insulation (Brickwork / Insulation)
Material: Wood Fibre Insulation (TCD 040)

When walls are being inserted, the top layer is always created on the right in the direction of insertion. For walls which do not form or change the contour of a building, the user must therefore decide by the direction of input, on which side the layers should be shown.

If a wall consists of multiple layers, the software proceeds from bottom to top for the layers defined in the 'layer construction' dialog. The top layer is therefore treated as the outside layer of the wall or building. When walls are being inserted, it is not always known in advance whether the individual walls, which create a polygon, form the exterior contour of the building when input is completed, if this is the case, the order of the layers is reversed automatically if necessary.

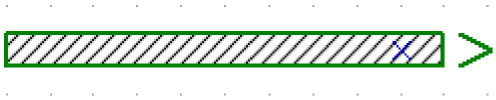
Example: In the following illustration we see a room and to the right of it a further room, which is being inserted as a polygon and which will be completed with the next mouse-click. Both rooms were created in a clockwise direction, therefore we see on the right that the insulation is on the 'inside', i.e. on the right in the direction of input. For the room on the left the insulation is on the 'outside', because if it formed its own exterior contour and the order of the layers in the walls was reversed when the room was completed. The same will happen for the room on the right as soon as input is completed.



9.2.6 Edit walls

9.2.6.1 Extend / shorten walls

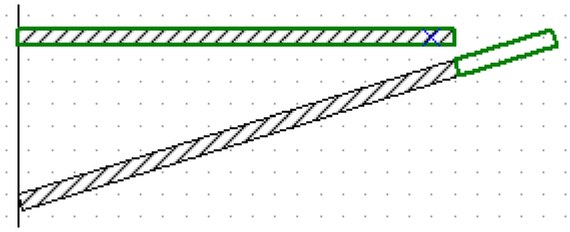
While the tool is active you can move the cursor in the plan. As soon as a wall is located under the cursor it is outlined in green. The direction in which the wall will be extended depends on the position of the cursor in relation to the midpoint of the wall, and changes if you move the cursor along the wall. With a left mouse click you can now begin to lengthen or also shorten the wall. The current length is shown in the preview in 2D and 3D.



The tool remains active until it is terminated with ESC, so that several walls can be processed in succession.

9.2.6.2 Trim walls

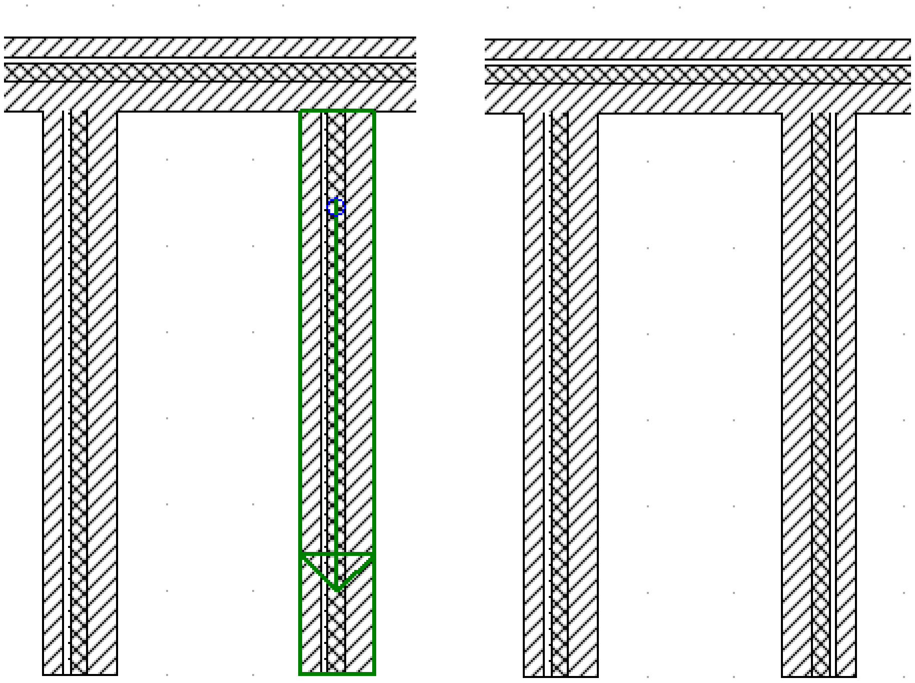
With this tool only adjoining walls can be trimmed. Firstly move the cursor to the wall to be lengthened or shortened and activate the function with a left mouse click as soon as the wall is outlined in green. Next select the second wall, again by positioning the cursor over it. As soon as a second wall is detected the length of the first wall is shown in the preview, and thus signalises that the process can be completed with a left mouse click. The tool remains active until it is terminated with ESC, so that several walls can be processed in succession.



9.2.6.3 Change wall direction

Changing the direction of a wall can be of interest for walls with a layered structure. As described in the chapter ‘Walls’ the representation of the structure of exterior walls depends on the order in which the layers are defined, and of interior walls on their orientation when being inserted. With the tool ‘Wall orientation’ the orientation of the wall can be subsequently reversed.

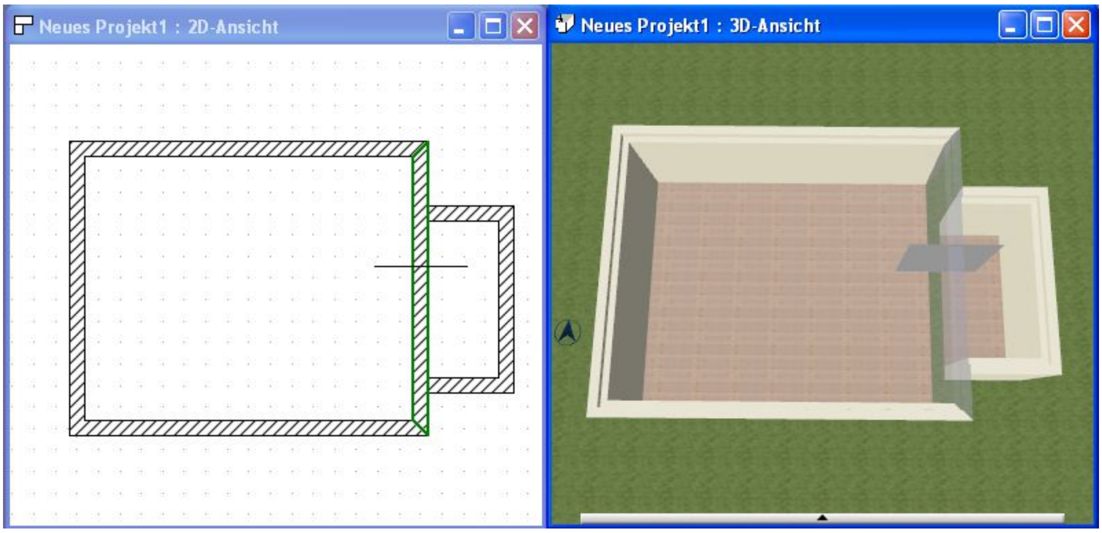
The following illustration shows on the left two walls which were inserted with the same orientation, the right-hand wall is selected and already outlined in green. The arrow shows the new orientation. The process is completed with a left mouse-click. The result is shown on the right.



9.2.6.4 Split walls

In some cases it is more effective to split a wall and then delete parts of it, rather than deleting the complete wall and inserting a new one.

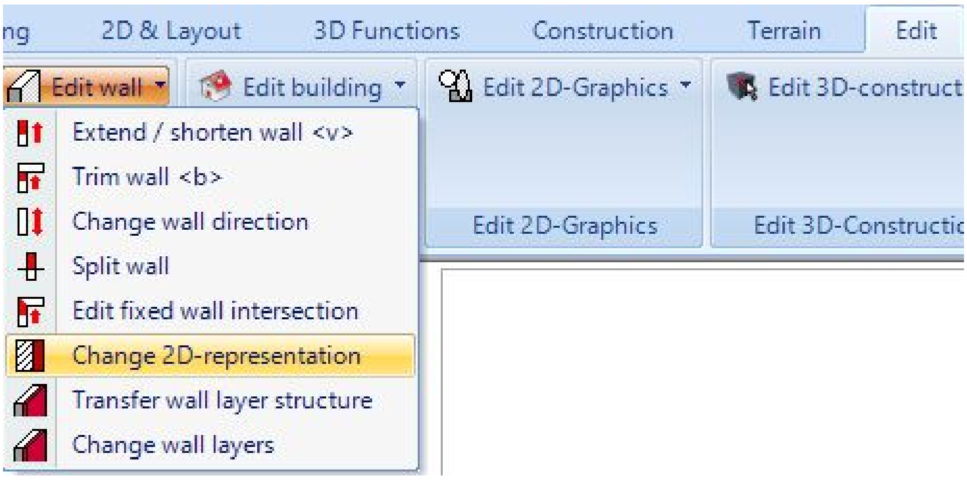
While the tool is active walls are outlined in green as soon as the cursor is positioned over them. A line in the 2D and a plane in the 3D preview mark the point at which the wall will be split to create two walls instead of one.



9.3 WIZARDS FOR EDITING AND MODIFYING WALLS

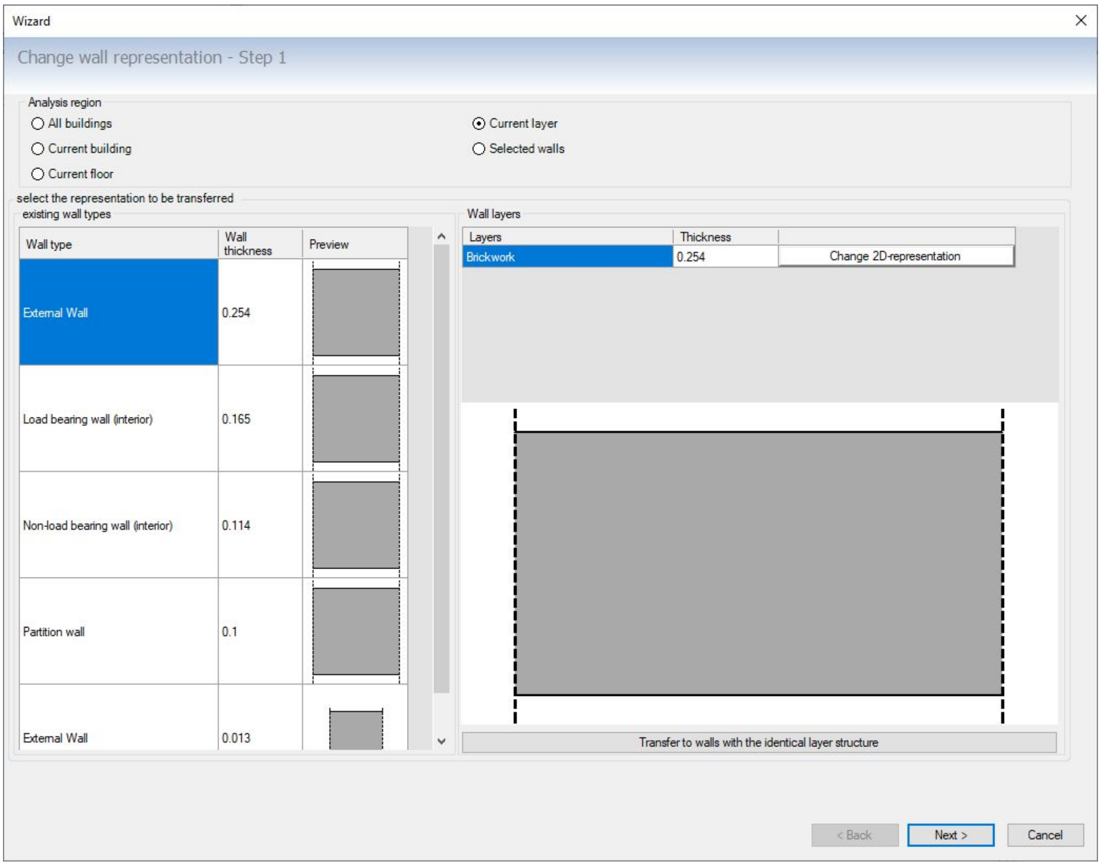
In our editing tools for walls we added wizards for the following tasks:

- Changing 2D representation of walls. This function only changes the 2D fill properties of existing walls, not the layer structure itself
- Transferring wall layers: transfers the layer structure of one wall to others
- Changing wall layers: changes the layer structure of multiple walls



9.3.1 Changing 2D representation of walls

When you start the function, the following dialog appears in step 1. With the analysis region you determine the evaluation area. This refers both to the list of walls on the left side of the dialog and to the region to which the changed wall properties are transferred.
In our example, the "Current layer" option is active. All walls located on the active layer are listed.
The software compares all walls based on their properties in terms of thickness, layer structure and the currently set 2D properties and lists the walls with different properties separately. Two exterior walls with the same layer construction and colour, but one 25 cm thick and one 24 cm, are shown as two different walls.



Wizard

Change wall representation - Step 1

Analysis region
○ All buildings
○ Current building
○ Current floor
● Current layer
○ Selected walls

select the representation to be transferred

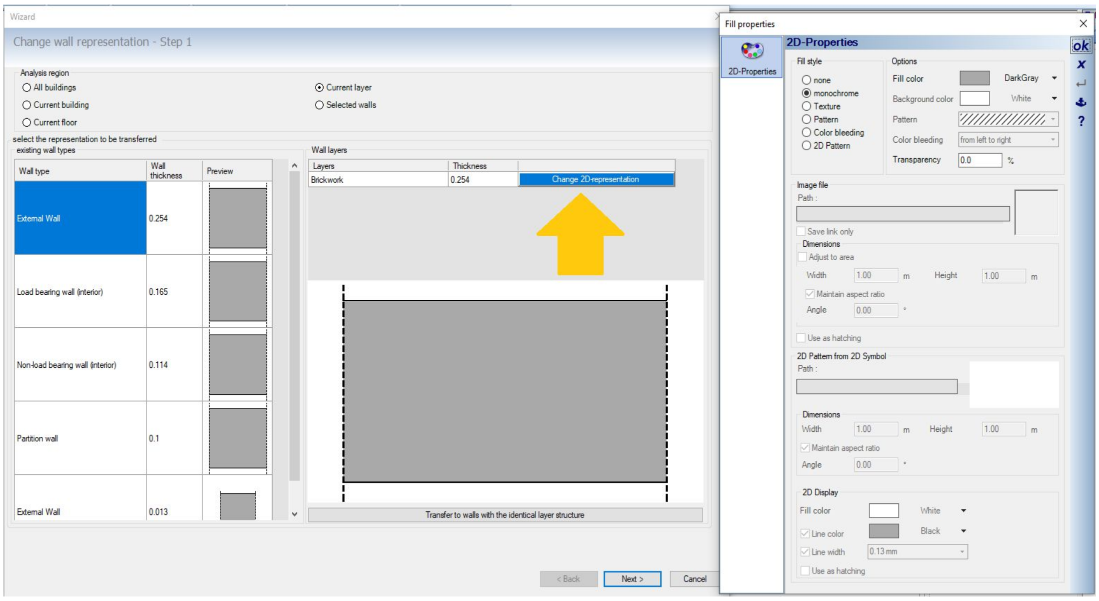
existing wall types

Wall type	Wall thickness	Preview
External Wall	0.254	
Load bearing wall (interior)	0.165	
Non-load bearing wall (interior)	0.114	
Partition wall	0.1	
External Wall	0.013	

Wall layers

Layers	Thickness	
Brickwork	0.254	Change 2D-representation

On the right side you find a larger preview of the selected wall type and the wall layers listed above. Next of each layer is a "Change 2D representation" button. This button opens our standard dialog for editing 2D fill properties.



Wizard

Change wall representation - Step 1

Analysis region

○ All buildings
○ Current building
○ Current floor
● Current layer
○ Selected walls

select the representation to be transferred

existing wall types

Wall type	Wall thickness	Preview
External Wall	0.254	
Load bearing wall (interior)	0.165	
Non-load bearing wall (interior)	0.114	
Partition wall	0.1	
External Wall	0.013	

Wall layers

Layers	Thickness	
Brickwork	0.254	Change 2D-representation

Fill properties

2D-Properties

Fill style

○ none
● monochrome
○ Texture
○ Pattern
○ Color bleeding
○ 2D Pattern

Options

Fill color: DarkGray
Background color: White
Pattern
Color bleeding: from left to right
Transparency: 0.0 %

Image file

Path :

☐ Save link only

Dimensions

☐ Adjust to area

Width 1.00 m Height 1.00 m

☑ Maintain aspect ratio

Angle 0.00 °

☐ Use as hatching

2D Pattern from 2D Symbol

Path :

Dimensions

Width 1.00 m Height 1.00 m

☑ Maintain aspect ratio

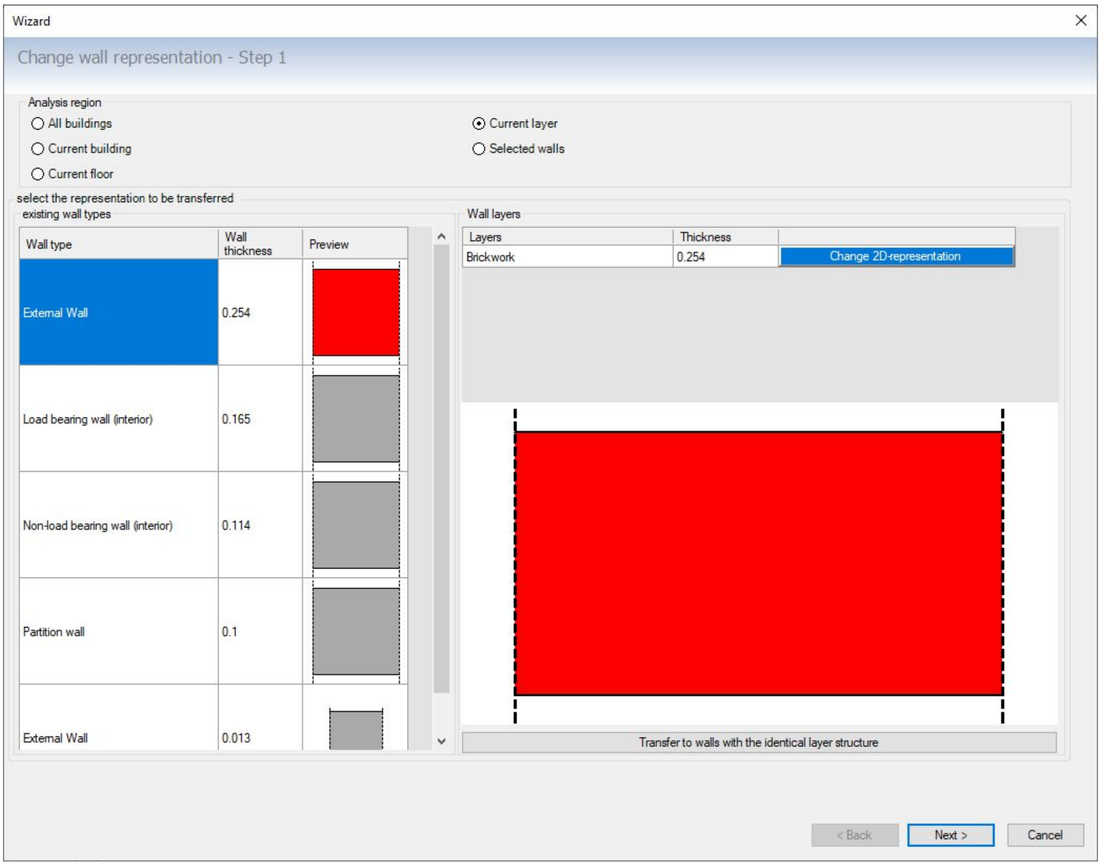
Angle 0.00 °

2D Display

Fill color: White
☑ Line color: Black
☑ Line width: 0.13 mm
☐ Use as hatching

Note: depending on the functionality of your version, fewer options may be offered here.

Change the 2D representation as desired and close the Fill Properties dialog. The appearance of the wall is immediately updated in our preview and the wall list, correctly only for the previously selected wall type.



Wizard

Change wall representation - Step 1

Analysis region

○ All buildings
○ Current building
○ Current floor
● Current layer
○ Selected walls

select the representation to be transferred

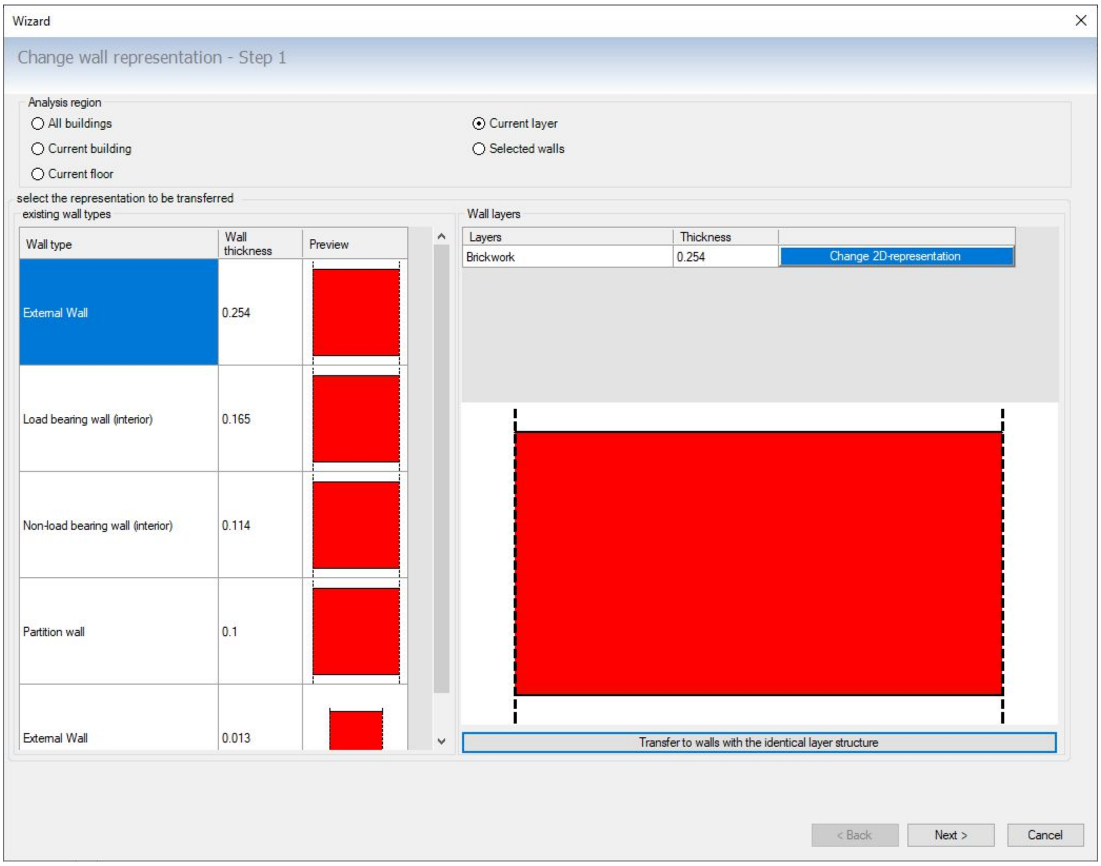
existing wall types

Wall type	Wall thickness	Preview
External Wall	0.254	🟥
Load bearing wall (interior)	0.165	
Non-load bearing wall (interior)	0.114	
Partition wall	0.1	
External Wall	0.013	

Wall layers

Layers	Thickness	
Brickwork	0.254	Change 2D-representation

At the bottom you find a button "Transfer to walls with identical layer structure". With this function you could transfer the representation to all other walls, but only if they have a single wall layer and no matter what thickness and 2D representation they are currently using. So you don't need to click through all walls individually if you want all walls to look the same.
The list of walls would then look like this in our example. All walls with only one layer would be red.


Wizard
Change wall representation - Step 1
select the representation to be transferred
Change 2D-representation
Transfer to walls with the identical layer structure
< Back
Next >
Cancel

Analysis region
○ All buildings
○ Current building
○ Current floor
● Current layer
○ Selected walls

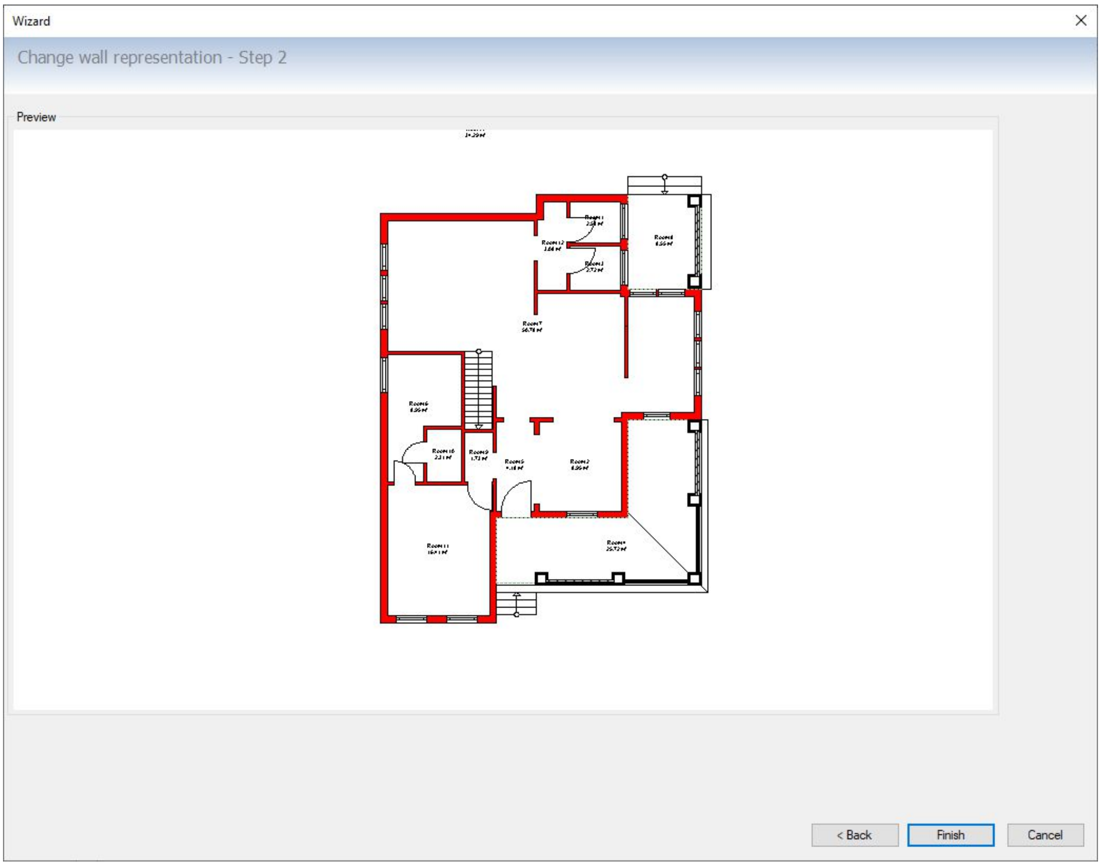
existing wall types

Wall type	Wall thickness	Preview
External Wall	0.254	🟥
Load bearing wall (interior)	0.165	🟥
Non-load bearing wall (interior)	0.114	🟥
Partition wall	0.1	🟥
External Wall	0.013	🟥

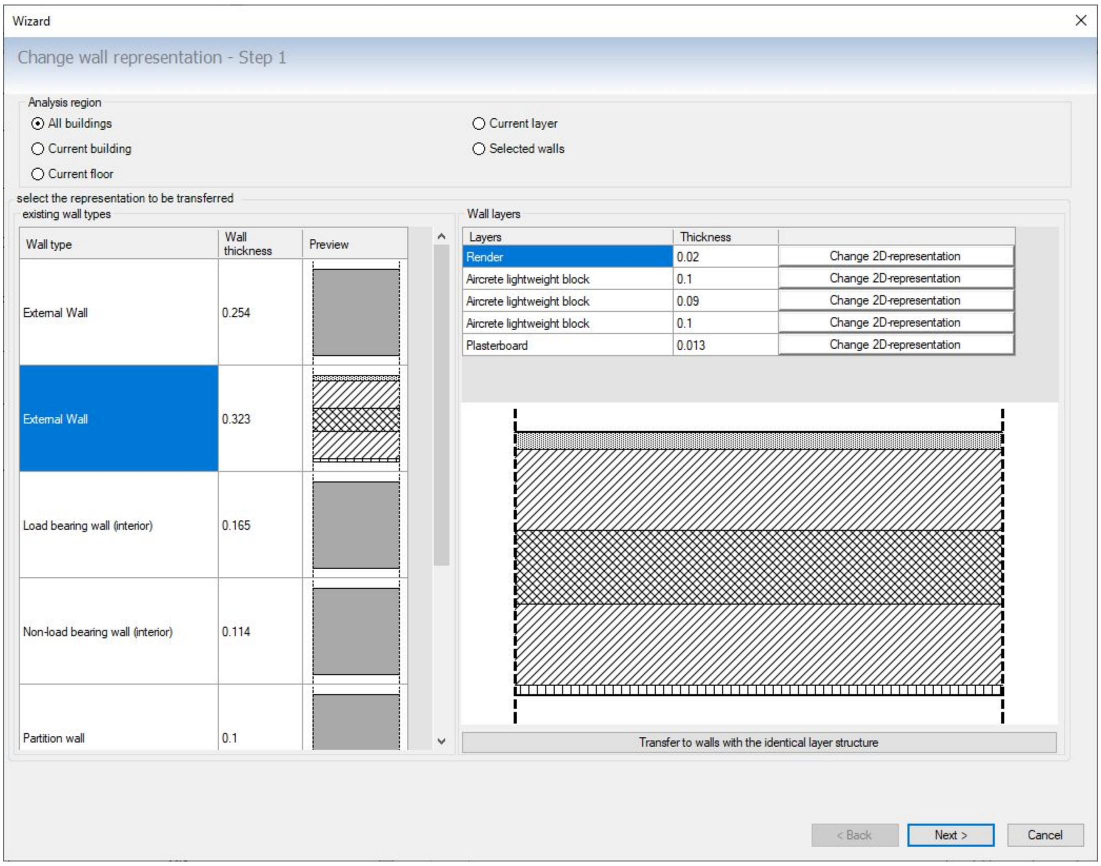
Wall layers

Layers	Thickness
Brickwork	0.254

In a second step, you get a preview before the changes are transferred to the project. As in 2D views, you can also zoom and scroll within the preview if a more detailed view on the floor plan is required.



For walls with multiple layers you get a list of the layers and the option to change the 2D representation for each.



Analysis region

● All buildings
○ Current building
○ Current floor
○ Current layer
○ Selected walls

select the representation to be transferred

existing wall types

Wall type	Wall thickness	Preview
External Wall	0.254	
External Wall	0.323	
Load bearing wall (interior)	0.165	
Non-load bearing wall (interior)	0.114	
Partition wall	0.1	

Wall layers

Layers	Thickness	
Render	0.02	Change 2D-representation
Aircrete lightweight block	0.1	Change 2D-representation
Aircrete lightweight block	0.09	Change 2D-representation
Aircrete lightweight block	0.1	Change 2D-representation
Plasterboard	0.013	Change 2D-representation

Note: changes made in the wizard cannot be undone once they have been transferred to the project, at least not via Undo. If you do not like the new wall representation, you would have to go through the wizard again if necessary.

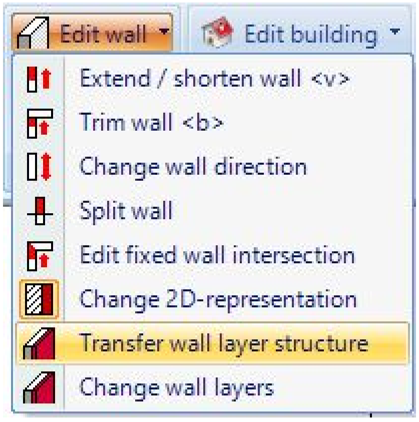
9.3.2 Transferring the layer structure of a wall to other walls

There are two variants of this function, which differ only in the process. With the variant via our Edit menu, the process uses a wizard with two dialog pages, when calling up the function from the context menu of a selected wall in just one dialog. The reason is that the source wall is already known when it is called up via the context menu and the source wall must first be determined in the dialog via the menu.

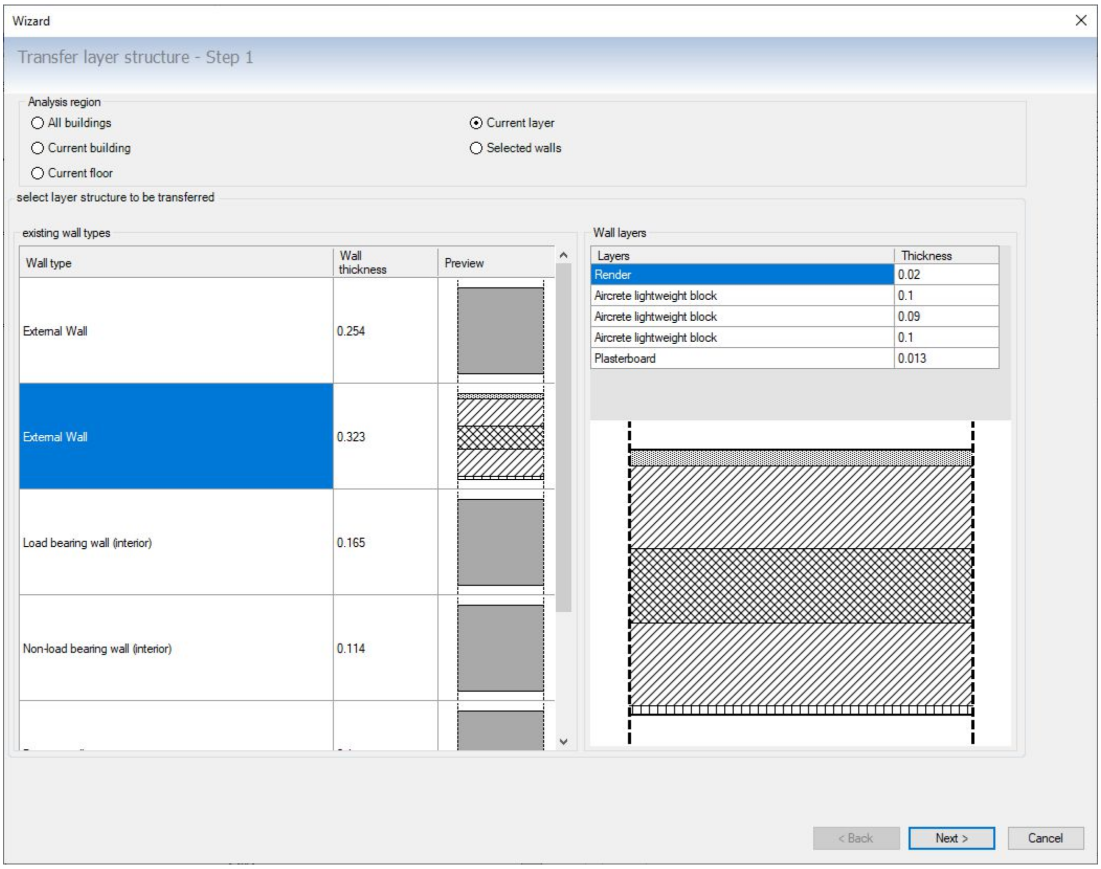
Note: the layer structure also determines the thickness of the wall and changes of the thickness affects, among other things, the positions of the walls in relation to others and the automatic wall intersection and room formation. It can therefore happen that in the event of deviations, existing rooms are not recreated and the situation of the walls may have to be reworked. See also the Floor Plan Analysis feature. Either way, it makes sense to save the project before making such changes in order to be able to return to the initial situation if necessary. Once the wall layers have been transferred, it is not possible to undo the changes, e.g. via Undo.

9.3.2.1 Transferring the layer structure via the Edit menu

Start the function via "Edit walls" on the EDIT ribbon.



It follows step 1 in which you can define the analysis area if required, and select the starting wall from the list of existing wall types, the layer structure which will then be transferred.



Analysis region

○ All buildings
○ Current building
○ Current floor
● Current layer
○ Selected walls

select layer structure to be transferred

existing wall types

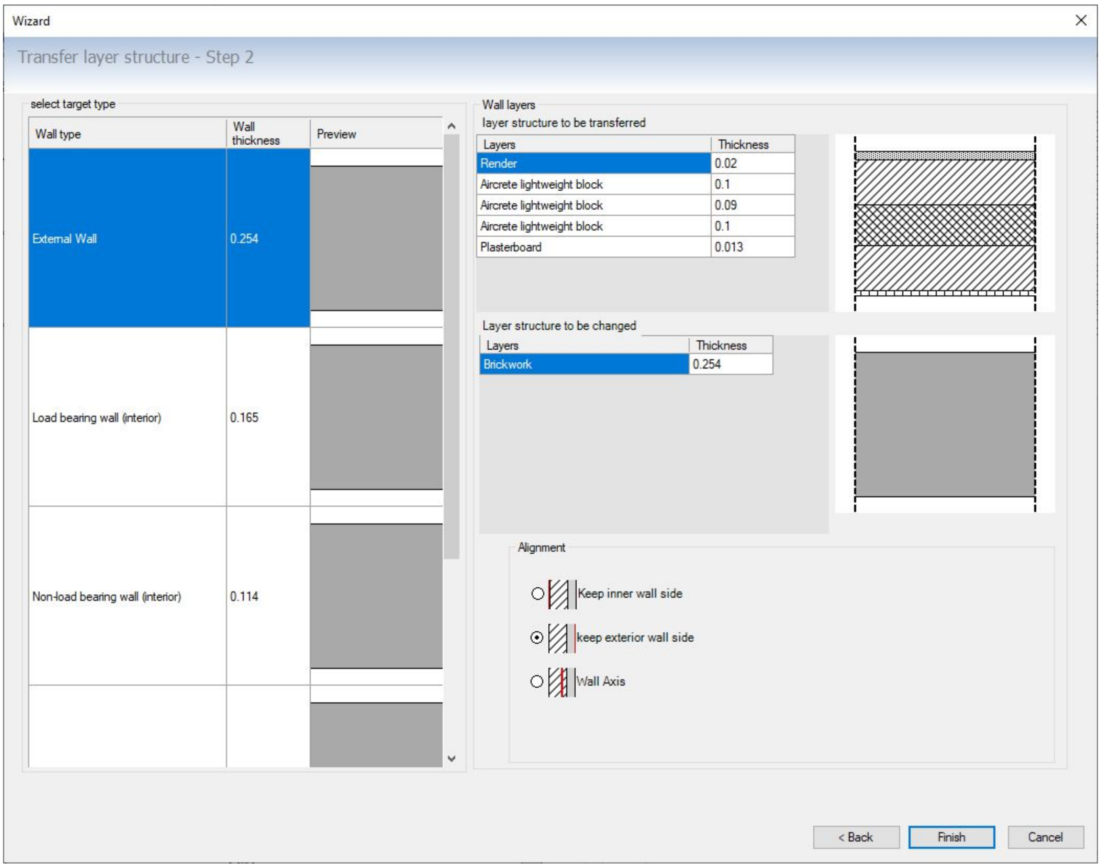
Wall type	Wall thickness	Preview
External Wall	0.254	
External Wall	0.323	
Load bearing wall (interior)	0.165	
Non-load bearing wall (interior)	0.114	

Wall layers

Layers	Thickness
Render	0.02
Aircrete lightweight block	0.1
Aircrete lightweight block	0.09
Aircrete lightweight block	0.1
Plasterboard	0.013

In step 2 you select the type of target wall, i.e. the walls to which the new layer structure is to be transferred. On the right you can see the list of layers and a preview.

In the Alignment area, you specify which side of the wall the changes should be applied to. If the thickness of the starting wall and the target wall are identical, on axis should be selected here.
If there is a deviation in the thickness, you can define for exterior walls whether the exterior or interior wall side should be retained.
The definition of outside or inside does not apply to interior walls. The software analyses the wall sides and determines whether a side belongs to a room or not. So no room would be the identifier for an exterior wall. Since interior walls usually only have wall sides that belong to rooms, this distinction does not apply. So the best option for alignment would be on axis, i.e. the inner wall would be thicker or thinner in either direction. The distances between the inner walls would then have to be adjusted using the standard wall editing tools



Wall type	Wall thickness	Preview
External Wall	0.254	
Load bearing wall (interior)	0.165	
Non-load bearing wall (interior)	0.114	

layer structure to be transferred

Layers	Thickness
Render	0.02
Aircrete lightweight block	0.1
Aircrete lightweight block	0.09
Aircrete lightweight block	0.1
Plasterboard	0.013

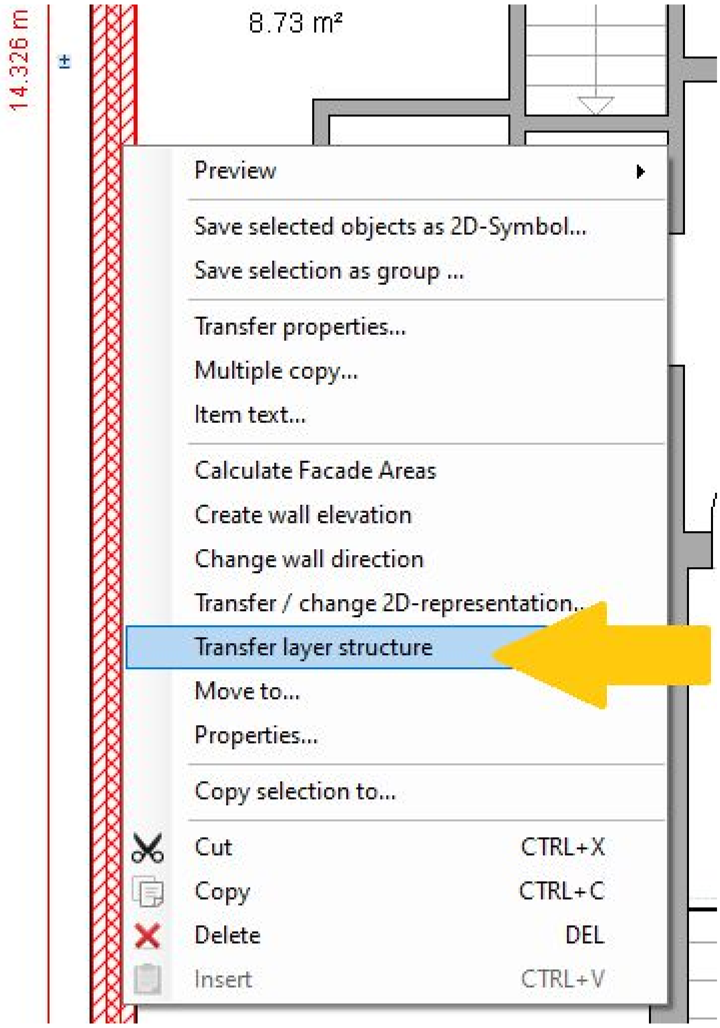
Layer structure to be changed

Layers	Thickness
Brickwork	0.254

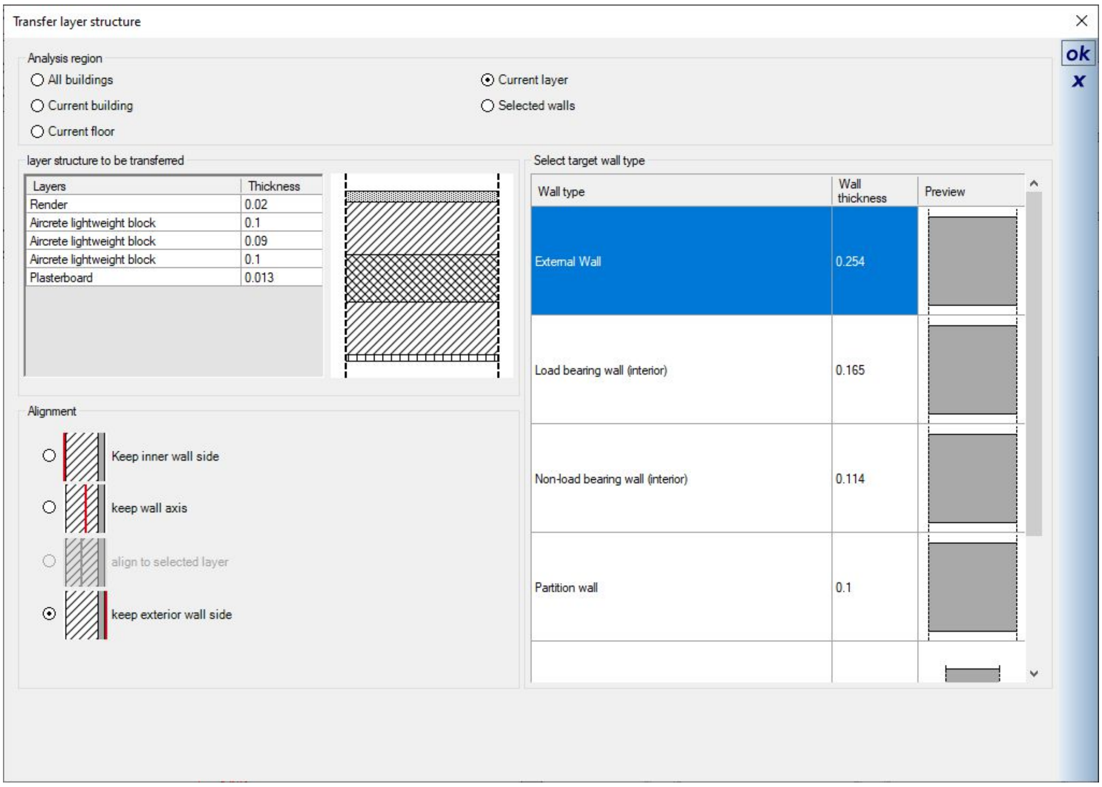
○ Keep inner wall side
● keep exterior wall side
○ Wall Axis

9.3.2.2 Transferring a layer structure via the context menu

If you have already selected the initial wall in your floor plan, you can start the function from your context menu.



As already mentioned, there is no need to specify the starting wall and you will see the following dialog for selecting the target wall and orientation. Please note the information from the previous chapters.



Transfer layer structure

Analysis region

○ All buildings
○ Current building
○ Current floor
● Current layer
○ Selected walls

layer structure to be transferred

Layers	Thickness
Render	0.02
Aircrete lightweight block	0.1
Aircrete lightweight block	0.09
Aircrete lightweight block	0.1
Plasterboard	0.013

Alignment

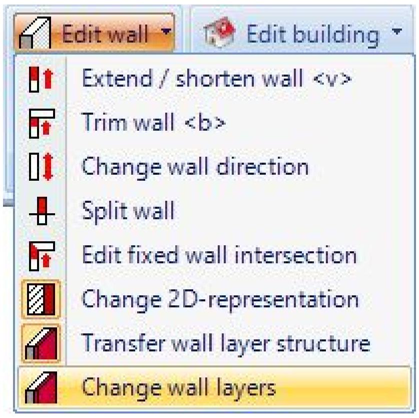
○ Keep inner wall side
○ keep wall axis
○ align to selected layer
● keep exterior wall side

Select target wall type

Wall type	Wall thickness	Preview
External Wall	0.254	
Load bearing wall (interior)	0.165	
Non-load bearing wall (interior)	0.114	
Partition wall	0.1	

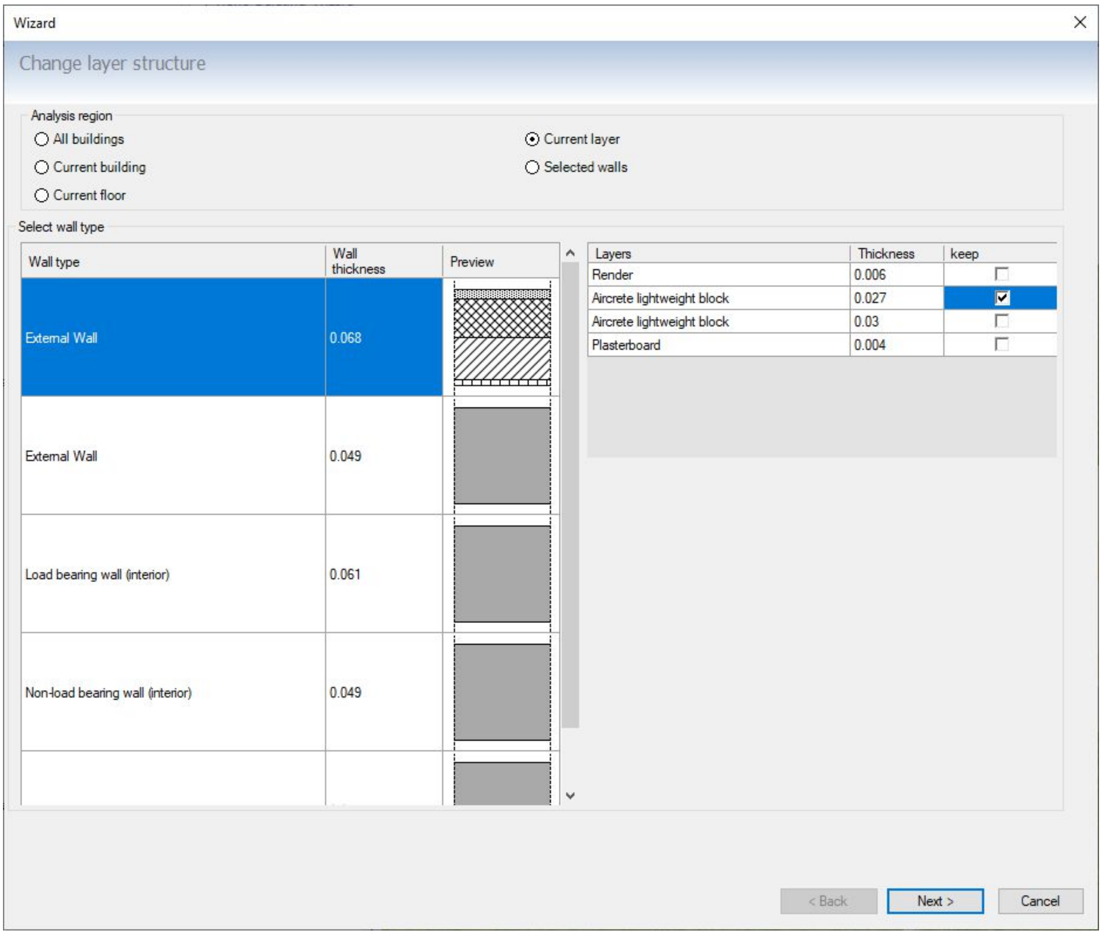
9.3.3 *Changing the layer structure of walls, e.g. adding insulation*

If you want to change the layer structure of multiple walls, the Change Wall Layers wizard, started from the Edit Walls menu on the EDIT ribbon, is an option with certain benefits.



Once started, you first get dialog for selecting the walls whose layer structure is to be changed.

On the right side you have the possibility to determine one of these layers as fixed in their position with the checkbox fix / keep.



Analysis region
○ All buildings
○ Current building
○ Current floor
● Current layer
○ Selected walls

Select wall type

Wall type	Wall thickness	Preview
External Wall	0.068	
External Wall	0.049	
Load bearing wall (interior)	0.061	
Non-load bearing wall (interior)	0.049	

Layers	Thickness	keep
Render	0.006	☐
Aircrete lightweight block	0.027	☑
Aircrete lightweight block	0.03	☐
Plasterboard	0.004	☐

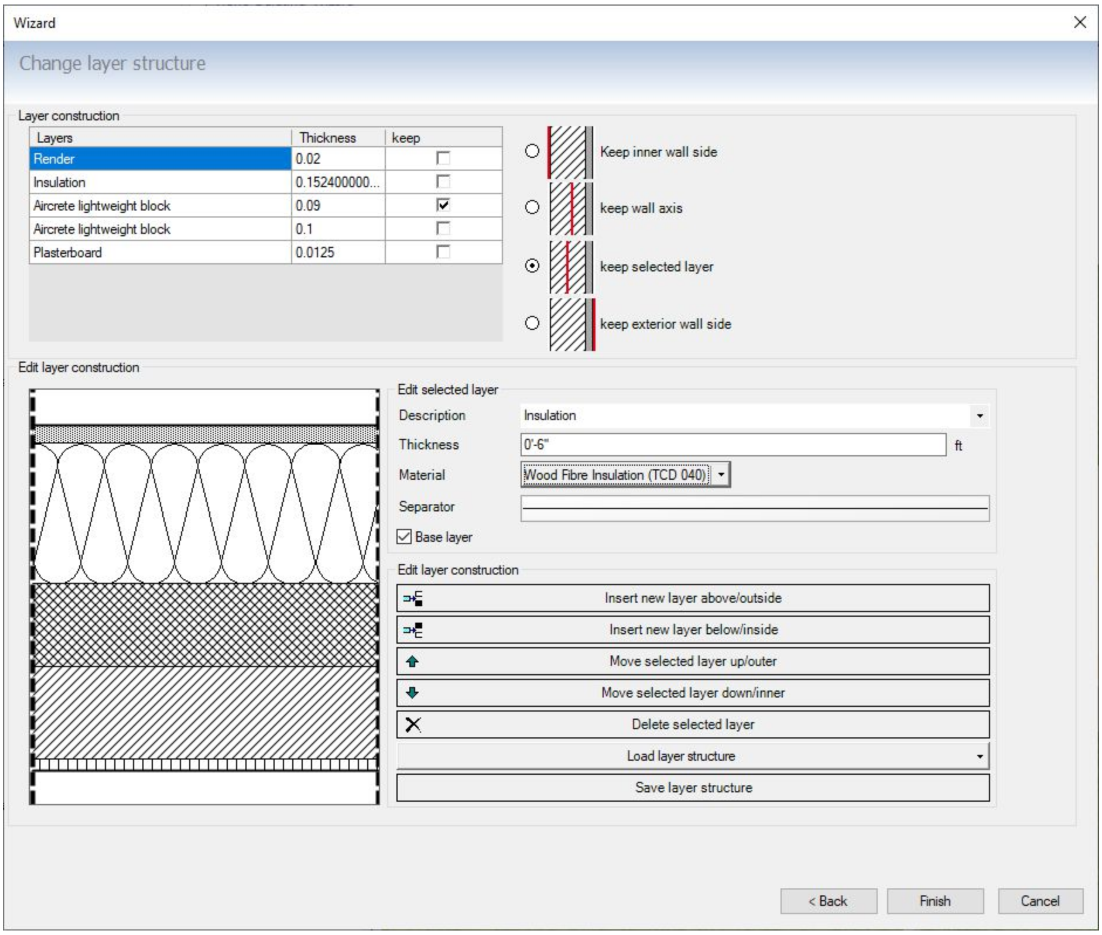
In the second step, as in our standard wall dialog, you can change the layer structure by adding layers, changing the display by clicking on the material button, etc. You also have the option of loading an existing layer structure. But that only makes sense in this example if it also contains the fixed wall layer with the same properties.

In addition to the other methods for transferring layer structures, the wizard offers a significant advantage.

An example:

- As you can see in the dialogs, you may have recorded the current status of your building and its walls in your project.
- In a second step, e.g. in a copy for your renovation project, you want to apply one or more layers to the outer wall, in the example a layer with insulation 16 cm thick, the former insulating plaster is omitted and an additional plaster layer of 2 cm can also be applied outside
- What is and must remain unchanged is the original lightweight block of 2,7 cm. You don't want to rebuild or move walls in reality

- In our other methods, you could only make the changes related to the inside or outside or to the axis
- However, the lightweight layer should serve as a starting point and the other layers should be added to the outside and inside
- You can achieve this by fixing the masonry layer and using the Keep selected layer option



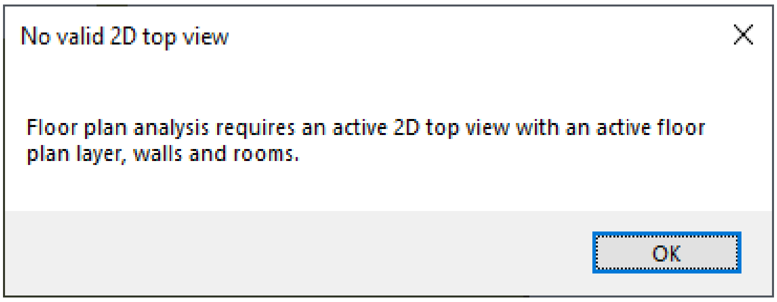
Layers	Thickness	keep
Render	0.02	☐
Insulation	0.152400000...	☐
Aircrete lightweight block	0.09	☑
Aircrete lightweight block	0.1	☐
Plasterboard	0.0125	☐

○ Keep inner wall side
○ keep wall axis
● keep selected layer
○ keep exterior wall side

Description: Insulation
Thickness: 0'-6" ft
Material: Wood Fibre Insulation (TCD 040)
Separator:
☑ Base layer

9.4 FLOOR PLAN ANALYSIS AND REPAIR FUNCTIONS

To start the floor plan analysis, the software needs an active 2D view with an active layer that contains at least walls for the preview. If this is not the case, you will receive the following message and can first activate such a view or layer.

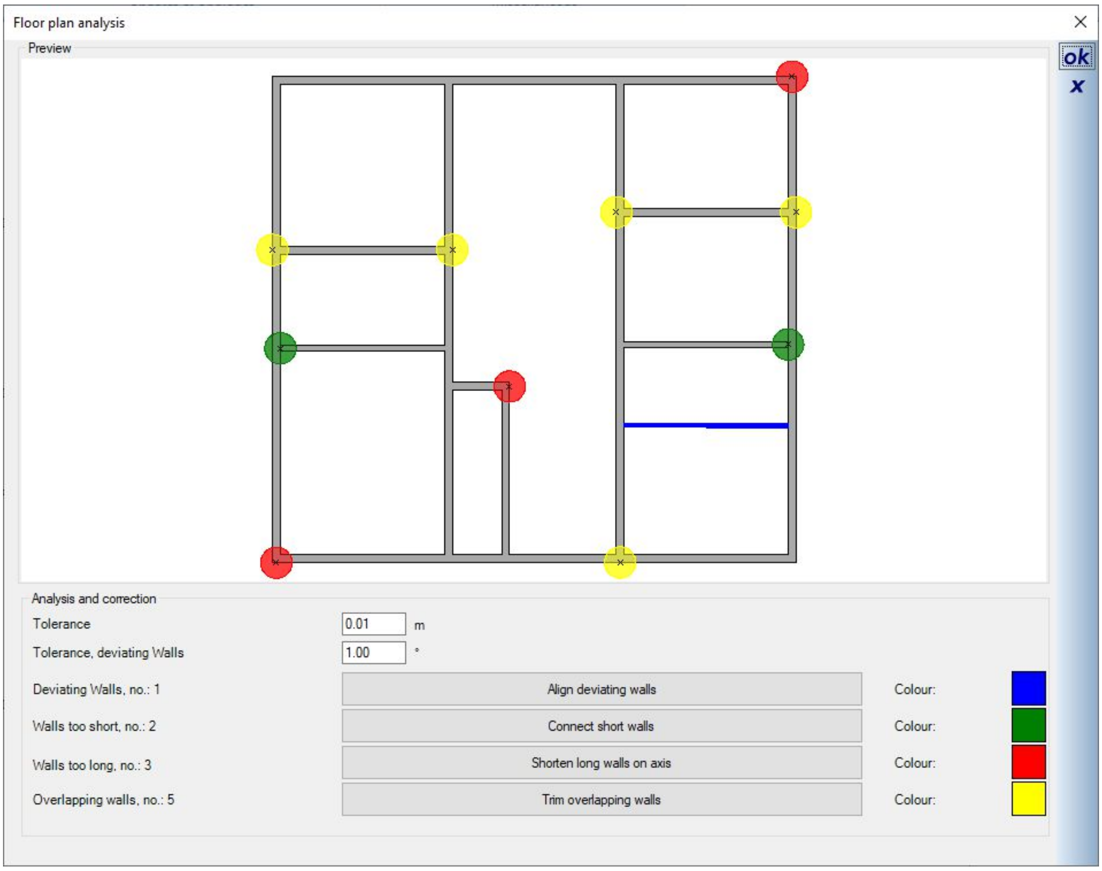


No valid 2D top view

Floor plan analysis requires an active 2D top view with an active floor plan layer, walls and rooms.

In our floor plan analysis dialog, only the active floor and walls on it are shown and possible problems are highlighted in different colours.

Note: within the preview you can zoom and scroll with our standard 2D view functions.



Floor plan analysis

Preview

Analysis and correction

Tolerance 0.01 m

Tolerance, deviating Walls 1.00 °

Deviating Walls, no.: 1 Colour: 🟦

Walls too short, no.: 2 Colour: 🟩

Walls too long, no.: 3 Colour: 🟥

Overlapping walls, no.: 5 Colour: 🟨

The floor plan analysis tries to identify possible problems by type with different colours. You can change the colours by clicking on the coloured box if that helps.

By clicking on the assigned buttons the program attempts to correct the respective problem. The deviating walls are at the top and if there are any, you should start with them. Aligning deviating walls could create subsequent problems, such as gaps at wall intersections.

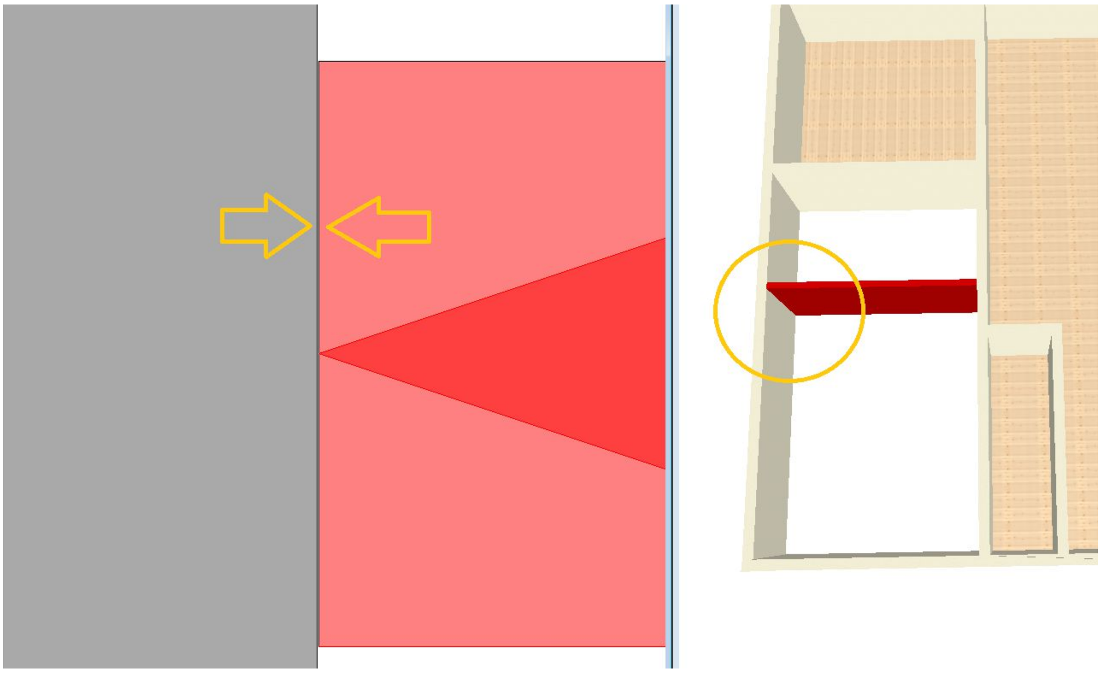
With each action, the floor plan analysis not only changes the preview, but also the walls in the project itself. The analysis is then automatically repeated and the preview updated. Ideally, the marked problems will gradually disappear.

Note: the changes to the project itself cannot be reversed, even if you exit the dialog with Cancel.

9.4.1 Some examples for highlighted wall problems

Below are some examples of wall situations that should be identified and fixed in our floor plan analysis dialog.

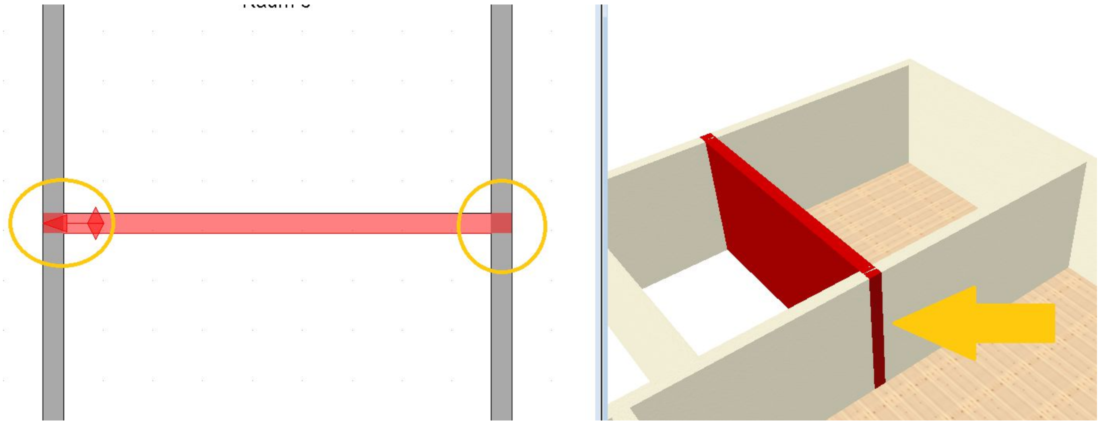
9.4.1.1 Walls too short



As you can see in the screenshot there is a small gap between the inner and the exterior wall.
This means that the walls are not intersected and no room is created. In order to see this in a 2D floor plan, you have to zoom in very closely and sometimes also switch off the line widths using the button in our top toolbar.

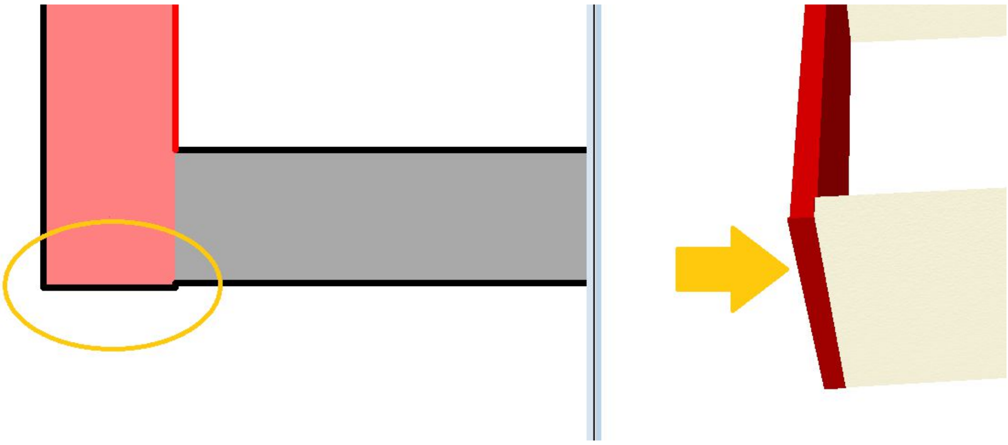
9.4.1.2 Walls too long

When inserting walls, you don't have to hit the edge of another wall directly to trigger the automatic wall intersection. If you put the second point anywhere on the wall, that's fine.
However, it is unfavorable if you pull a wall over a crossing one and place the end of the wall on the opposite side of the wall.
In such a case additional wall segments are created from the front of the crossing wall and these unwanted segments may be taken into account when creating the room and, depending on the room contour, lead to problems.
You can best see such situations when you select a wall and the wall in a 3D view completely penetrates another and the end becomes visible on the opposite side. As shown in the figure below.



9.4.1.3 Overlapping walls

Here you see a corner situation in which one wall protrudes slightly over the other. Even such situations, if not deliberately created, are unfavorable and can lead to various effects, e.g. when calculating the automatic ceilings or when determining the building contour in order to create an opening in our terrain.



9.5 TIMBER CONSTRUCTION FOR WALLS, STUD WALLS

From version 8, the software supports the planning of walls in timber frame construction. This feature is not included in all versions, but may also be part of an additional plug-in. If in doubt, please ask your distributor.

In handling there are basically two different ways:

A) You already know at the beginning of the project that the walls should be executed in timber frame construction. In this case activate the options in the extended wall dialog during or before you enter the walls. Just as before, when you set the properties of your walls before inserting.

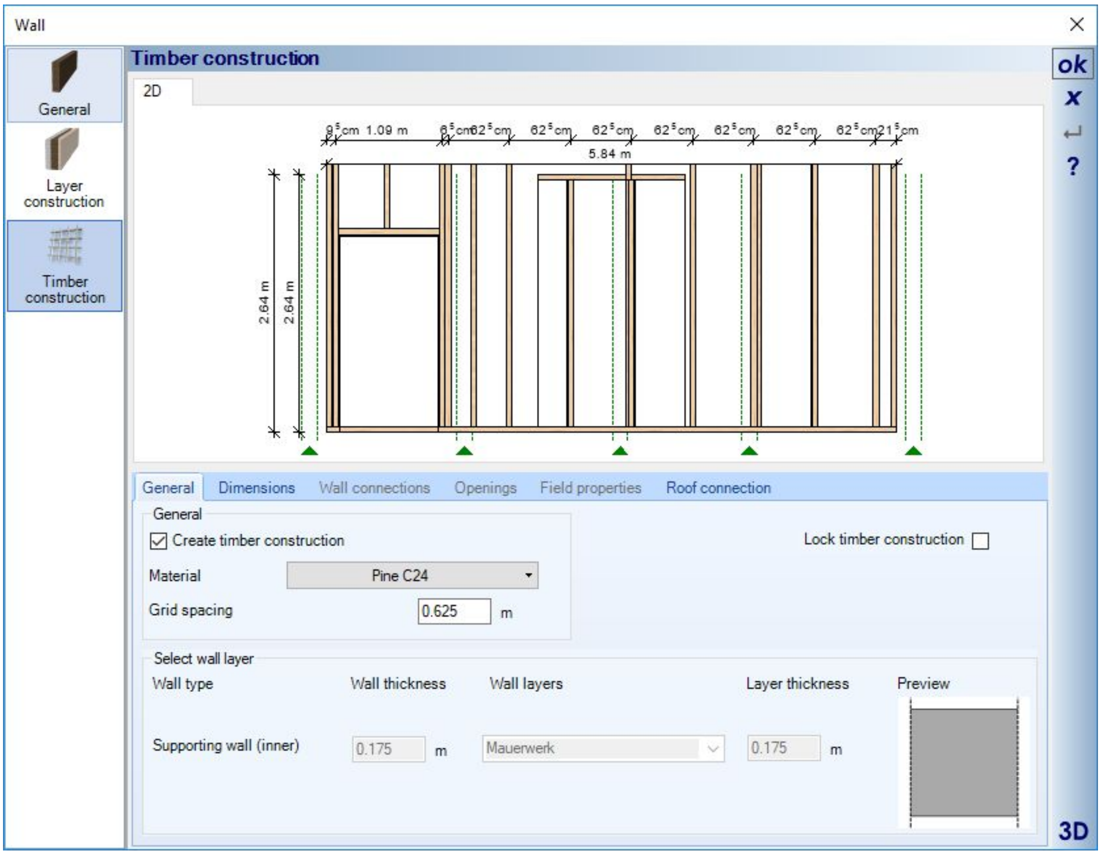
B) You plan the project with "normal" walls or receive such a planned project from customers and add the timbers for the project only later. So you do not have to touch each wall individually, you are assisted by the wizard, which fills the entire project or selectable areas and wall types automatically.

Note: the function always analyses the whole wall and its connections as well as the contour of the walls under roofs. You should make sure that your walls do not consist of single wall segments. This would result in a meaningless distribution of the wood in the individual wall parts.

9.5.1 Extended wall dialog for timber construction

If you have a version with the timber frame construction functions, the wall dialog is automatically extended by an additional property page.

On this page you will find an active sketch in which you can also perform certain actions with the mouse, as well as all the properties required to produce the timber elements.



General

☑ Create timber construction

Material: Pine C24

Grid spacing: 0.625 m

Lock timber construction ☐

Select wall layer

Wall type	Wall thickness	Wall layers	Layer thickness	Preview
Supporting wall (inner)	0.175 m	Mauerwerk	0.175 m	

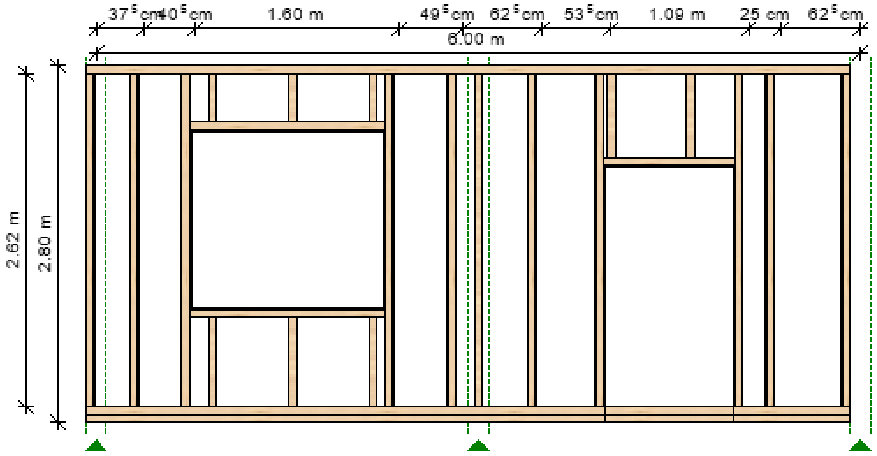
9.5.2 *General Settings*

On the tab page "General" activate the timber construction via the checkbox. In addition, you specify the grid spacing for the distances between the studs.
Internally, we fill the walls with a grid consisting of fields that may also have individual properties. The grid spacing is the width of a grid field. At the end of each field a stud is created.
If your wall consists of several layers, you must determine in the lower part of the dialog in which layer the timber construction is created. If there is only one wall layer, this area remains deactivated and the timbers are created on the wall axis.

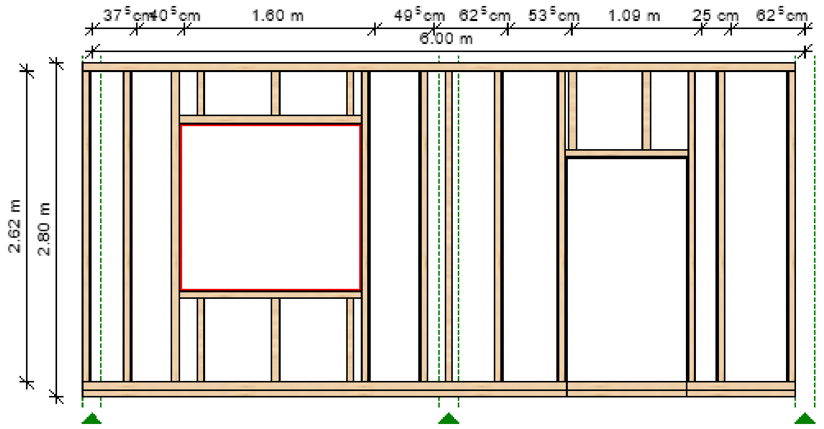
Note: it is generally not checked if the thickness of the timber elements fit in the wall layer or the walls. But you can immediately see that in your planning views when the elements stick out of the wall. So you have to make sure that the thickness matches the walls, or you may have to make the walls a bit thicker.

9.5.3 The Timber Construction Sketch / Preview

In the sketch, you can zoom and scroll as in normal 2D views, so you zoom with the mouse wheel to the cursor position, for example, if you want to see a specific dimension. Or you scroll with the SHIFT key and mouse wheel. If necessary, you can return to the starting position by pressing the HOME key or by left-clicking on an empty area of the sketch.
You can also select fields, openings, wall connections or timber elements and then change their properties in the options shown below.

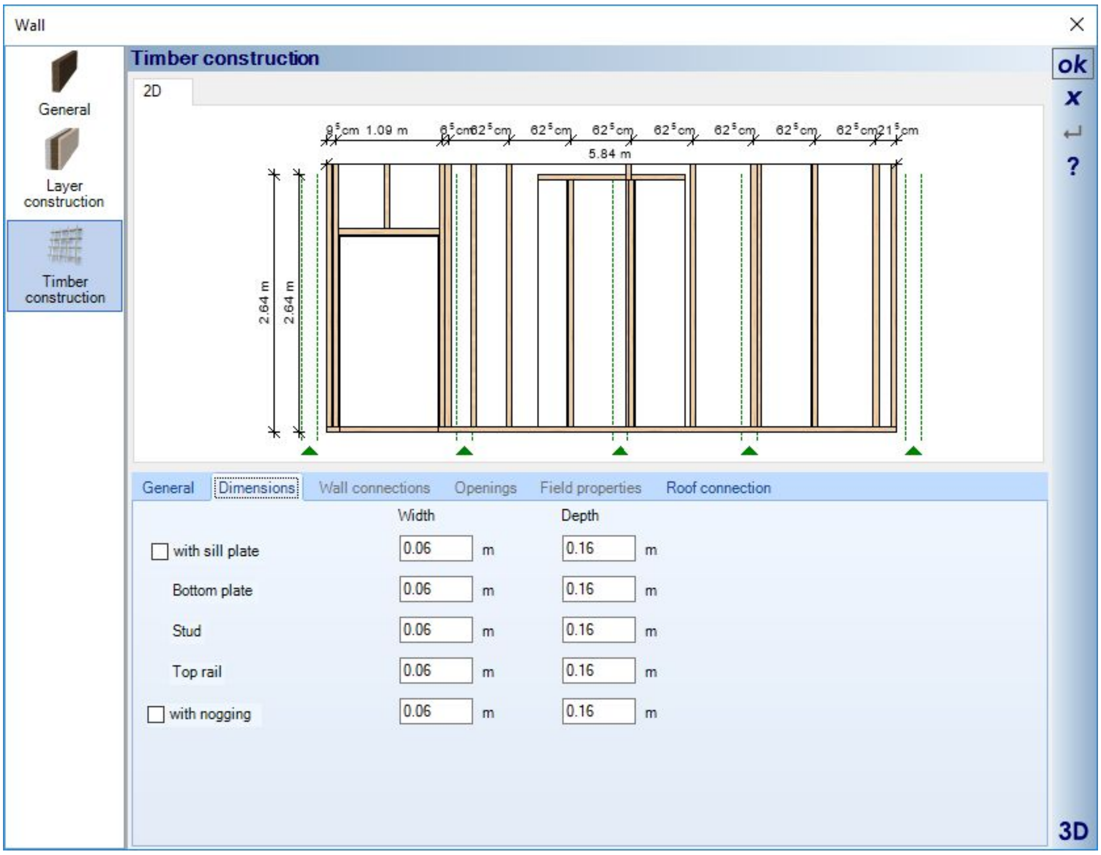


The sketch itself shows openings, the timber elements as well as the wall connections.
The wall connections are symbolized by green lines and a triangle at the bottom. These are the places where other walls intersect with the shown wall.
Using the green triangles, you can select the wall connection segments of the grid and change the execution of the connection.
Selected elements in the sketch are outlined in red, in the following illustration the selected window opening on the left.



9.5.4 Timber Properties

You can set the dimensions of the woods on the "Dimensions" tab page. However, these settings apply equally to all elements in the wall, even if you can obviously select a single stud in the sketch.



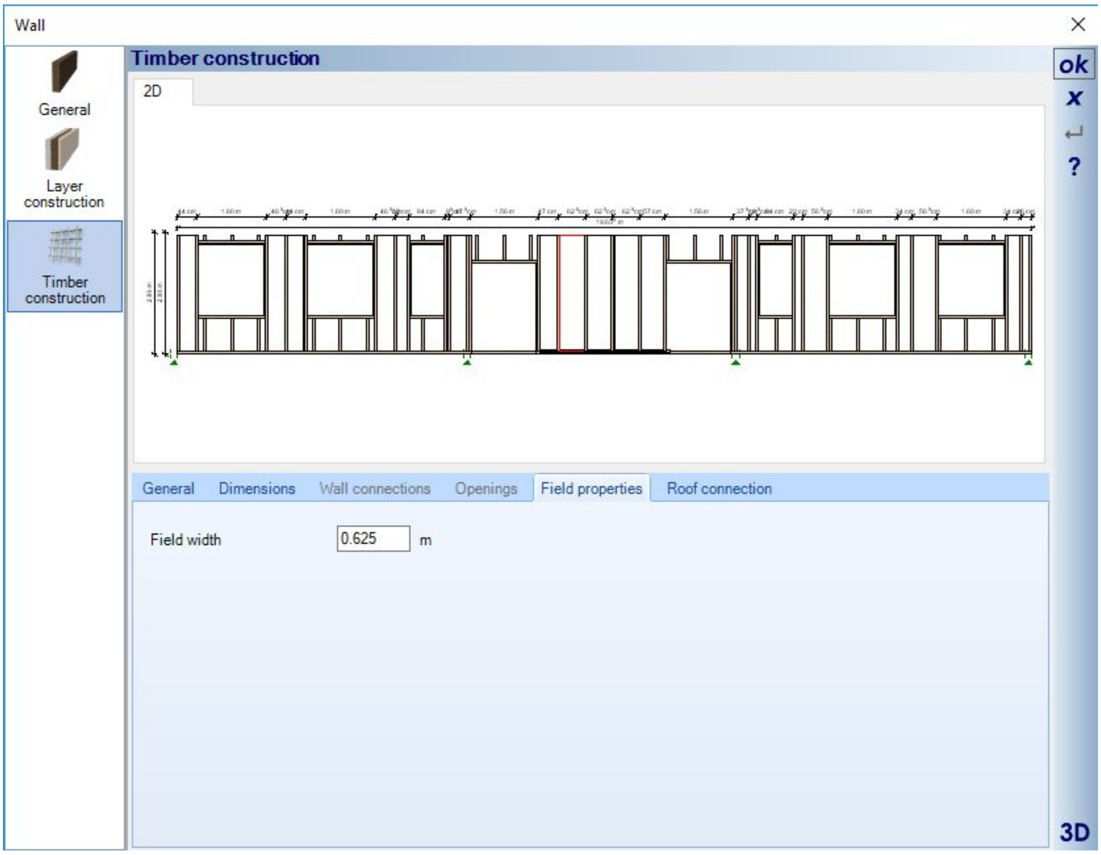
	Width		Depth	
☐ with sill plate	0.06	m	0.16	m
Bottom plate	0.06	m	0.16	m
Stud	0.06	m	0.16	m
Top rail	0.06	m	0.16	m
☐ with nogging	0.06	m	0.16	m

9.5.5 Field Properties / Grid Dimensions

As a general rule, the walls are evenly filled with studs in the set grid size. However, there may be cases where individual fields must deviate from it.

You can therefore select individual fields and assign a width deviating from the grid width to a field. The rest of the fields react to it and adapt, in the input direction of the wall.

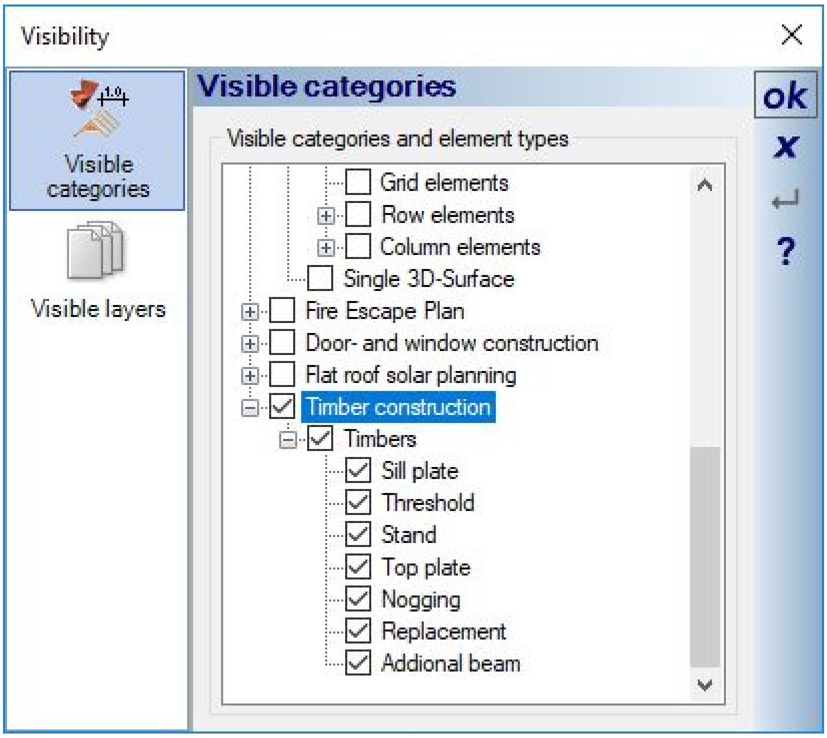
This does not apply to fields of a special type, like openings.



Field width 0.625 m

9.5.6 *Visibility of Timber Elements in standard views*

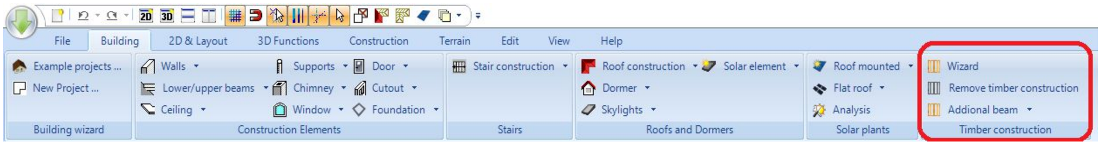
The category timber frame construction allows you to set the visibility in the views in detail. In 2D top views the display is deactivated by default.



☐ Grid elements
☐ Row elements
☐ Column elements
☐ Single 3D-Surface
☐ Fire Escape Plan
☐ Door- and window construction
☐ Flat roof solar planning
☑ Timber construction
  ☑ Timbers
    ☑ Sill plate
    ☑ Threshold
    ☑ Stand
    ☑ Top plate
    ☑ Nogging
    ☑ Replacement
    ☑ Addional beam

9.5.7 The Timber Construction Wizard

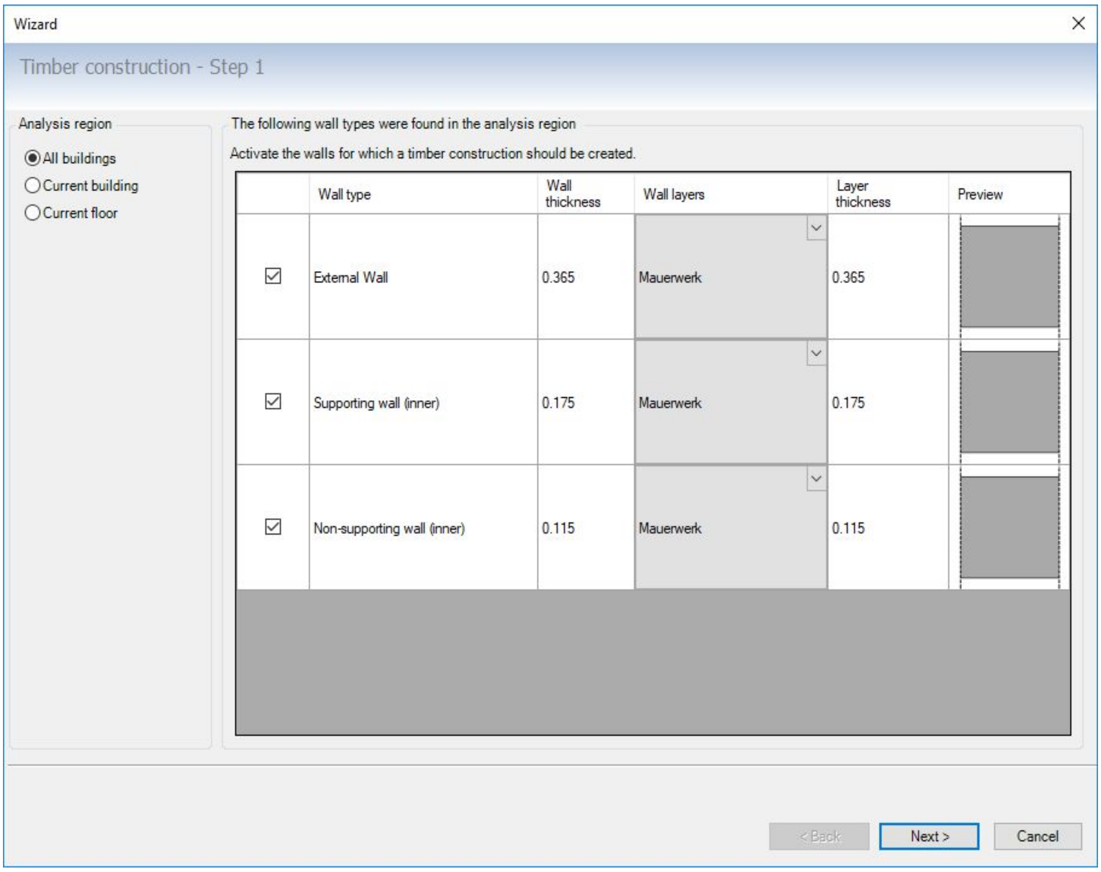
With the help of the wizard, you can fill walls of selectable type and in selectable areas with timber construction elements.
The wizard should make work easier in cases where you did not activate the functions per wall from the beginning or get a project from a customer that was only planned with standard walls.
There is a wizard variant for creating timber construction and one to remove it.
If you had created a construction with wrong settings, you would otherwise have to work on each wall individually. With the function „Remove construction" you delete all automatically generated timber elements in one operation and create a new one with other parameters.



The wizard consists oft wo steps.

9.5.7.1 Step 1, select walls and region

Here you determine in which buildings or floors the wizard should create the timber construction.
In addition, you will get a list of walls. It is analyzed in detail whether the walls are really identical according to type and layer structure. So it may be that you get offered several external walls, because they have different layer structures or properties. Separated for each wall type, you still have to specify the layer in which the timber elements are to be produced.
You can go through the wizard several times if necessary and create the elements step by step for each floor for example.
In this case, you would have to switch the current active floor in the planning software in between.



Timber construction - Step 1

Analysis region

● All buildings
○ Current building
○ Current floor

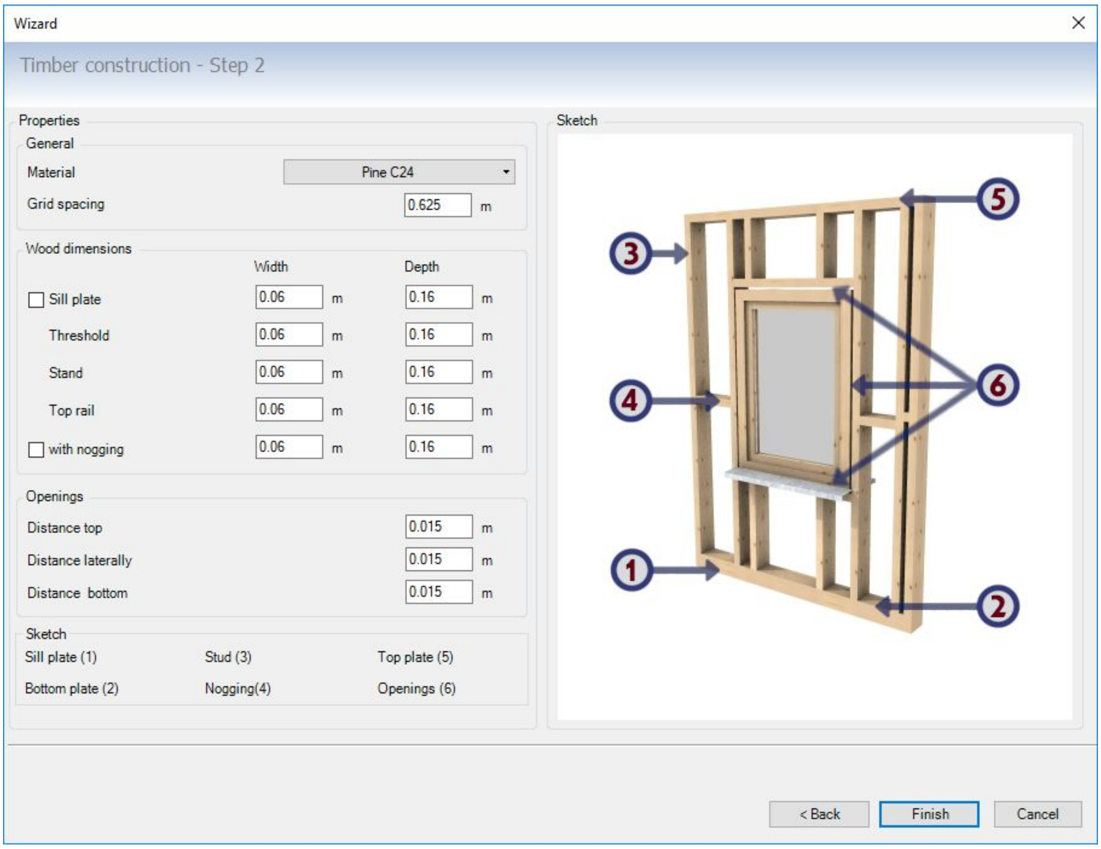
The following wall types were found in the analysis region

Activate the walls for which a timber construction should be created.

	Wall type	Wall thickness	Wall layers	Layer thickness	Preview
☑	External Wall	0.365	Mauerwerk	0.365	
☑	Supporting wall (inner)	0.175	Mauerwerk	0.175	
☑	Non-supporting wall (inner)	0.115	Mauerwerk	0.115	

9.5.7.2 Step 2, Grid dimensions and Timber properties

As already mentioned, the settings made here apply to all walls in the previously selected region.



Timber construction - Step 2

Properties

General

Material: Pine C24

Grid spacing: 0.625 m

Wood dimensions

	Width		Depth	
☐ Sill plate	0.06	m	0.16	m
Threshold	0.06	m	0.16	m
Stand	0.06	m	0.16	m
Top rail	0.06	m	0.16	m
☐ with nogging	0.06	m	0.16	m

Openings

Distance top: 0.015 m

Distance laterally: 0.015 m

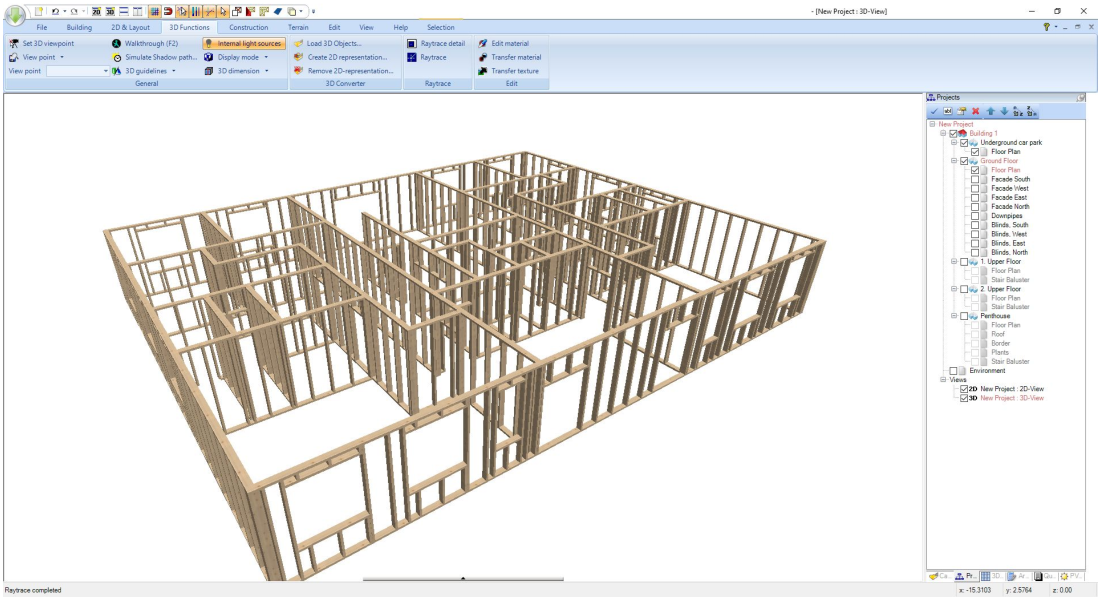
Distance bottom: 0.015 m

Sketch

Sill plate (1)	Stud (3)	Top plate (5)
Bottom plate (2)	Nogging(4)	Openings (6)

9.5.8 Example: 3D Visualisation Timber Construction

From the example project. Effort to create a timber construction with our wizard for the current floor about 10 seconds.



9.5.9 Inserting additional beams in walls with timber construction

It may be necessary to add beams in walls with automatically created timber construction.
There is the additional beam function in three versions, for horizontal, vertical and diagonal elements. The element itself is inserted in a wall elevation view.

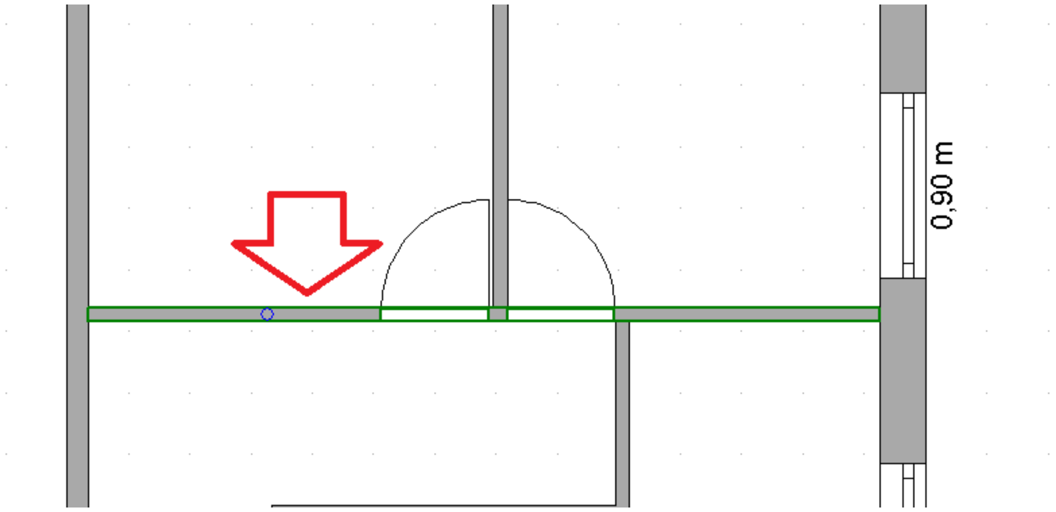
There are two steps behind each variant.

- You must first create a wall elevation view. But only once per wall, even if you want to enter several individual additional beams.
- You can then enter additional beams in this view type.

After inserting additional beams you should delete the wall elevation view.

9.5.9.1 Additional beams, create wall elevation view

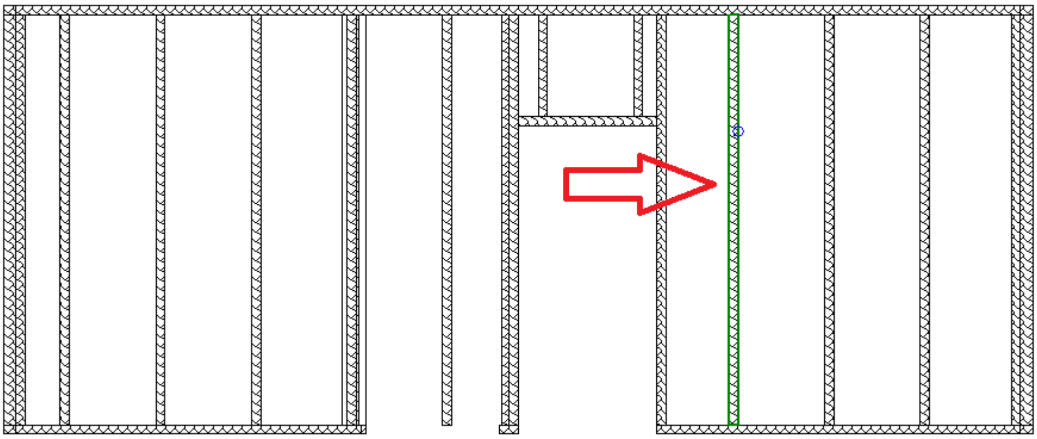
Start creating a wall elevation view via the corresponding button. Next you have to choose a wall in your floor plan. Move the mouse over the desired wall. As soon as the software recognizes a wall at this position, it is highlighted in green.



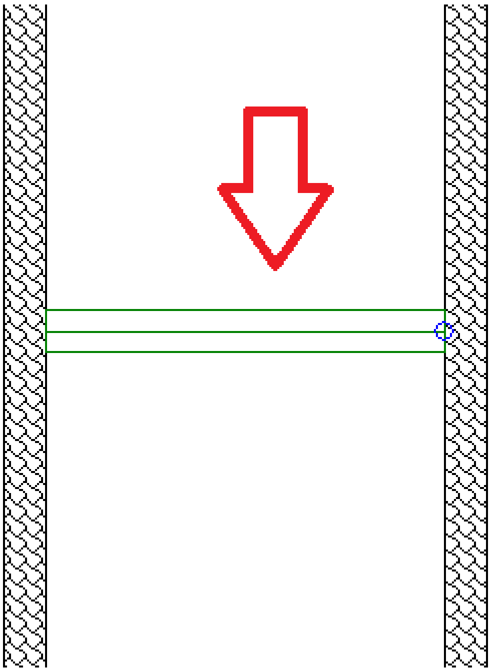
A left mouse click automatically creates a wall elevation view

9.5.9.2 Inserting beams in a wall elevation view

In the elevation view you can now add beams. Start the appropriate input tool and activate the wall by pointing the mouse over one of the shown timber elements. With a left mouse click, the software identifies the wall layer in which the shown elements are located and you can directly draw your own beams.

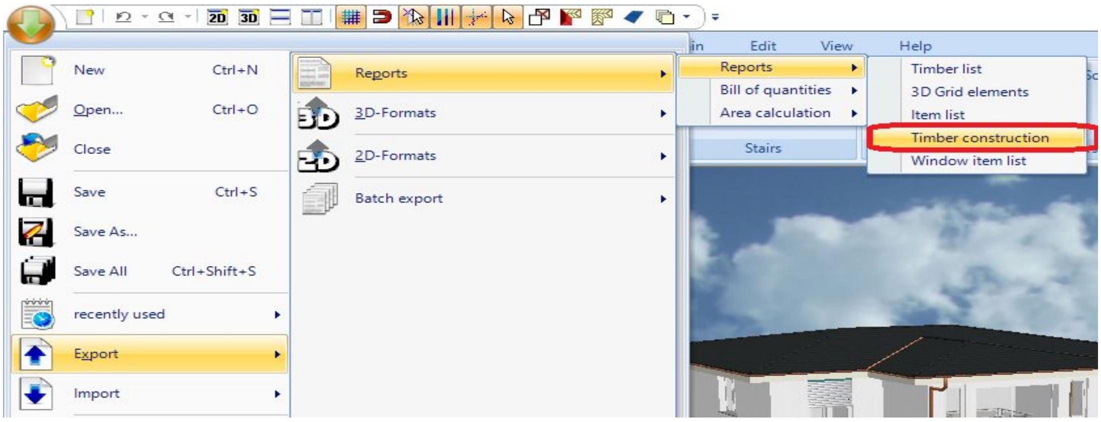


Depending on the input type, horizontal for example, the allowed mouse cursor direction is restricted, simply to allow you to draw a horizontal elements without moving out of direction.

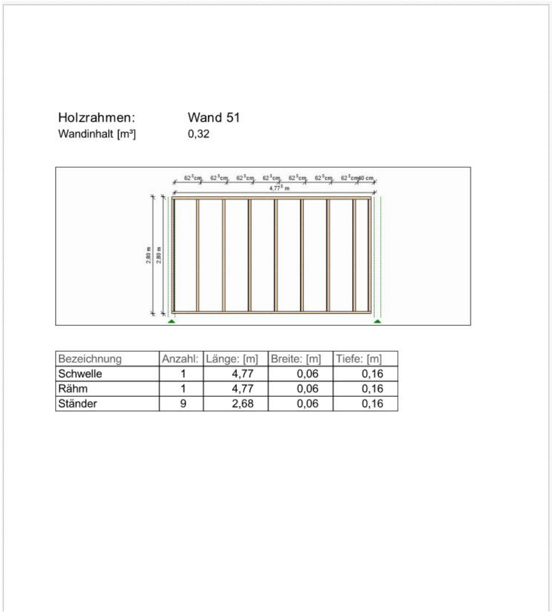


9.5.10 Timber Construction, Export of reports as PDF etc.

The timber construction functions also include the export of reports via the familiar menu.

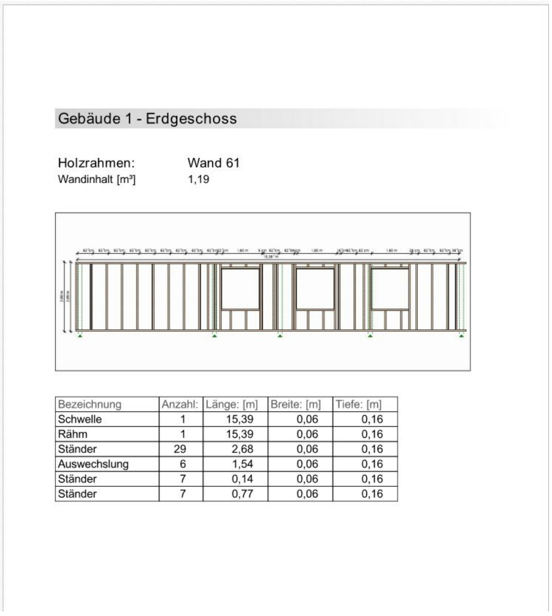


The generated list contains a table with information on the planned timbers and a sketch that corresponds to the representation in the wall dialog.



Holzrahmen: Wand 51
Wandinhalt [m³] 0,32

Bezeichnung	Anzahl:	Länge: [m]	Breite: [m]	Tiefe: [m]
Schwelle	1	4,77	0,06	0,16
Rähm	1	4,77	0,06	0,16
Ständer	9	2,68	0,06	0,16



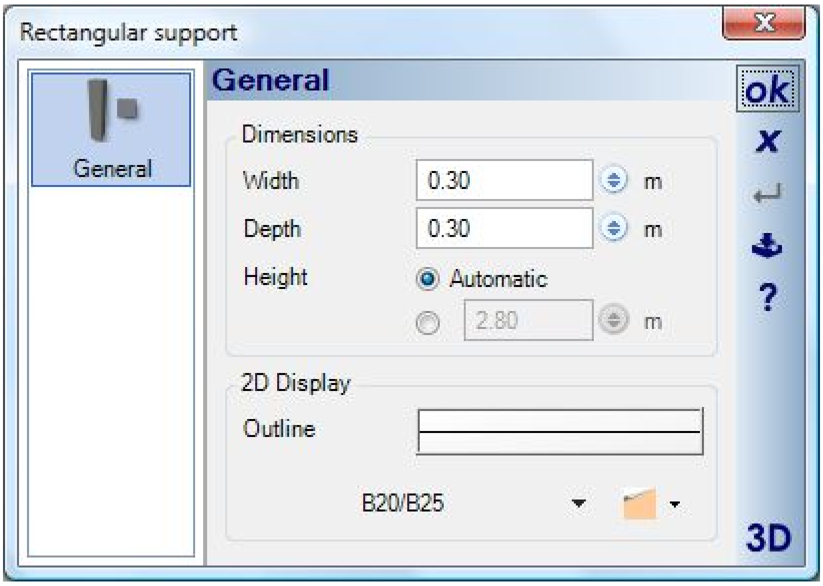
Gebäude 1 - Erdgeschoss

Holzrahmen: Wand 61
Wandinhalt [m³] 1,19

Bezeichnung	Anzahl:	Länge: [m]	Breite: [m]	Tiefe: [m]
Schwelle	1	15,39	0,06	0,16
Rähm	1	15,39	0,06	0,16
Ständer	29	2,68	0,06	0,16
Auswechslung	6	1,54	0,06	0,16
Ständer	7	0,14	0,06	0,16
Ständer	7	0,77	0,06	0,16

9.6 SUPPORTS

Supports can have a round or rectangular profile. Both forms can be positioned freely with a mouse click. The dimensions, the representation of the outline and the building material with its characteristics, can be specified in the 'Properties' dialog. Supports assume by default automatically the height of floor of the building and the level of the layer in which they are being inserted.



Rectangular support

General

Dimensions

Width 0.30 m

Depth 0.30 m

Height ● Automatic
○ 2.80 m

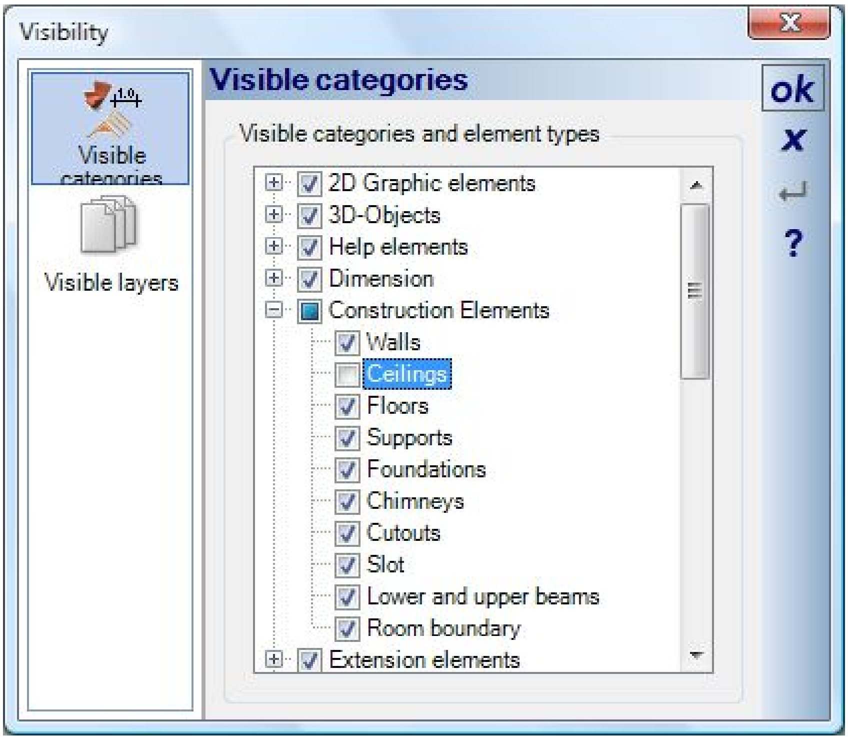
2D Display

Outline

B20/B25

9.7 CEILINGS

In 2D plan views and 3D views ceilings are set as invisible by default, in order to be able to see into the rooms in the 3D views. If you therefore wish to see or edit ceilings, activate the 'Visibilities' dialog for the view and check the box for ceilings in the construction elements category.



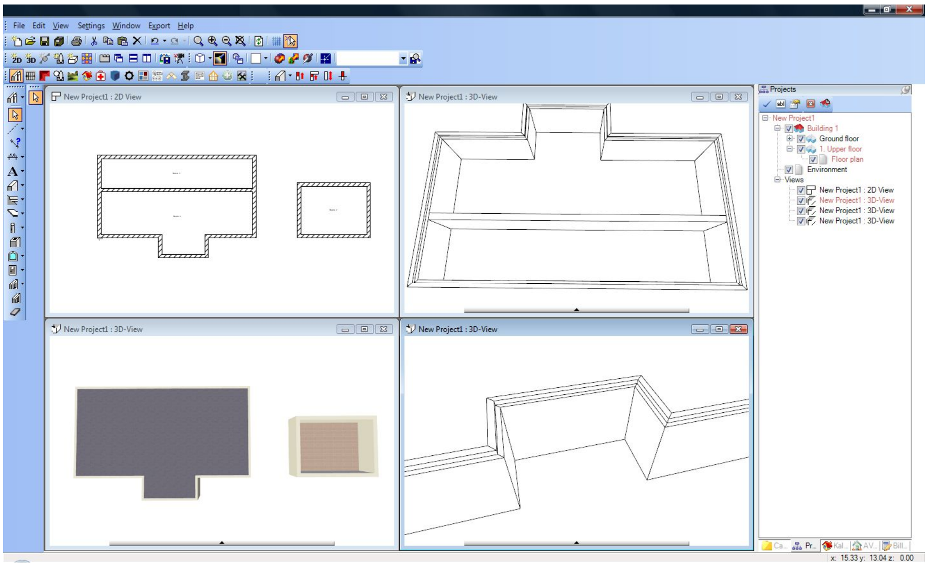
Visible categories and element types

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension
- ■ Construction Elements
  - ☑ Walls
  - ☐ Ceilings
  - ☑ Floors
  - ☑ Supports
  - ☑ Foundations
  - ☑ Chimneys
  - ☑ Cutouts
  - ☑ Slot
  - ☑ Lower and upper beams
  - ☑ Room boundary
- ☑ Extension elements

9.7.1 *Automatic Ceilings*

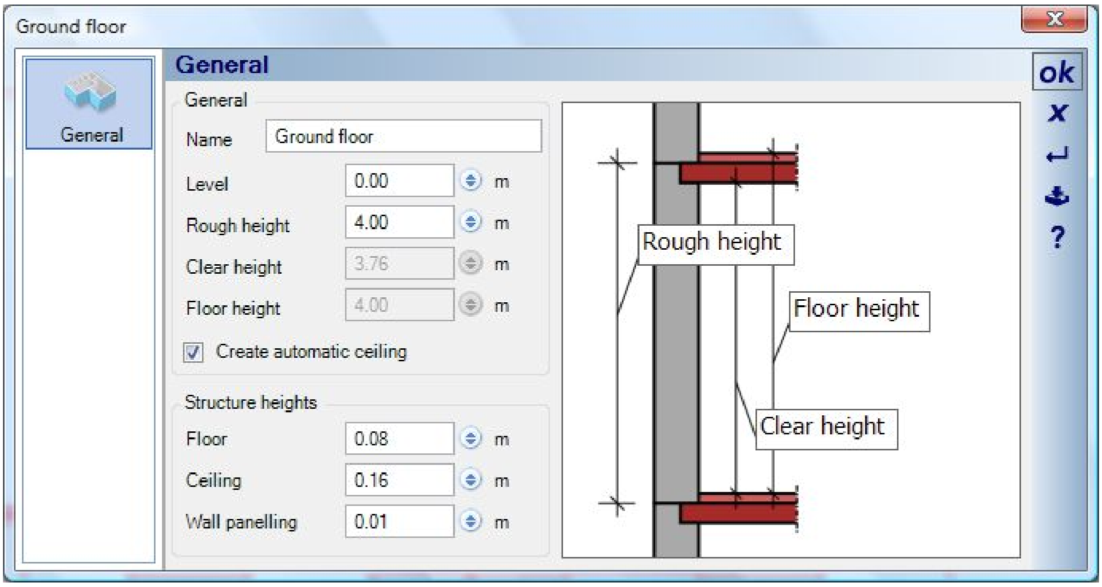
For each floor of the building the software automatically creates a ceiling over the first exterior contour of connected rooms. In the example shown, the software proceeds as follows:

- Room 1 and Room 2 together form a contour, therefore an automatic ceiling is generated for them.
- Room 3 was input later and is not connected to the first contour, therefore it has no ceiling. So if a ceiling is required here, it must be inserted manually.
- The ceilings are visible in the 3D view with textures.
- In the bottom two 3D views the presence of a ceiling can be recognized by the top edge of the walls. The recesses in the top of the walls are caused by the ceiling which they support, and can be specified for each wall in its properties dialog.



9.7.2 *Deactivating Automatic Ceilings*

In some cases automatic ceilings are not necessary or desirable. Therefore they can be deactivated for a floor in the properties dialog of the particular floor, which can be activated over the project viewer. Additionally, the creation of an automatic ceiling can be suppressed when a floor is copied.



Ground floor

General

Name: Ground floor
Level: 0.00 m
Rough height: 4.00 m
Clear height: 3.76 m
Floor height: 4.00 m
☑ Create automatic ceiling

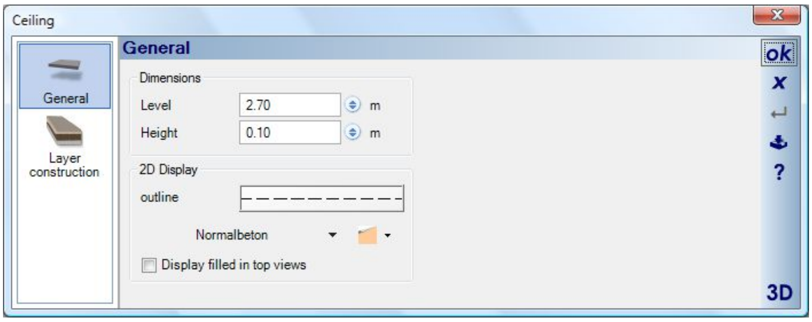
Structure heights
Floor: 0.08 m
Ceiling: 0.16 m
Wall panelling: 0.01 m

9.7.3 Manual Ceilings

In addition to automatic ceilings, ceiling slabs can also be inserted using a rectangle or polygon. Here it is important to consider the visibility in the corresponding 2D plan view. If ceilings are not set explicitly as visible in the view, ceiling slabs can be inserted but the results will not be shown in the view.

9.7.4 Properties of Ceilings

For the possibilities for defining various structural layers please refer to the chapter titled ‘Layer constructions’ of Building Components’. Apart from representation and building material, you can only change the height or thickness of ceilings. The ceiling level/height is the result of the height of the floor of the building minus the thickness of the ceiling.



General

Dimensions

Level 2.70 m

Height 0.10 m

2D Display

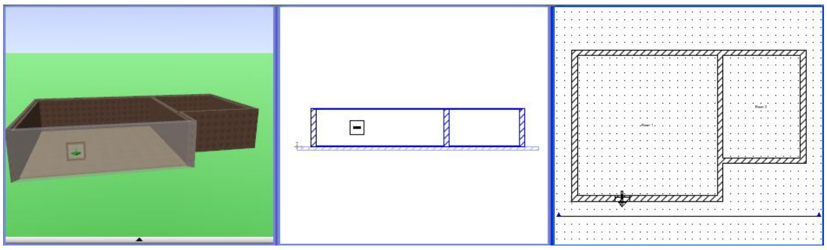
outline

Normalbeton

☐ Display filled in top views

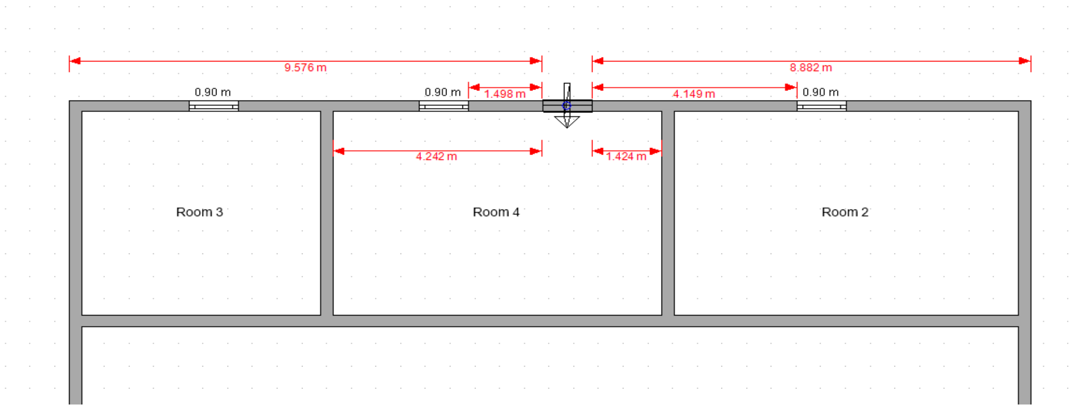
9.8 WINDOWS AND DOORS

Windows and doors can be positioned freely in all views . On input, their reference points can be changed using ‘Ctrl+w’, and of course the construction aids can also be used. The software automatically recognizes in views / sections the first visible wall within the depth of the section, and offers the element for insertion here. In 3D views, the wall in which the window or door is being positioned appears transparent, to allow a view of the rooms and furnishings behind it.

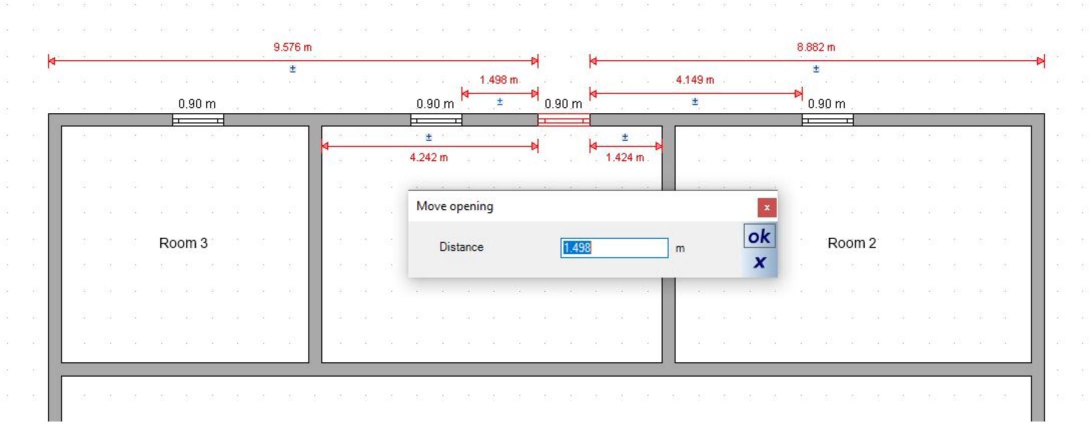


9.8.1 *Numerical input and positioning of windows and doors*

Real time dimension lines also appear when you insert windows and doors into a wall. They serve as an orientation and not to achieve an exact placement at this stage. Instead, insert the element roughly at the position where you want it.



Then select the window or door with a left mouse click. Different dimensions appear depending on your floor plan. These are, for example, the dimensions along the outer wall, measured from the left and right corner of the window.
In addition, the distances to the next interior walls and to the next opening elements.
There is a "button" +/- on each of the dimension lines with which you can enter precisely this distance.



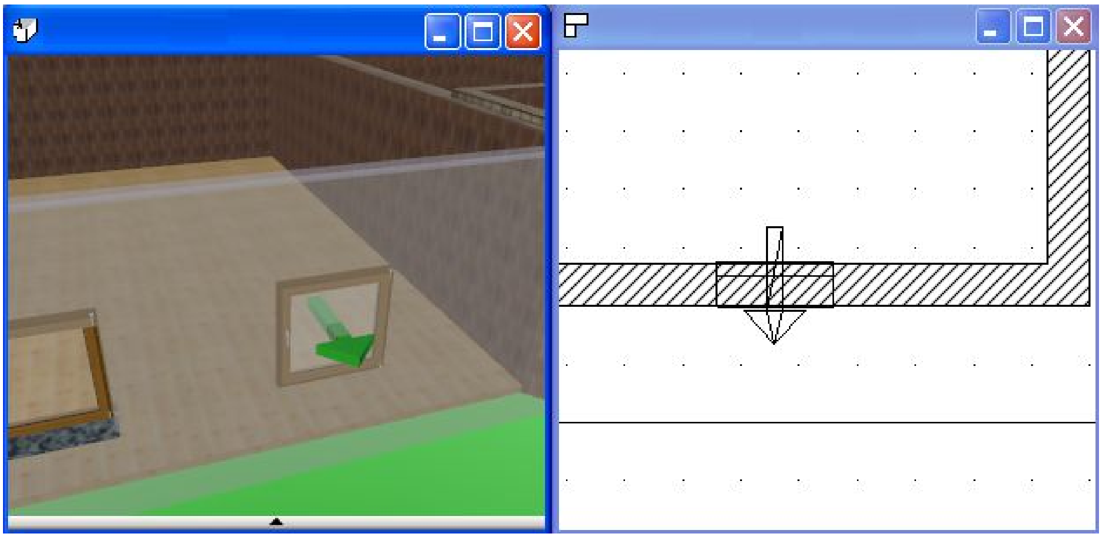
Move opening

Distance 1.498 m

.

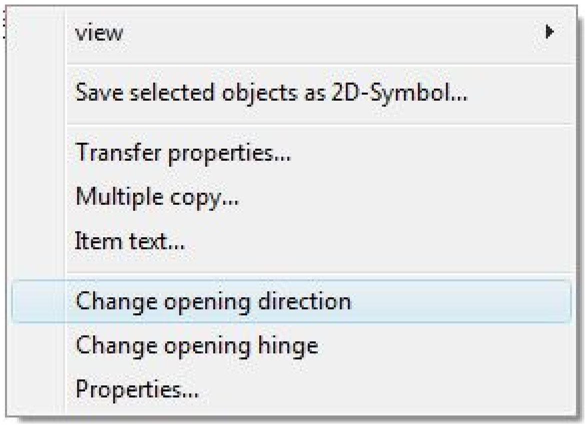
9.8.2 Setting Direction of Opening on Insertion

The direction of opening is indicated by an arrow during insertion in 2D and 3D views. The direction of opening changes in 3D depending on the side of the wall to which the cursor is pointed, and in 2D plan views depending on the position of the cursor in relation to the axis of the wall. In cross-sections the direction of opening does not change on insertion and is always in the direction of the cutting line.



9.8.3 Changing the Direction of Opening

In all views, if a window or door is selected, the direction of opening can be changed over the context menu activated with the right mouse button.

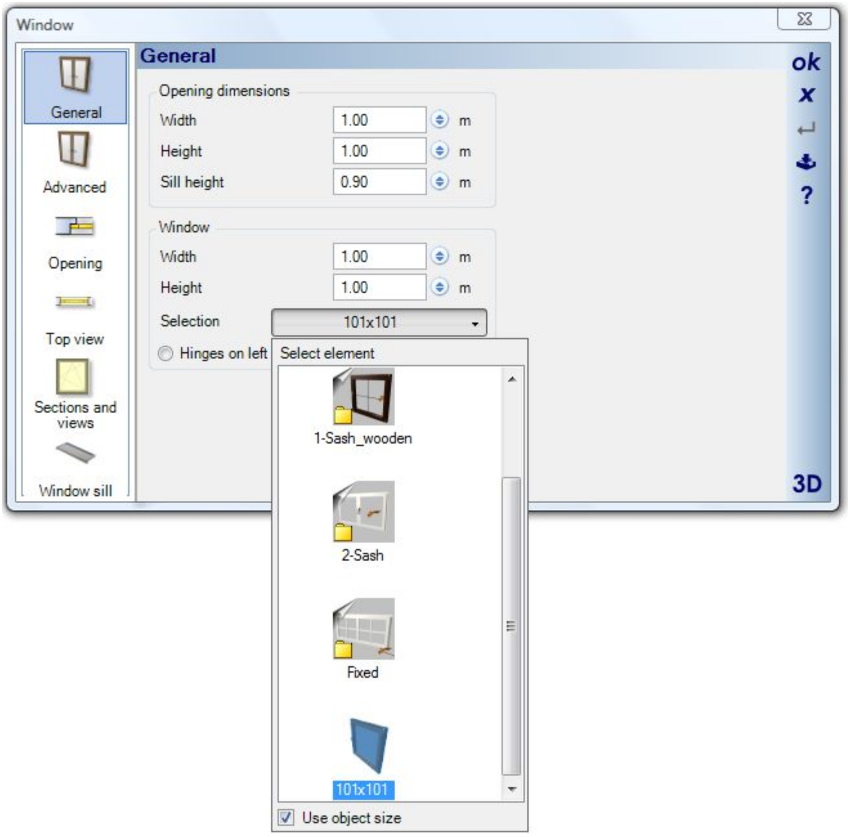


9.8.4 Selecting or Changing Windows and Doors on Insertion

You can position several windows or doors, until input is terminated with ‘Esc’ or over the context menu. It is therefore recommended that on insertion, or before you insert the first of several elements, the correct object with the correct properties is used, to avoid subsequent changes as far as possible. As with other elements, while the input tool is active the ‘Properties’ dialog can be opened over ‘Properties’ in the context menu activated with the right mouse-button.
You can select another object from the catalog, change its properties, terminate the dialog with ‘OK’ and then continue the insertion procedure.

9.8.5 Selecting Windows and Doors from the Catalog

As already mentioned in the chapter ‘Catalog Selection in Dialogs’, 3D objects for windows and doors can be selected from the appropriate catalog. A double mouse click selects an object or switches to a sub-directory. The ‘Use object size’ option at the bottom of the selection window specifies whether the current values for the dimensions of the opening should be retained, or whether they should be overwritten by the dimensions of the 3D object. If you accept the values of the 3D object, the size of the opening is changed, unless the current opening and the 3D object already have identical values. If instead you retain the values for the current opening, the size of the object is modified to fit the opening.



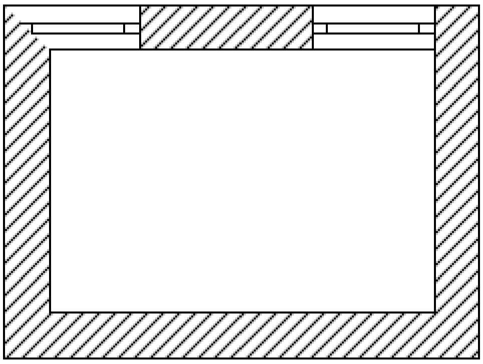
Opening dimensions
Width 1.00 m
Height 1.00 m
Sill height 0.90 m

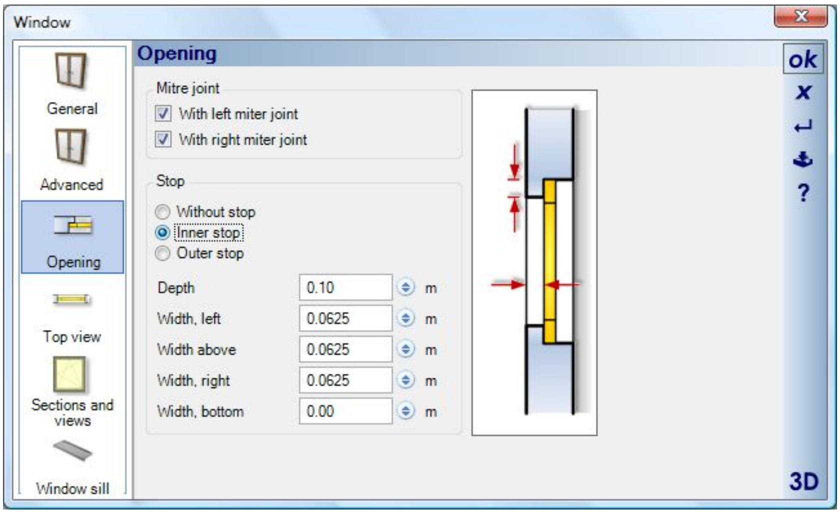
Window
Width 1.00 m
Height 1.00 m
Selection 101x101
○ Hinges on left

☑ Use object size

9.8.6 Openings, Hinges

The ‘Mitres’ part of the dialog enables windows and doors to be placed at the intersection of walls, and to create a corresponding opening there. On the left you see a window where a mitre is allowed, and on the right where one is not allowed.





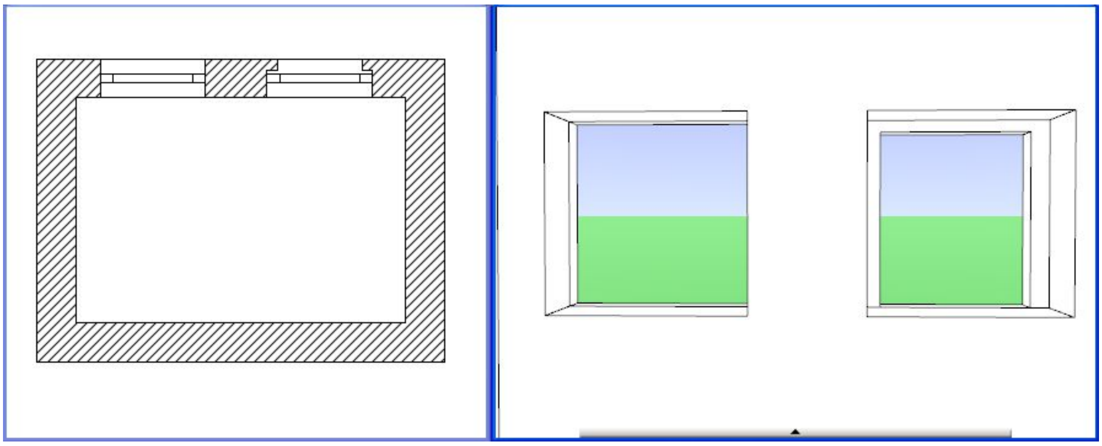
Opening

Mitre joint
☑ With left miter joint
☑ With right miter joint

Stop
○ Without stop
● Inner stop
○ Outer stop

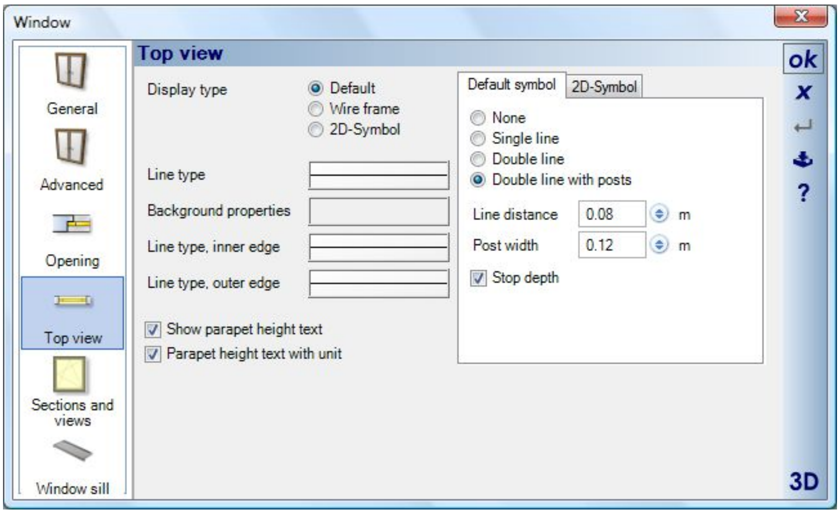
Depth 0.10 m
Width, left 0.0625 m
Width above 0.0625 m
Width, right 0.0625 m
Width, bottom 0.00 m

The ‘stop’ part of the dialog also changes the settings for the (invisible) 3D body which surrounds the window and is deducted from the 3D body of the wall. The results can not only be seen in the 2D views, but also in 3D. In the 3D view the window objects are set as invisible, so that the stop can be seen.



9.8.7 *Representation in 2D Plan Views*

The options for the representation of windows and doors in 2D plan views may differ in detail, but the basic options are identical. Both objects offer the options ‘Standard’, ‘Wire frame’ and ‘Symbol file’. For the ‘Standard’ option you can specify, using the properties available together with line- and fill-in styles, the settings which t uses to draw the alternative representation of the object in the plan.
The ‘Wire frame’ option provides a wire frame representation of the 3D door or window object, in exactly the same way as for furnishings from the catalog.
If the 3D object has an integrated symbol file available, which can be allocated using the chunk editor (see chapter ‘Alternative 2D Representation of 3D Objects, Chunk Type 2D Alternative Representation’), then this file is used with the specified scaling options.
It should be noted for doors with the representation option set to ‘none’, that you can no longer select these doors, or see that a door has been selected, in 2D plan views, since the alternative representation of the object, which is normally highlighted in a specified colour on selection, is missing.



Top view

Display type ● Default ○ Wire frame ○ 2D-Symbol

Line type

Background properties

Line type, inner edge

Line type, outer edge

☑ Show parapet height text

☑ Parapet height text with unit

Default symbol | 2D-Symbol

○ None
○ Single line
○ Double line
● Double line with posts

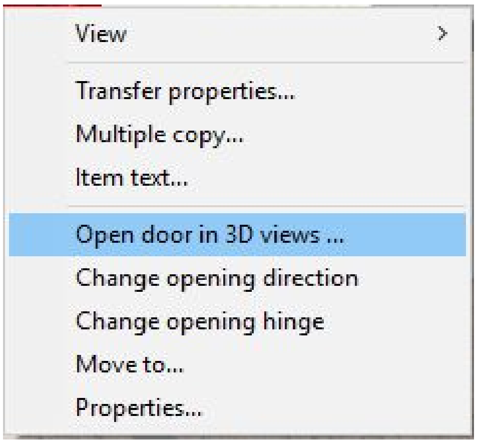
Line distance 0.08 m

Post width 0.12 m

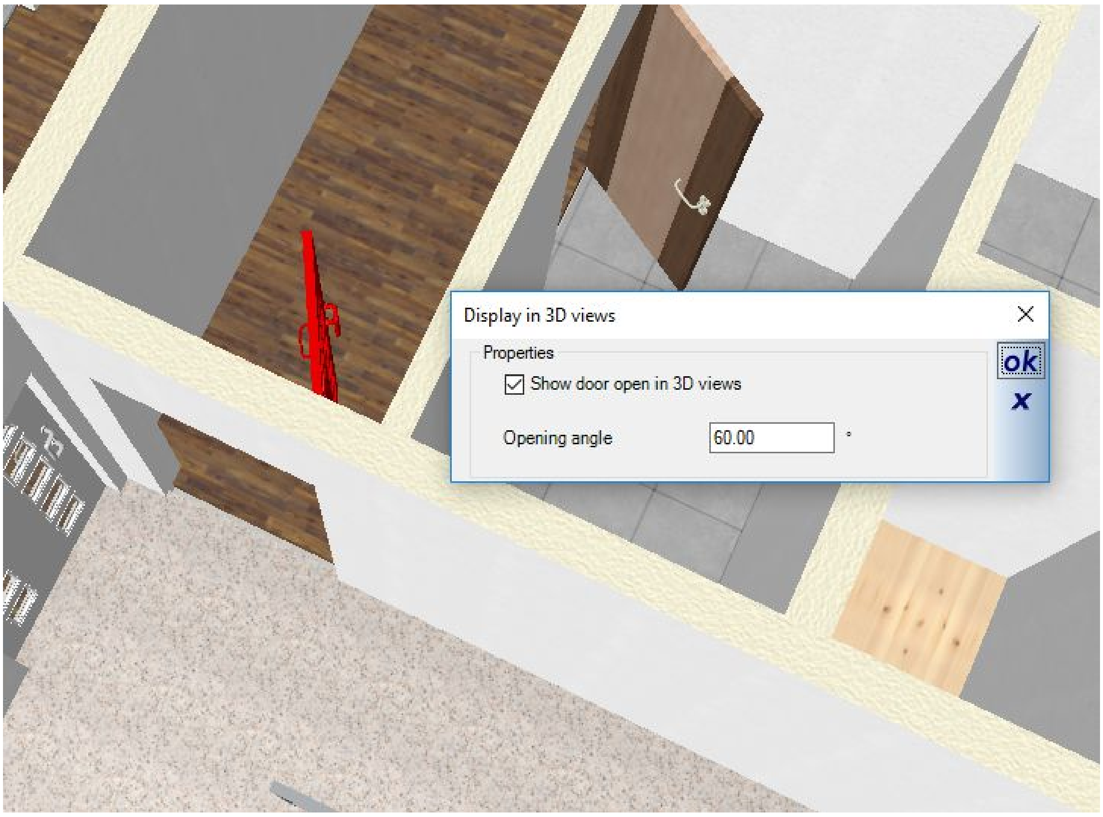
☑ Stop depth

9.8.8 Show doors opened in 3D Views

You can now “open” your doors in 3D views. To do this, select the door and choose "Open door in 3D views ..." from the context menu. Alternatively, find the same option in the properties dialog of the door.



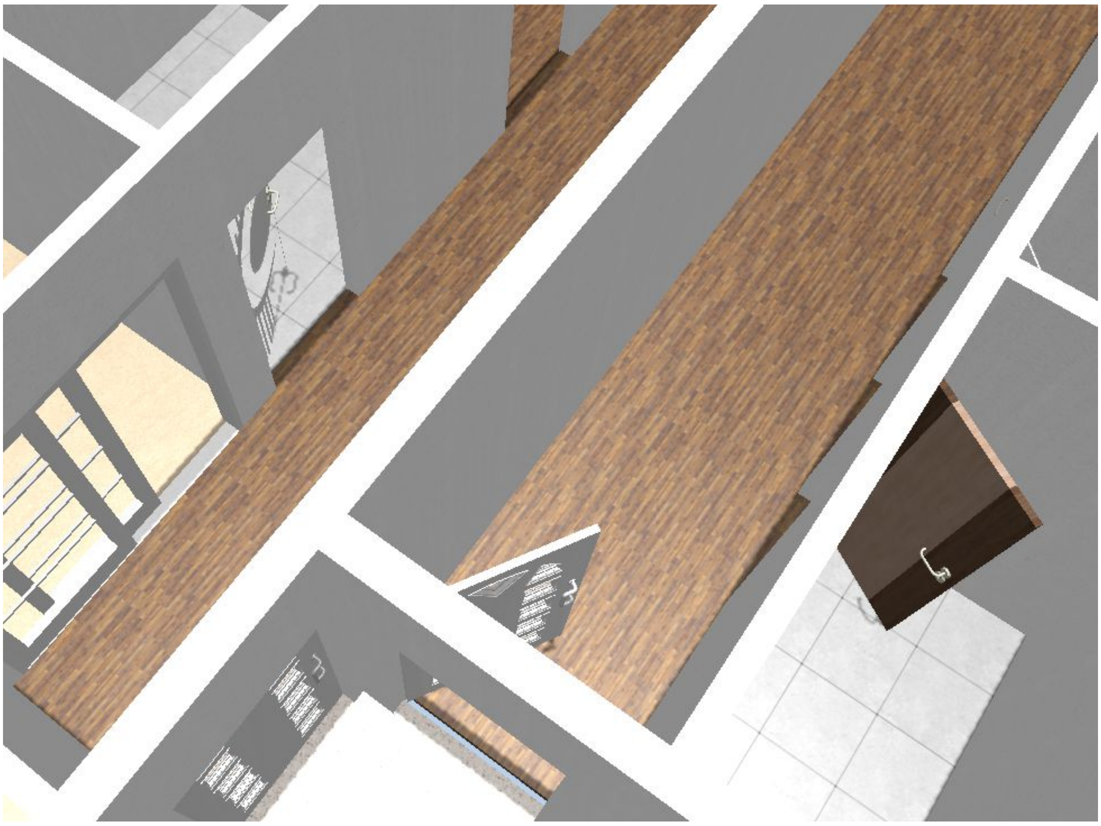
The context menu then opens a dialog in which you can activate the option and specify an opening angle. The option is needed to close the door again.



☑ Show door open in 3D views

Opening angle 60.00 °

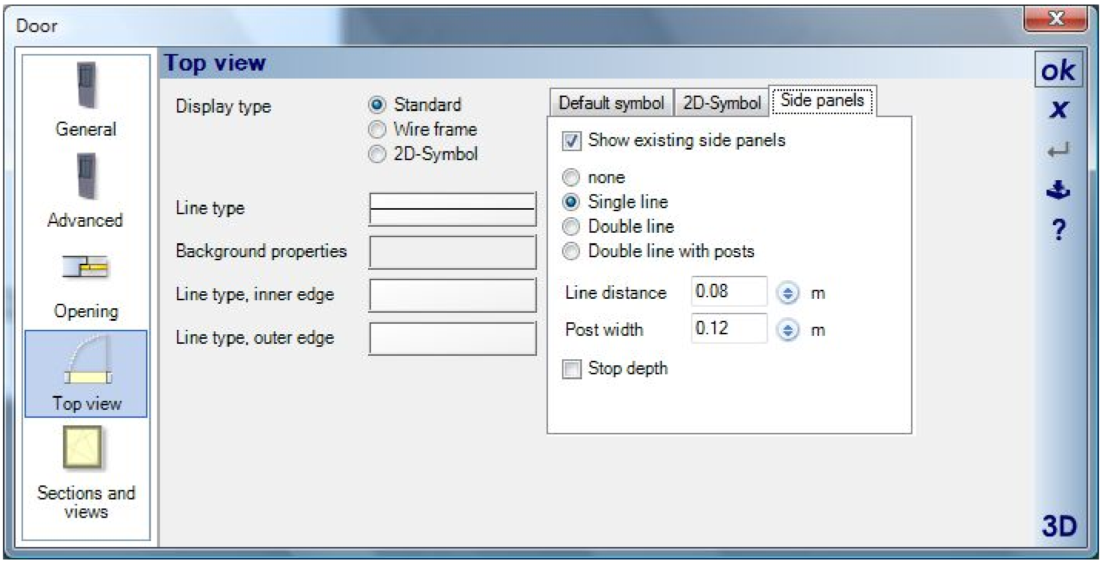
This feature has often been desired for 3D top views. So far, neither hinge nor opening direction of the doors were recognizable in such cases. But also for a more realistic representation of the scenes when wandering through or for 360 degrees panoramic sequences, in which you move from one room to another and no longer run through closed doors.



The option always rotates the entire door 3D object and is therefore reasonable for simple doors only and not for those with two wings or side panels.

9.8.9 2D Representation of Doors, Side Panels, Folding and Sliding Doors

Using the chunk editor, door objects can be allocated additional properties with regard to their representation when used in planning. This includes the allocation of user-drawn 2D symbols, the definition of side panels, and properties for the representation of folding and sliding doors.
Further settings for the representation of side panels can be specified using the ‘Side panels’ tab in the door dialog.



Top view

Display type: ● Standard ○ Wire frame ○ 2D-Symbol

Line type

Background properties

Line type, inner edge

Line type, outer edge

☑ Show existing side panels

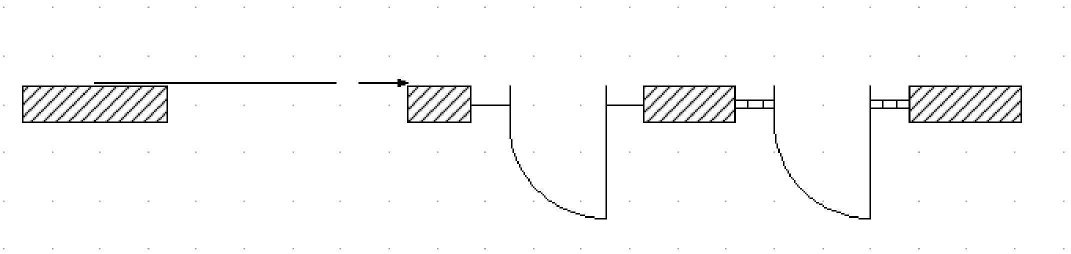
○ none
● Single line
○ Double line
○ Double line with posts

Line distance 0.08 m

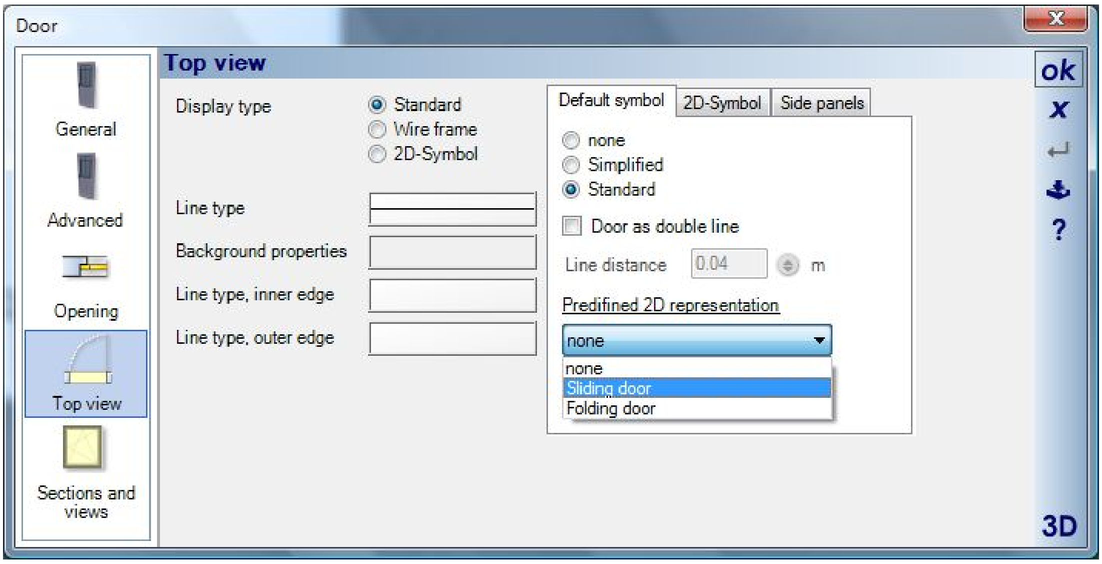
Post width 0.12 m

☐ Stop depth

The following illustration shows, from left to right, a sliding door, and a front door with side panels represented by a single line and by a double line with posts.



The predefined alternative representations can be used to change the representation from a standard door to a sliding or a folding door.



Top view

Display type: ● Standard ○ Wire frame ○ 2D-Symbol

Line type

Background properties

Line type, inner edge

Line type, outer edge

○ none
○ Simplified
● Standard

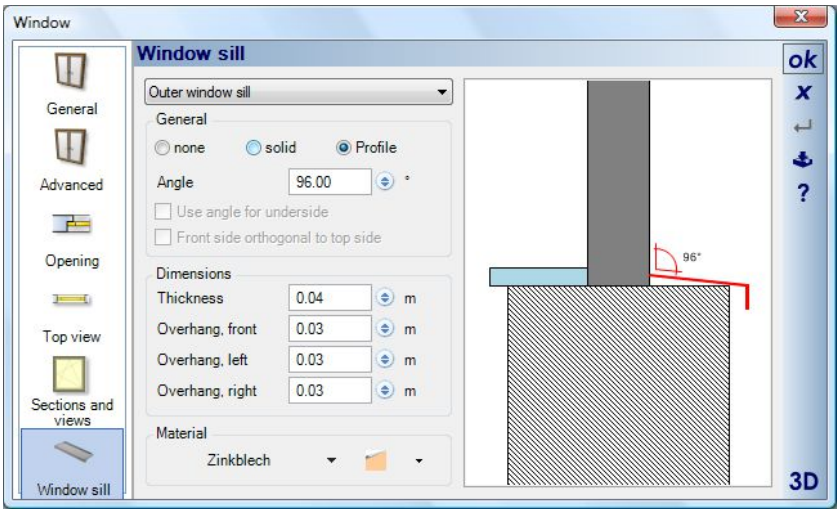
☐ Door as double line

Line distance 0.04 m

Predifined 2D representation: none

9.8.10 Window Sills

Windows sills are not derived from 3D objects, but are generated by the program itself based on values which are specified in the dialog. This is done separately for exterior and interior sills. In addition to the 3D preview, a drawing shows the profile of the window sill, so that the effects of the values entered can be checked immediately.



Window sill

Outer window sill

General

○ none ○ solid ● Profile

Angle 96.00 °

☐ Use angle for underside

☐ Front side orthogonal to top side

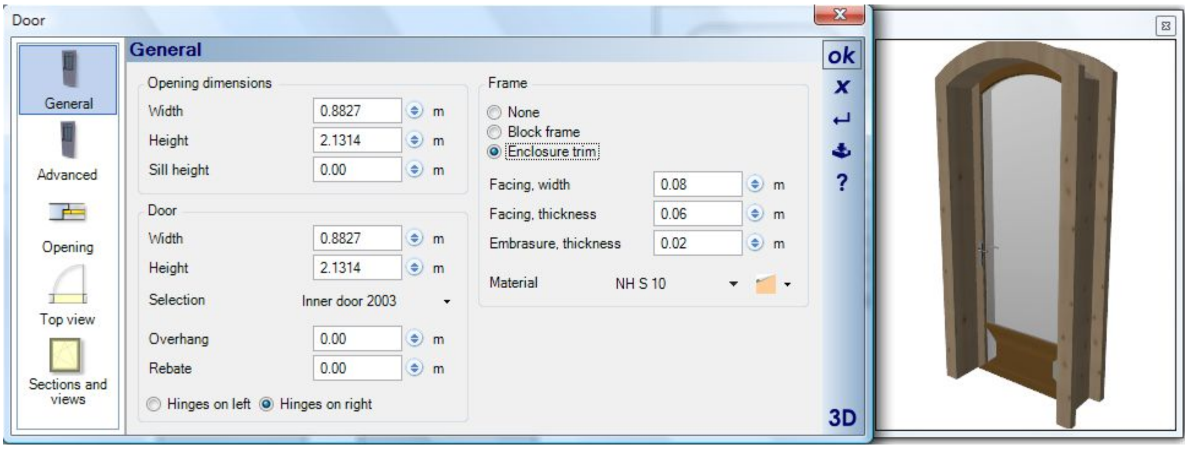
Dimensions

Thickness	0.04	m
Overhang, front	0.03	m
Overhang, left	0.03	m
Overhang, right	0.03	m

Material Zinkblech

9.8.11 Door Frames

As with window sills, door frames are also generated as a 3D model with specified values. For each door leaf object you can create an internally-fitted or closed frame.



General

Opening dimensions

Width	0.8827	m
Height	2.1314	m
Sill height	0.00	m

Door

Width	0.8827	m
Height	2.1314	m
Selection	Inner door 2003	
Overhang	0.00	m
Rebate	0.00	m

○ Hinges on left ● Hinges on right

Frame

○ None
○ Block frame
● Enclosure trim

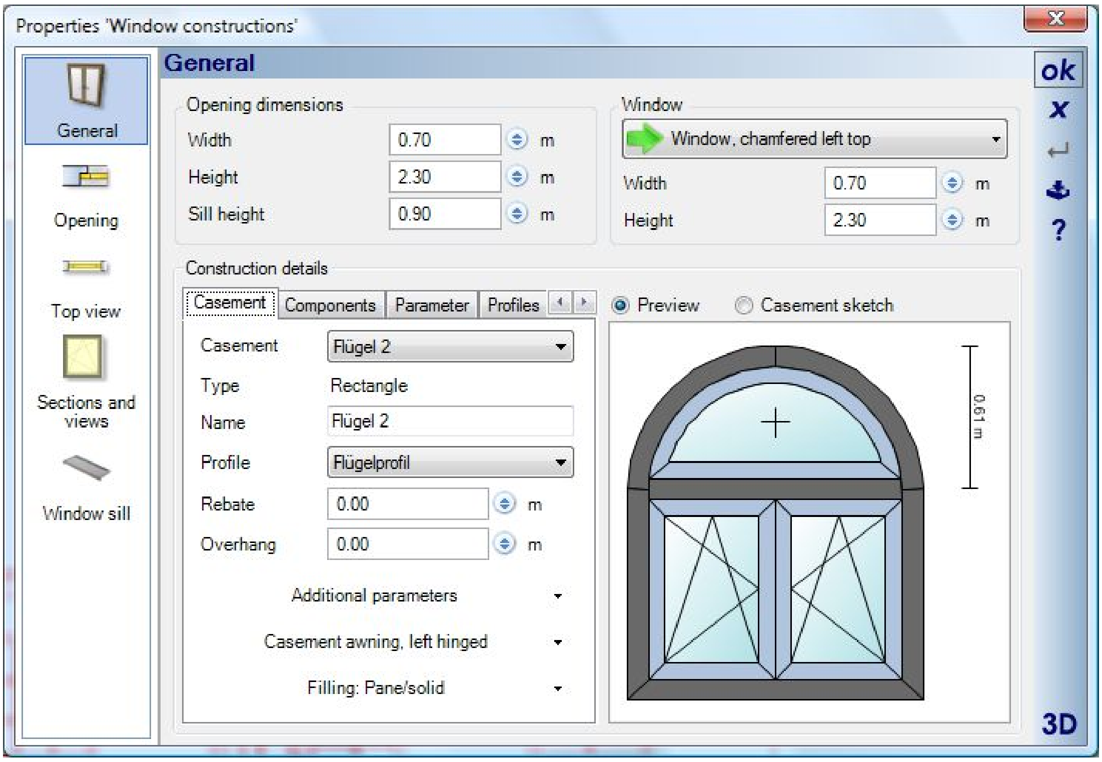
Facing, width	0.08	m
Facing, thickness	0.06	m
Embrasure, thickness	0.02	m

Material NH S 10

9.9 WINDOW CONSTRUCTIONS

9.9.1 *General*

Standard windows have the advantage that they can be entered directly, and since they are predefined 3D objects, no further details need be specified. On the other hand, their dimensions can only be altered realistically within certain limits. If the size of a window selected from the 3D objects is changed, then the object itself, including all sub-objects, is scaled to reflect the new dimensions. For instance, if a window measures 1 x 1 m and its frame is 10 cm wide, then if its dimensions are changed to 2 x 2m the frame is 'widened' to 20 cm.
Window constructions avoid this problem, since all component parts are defined individually and the 3D object for the 'finished' window is automatically reconstructed when any details of the component parts are changed. The 'Window construction' dialog caters for all necessary modifications to windows.



Properties 'Window constructions'

General

Opening dimensions
Width 0.70 m
Height 2.30 m
Sill height 0.90 m

Window
Window, chamfered left top
Width 0.70 m
Height 2.30 m

Construction details

Casement Flügel 2
Type Rectangle
Name Flügel 2
Profile Flügelprofil
Rebate 0.00 m
Overhang 0.00 m

Additional parameters
Casement awning, left hinged
Filling: Pane/solid

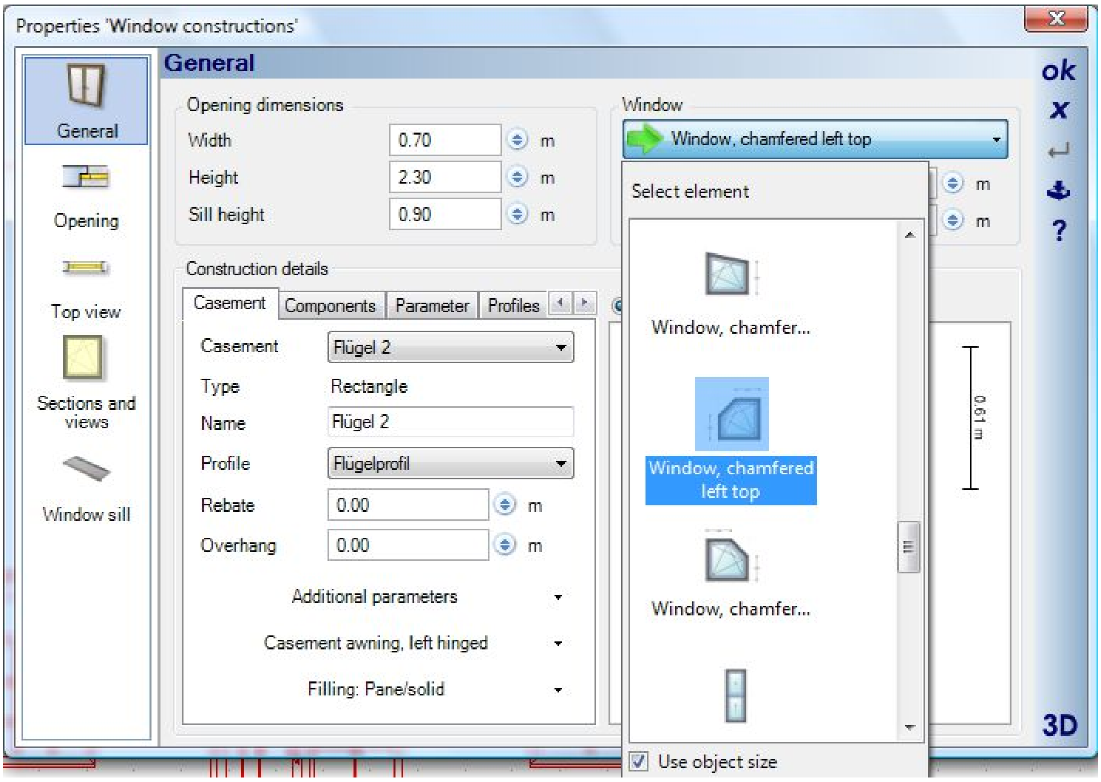
● Preview ○ Casement sketch

0.61 m

9.9.2 *Catalog of Window Constructions*

The most common types of window construction required are contained in a catalog, which can be opened in the 'Window' section, and from which a basic window design can be selected and then modified.

The catalog itself can be extended with the aid of a separate plug-in that contains functions to enable you to design your own windows.



Properties 'Window constructions'

General

Opening dimensions

Width 0.70 m
Height 2.30 m
Sill height 0.90 m

Window: Window, chamfered left top

Construction details

Casement: Flügel 2
Type: Rectangle
Name: Flügel 2
Profile: Flügelprofil
Rebate: 0.00 m
Overhang: 0.00 m

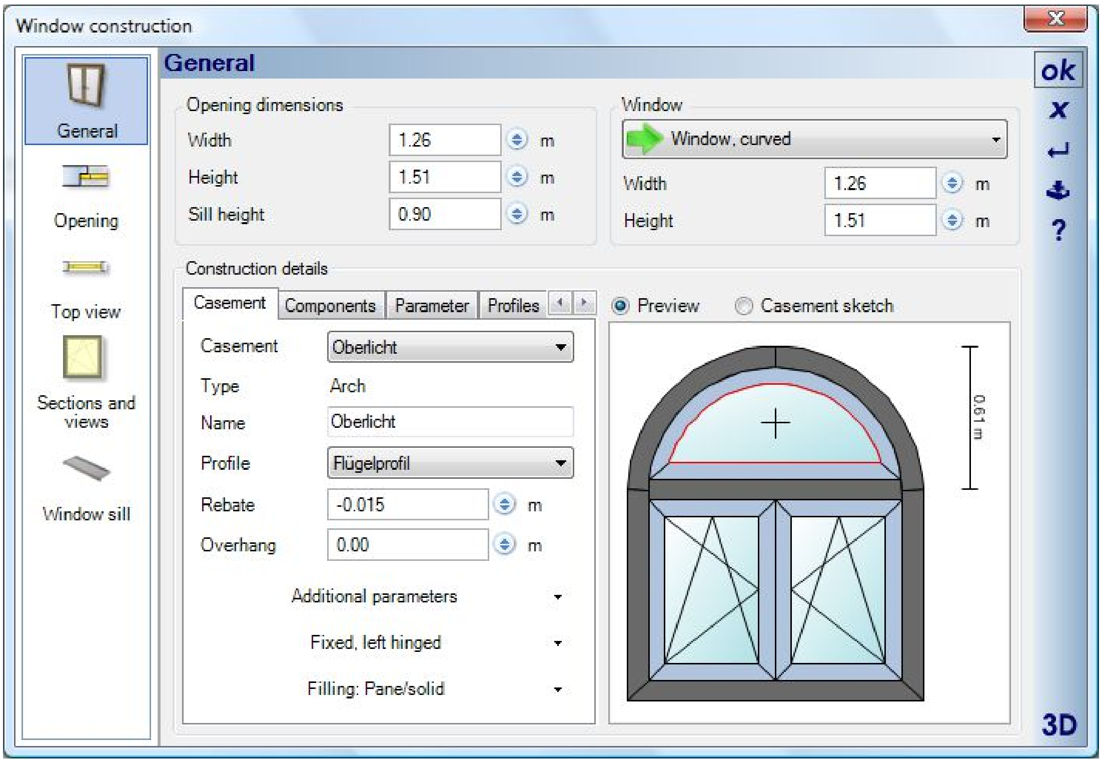
Additional parameters
Casement awning, left hinged
Filling: Pane/solid

☑ Use object size

9.9.3 *Editing Window Constructions*

Window constructions consist of one or more casements. To alter the properties of a casement, first the casement has to be selected. This can be performed with the mouse in the dynamic preview with a click on the desired casement, or by selection from the list in the 'casement' tab.

In the preview the active casement is highlighted in red.



General

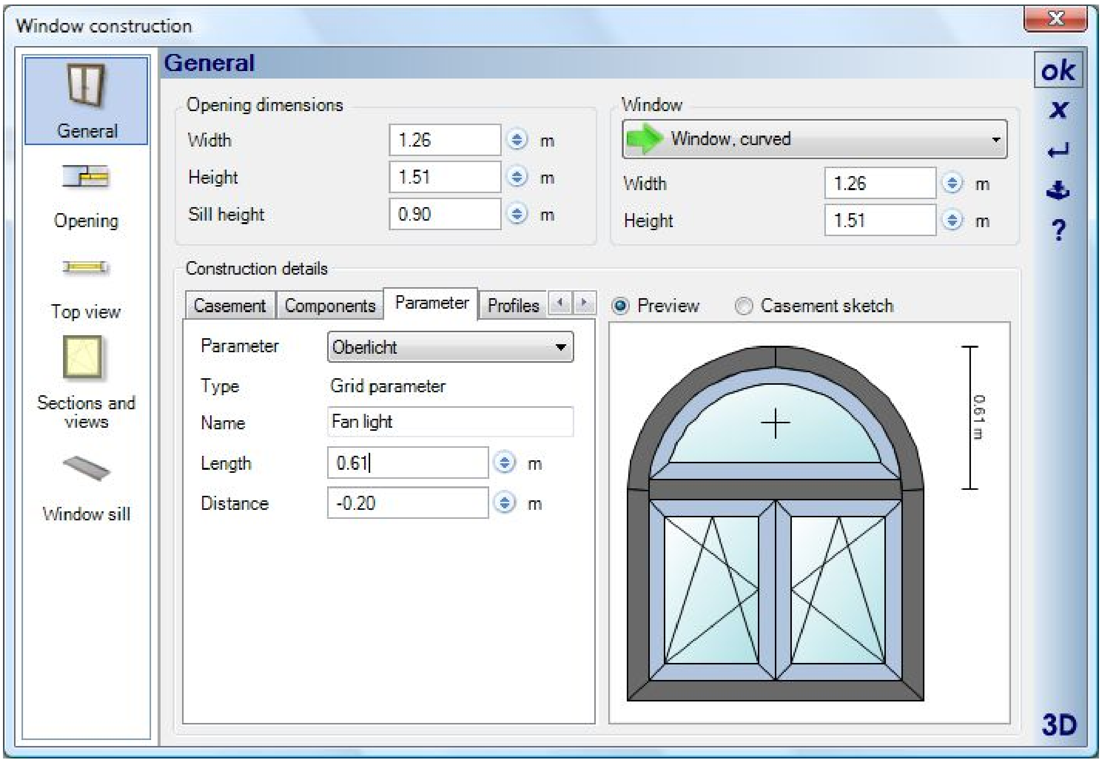
Opening dimensions
Width 1.26 m
Height 1.51 m
Sill height 0.90 m

Window
Window, curved
Width 1.26 m
Height 1.51 m

Construction details
Casement: Oberlicht
Type: Arch
Name: Oberlicht
Profile: Flügelprofil
Rebate: -0.015 m
Overhang: 0.00 m
Additional parameters
Fixed, left hinged
Filling: Pane/solid

● Preview ○ Casement sketch

Window constructions can contain one or more additional dimensions, which are shown in the preview. These additional dimensions and the grid dimension can be changed by clicking on the dimension in the preview, or manually switching to the 'Parameter' tab. In the example shown, the only parameter is for the skylight in the arched window, as can be seen in the preview. The 'Length' field specifies the value for the grid dimension, 'Distance' refers to the distance from the window to the measurement line drawn in the preview, and has no relevance for the construction itself.



General

Opening dimensions
Width 1.26 m
Height 1.51 m
Sill height 0.90 m

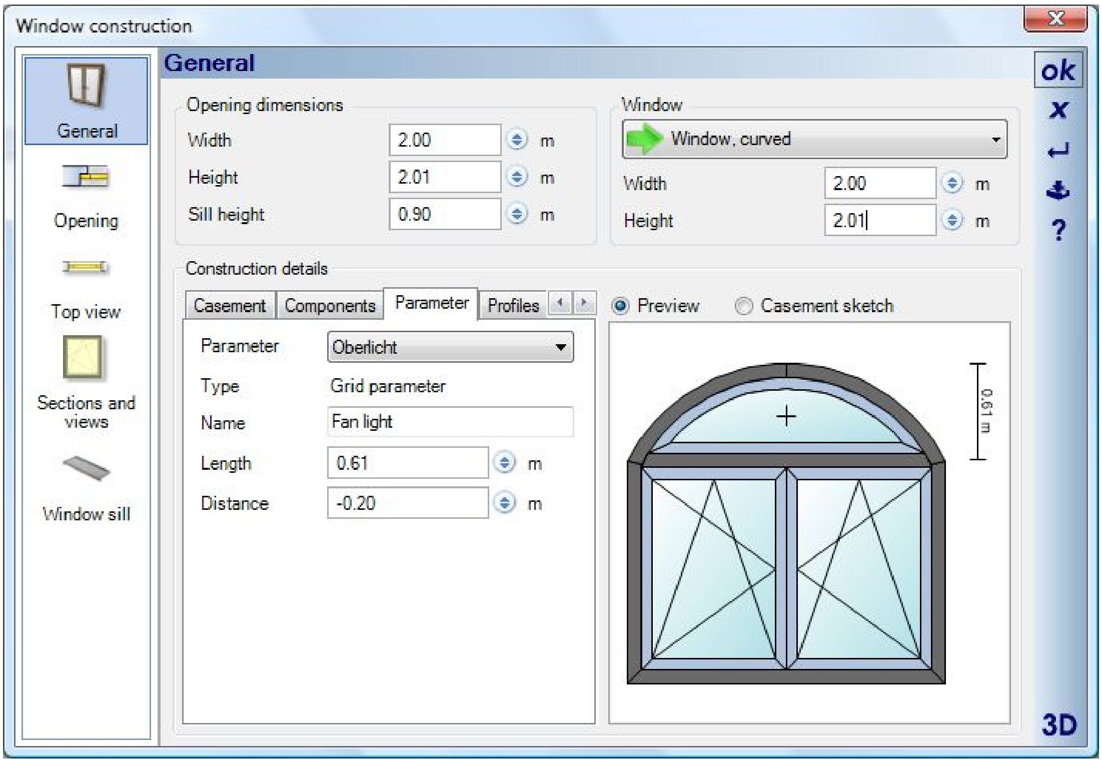
Window: Window, curved
Width 1.26 m
Height 1.51 m

Parameter: Oberlicht
Type: Grid parameter
Name: Fan light
Length: 0.61 m
Distance: -0.20 m

● Preview ○ Casement sketch

In window constructions there are dependencies between the absolute window dimensions and the additional dimensions and grid dimension. In the example shown, the absolute height of the window is 1,51m and the height of the parameterizable skylight is 0,61m. The height of the casements below the skylight is calculated automatically and is thus set to 90 cm. The height the casements is automatically recalculated if the absolute height of the window or the height of the skylight is changed.

An example: You would like to create a version of the existing arched window which is 2.01 m high and 2 m wide. The overall height of the skylight is to be 81cm, the height of the arch 41cm. First change the absolute dimensions of the window to the values given above. The following result should obtained.



General

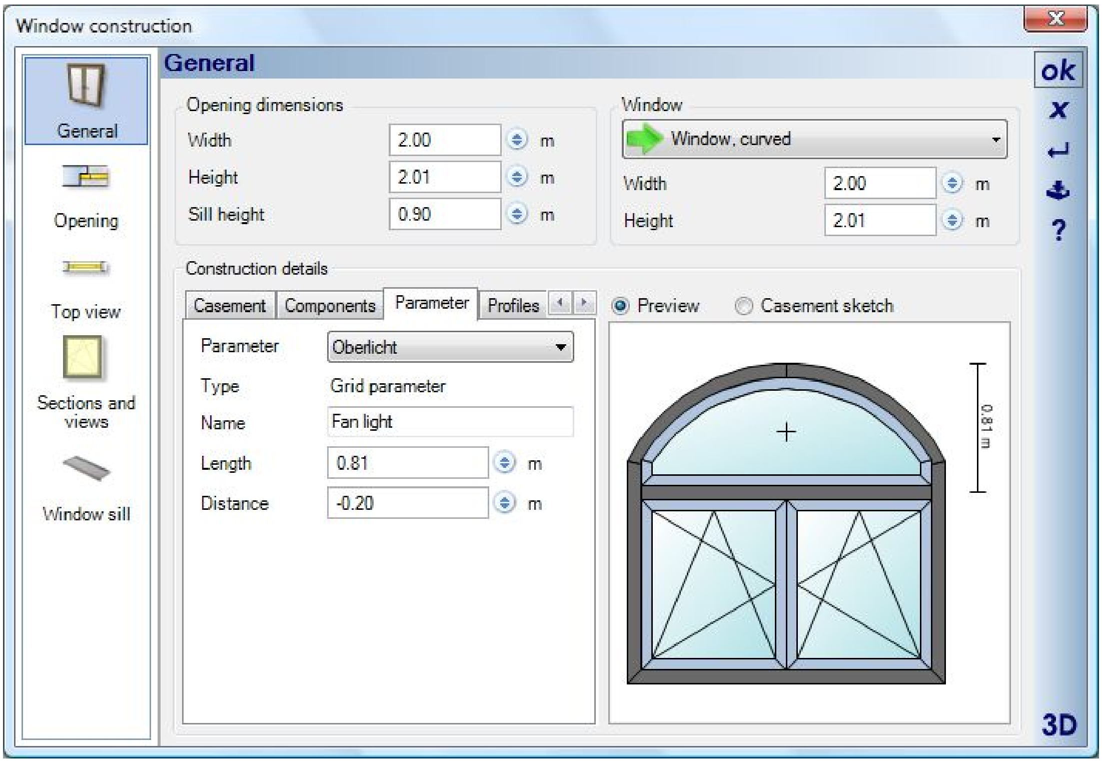
Opening dimensions
Width 2.00 m
Height 2.01 m
Sill height 0.90 m

Window
Window, curved
Width 2.00 m
Height 2.01 m

Construction details
Parameter: Oberlicht
Type: Grid parameter
Name: Fan light
Length 0.61 m
Distance -0.20 m

● Preview ○ Casement sketch

As a result of the changes the casements have now been enlarged accordingly. Only the height of the skylight, which is determined by the additional dimension, remains unchanged. The height of the casements is now automatically 1,40 m. The skylight can now be altered over the additional dimension by clicking on the dimension in the preview and changing the 'Length' value to 0,81 m in the 'Parameter' tab .



General

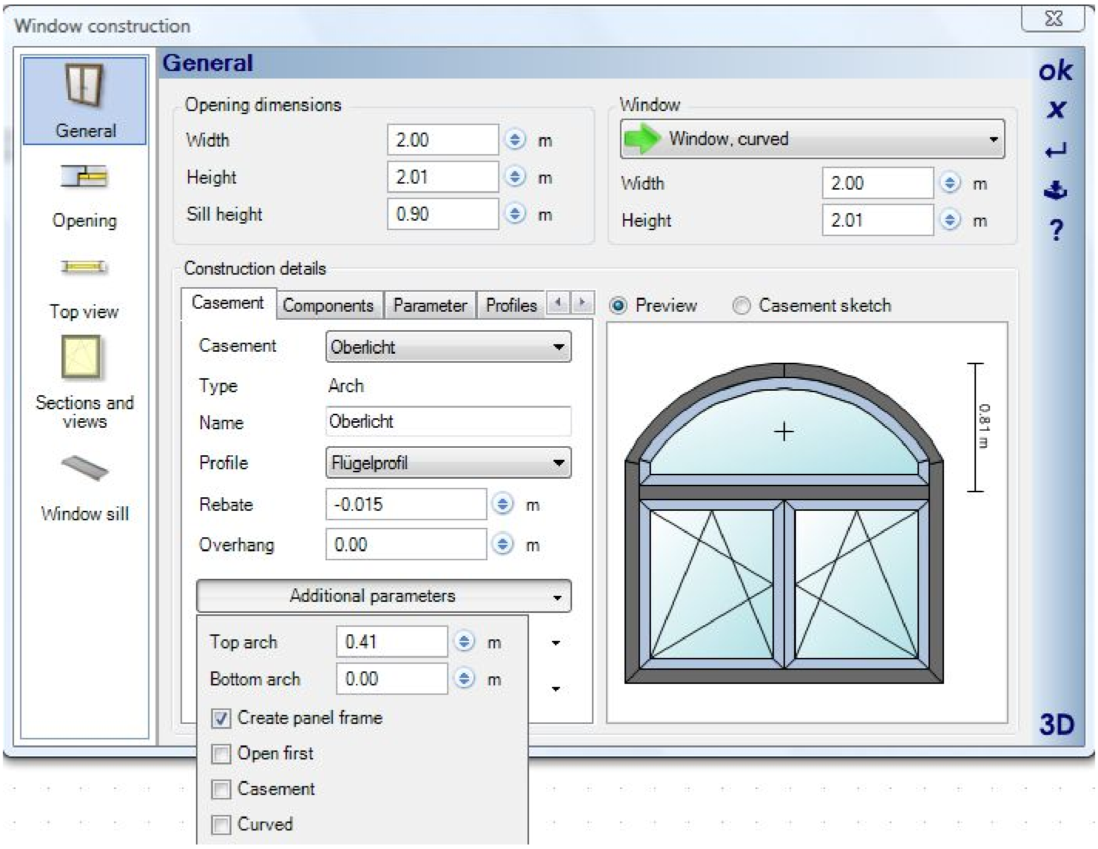
Opening dimensions
Width 2.00 m
Height 2.01 m
Sill height 0.90 m

Window: Window, curved
Width 2.00 m
Height 2.01 m

Construction details
Parameter: Oberlicht
Type: Grid parameter
Name: Fan light
Length 0.81 m
Distance -0.20 m

● Preview ○ Casement sketch

Because of the change made to the additional dimension, the casements are now only 1.20 m high, since the absolute dimensions of the window were left unchanged. Finally, in the example, the height of the arch has to be adjusted, which can be performed in the 'Casement' tab in the section 'Additional parameters'.



Window construction

General

Opening dimensions
Width 2.00 m
Height 2.01 m
Sill height 0.90 m

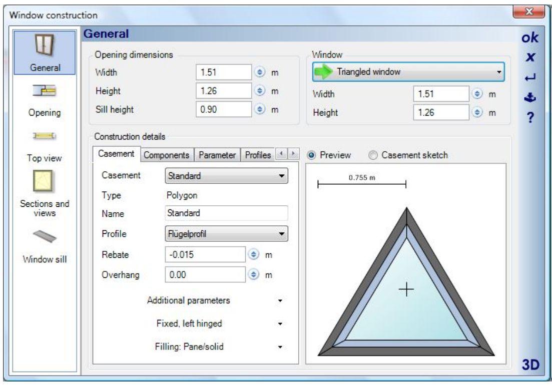
Window: Window, curved
Width 2.00 m
Height 2.01 m

Construction details
Casement | Components | Parameter | Profiles
● Preview ○ Casement sketch

Casement: Oberlicht
Type: Arch
Name: Oberlicht
Profile: Flügelprofil
Rebate -0.015 m
Overhang 0.00 m

Top arch 0.41 m
Bottom arch 0.00 m
☑ Create panel frame
☐ Open first
☐ Casement
☐ Curved

With the aid of the additional dimensions, the examples provided can be modified and different versions created. A triangular window, for instance, can be changed from its original form in order to fit into the corner of a gable wall, as in the example on the right.

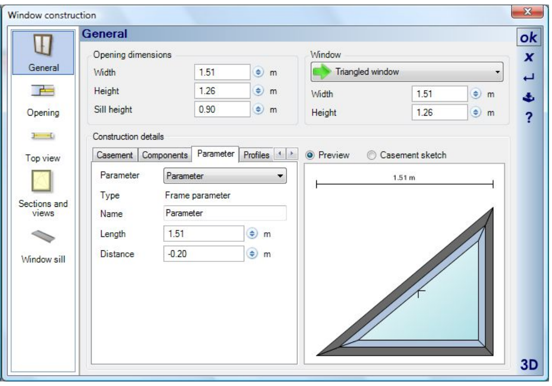


Opening dimensions
Width 1.51 m
Height 1.26 m
Sill height 0.90 m

Window: Triangled window
Width 1.51 m
Height 1.26 m

Construction details
Casement | Components | Parameter | Profiles
● Preview ○ Casement sketch

Casement: Standard
Type: Polygon
Name: Standard
Profile: Flügelprofil
Rebate -0.015 m
Overhang 0.00 m
Additional parameters
Fixed, left hinged
Filling: Pane/solid



Opening dimensions
Width 1.51 m
Height 1.26 m
Sill height 0.90 m

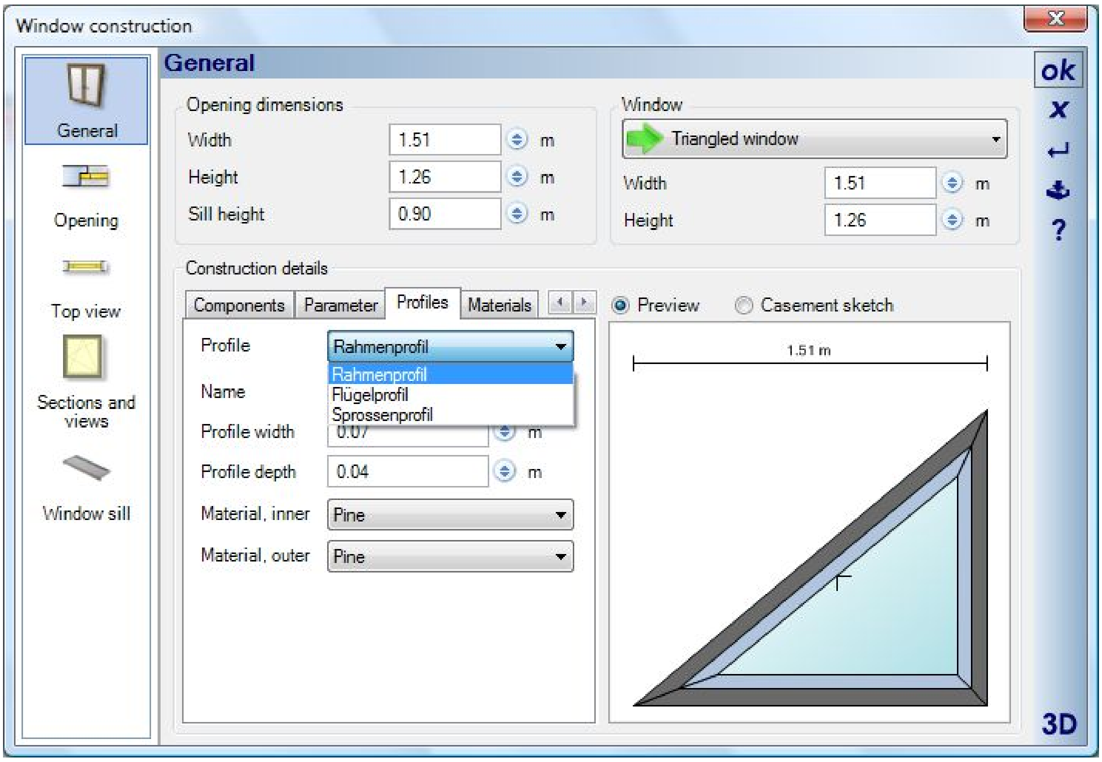
Window: Triangled window
Width 1.51 m
Height 1.26 m

Construction details
Casement | Components | Parameter | Profiles
● Preview ○ Casement sketch

Parameter: Parameter
Type: Frame parameter
Name: Parameter
Length 1.51 m
Distance -0.20 m

9.9.4 Modifying Profiles

Any window construction can contain one or more profiles, which determine the dimensions of the window frame or the casements' frames. Profiles can be selected in the tab of the same name.



Opening dimensions
Width 1.51 m
Height 1.26 m
Sill height 0.90 m

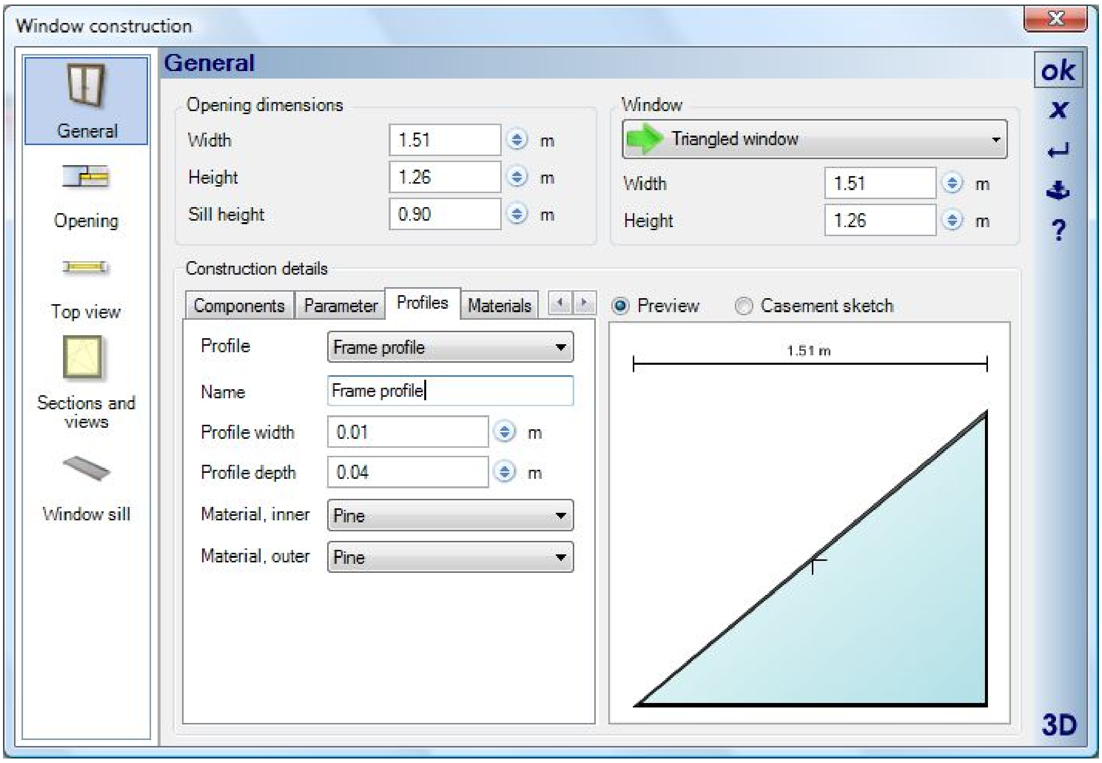
Window: Triangled window
Width 1.51 m
Height 1.26 m

Construction details
Profile: Rahmenprofil
- Rahmenprofil
- Flügelprofil
- Sprossenprofil

Name
Profile width 0.07 m
Profile depth 0.04 m
Material, inner: Pine
Material, outer: Pine

● Preview ○ Casement sketch

Each profile contains values for width and depth, with which frames and frame components can be modified.



Width 1.51 m
Height 1.26 m
Sill height 0.90 m

Window: Triangled window
Width 1.51 m
Height 1.26 m

Profile: Frame profile
Name: Frame profile
Profile width 0.01 m
Profile depth 0.04 m
Material, inner: Pine
Material, outer: Pine

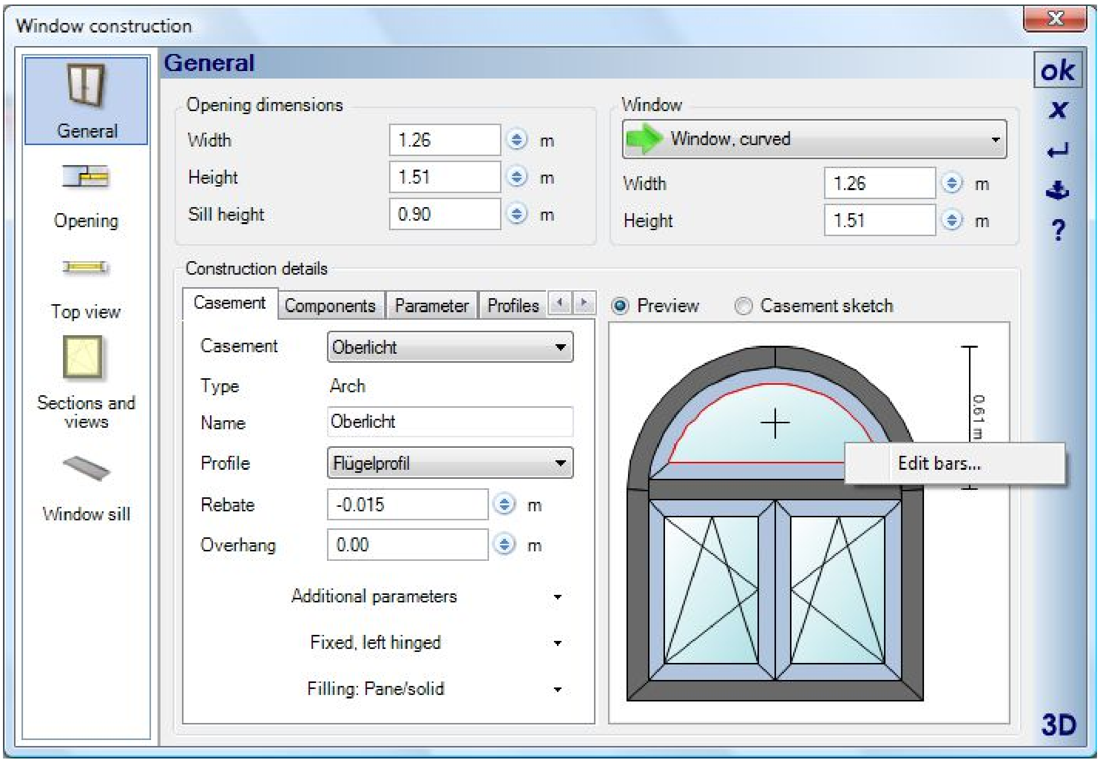
● Preview ○ Casement sketch

9.9.5 *Bars for Window Constructions*

The subject 'Bars' can be divided basically into two areas.:

- Creating and saving bars and bar arrangements
- Allocating and using bars

Bars are always allocated to a casement. The allocation is performed in a selected casement over the context menu activated with a right mouse-click.



General

Opening dimensions
Width 1.26 m
Height 1.51 m
Sill height 0.90 m

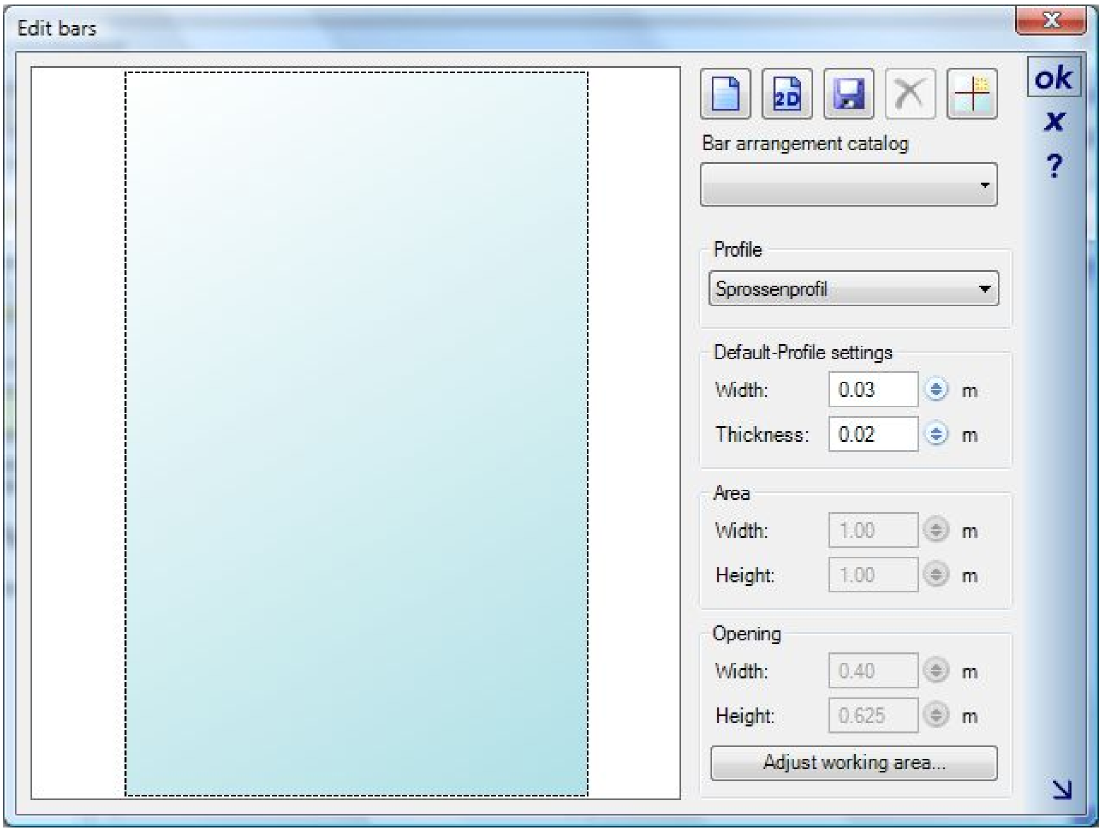
Window
Window, curved
Width 1.26 m
Height 1.51 m

Construction details
Casement Oberlicht
Type Arch
Name Oberlicht
Profile Flügelprofil
Rebate -0.015 m
Overhang 0.00 m

● Preview ○ Casement sketch

9.9.6 Editing Bars

When the 'Edit Bars' dialog is activated, it first shows a preview of the working area.



Profile
Sprossenprofil

Default-Profile settings
Width: 0.03 m
Thickness: 0.02 m

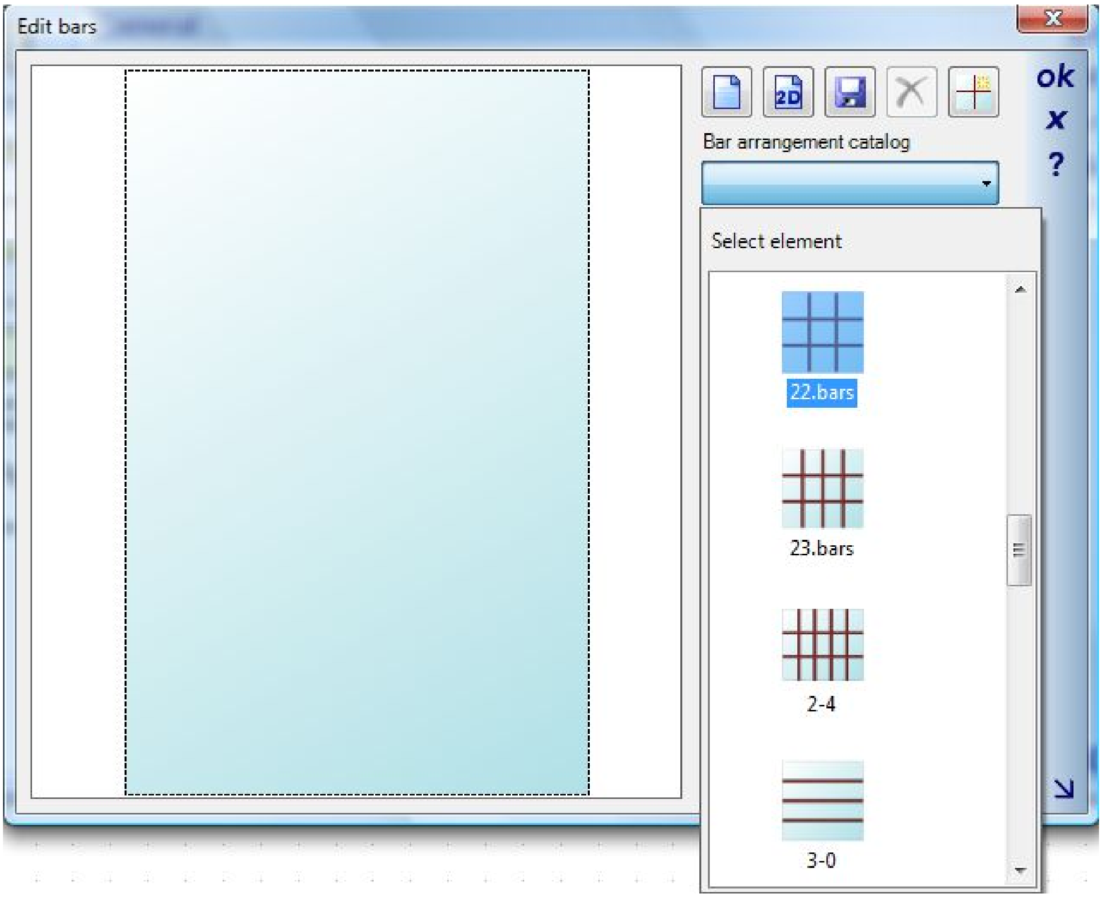
Area
Width: 1.00 m
Height: 1.00 m

Opening
Width: 0.40 m
Height: 0.625 m

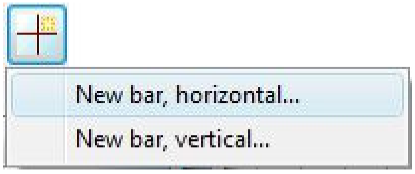
There are three possible ways to create bar arrangements in the working area:

- Load a bar arrangement from the catalog
- Create a bar arrangement from a 2D symbol
- Enter individual bars

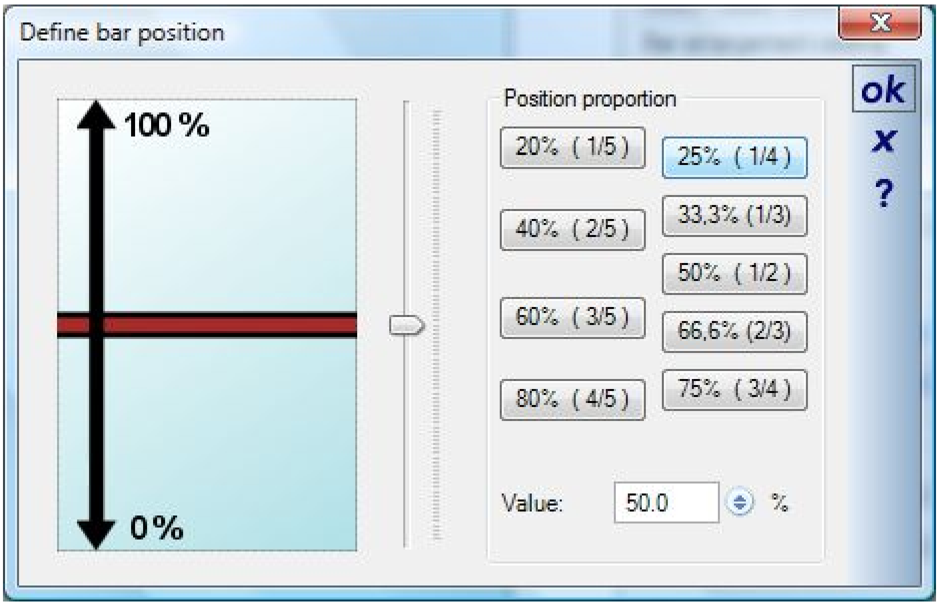
Selection from the catalog is performed in the same way as for other elements. User-created bar arrangements are also available in the catalog if the are saved in the directory Installation\AEC\Bars. This can be performed directly in the dialog with the 💾 button.



Single bars can be added using the following button and the corresponding context menu:

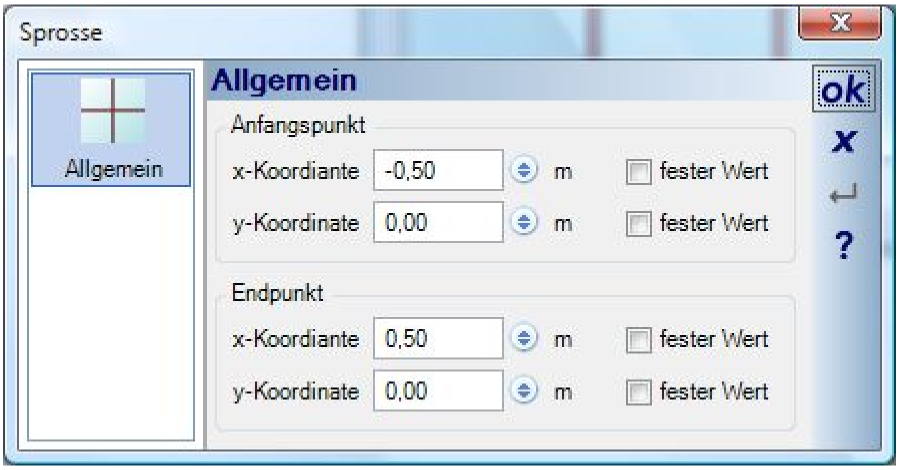


Positioning of the bars is performed in the dialog which then appears.



Value: 50.0 %

When a bar has been positioned, you can change its position numerically in the following dialog and at the same time specify whether the value is fixed. If a value is not defined as fixed, the position of the bar will change accordingly when the casement size is changed.



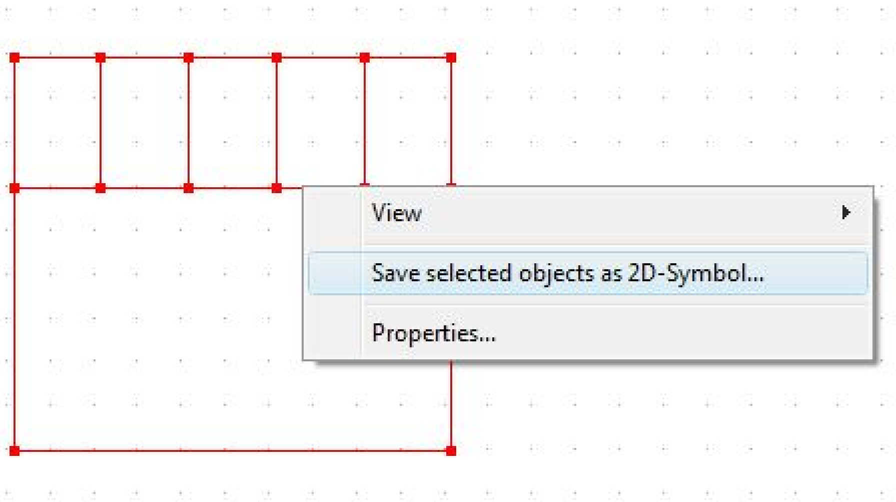
Anfangspunkt
x-Koordiante -0,50 m ☐ fester Wert
y-Koordinate 0,00 m ☐ fester Wert

Endpunkt
x-Koordiante 0,50 m ☐ fester Wert
y-Koordinate 0,00 m ☐ fester Wert

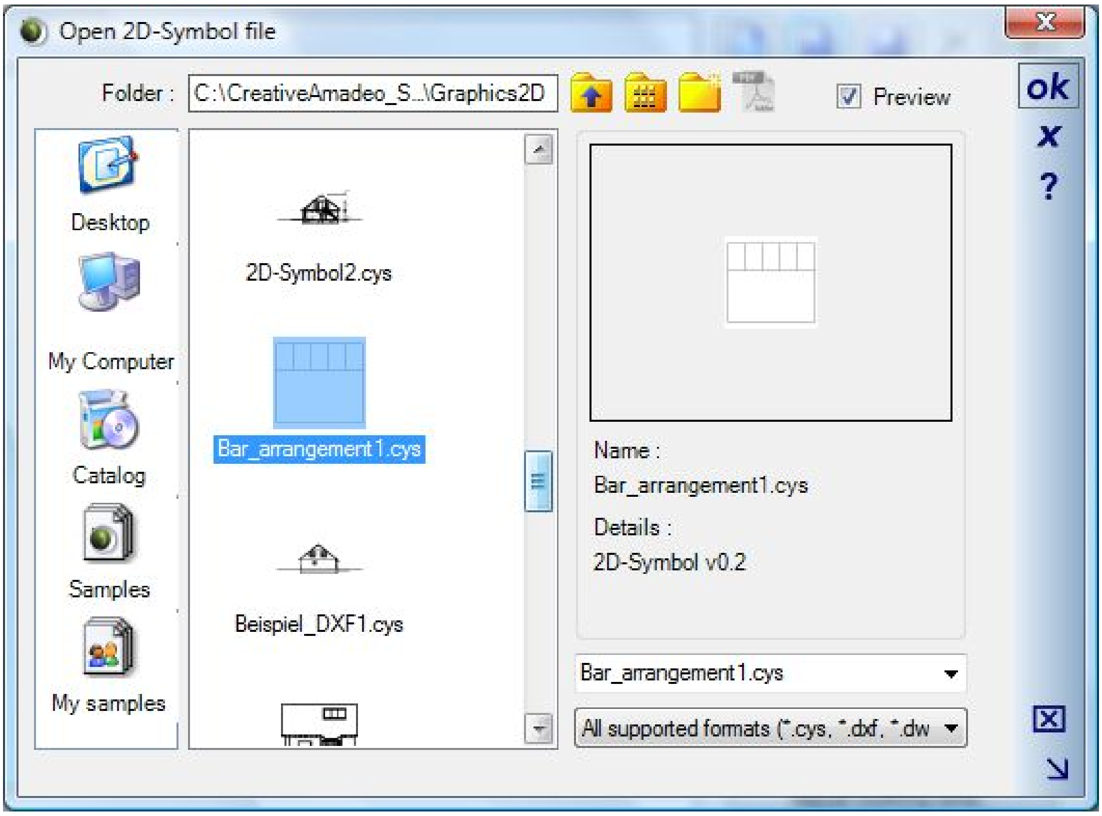
9.9.7 Drawing Bar Arrangements

Another way to create bar arrangements is by drawing a 2D symbol using the graphic functions of the 2D graphic plug-in.
First draw a rectangle. Within the rectangle draw the 'bars' as lines. Select the rectangle and lines using a selection frame and save the elements as a 2D symbol in the catalog.

Drawing a bar arrangement and saving it as a 2D symbol:



The 2D symbol drawn can be imported using the '2D' button. The surrounding rectangle is then removed and only the lines will be imported as bars.



Folder : C:\CreativeAmadeo_S...\Graphics2D

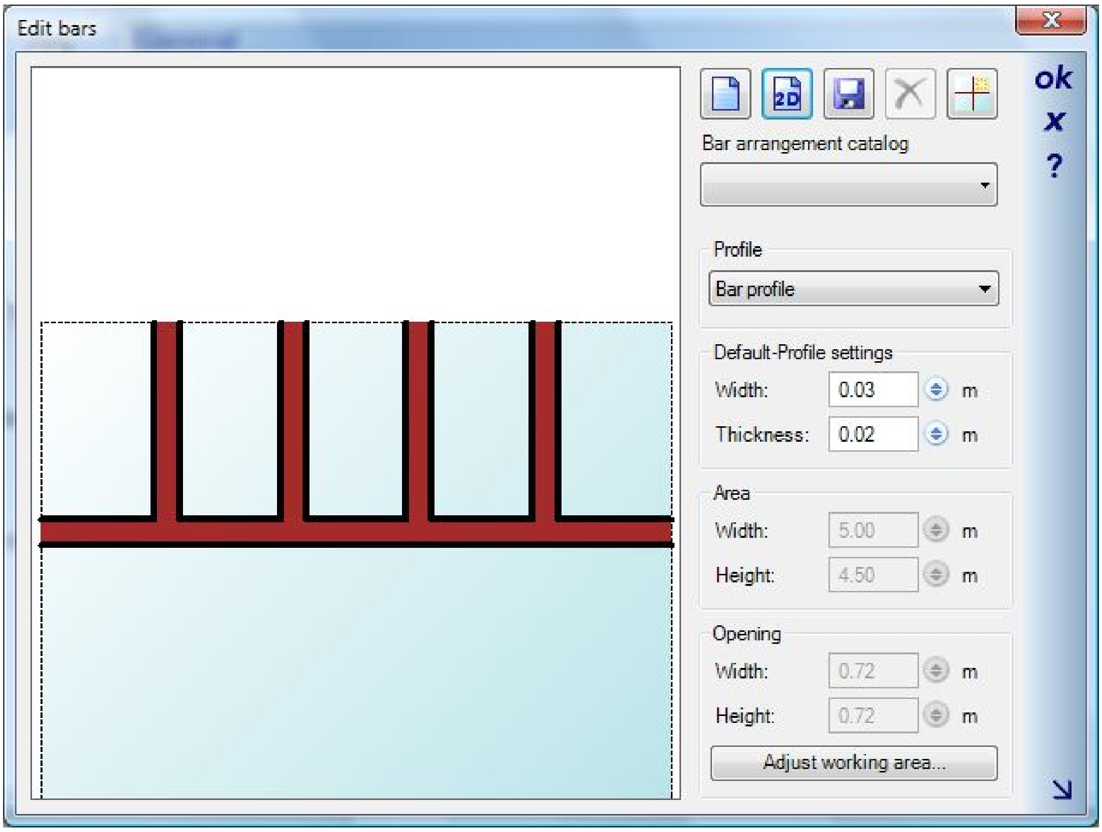
☑ Preview

Name :
Bar_arrangement1.cys

Details :
2D-Symbol v0.2

Bar_arrangement1.cys

The imported result:



Profile: Bar profile

Default-Profile settings

Width: 0.03 m

Thickness: 0.02 m

Area

Width: 5.00 m

Height: 4.50 m

Opening

Width: 0.72 m

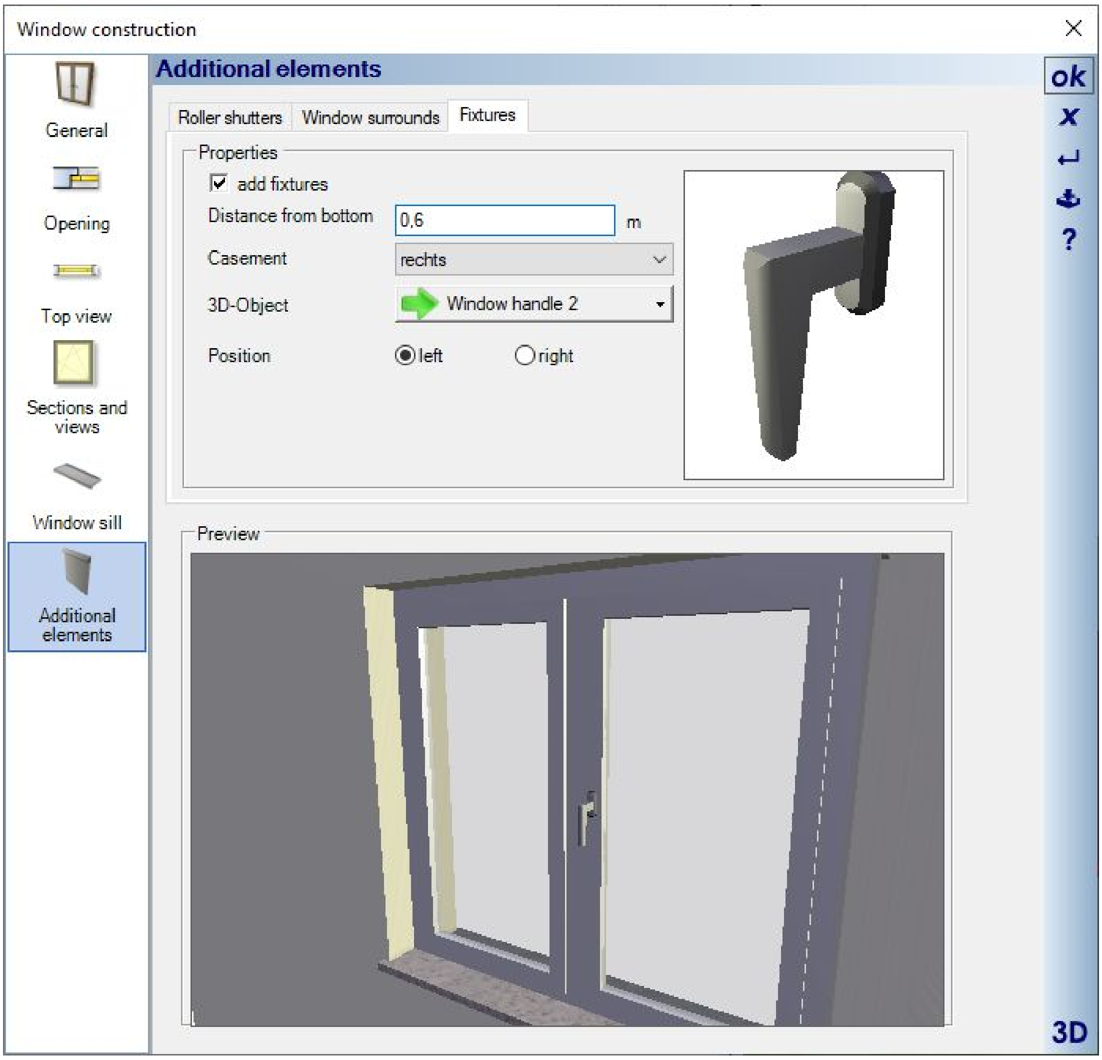
Height: 0.72 m

The dimensions of the bars can be modified as usual in the corresponding profile. Every window construction always contains automatically a profile for bars.

9.10 ADDITIONAL COMPONENTS FOR WINDOW CONSTRUCTIONS, WINDOWS AND DOORS

You can activate additional elements for the mentioned elements within the property dialog. These include roller shutters and lintels, window surrounds and fixtures (handles).

Depending on the element, certain options are disabled in the dialog, so the option fixtures for doors and windows from 3D objects is not available because both, doors and windows consist of finished 3D objects and fixtures are or should be included there. Fixtures are only available for window constructions.
In the dialogs, you find all properties and options on a separate page for additional elements.
On this dialog page you get a tab for each topic and a 3D preview in which you can check the effects of the settings. The 3D preview behaves exactly like a normal 3D view, so you can zoom, rotate, etc..



Properties

☑ add fixtures

Distance from bottom: 0,6 m

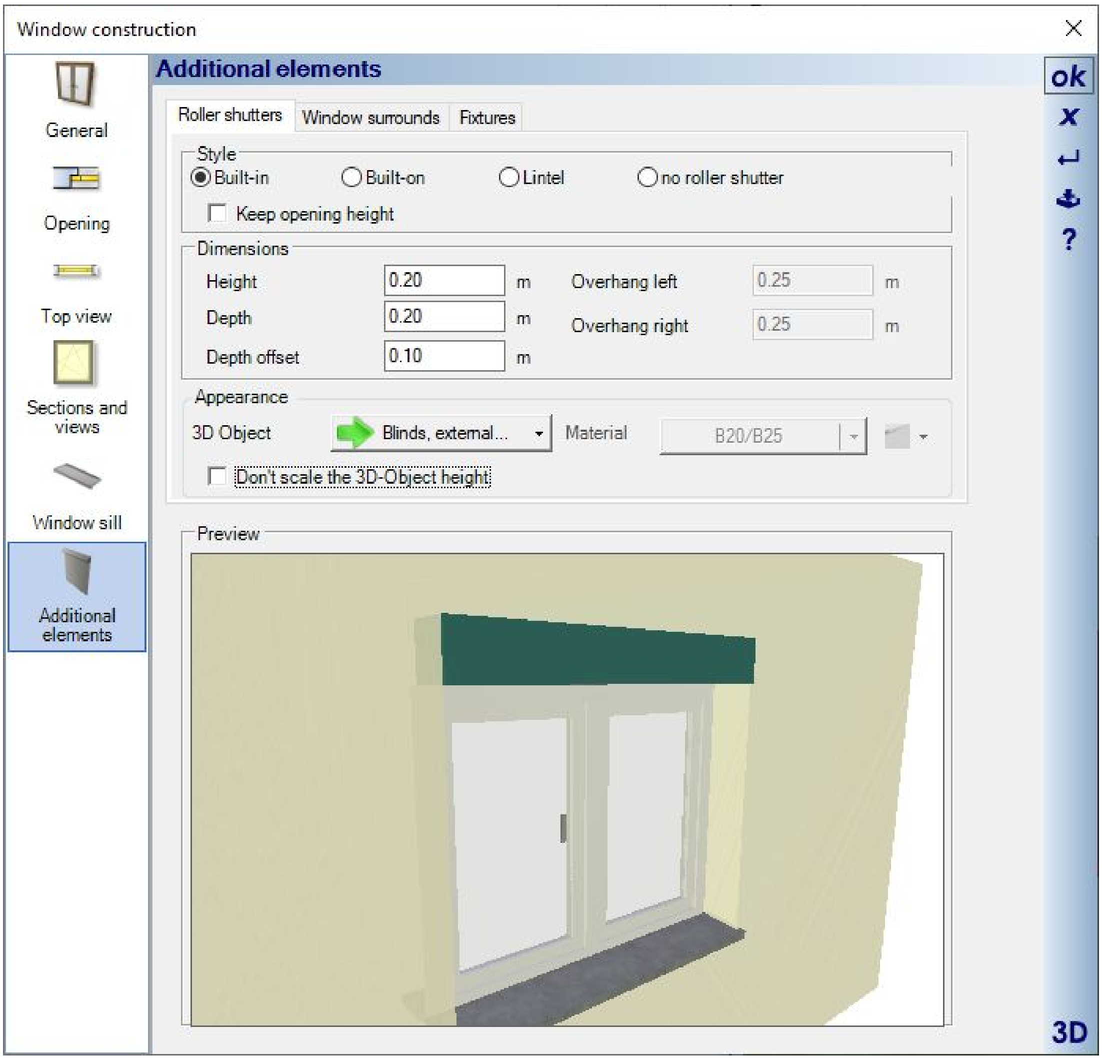
Casement: rechts

3D-Object: Window handle 2

Position: ● left ○ right

9.10.1 *Lintels and roller shutters*

You can activate various roller shutter designs and lintels on the roller shutter property page.
Lintels are internally generated by the software based on the dimensions, roller shutters are loaded and scaled from finished 3D objects in our catalog.
The option "Keep opening height" determines whether the window height should be decreased by the height of the roller shutter or the window height remains and the roller shutter above increases the wall opening.

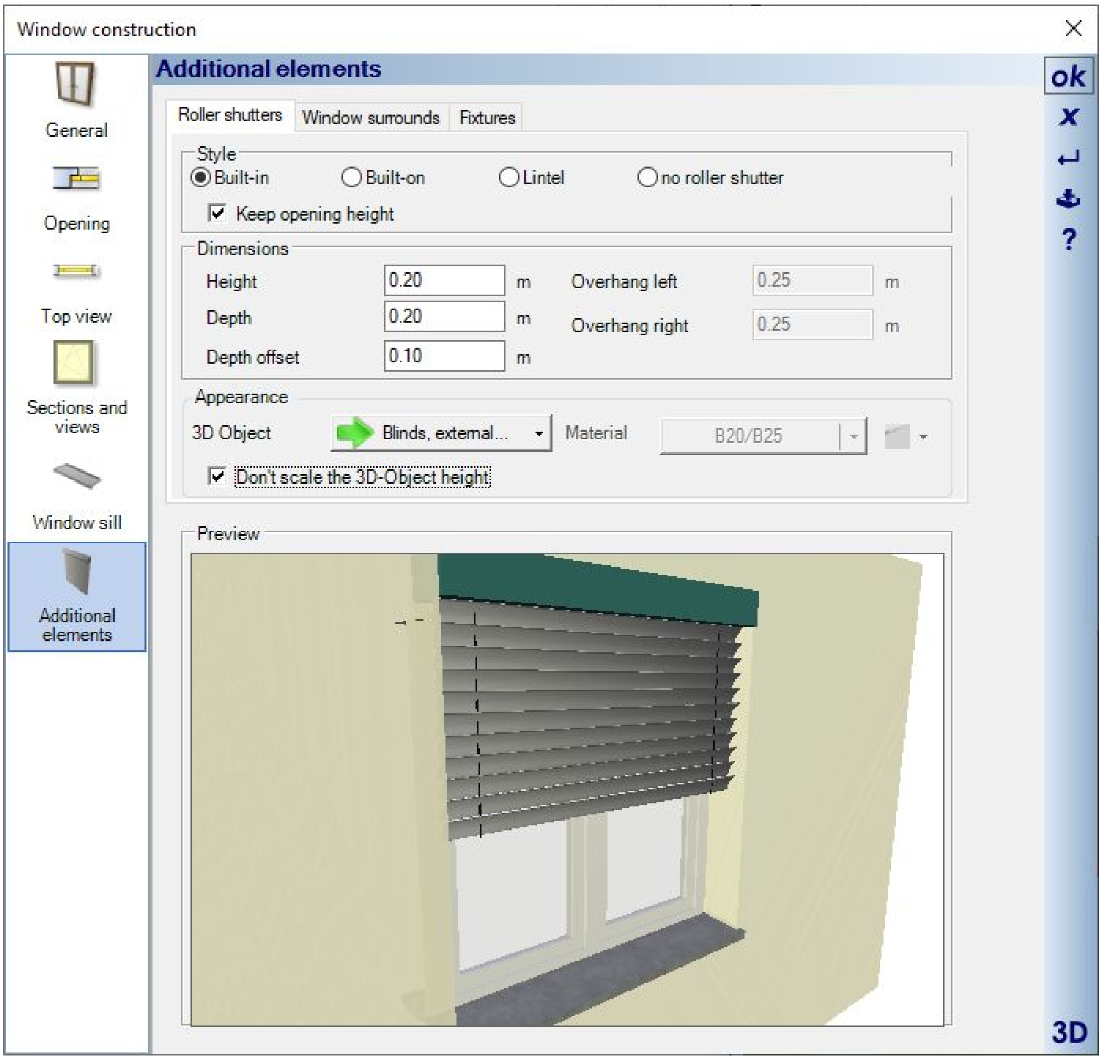


Style
● Built-in ○ Built-on ○ Lintel ○ no roller shutter
☐ Keep opening height

Dimensions
Height 0.20 m
Depth 0.20 m
Depth offset 0.10 m
Overhang left 0.25 m
Overhang right 0.25 m

Appearance
3D Object: Blinds, external...
Material: B20/B25
☐ Don't scale the 3D-Object height

The software already contains an extensive catalog of 3D objects for the various roller shutter designs. Including those in which the slats are visible at different heights.
You can use this to make your views and 3D visualizations a little bit more realistic.
If you choose a 3D object with visible slats, you would have to use the "Don't scale the 3D Object height" option to ensure that the new 3D object is not scaled down to the pure roller shutter dimensions.
The following example shows such a constellation:



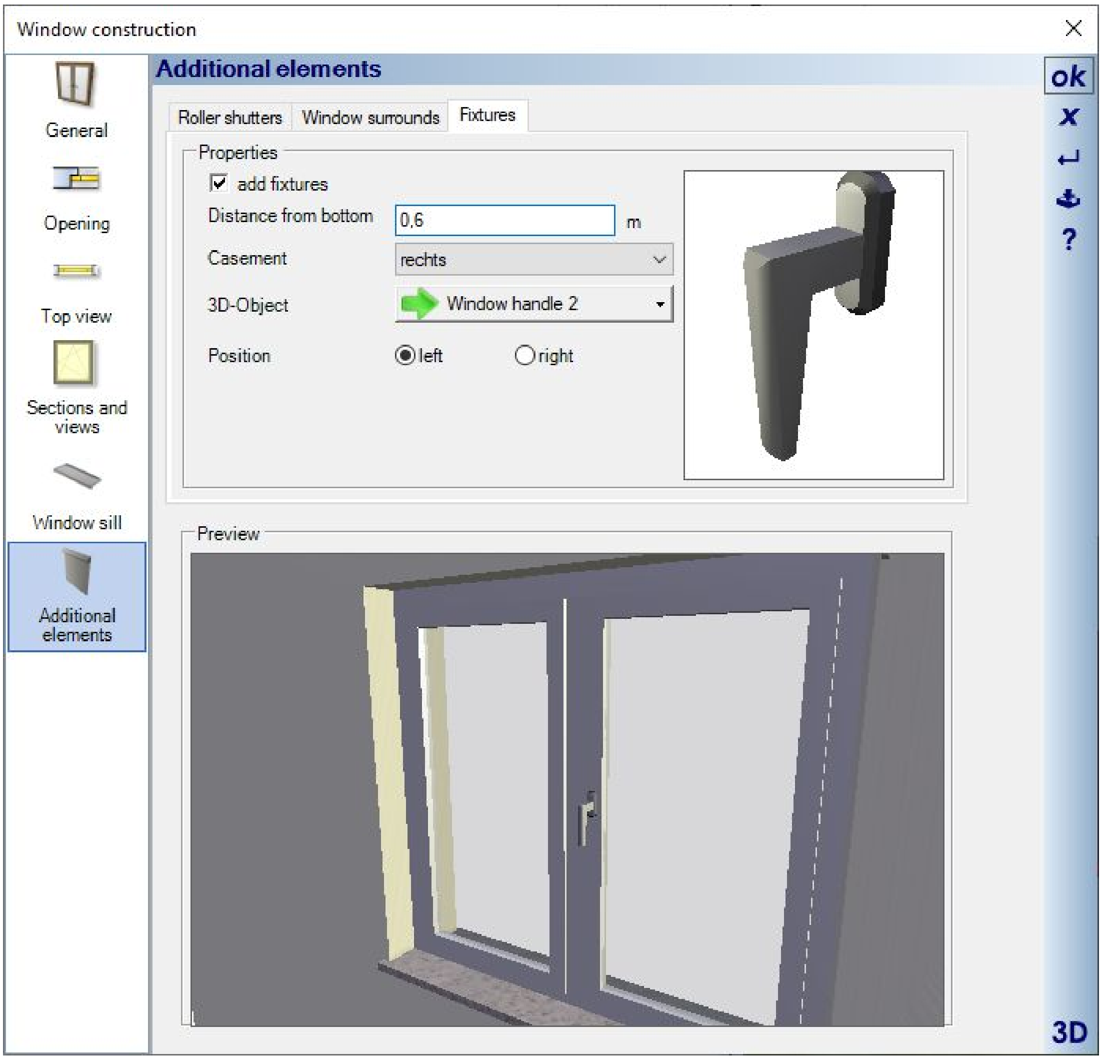
Style
● Built-in ○ Built-on ○ Lintel ○ no roller shutter
☑ Keep opening height

Dimensions
Height 0.20 m
Depth 0.20 m
Depth offset 0.10 m
Overhang left 0.25 m
Overhang right 0.25 m

Appearance
3D Object Blinds, external...
Material B20/B25
☑ Don't scale the 3D-Object height

9.10.2 Fixtures (handles for window constructions)

As already mentioned, window handles can only be used with window constructions. The handle objects themselves are normal 3D objects from the catalog. You could therefore use other versions, you just have to take into account that the 3D objects are rotated in the same way as shown in our example.
With the distance from below you position the object vertically. The horizontal alignment is centered on the frame profile of the active window sash.
The list of sashes is based on the structure of the window construction itself and the position determines whether the handle is placed on the left or right of the active sash.



Window construction

Additional elements

Properties

☑ add fixtures

Distance from bottom: 0,6 m

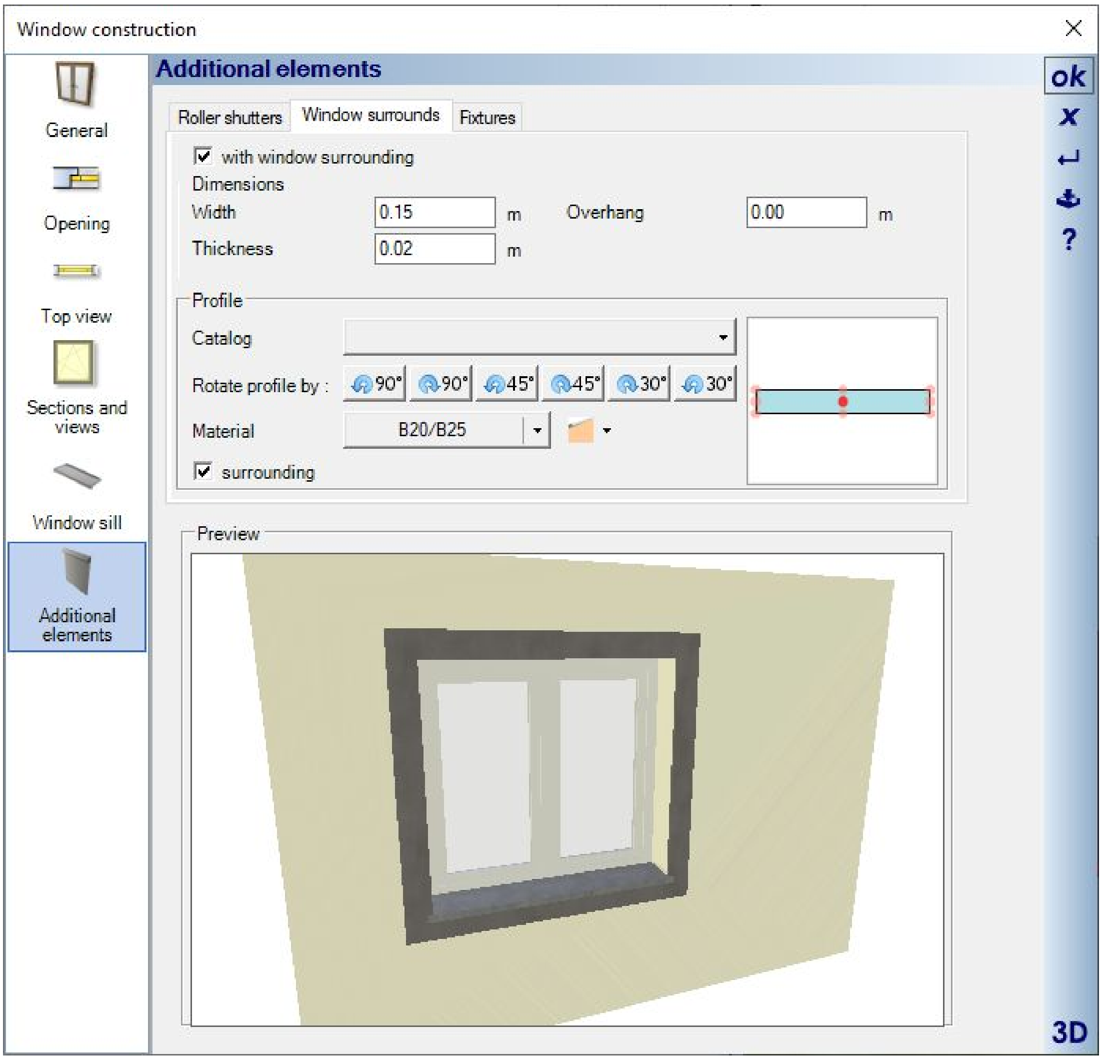
Casement: rechts

3D-Object: Window handle 2

Position: ● left ○ right

9.10.3 *Window surrounds (surroundings for windows and doors)*

Window surrounds are created exactly like the sweep solids of our 3D constructions and automatically follow the opening polygon. By default, a rectangular profile is specified here, but you can also use other profiles from the profiles catalog or add your own. The behaviour and the profile options correspond to those of sweep solids. With active option "surrounding", the window or door is completely surrounded. Without this option, the lower part of the polygon remains free, which you need for doors or floor-to-ceiling windows.



☑ with window surrounding

Width 0.15 m

Overhang 0.00 m

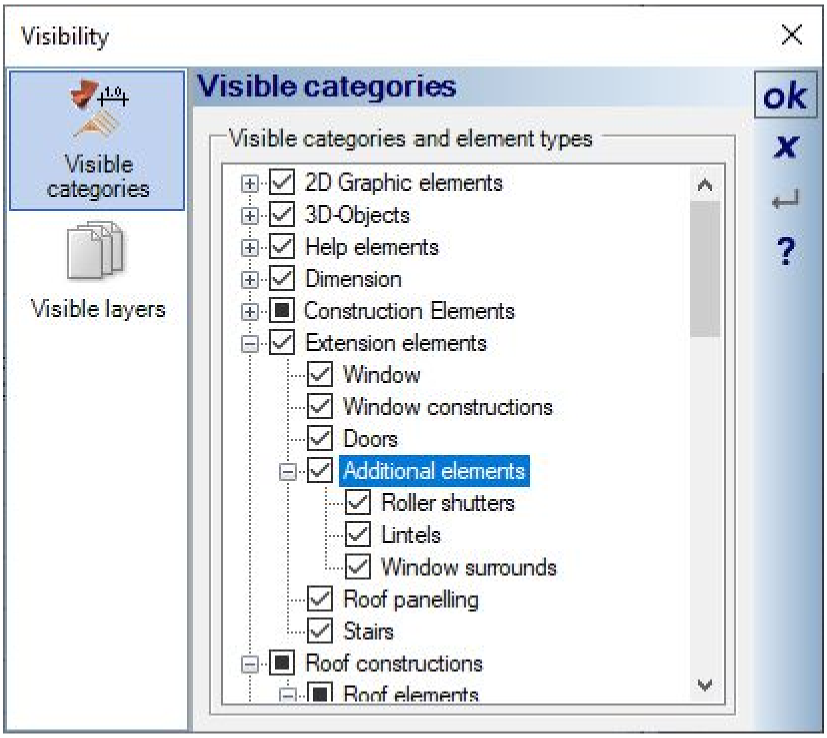
Thickness 0.02 m

Material B20/B25

☑ surrounding

9.10.4 *Visibilities for additional elements*

Additional elements are managed via their own visibilities in the category extension elements.
They are disabled by default in 2D top views so that they do not overlay the display of windows and doors.



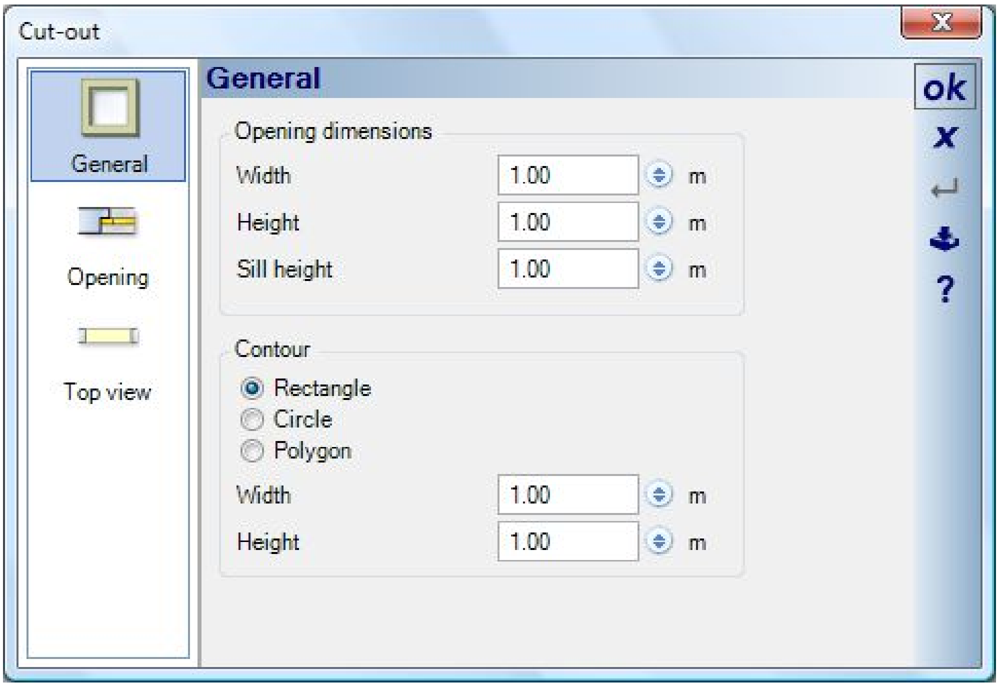
Visible categories and element types

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension
- ■ Construction Elements
- ☑ Extension elements
  - ☑ Window
  - ☑ Window constructions
  - ☑ Doors
  - ☑ Additional elements
    - ☑ Roller shutters
    - ☑ Lintels
    - ☑ Window surrounds
  - ☑ Roof panelling
  - ☑ Stairs
- ■ Roof constructions
  - ■ Roof elements

9.11 OPENINGS

Openings can be inserted into walls and ceilings. When they are being inserted into ceilings, it should be noted that these elements are by default invisible and must be set as visible before inserting an opening. An attempt to insert an opening in an invisible or non-existent ceiling will, depending on the input tool, either be ignored or a message is displayed indicating that there is no appropriate object at this position into which the opening can be inserted.

Openings can be created freely or entered using rectangles, circles or polygons. On free input, the opening is defined in the ‘Properties’ dialog, which is opened over the ‘Properties’ entry in the context menu activated with the a right mouse click - in this way changes to the opening can also be made during input.



General

Opening dimensions

Width 1.00 m

Height 1.00 m

Sill height 1.00 m

Contour

● Rectangle
○ Circle
○ Polygon

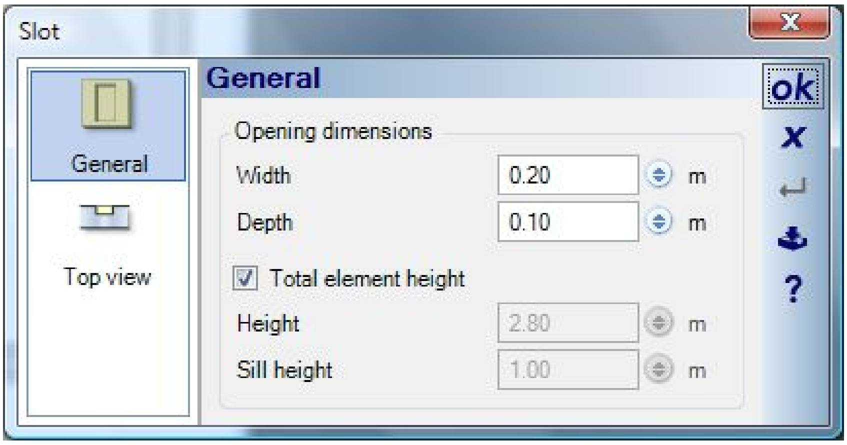
Width 1.00 m

Height 1.00 m

The other types of input are used for walls in cross-sections and views, and for ceiling openings in 2D plan views. In this case the ‘Properties’ dialog is not available on input, since the dimensions, sill height and contour are already determined by the choice of input tool.

9.12 SLOTS

Slots are recesses which do not fully penetrate walls to form a opening, unless you specify a depth which exceeds the thickness off the wall. The option for ‘Total element height’ ensures that on input the slit created assumes the full height of the wall into which it is being inserted. Alternatively, the height and the sill height can be entered manually to create recesses in walls.



General

Opening dimensions

Width 0.20 m

Depth 0.10 m

☑ Total element height

Height 2.80 m

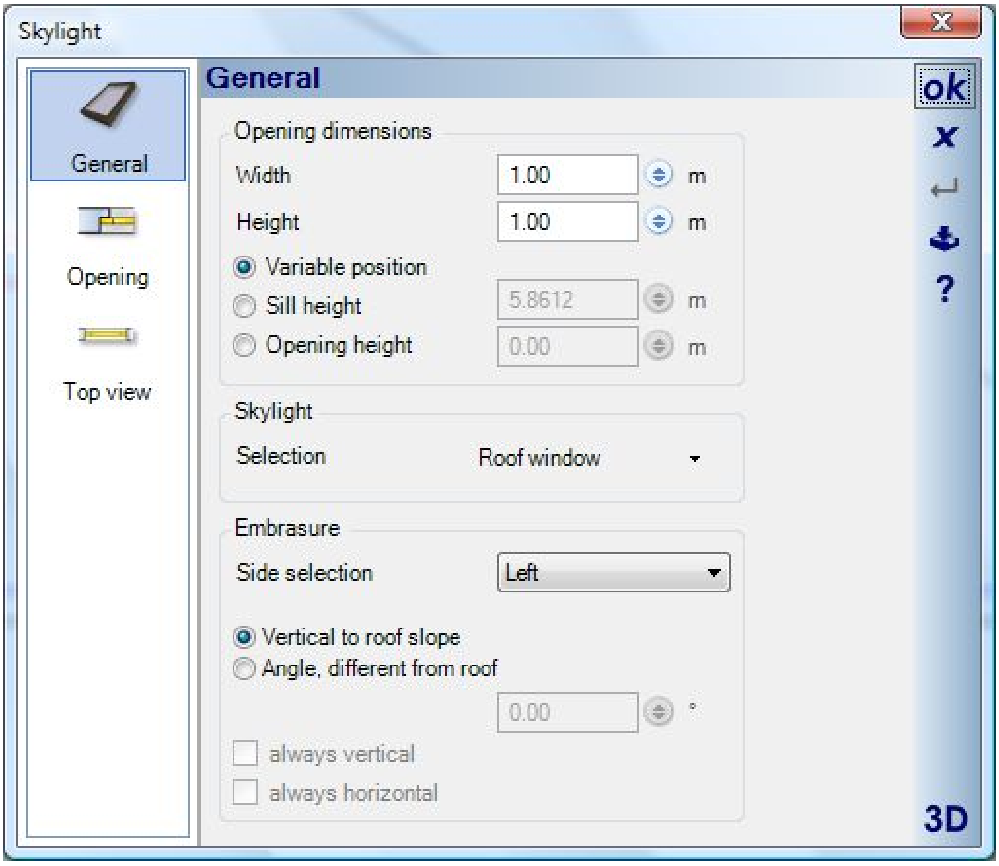
Sill height 1.00 m

9.13 SKYLIGHTS

Skylights can be inserted into roof planes in both 2D and in 3D views. On switching roof planes, the skylight is automatically turned to face the outside of the roof if necessary. In 3D views the roof planes, in which the skylight is situated, appear transparent to allow a view of the rooms and the timber construction beneath.

When skylights are inserted, matching openings in the timber construction are created automatically. The dimensions of the timber for the openings are identical to the dimensions of the rafters specified in the 'Roof' dialog.

Skylights can be positioned freely within a roof plane using the mouse. The calculated position of the skylight can be numerically adjusted, with regard to the sill height and the Opening height, in the 'Properties' dialog for the skylight.



General

Opening dimensions

Width 1.00 m

Height 1.00 m

● Variable position

○ Sill height 5.8612 m

○ Opening height 0.00 m

Skylight

Selection Roof window

Embrasure

Side selection Left

● Vertical to roof slope

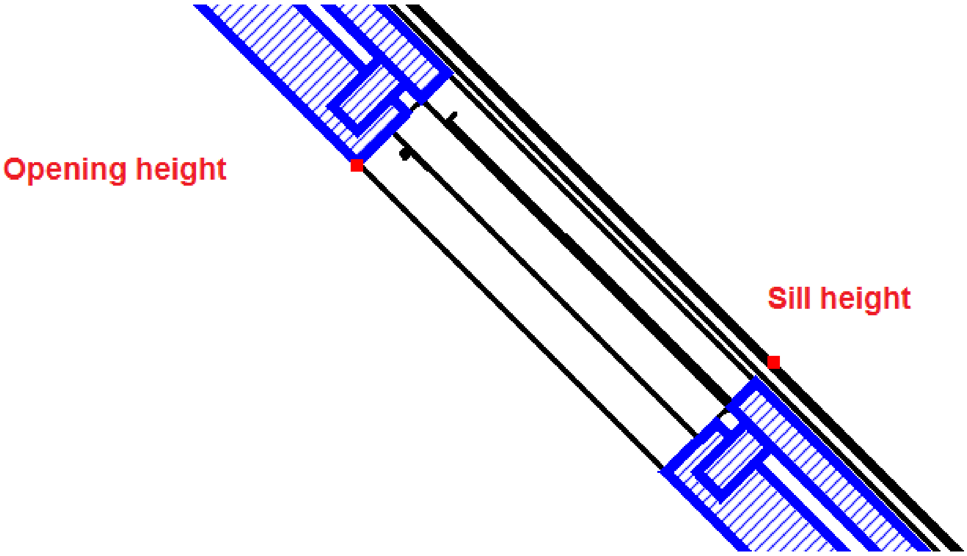
○ Angle, different from roof

0.00 °

☐ always vertical

☐ always horizontal

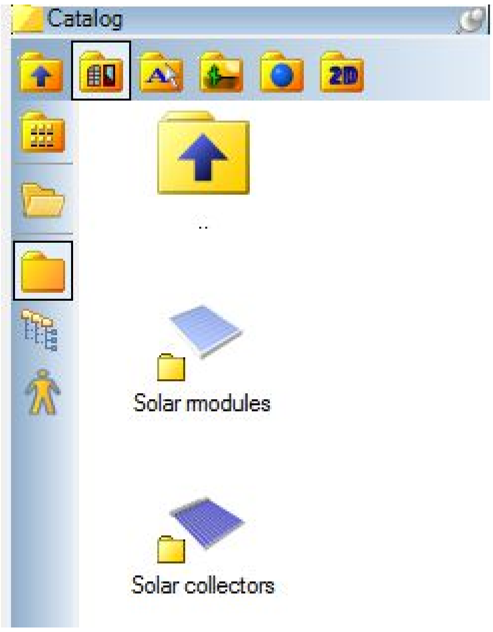
The values for sill height and opening height are taken from the deduction body surrounding the skylight, i.e. the invisible body which determines the opening in the roof and roof covering. The following sketch shows the positions to which the values refer, measured from the top of the ceiling structure.



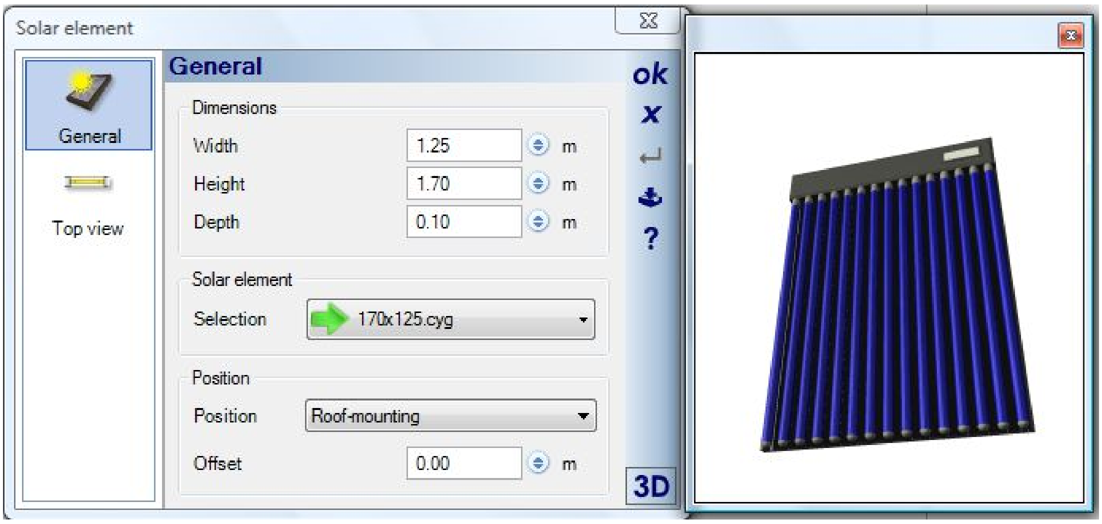
Additionally, the embrasure for each side of the skylight can be specified if it differs from the default setting, which is perpendicular to the slope of the roof. The values for the embrasure also change the deduction body, and the lining of the roof starting from the inside edge of the skylight's 3D object.

9.14 SOLAR ELEMENTS

Solar elements can be placed in or on roofs using the appropriate button , or directly via drag and drop from the catalog of construction elements.



Solar elements behave in a similar way to windows, but in addition also have options in the properties dialog for roof-mounting or roof integrated mounting. For roof integrated mounting the solar elements create openings in the roofing, but not in the roof paneling



General

Dimensions

Width 1.25 m

Height 1.70 m

Depth 0.10 m

Solar element

Selection 170x125.cyg

Position

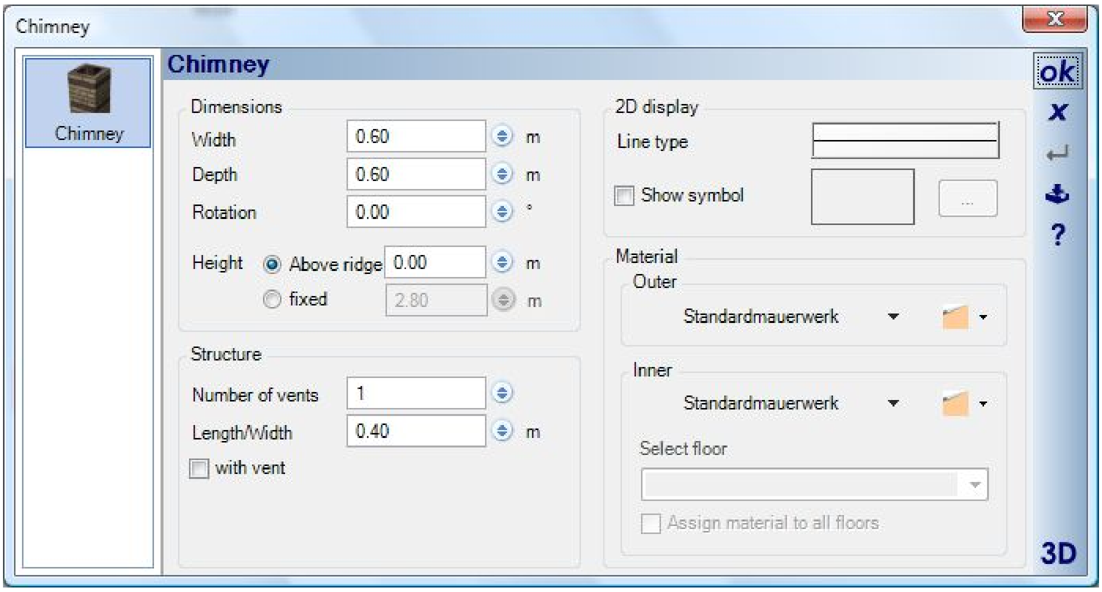
Position Roof-mounting

Offset 0.00 m

Note: Using normal input, solar elements can only be placed on roof planes. However, if the 'Ctrl' key is kept pressed on drag and drop from the catalog, the elements are treated as normal 3D objects and can be used anywhere.

9.15 CHIMNEYS

Basically, the software assumes that chimneys begin on the floor in which they are inserted and extend upwards through all upper floors and the roof. Therefore, when floors are copied, a new chimney is not created, instead the existing chimney in the floor of origin is extended by the height of the additional floor. A chimney is treated as a single object, but is split into sections, with a section for each floor and a section above the roofing, so that the various sections can be allocated different visualisation materials or textures.



Dimensions
Width 0.60 m
Depth 0.60 m
Rotation 0.00 °
Height ● Above ridge 0.00 m
○ fixed 2.80 m

Structure
Number of vents 1
Length/Width 0.40 m
☐ with vent

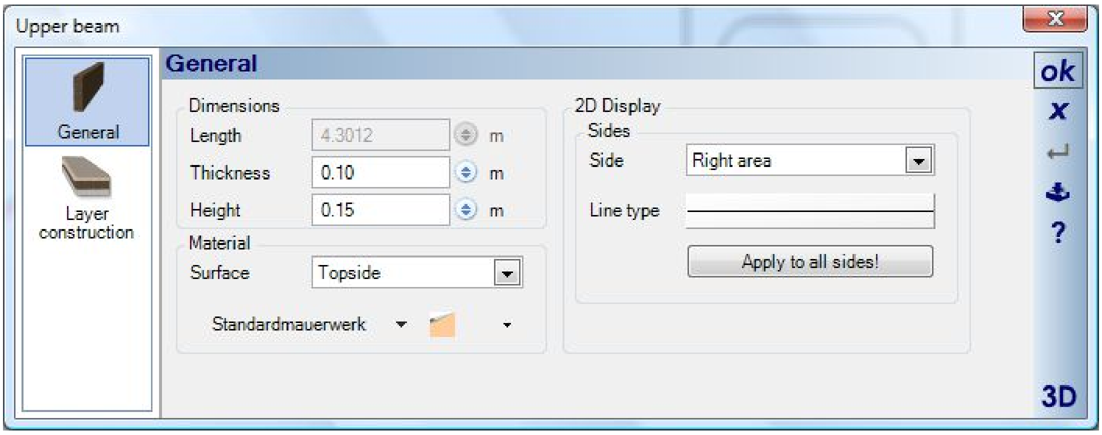
2D display
Line type
☐ Show symbol

Material
Outer
Standardmauerwerk
Inner
Standardmauerwerk
Select floor
☐ Assign material to all floors

The options for height set either an absolute height in relation to the floor in which the chimney is situated, or a relative height above the highest ridge of the roof defined for the current building. If a roof has several ridges and you do not want the highest one to determine the height of the chimney, then an absolute height has to be specified. Under structure you can specify the number and the dimensions of the vents, as well as an option for ventilation. Here it is important that the absolute dimensions of the chimney match the number and the length of the vents.
The 2D representation of the chimney in 2D plan views depends by default on the shape of the 3D model. Other representations can be allocated using 2D symbols from the catalog. A representation using a symbol file is automatically scaled to match the absolute dimensions of the chimney.

9.16 BEAMS – LOWER/UPPER BEAMS

Beams above or below a ceiling behave on input similar to walls, i.e. they join up on input, and can be inserted as a polygon or individually between two points.
Beams below a ceiling are automatically placed on the underside of the ceiling, whereas beams above are placed on the ceiling structure and modify the floor of the room.
Their properties are also similar to those of walls, so refer to those chapters for further options if necessary.



General

Dimensions
Length 4.3012 m
Thickness 0.10 m
Height 0.15 m

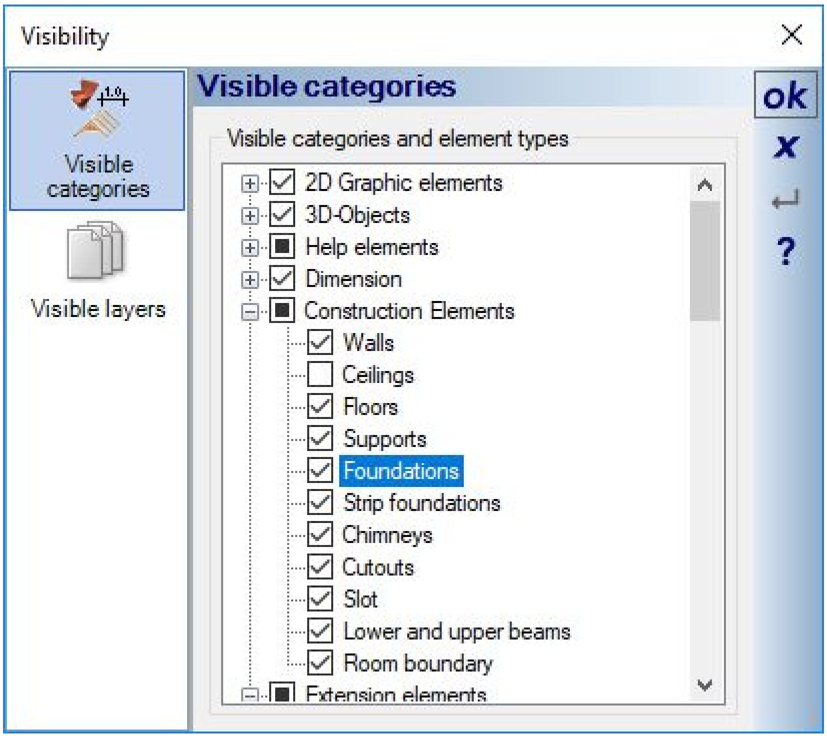
Material
Surface Topside
Standardmauerwerk

2D Display
Sides
Side Right area
Line type

9.17 FOUNDATIONS

Foundations were added as new component types, in the versions single foundations, strip foundations and bottom plate.
The dialogues and properties are similar to those of upper/ lower beams or ceilings.

For foundations, there are two visible categories, separated according to strip foundation and single foundation (including bottom plate).

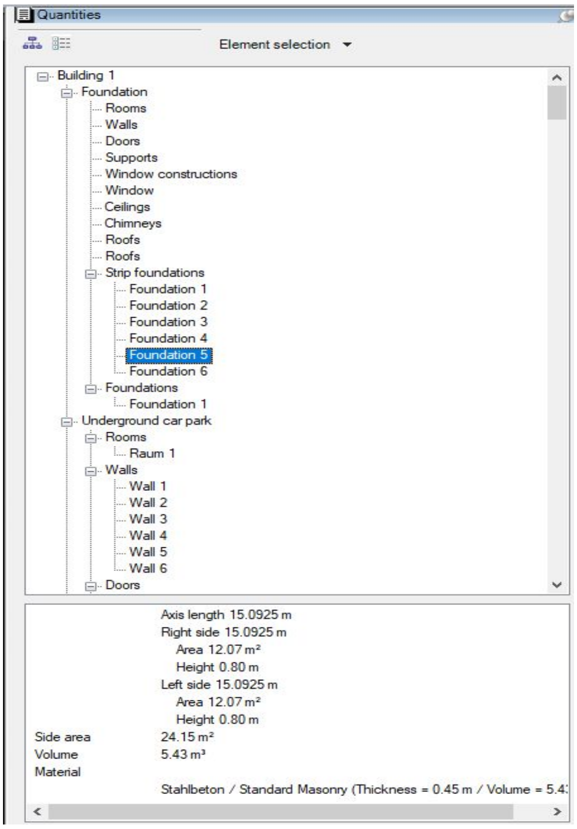


Visible categories

Visible categories and element types

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ■ Help elements
- ☑ Dimension
- ■ Construction Elements
  - ☑ Walls
  - ☐ Ceilings
  - ☑ Floors
  - ☑ Supports
  - ☑ Foundations
  - ☑ Strip foundations
  - ☑ Chimneys
  - ☑ Cutouts
  - ☑ Slot
  - ☑ Lower and upper beams
  - ☑ Room boundary
- ■ Extension elements

Stripes and single foundations intersect with each other, similar to walls, to form a closed contour if necessary and not to overlap. This does not apply to bottom plates in this respect.
Foundations also appear as elements in the quantity PlugIn.

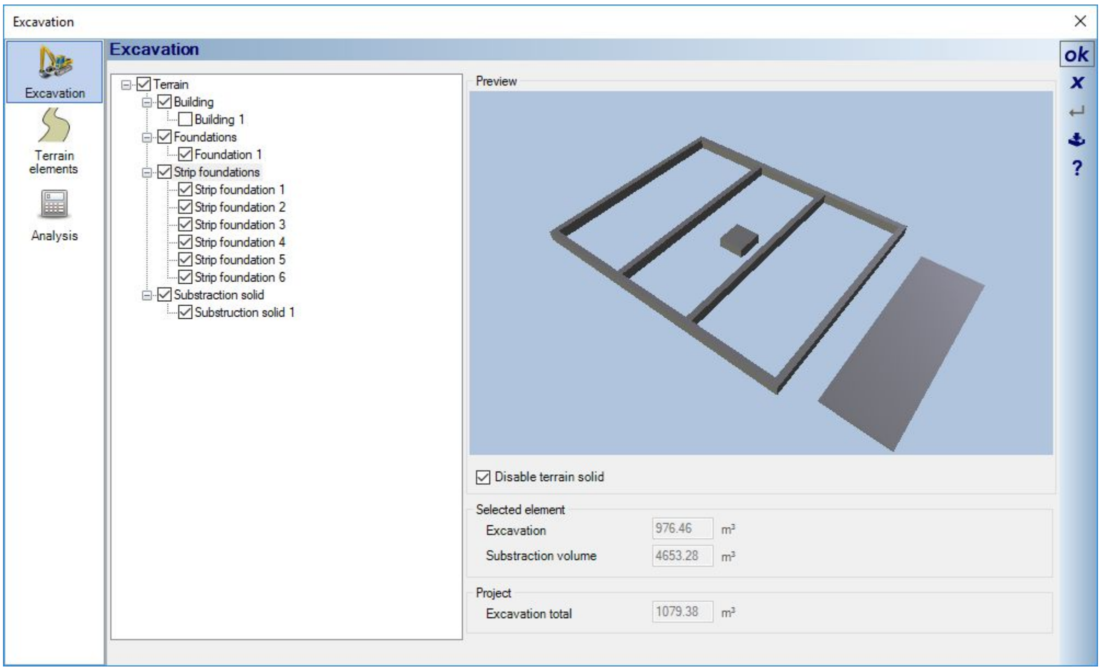


- Building 1
  - Foundation
    - Rooms
    - Walls
    - Doors
    - Supports
    - Window constructions
    - Window
    - Ceilings
    - Chimneys
    - Roofs
    - Roofs
    - Strip foundations
      - Foundation 1
      - Foundation 2
      - Foundation 3
      - Foundation 4
      - Foundation 5
      - Foundation 6
    - Foundations
      - Foundation 1
  - Underground car park
    - Rooms
      - Raum 1
    - Walls
      - Wall 1
      - Wall 2
      - Wall 3
      - Wall 4
      - Wall 5
      - Wall 6
    - Doors

Axis length 15.0925 m
Right side 15.0925 m
Area 12.07 m²
Height 0.80 m
Left side 15.0925 m
Area 12.07 m²
Height 0.80 m

Side area	24.15 m²
Volume	5.43 m³
Material	
	Stahlbeton / Standard Masonry (Thickness = 0.45 m / Volume = 5.4

And also in our new terrain analysis.



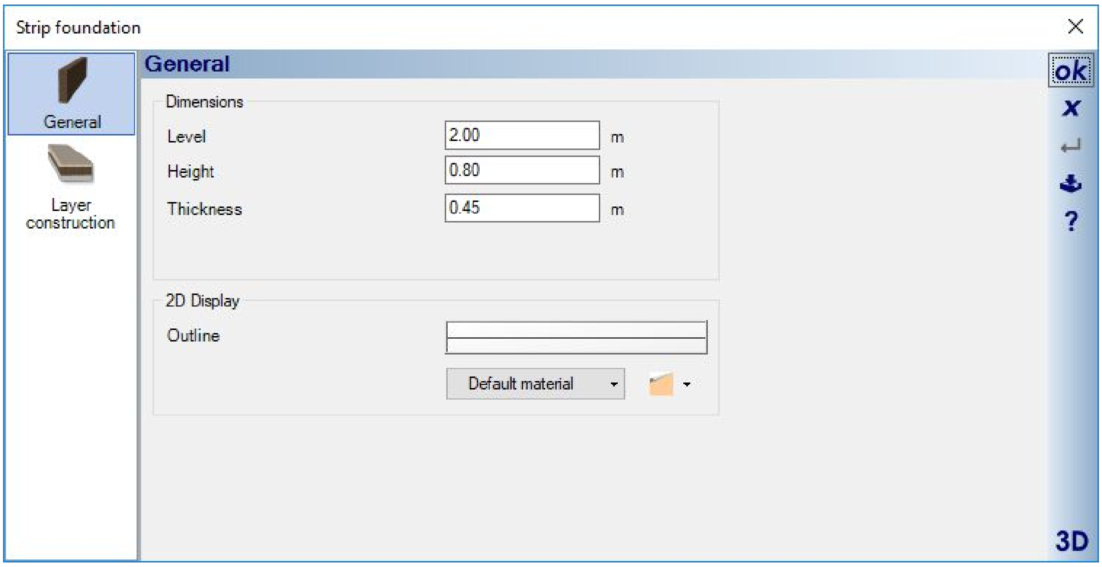
- ☑ Terrain
  - ☑ Building
    - ☐ Building 1
  - ☑ Foundations
    - ☑ Foundation 1
  - ☑ Strip foundations
    - ☑ Strip foundation 1
    - ☑ Strip foundation 2
    - ☑ Strip foundation 3
    - ☑ Strip foundation 4
    - ☑ Strip foundation 5
    - ☑ Strip foundation 6
  - ☑ Substraction solid
    - ☑ Substruction solid 1

☑ Disable terrain solid

Selected element
Excavation 976.46 m³
Substraction volume 4653.28 m³

Project
Excavation total 1079.38 m³

Property dialog of a strip foundation.



Dimensions
Level 2.00 m
Height 0.80 m
Thickness 0.45 m

2D Display
Outline
Default material

10 ROOF-CONSTRUCTION PLUG-IN

10.1 ROOFS

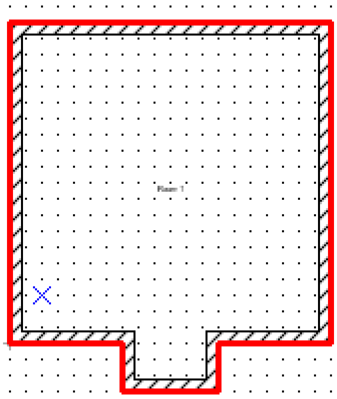
10.1.1 Inserting Roofs

There are three different ways to insert roofs.

Input using a rectangle.

Input using a variable polygon: Input is performed using a polygon and is terminated with 'Enter', or over the entry 'Complete with' in the context menu. The polygon is then automatically closed, i.e. the last point is connected to the first. On input, each point of the polygon defines a roof plane, whereby points on the same line are merged together.

Input using polygon recognition: Input is performed by moving the cursor over the plan of the building for which a roof is to be created. The exterior contour of the building is recognized automatically and highlighted. A left mouse click terminates input.

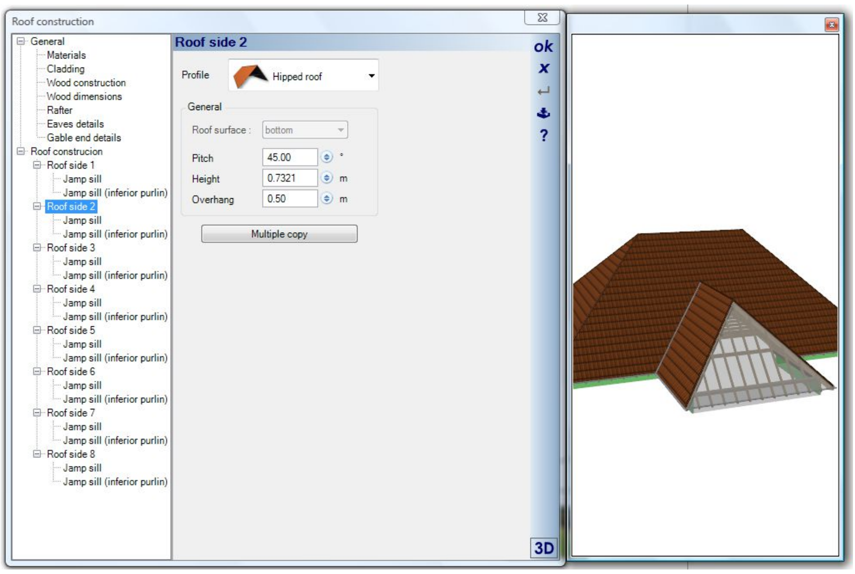


When the contour of the roof has been entered using one of these three methods, the 'Roof construction' dialog is opened.

10.1.2 The Roof Construction Dialog

The dialog consists of a tree structure for each of the sections named 'General', and 'Roof structure', under which you can specify settings for the individual roof planes. Changes under 'General' apply to the roof as a whole. Also for each point the

‘Properties’ dialog is available, and on the right a 3D preview can be optionally displayed, which has special features in the roof dialog. Roof planes can be selected either over the tree stucture or with a mouse click in the 3D preview, whereby the entry in the tree is then highlighted in blue and the roofing of the active roof plane becomes transparent in the preview.



Roof side 2

Profile: Hipped roof

General

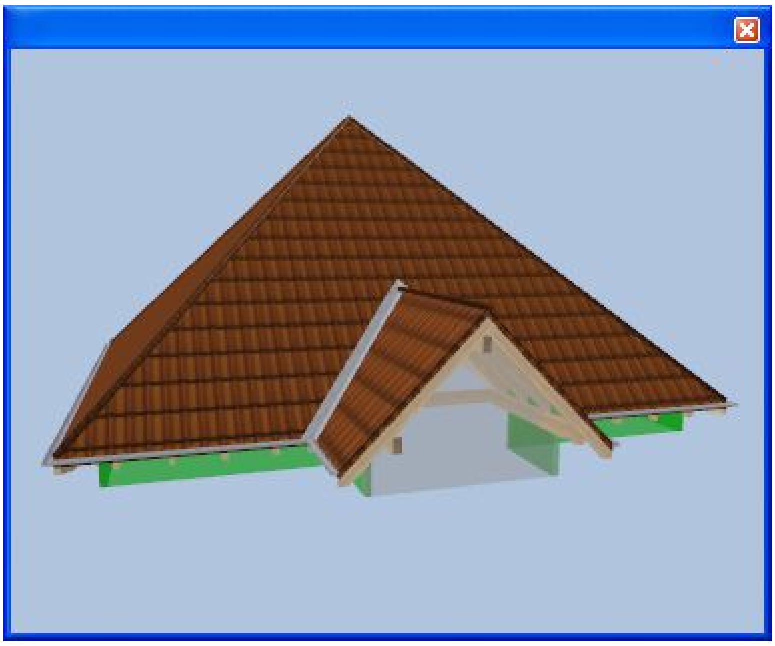
Roof surface : bottom

Pitch: 45.00 °

Height: 0.7321 m

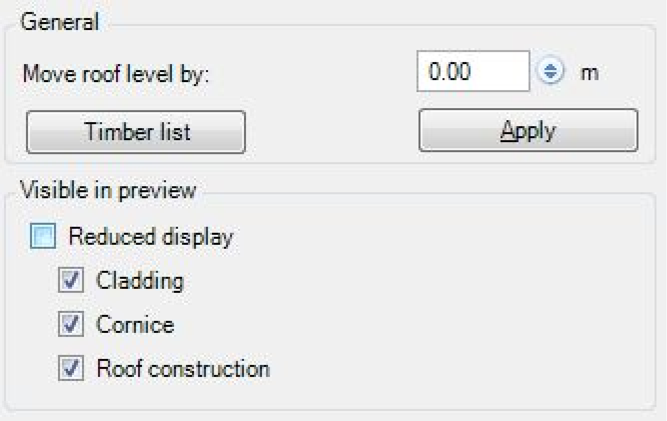
Overhang: 0.50 m

The green areas below the roof are a schematic representation of the walls, which form the contour of the building. They serve in particular to select the sides of the roof on which there are no further roof planes because of the type of profile, e.g. gable. A roof plane in the 3D preview can be selected either by a mouse click on the roof plane itself, or by a mouse click on the part of the schematic contour below it.



10.1.2.1 General

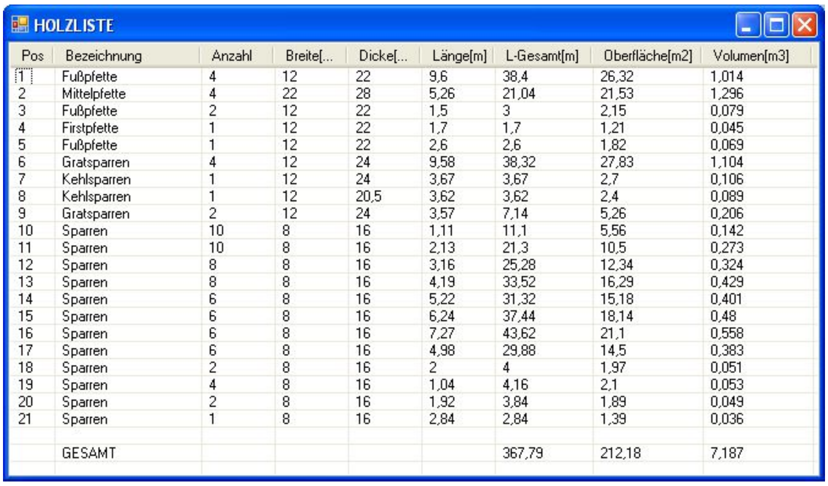
The ‘Roof construction’ dialog always starts with the ‘General’ section. Here the height of the complete roof can be adjusted, without having to edit each individual roof plane. A value for the adjustment relative to the lower edge of the rafters can be entered and the roof adjusted with a click on the ‘Apply’ button.
The options for ‘Visible in Preview’ change the representation of the roof, and have a effect on the speed of calculation of roofs with a large number of roof planes. Each change in the ‘Roof construction’ dialog results in a complete recalculation of the whole roof and its 3D preview. If you do without certain details in the representation, such as the ridge, valley gutters, guttering and cornices, the time required to calculate the roof is reduced. The ‘reduced display’ option is automatically activated when the dialog is opened for a roof with more than 10 roof planes.



Move roof level by: 0.00 m

☐ Reduced display
☑ Cladding
☑ Cornice
☑ Roof construction

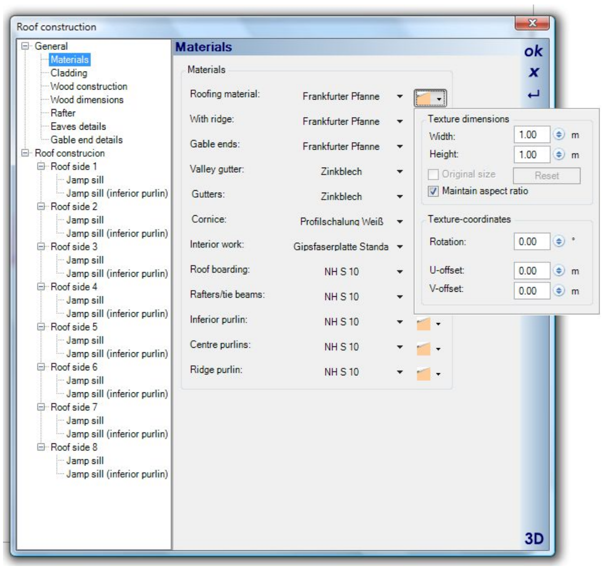
The ‘Timber list’ dialog provides a summary of the amount, dimensions, lengths and volume of the timber required to construct the current roof. The timber list can be exported in various formats, e.g. PDF, RTF, or Excel, over the ‘Export>Reports/ >Timber list’ menu, independent of the dialog.



Pos	Bezeichnung	Anzahl	Breite[...	Dicke[...	Länge[m]	L-Gesamt[m]	Oberfläche[m2]	Volumen[m3]
1	Fußpfette	4	12	22	9,6	38,4	26,32	1,014
2	Mittelpfette	4	22	28	5,26	21,04	21,53	1,296
3	Fußpfette	2	12	22	1,5	3	2,15	0,079
4	Firstpfette	1	12	22	1,7	1,7	1,21	0,045
5	Fußpfette	1	12	22	2,6	2,6	1,82	0,069
6	Gratsparren	4	12	24	9,58	38,32	27,83	1,104
7	Kehlsparren	1	12	24	3,67	3,67	2,7	0,106
8	Kehlsparren	1	12	20,5	3,62	3,62	2,4	0,089
9	Gratsparren	2	12	24	3,57	7,14	5,26	0,206
10	Sparren	10	8	16	1,11	11,1	5,56	0,142
11	Sparren	10	8	16	2,13	21,3	10,5	0,273
12	Sparren	8	8	16	3,16	25,28	12,34	0,324
13	Sparren	8	8	16	4,19	33,52	16,29	0,429
14	Sparren	6	8	16	5,22	31,32	15,18	0,401
15	Sparren	6	8	16	6,24	37,44	18,14	0,48
16	Sparren	6	8	16	7,27	43,62	21,1	0,558
17	Sparren	6	8	16	4,98	29,88	14,5	0,383
18	Sparren	2	8	16	2	4	1,97	0,051
19	Sparren	4	8	16	1,04	4,16	2,1	0,053
20	Sparren	2	8	16	1,92	3,84	1,89	0,049
21	Sparren	1	8	16	2,84	2,84	1,39	0,036
	GESAMT					367,79	212,18	7,187

10.1.2.2 Materials

Under ‘Materials’, you can select the desired building material for each component of the roof, and modify it to meet your requirements as regards 2D and 3D representation, and texture coordinates. Further information on this can be found in the section ‘Properties and Representation of Building Materials’.



Materials

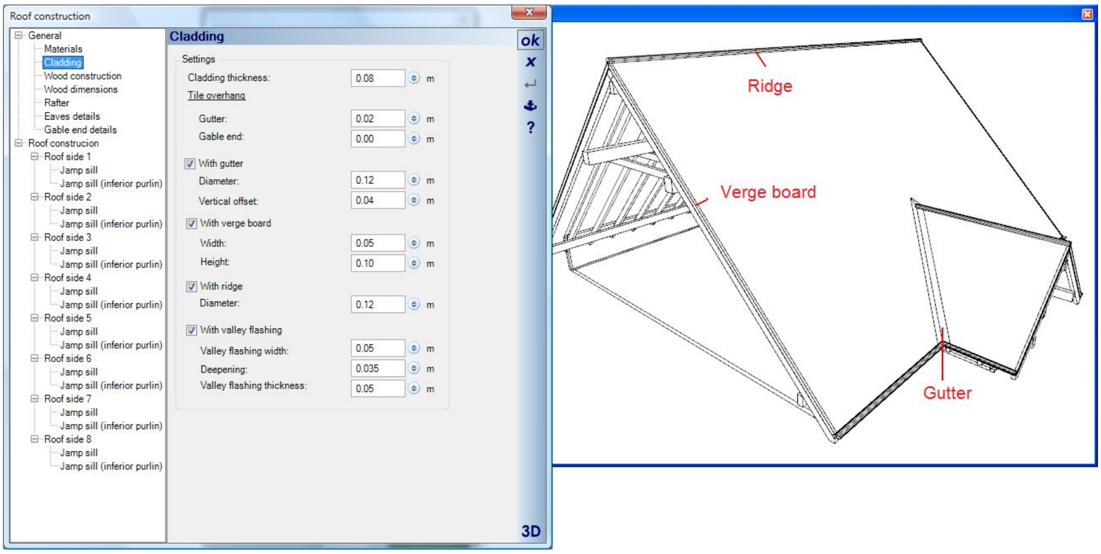
Roofing material: Frankfurter Pfanne
With ridge: Frankfurter Pfanne
Gable ends: Frankfurter Pfanne
Valley gutter: Zinkblech
Gutters: Zinkblech
Cornice: Profilschalung Weiß
Interior work: Gipsfaserplatte Standa
Roof boarding: NH S 10
Rafters/tie beams: NH S 10
Inferior purlin: NH S 10
Centre purlins: NH S 10
Ridge purlin: NH S 10

Texture dimensions
Width: 1.00 m
Height: 1.00 m
☐ Original size
☑ Maintain aspect ratio

Texture-coordinates
Rotation: 0.00 °
U-offset: 0.00 m
V-offset: 0.00 m

10.1.2.3 Cladding

Under ‘Cladding’ you can specify the dimensions of the cladding and the elements allocated to it. The two values for ‘Tile overhang’ do not have any effect on the plan view or on the visualisation, and are only provided for the calculation of areas and volumes.



Cladding

Settings

Cladding thickness: 0.08 m

Tile overhang

Gutter: 0.02 m

Gable end: 0.00 m

☑ With gutter

Diameter: 0.12 m

Vertical offset: 0.04 m

☑ With verge board

Width: 0.05 m

Height: 0.10 m

☑ With ridge

Diameter: 0.12 m

☑ With valley flashing

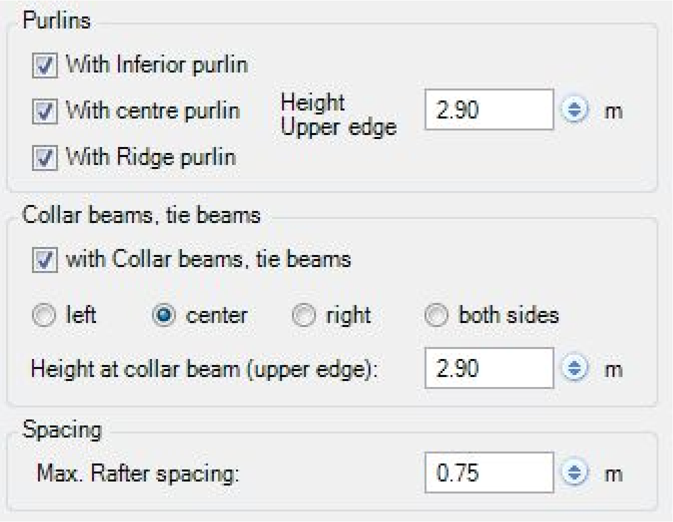
Valley flashing width: 0.05 m

Deepening: 0.035 m

Valley flashing thickness: 0.05 m

10.1.2.4 Timber Construction

The settings under 'Timber Construction' define the usage and position of the various timbers required for the complete roof.
You can also define which purlins are to be used in the roof construction. In addition, the position of the centre purlin, the position and type of collar beams, and the spacing of rafters can be specified.



Purlins

☑ With Inferior purlin

☑ With centre purlin Height Upper edge 2.90 m

☑ With Ridge purlin

Collar beams, tie beams

☑ with Collar beams, tie beams

○ left ● center ○ right ○ both sides

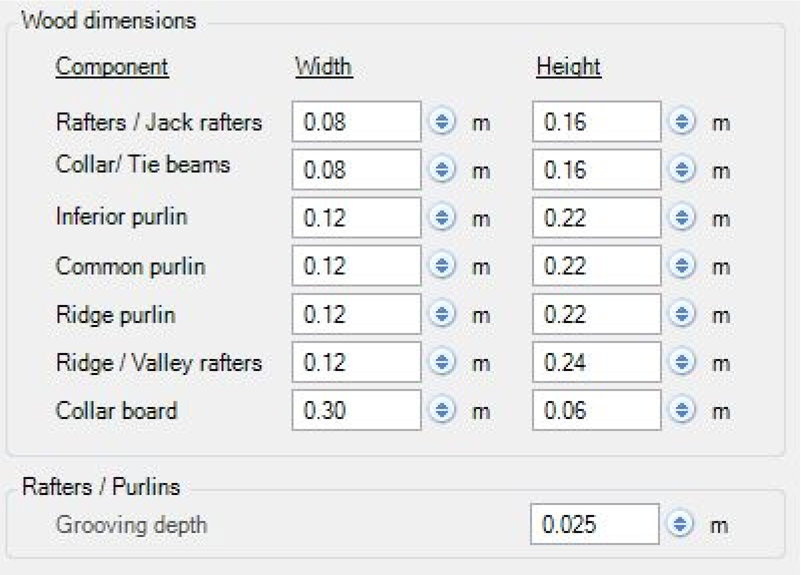
Height at collar beam (upper edge): 2.90 m

Spacing

Max. Rafter spacing: 0.75 m

10.1.2.5 Timber Dimensions

The dimensions of the individual timbers of the roof can be specified under ‘Timber Dimensions’. The depth of the grooving at the intersection of rafter/purlin is measured at right-angles to the slope of the roof.



Wood dimensions

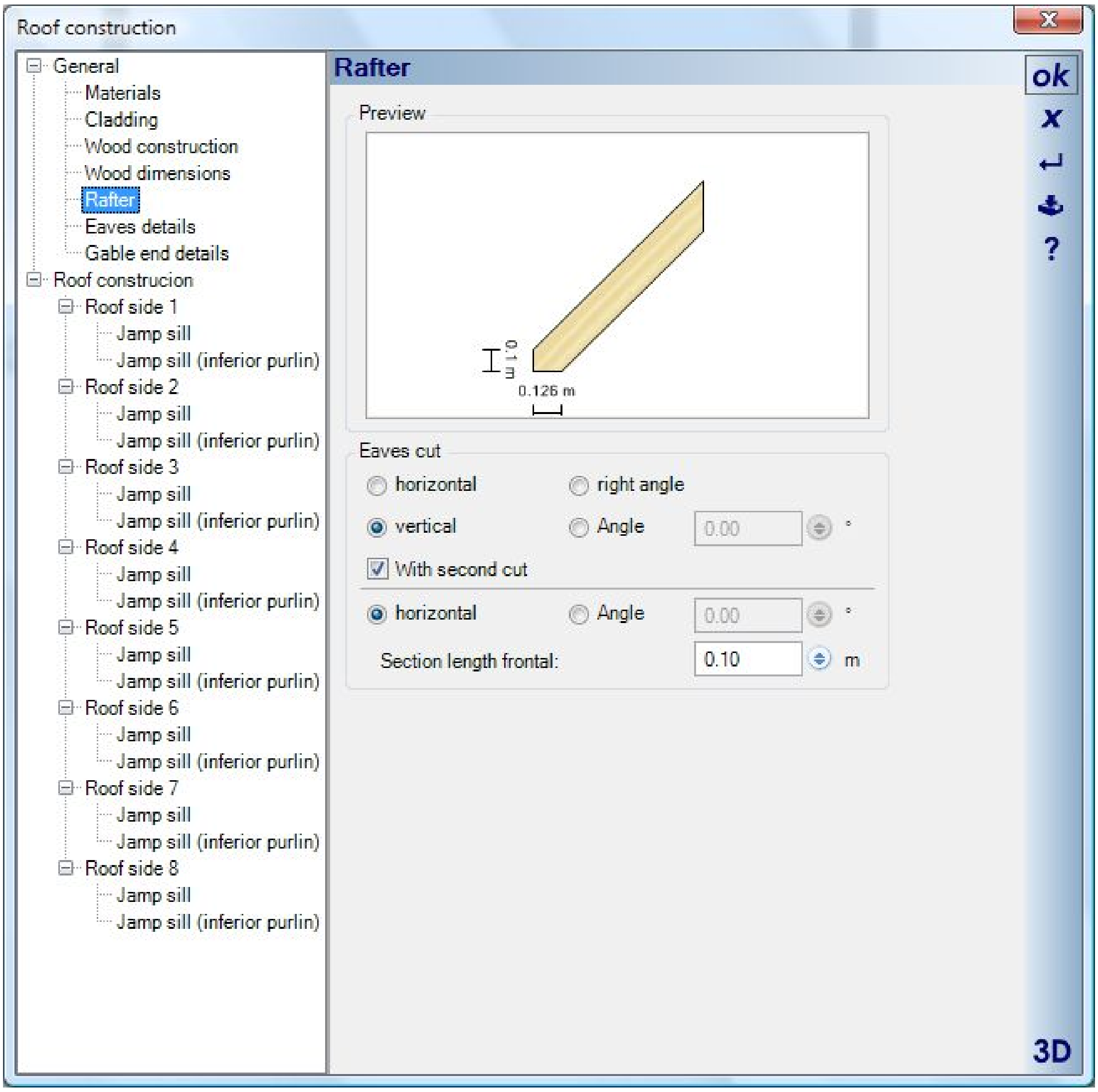
Component	Width		Height	
Rafters / Jack rafters	0.08	m	0.16	m
Collar/ Tie beams	0.08	m	0.16	m
Inferior purlin	0.12	m	0.22	m
Common purlin	0.12	m	0.22	m
Ridge purlin	0.12	m	0.22	m
Ridge / Valley rafters	0.12	m	0.24	m
Collar board	0.30	m	0.06	m

Rafters / Purlins

Grooving depth 0.025 m

10.1.2.6 Rafters

Under ‘Rafters’ the shape of the eaves cut can be defined with the aid of various settings.



Rafter

Eaves cut

○ horizontal ○ right angle

● vertical ○ Angle 0.00 °

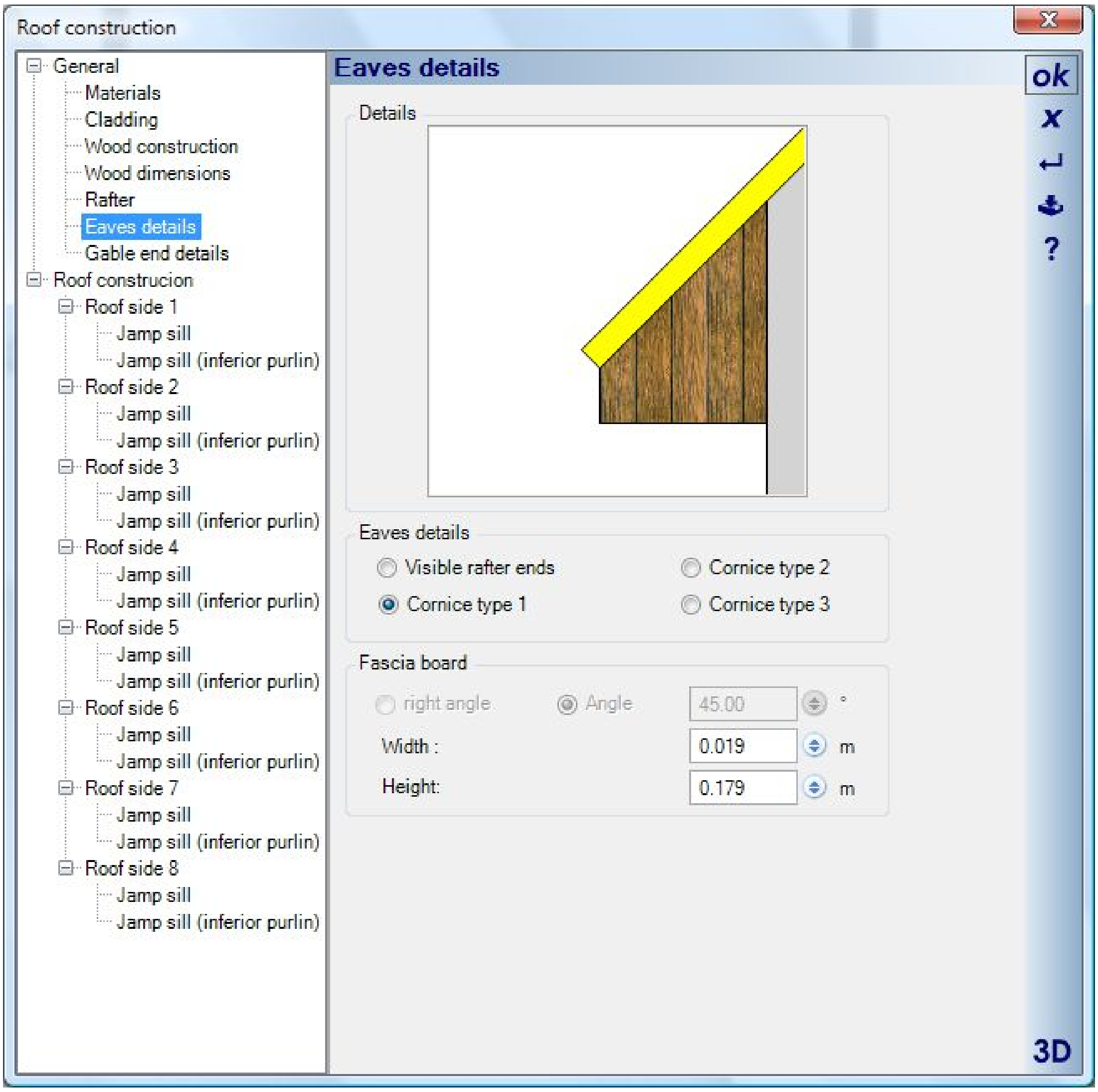
☑ With second cut

● horizontal ○ Angle 0.00 °

Section length frontal: 0.10 m

10.1.2.7 (Details of) Eaves

Three different types of boxed eaves are provided under ‘(Details of) Eaves’.



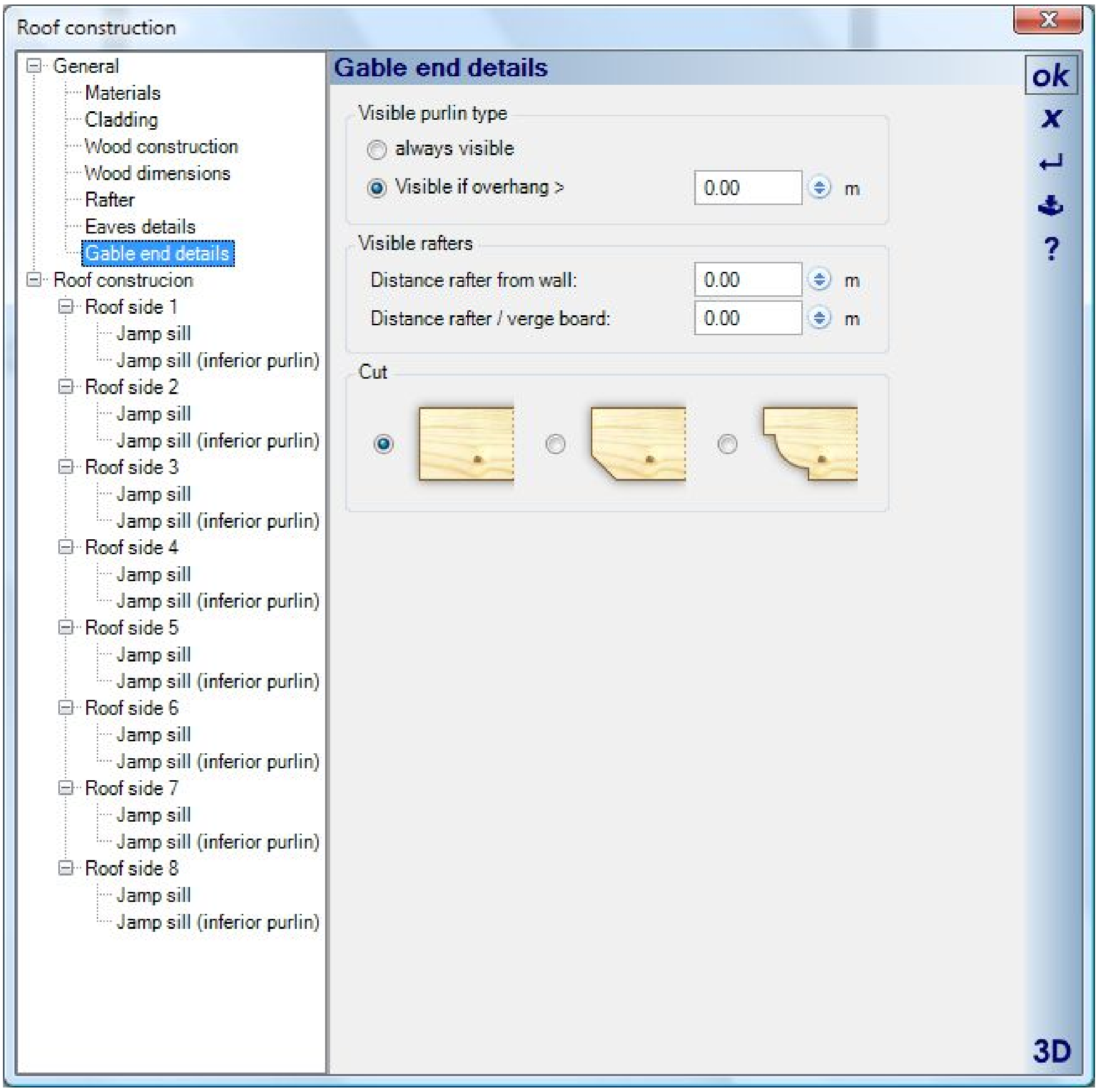
Eaves details

Eaves details
○ Visible rafter ends ○ Cornice type 2
● Cornice type 1 ○ Cornice type 3

Fascia board
○ right angle ● Angle 45.00 °
Width : 0.019 m
Height: 0.179 m

10.1.2.8 (Details of) Gable ends

The visibility and shape of the purlin heads can be selected under ‘(Details) of Gable ends. At the moment three different shapes are available.



Gable end details

Visible purlin type
○ always visible
● Visible if overhang > 0.00 m

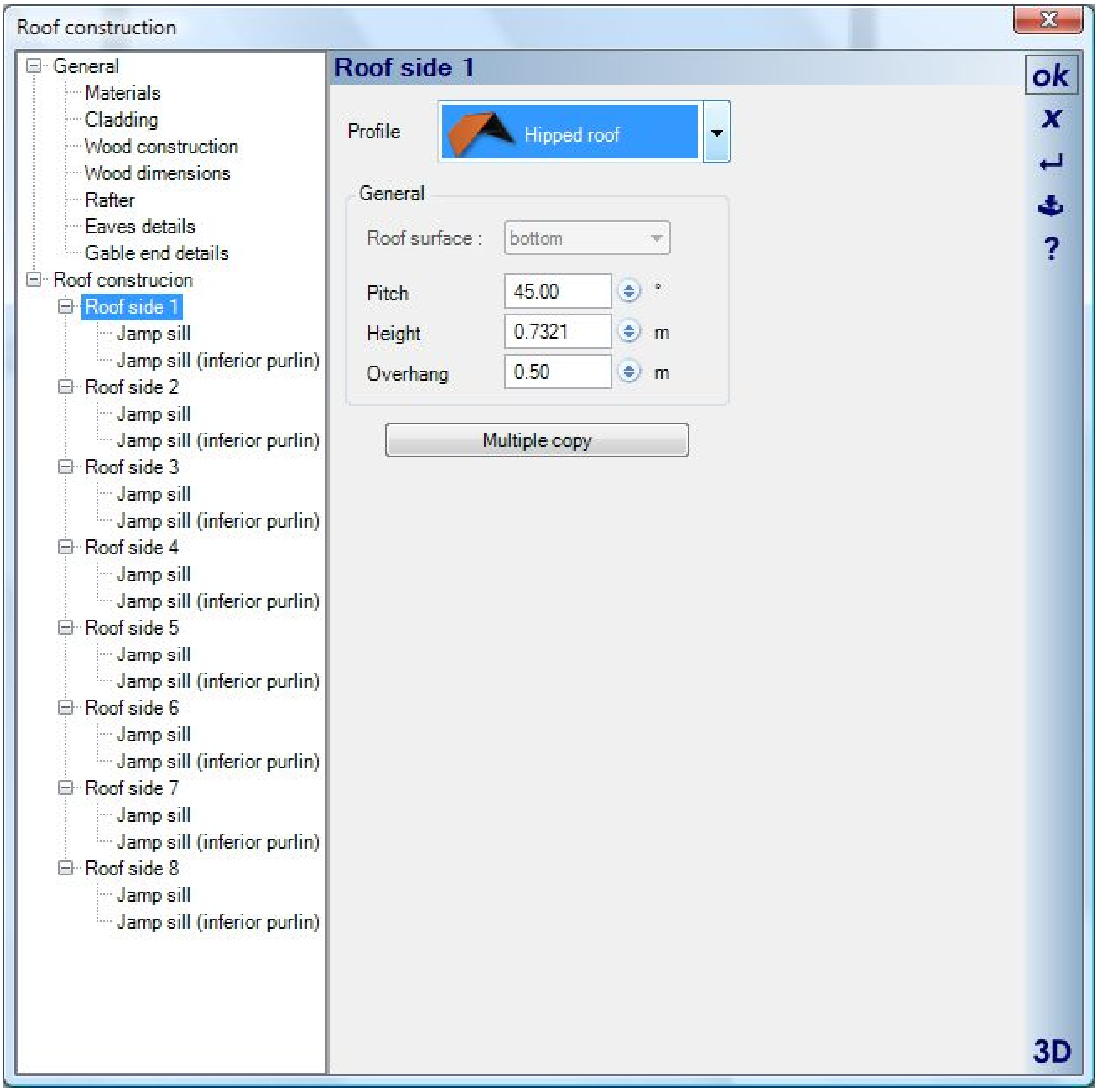
Visible rafters
Distance rafter from wall: 0.00 m
Distance rafter / verge board: 0.00 m

Cut
● ○ ○

10.1.3 Roof Construction

10.1.3.1 Roof side 1

In this view the profile of a single roof side can be calculated based on the settings for pitch, height and overhang. The type of roof side desired is specified under ‘Profile’.



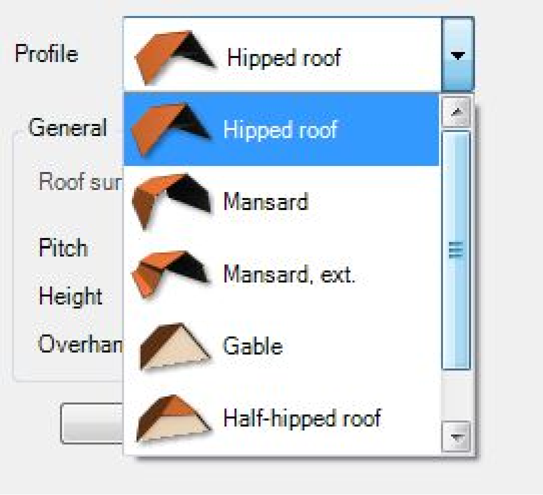
Profile: Hipped roof

Roof surface : bottom

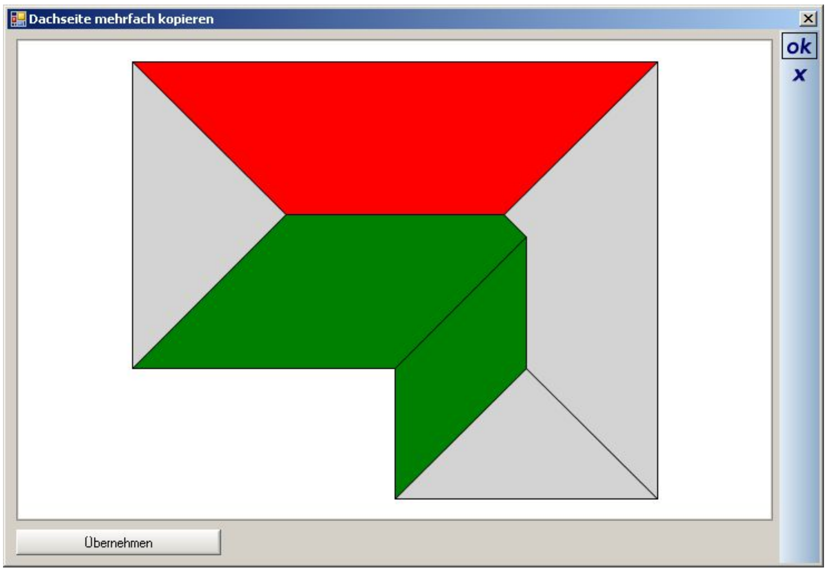
Pitch 45.00 °

Height 0.7321 m

Overhang 0.50 m

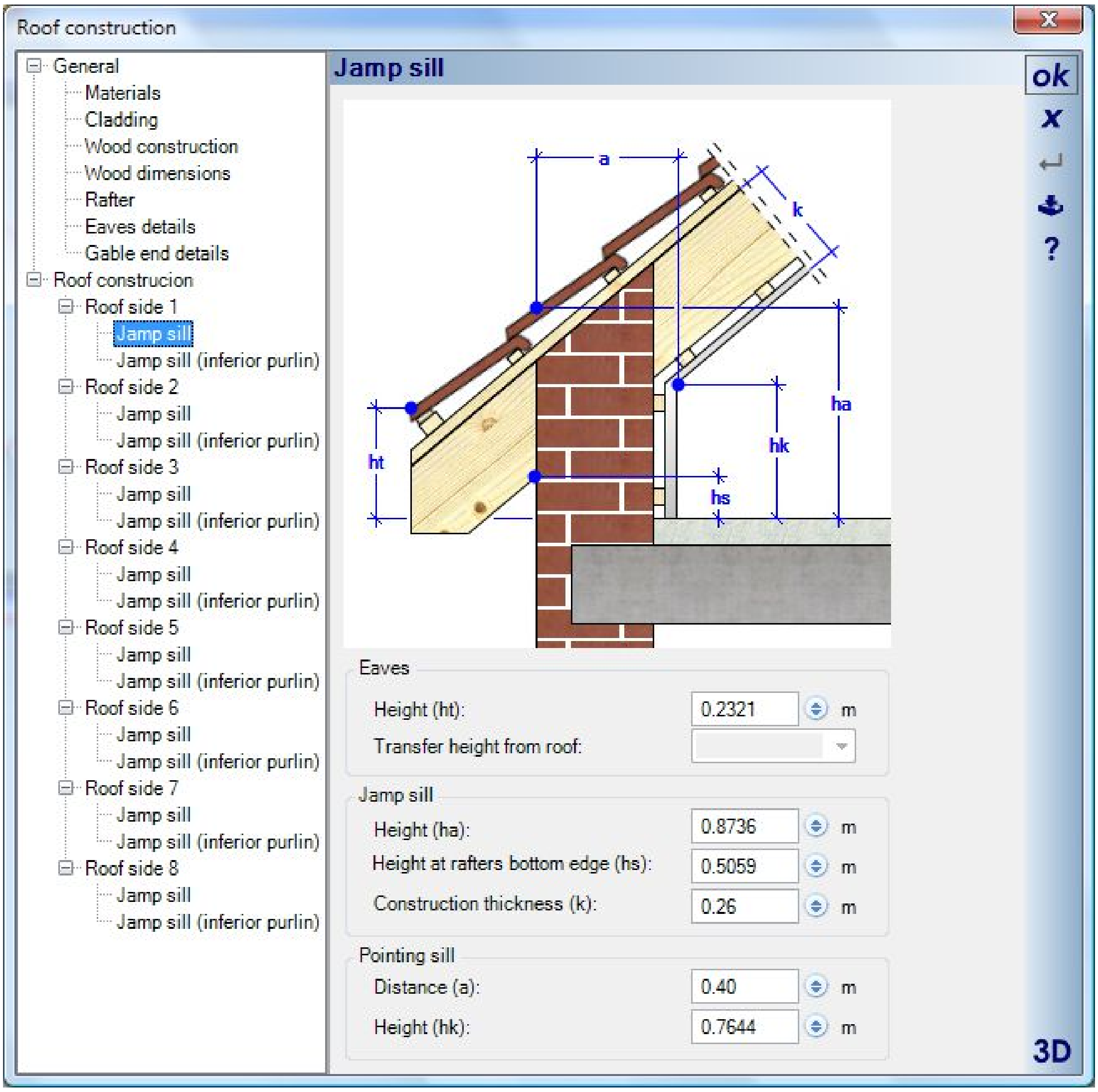


A click on the ‘Multiple copy’ button opens the dialog ‘Multiple copy of roof side’, in which the currently active roof side is shown in red. With one or more mouse clicks you can select roof planes, to which the properties of the source roof plane are to be copied. These roof planes are shown in green. You can cancel selection with a second click on the roof plane.



10.1.3.2 Roof Side 1/Jamp sill

Under ‘Jamp sill’ you can specify parameters for the bottom of the roof from an architectural aspect. Under ‘Transfer height of roof’, you can use an existing roof height for this roof side. This is of significance, above all, when the there are roof sides with different slopes, in order to guarantee that the eaves and the ridge of the roof are aligned for all roof planes.



Eaves

Height (ht): 0.2321 m

Transfer height from roof:

Jamp sill

Height (ha): 0.8736 m

Height at rafters bottom edge (hs): 0.5059 m

Construction thickness (k): 0.26 m

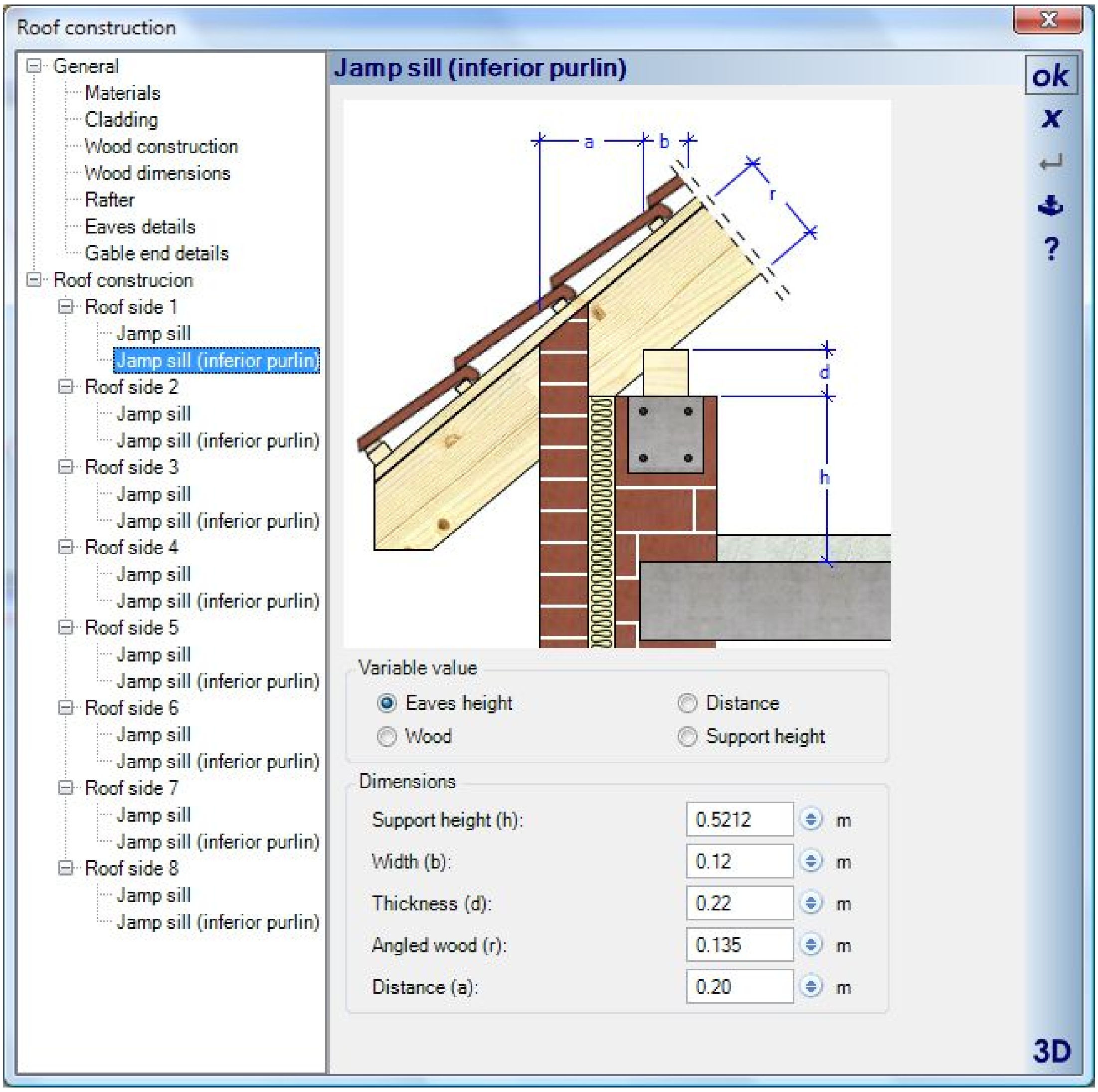
Pointing sill

Distance (a): 0.40 m

Height (hk): 0.7644 m

10.1.3.3 Roof Side 1/Jamp sill (inferior purlin)

Here you can specify the parameters for the bottom of roof with regard to structural aspects. The exact height of the eaves purlin can specified, taking into account, for example, the thickness of the brickwork. In addition, it can be positioned at an exact distance from the outside edge of the brickwork, in order to guarantee a reasonable static load. The 'Pointing sill' is measured from the top outside edge of the eaves purlin to the top edge of the rafter and at right angles to the slope of the roof.



Jamp sill (inferior purlin)

Variable value

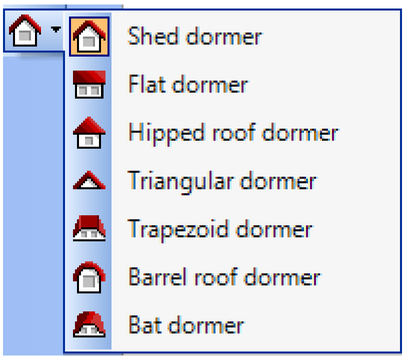
● Eaves height ○ Distance
○ Wood ○ Support height

Dimensions

Support height (h): 0.5212 m
Width (b): 0.12 m
Thickness (d): 0.22 m
Angled wood (r): 0.135 m
Distance (a): 0.20 m

10.2 DORMERS

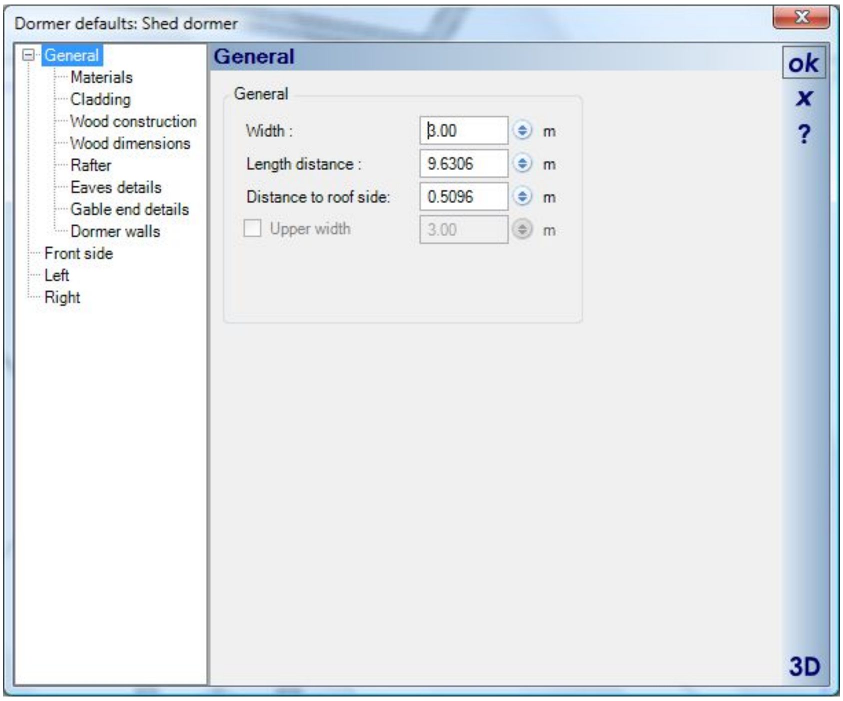
There are seven different types of dormers available.



On insertion the dormer is attached at its front left outside corner to the cursor and can be ‘dropped’ into the desired roof plane. Subsequently, the ‘Dormer’ dialog appears, in which details of the dormer can specified.

10.2.1 Shed Dormer

As with the ‘Roof’ dialog, the various properties of the dormer are presented in a tree structure.



General

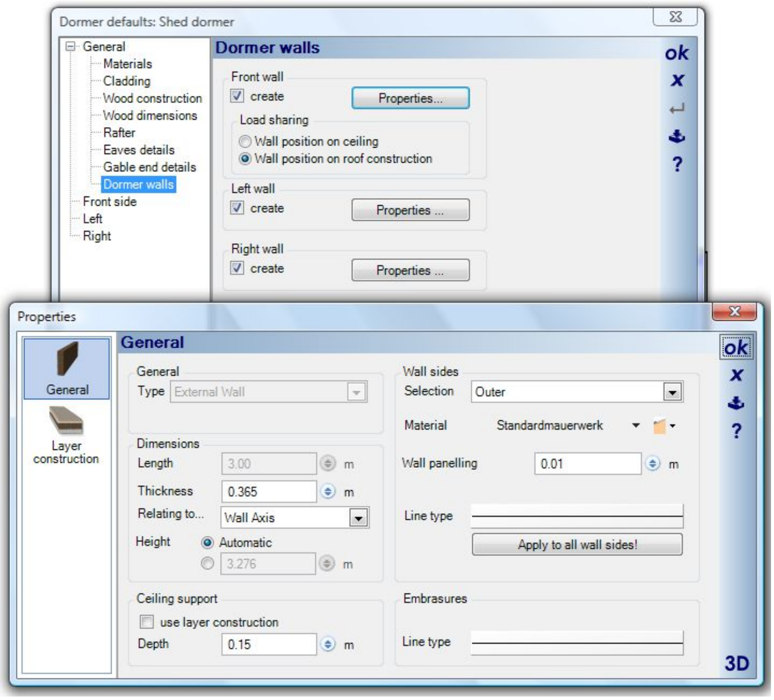
Width : 3.00 m

Length distance : 9.6306 m

Distance to roof side: 0.5096 m

☐ Upper width 3.00 m

Under ‘General’, in addition to the roof, the dormer walls can also be defined. Here you can specify whether a wall should be created for a particular side of the dormer, and if so, the normal ‘Wall’ dialog can be activated for each of the walls.



Dormer walls

Front wall
☑ create
Load sharing
○ Wall position on ceiling
● Wall position on roof construction

Left wall
☑ create

Right wall
☑ create

General

General
Type: External Wall

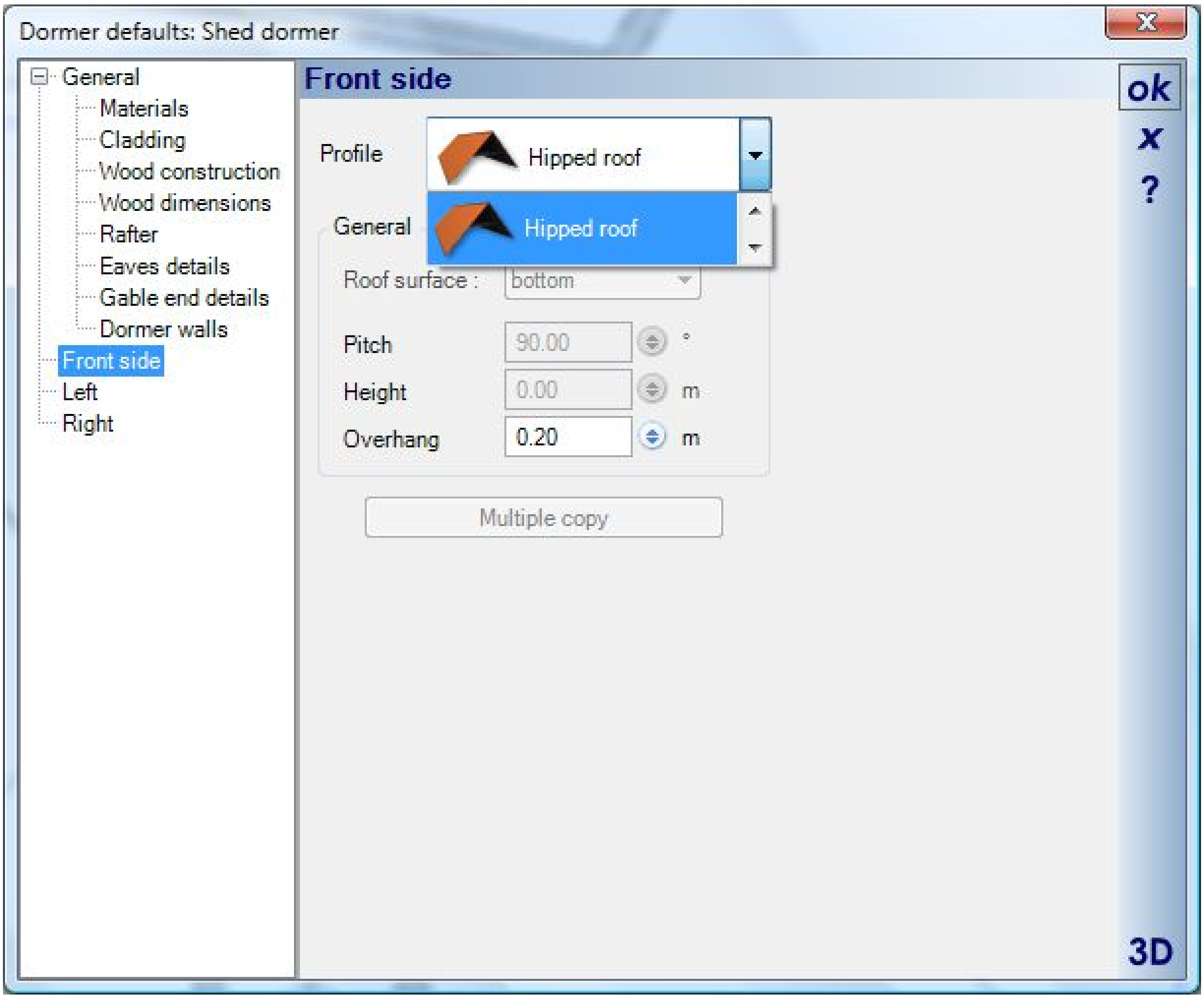
Dimensions
Length: 3.00 m
Thickness: 0.365 m
Relating to...: Wall Axis
Height: ● Automatic
○ 3.276 m

Wall sides
Selection: Outer
Material: Standardmauerwerk
Wall panelling: 0.01 m
Line type

Ceiling support
☐ use layer construction
Depth: 0.15 m

Embrasures
Line type

Additionally, for the shed dormer you can select under ‘Front side’, whether the dormer should be hipped.



Front side

Profile: Hipped roof

General

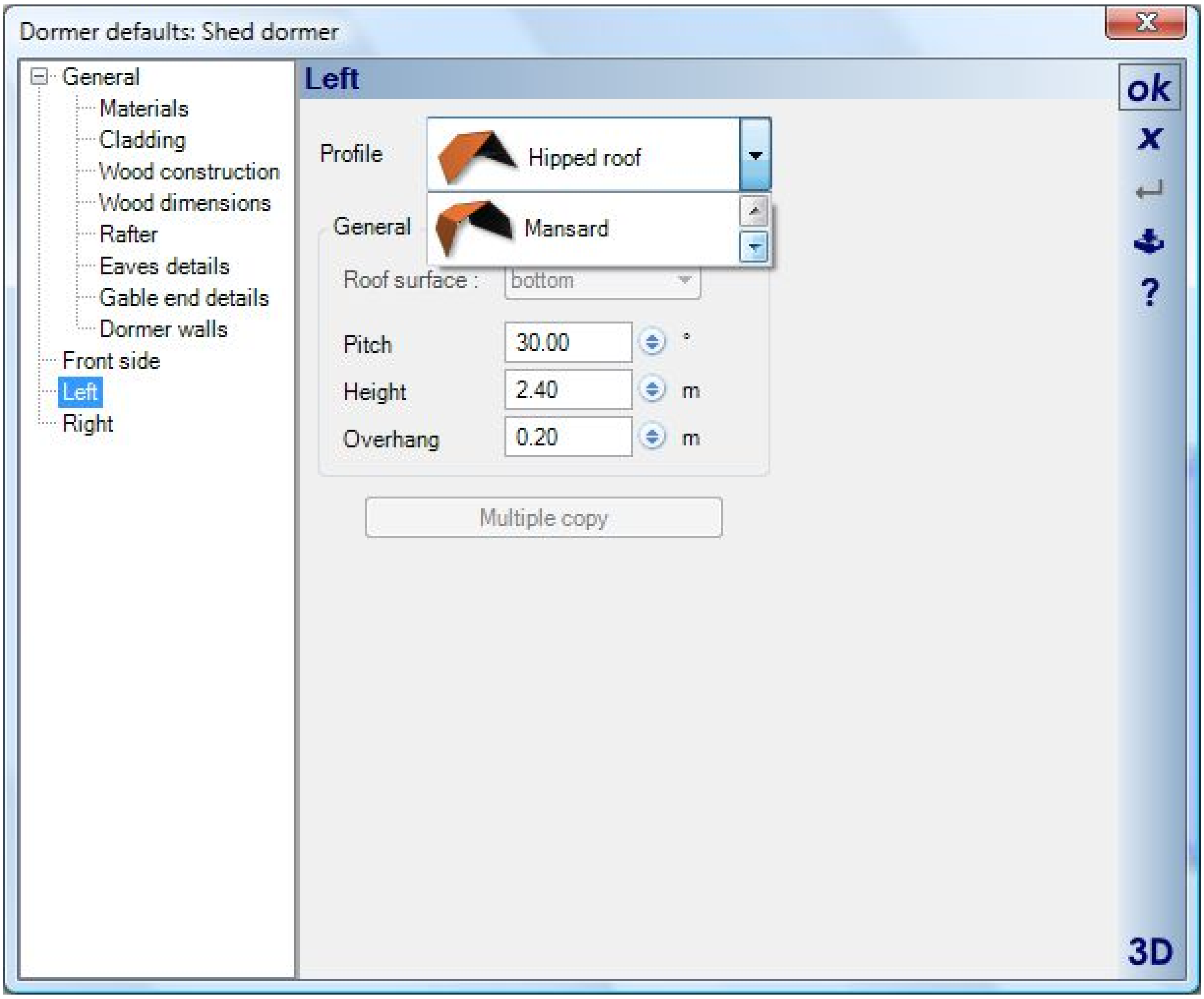
Roof surface : bottom

Pitch 90.00 °

Height 0.00 m

Overhang 0.20 m

Under ‘Left’ or ‘Right’ you can specify the usual settings for the roof planes and select one of the roof profiles available.



Dormer defaults: Shed dormer

Left

Profile: Hipped roof

General

Roof surface : bottom

Pitch 30.00 °

Height 2.40 m

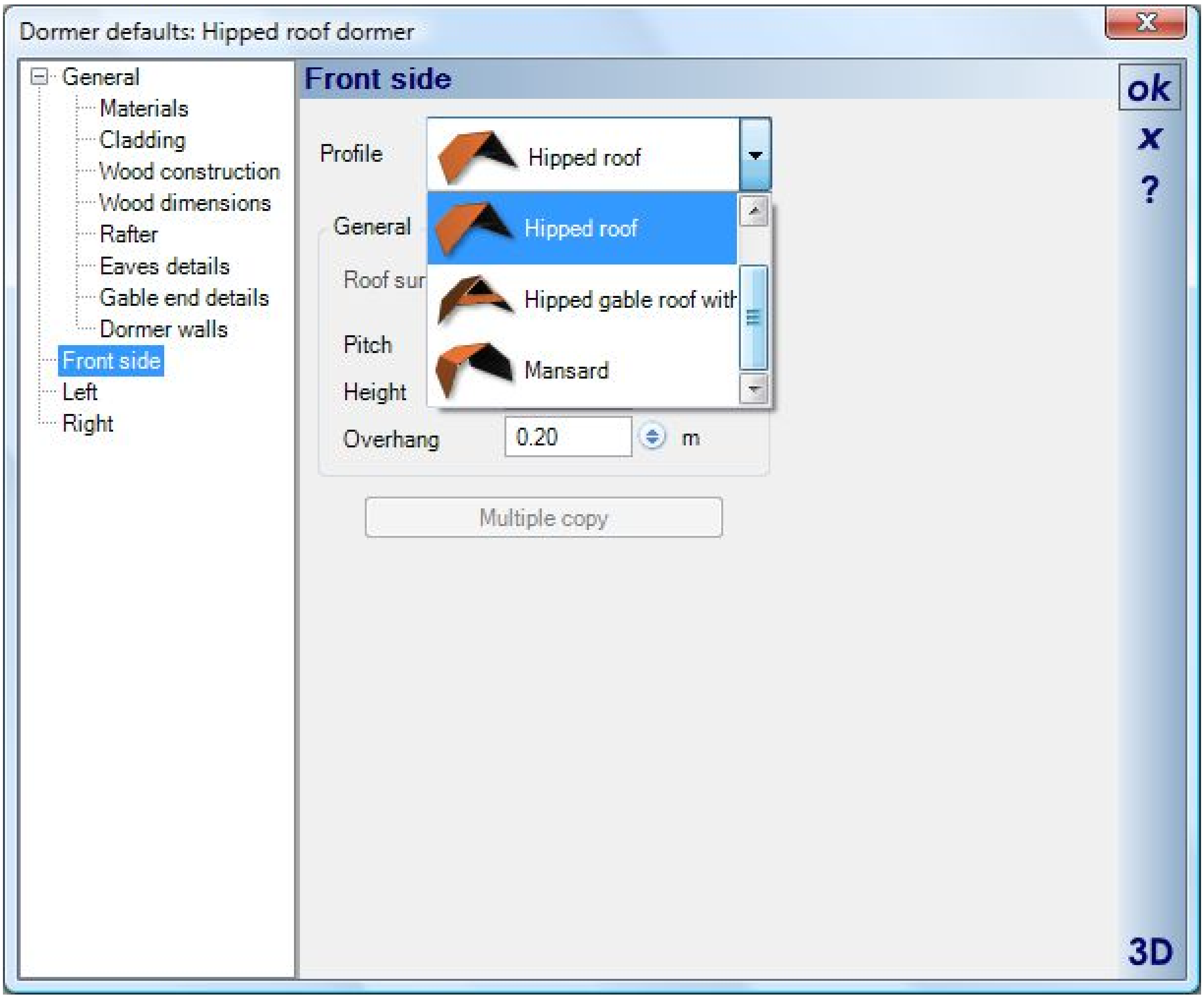
Overhang 0.20 m

10.2.2 Flat Dormer

The Flat dormer has no special characteristics compared to a gable fronted dormer.

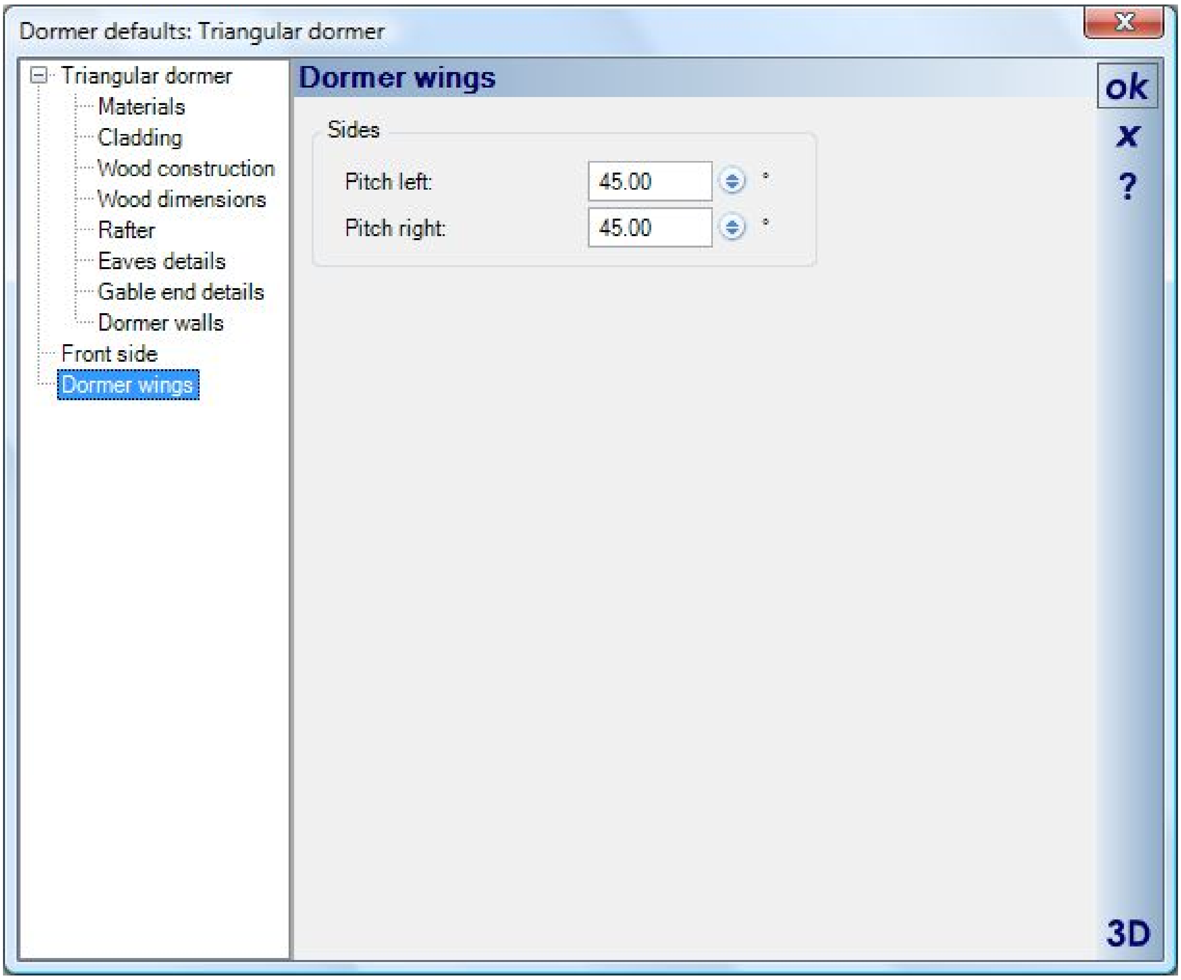
10.2.3 Hipped roof dormer

For the front of the hipped roof dormer, in addition to the option of a mansard roof, a ‘Half-hipped roof with opening’ can also be selected.



10.2.4 Triangular Dormer

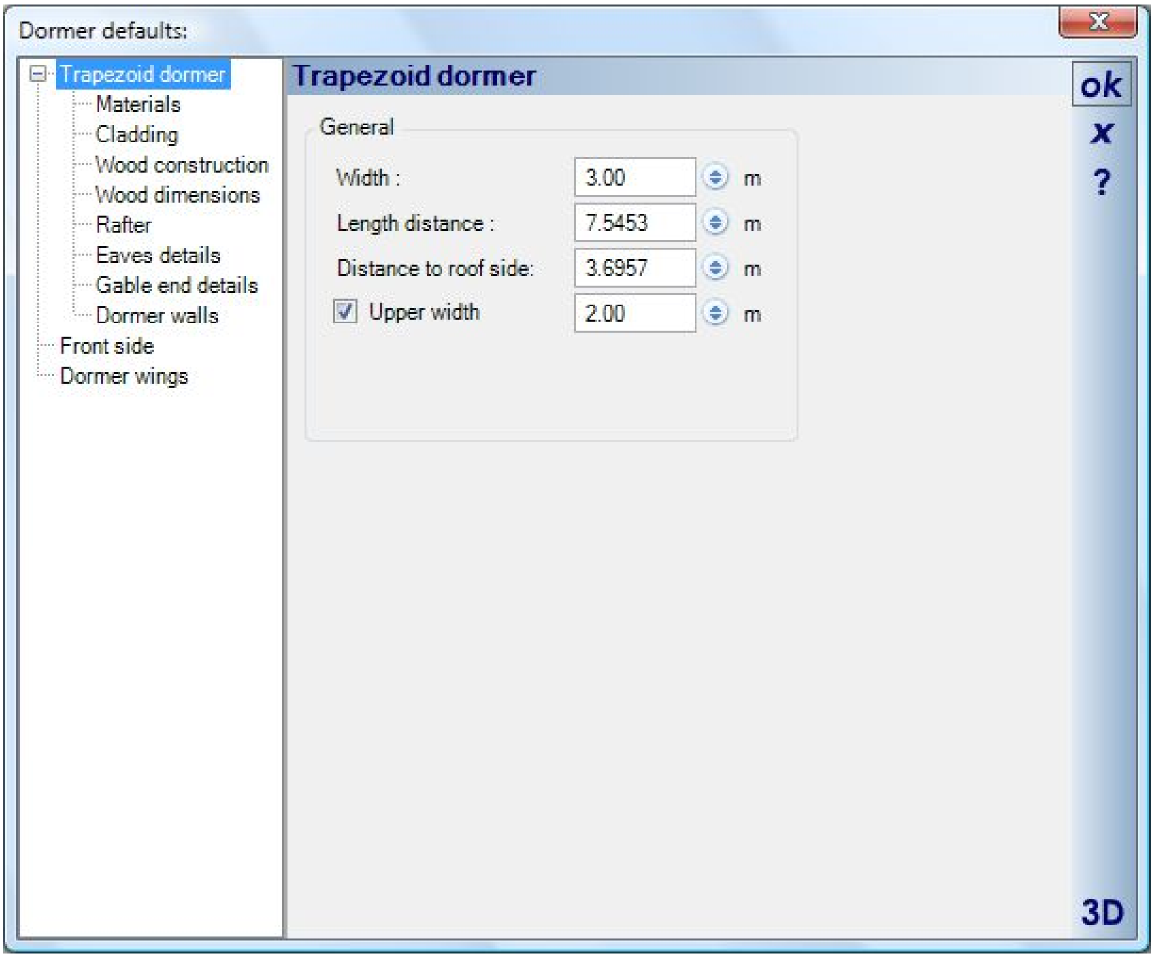
The pitch of the roof of a triangular dormer can be specified under ‘Dormer wings’.



Pitch left: 45.00 °
Pitch right: 45.00 °

10.2.5 Trapezoidal Dormer

As opposed to other dormers, the ‘Top width’ for a trapezoidal dormer can also be specified under general settings. This determines the width of the dormer roof at the intersection with the main roof. You can also specify, for example, that the door roof should taper towards the top.



Width : 3.00 m

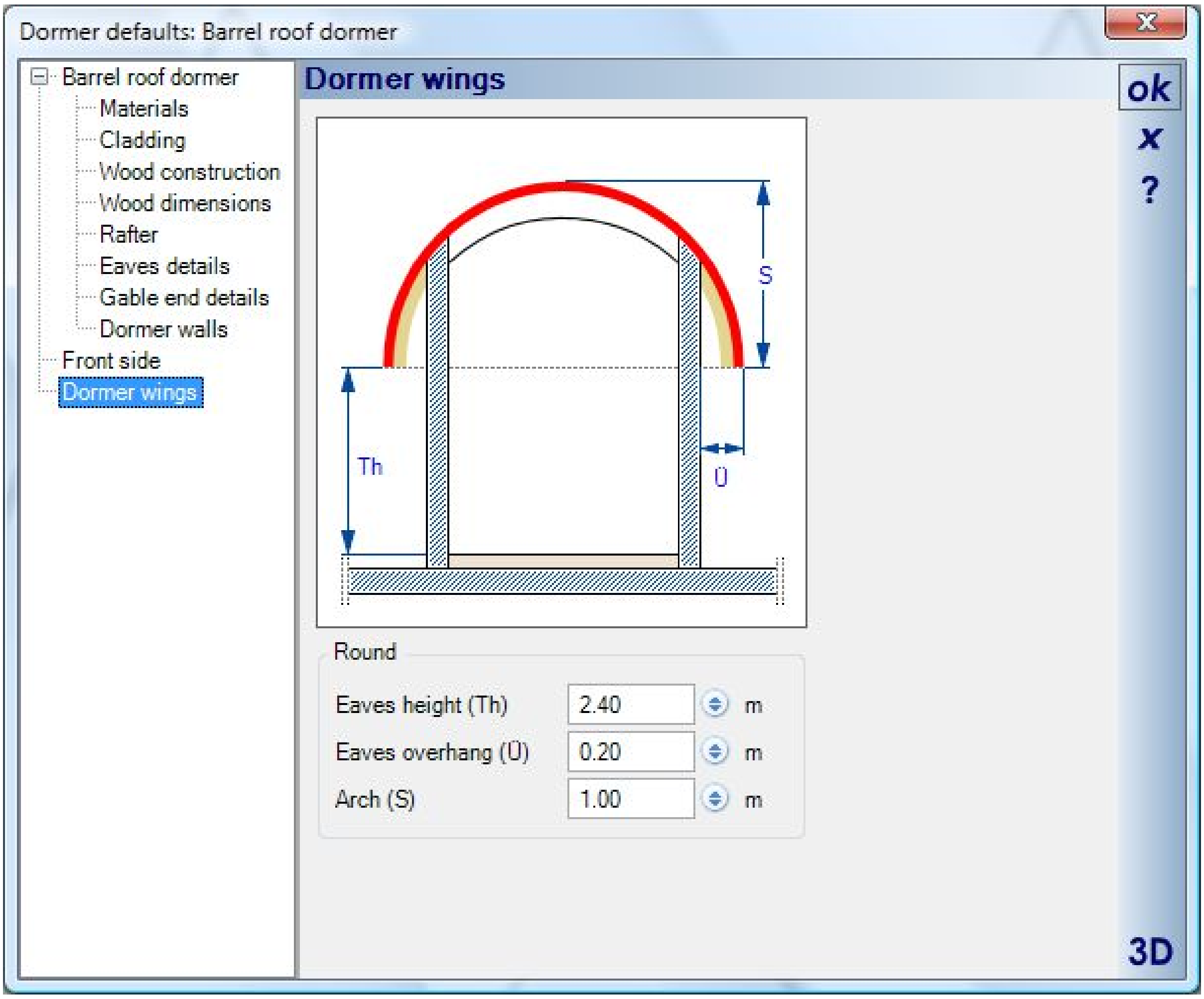
Length distance : 7.5453 m

Distance to roof side: 3.6957 m

☑ Upper width 2.00 m

10.2.6 Barrel roof dormer

A customised barrel roof dormer can be created by specifying the width of the dormer, the overhang at the sides and the height of the arch.



Round

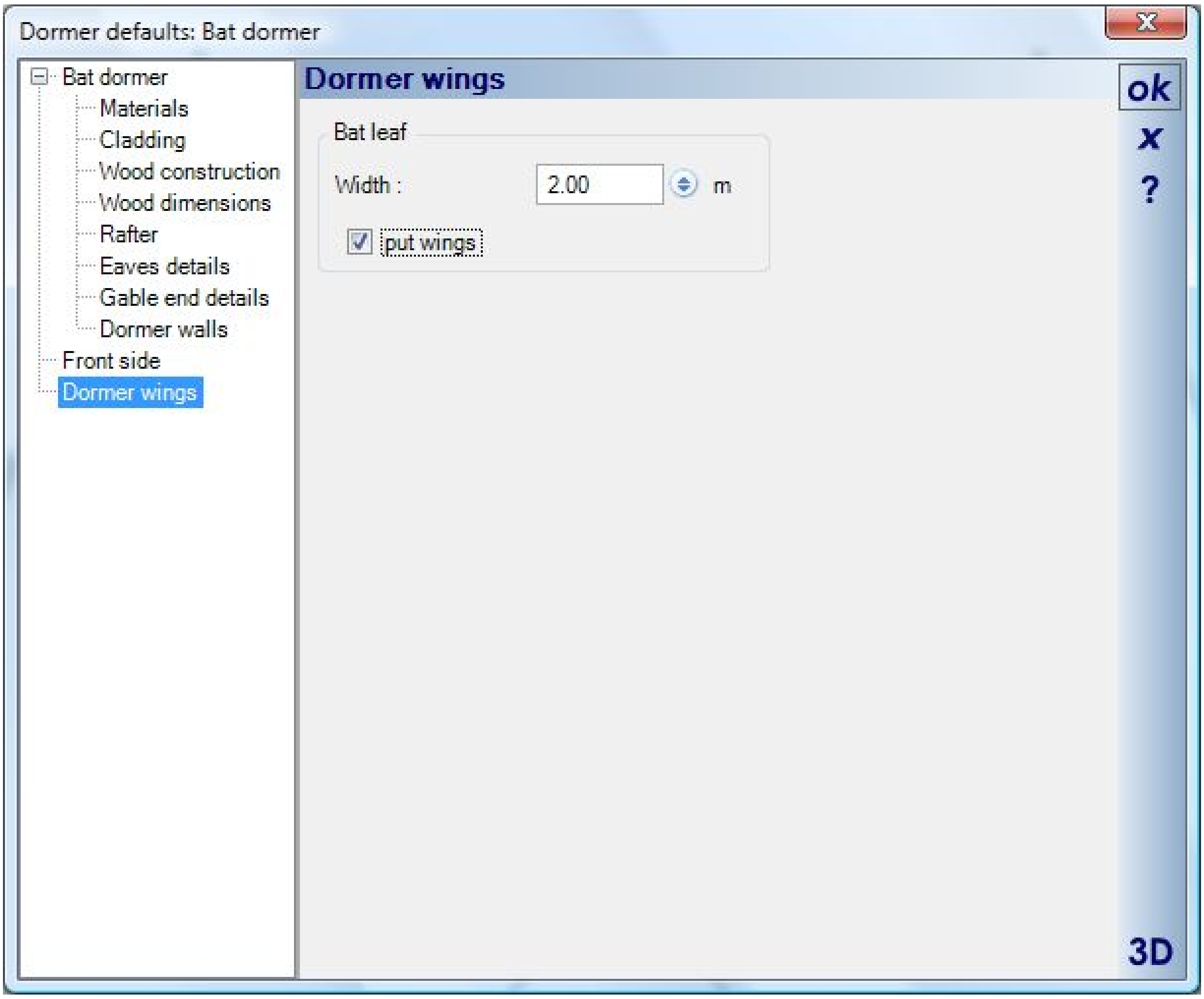
Eaves height (Th) 2.40 m

Eaves overhang (Ü) 0.20 m

Arch (S) 1.00 m

10.2.7 Bat dormer

The wings of a bat dormer can be altered by entering their width.



Dormer wings

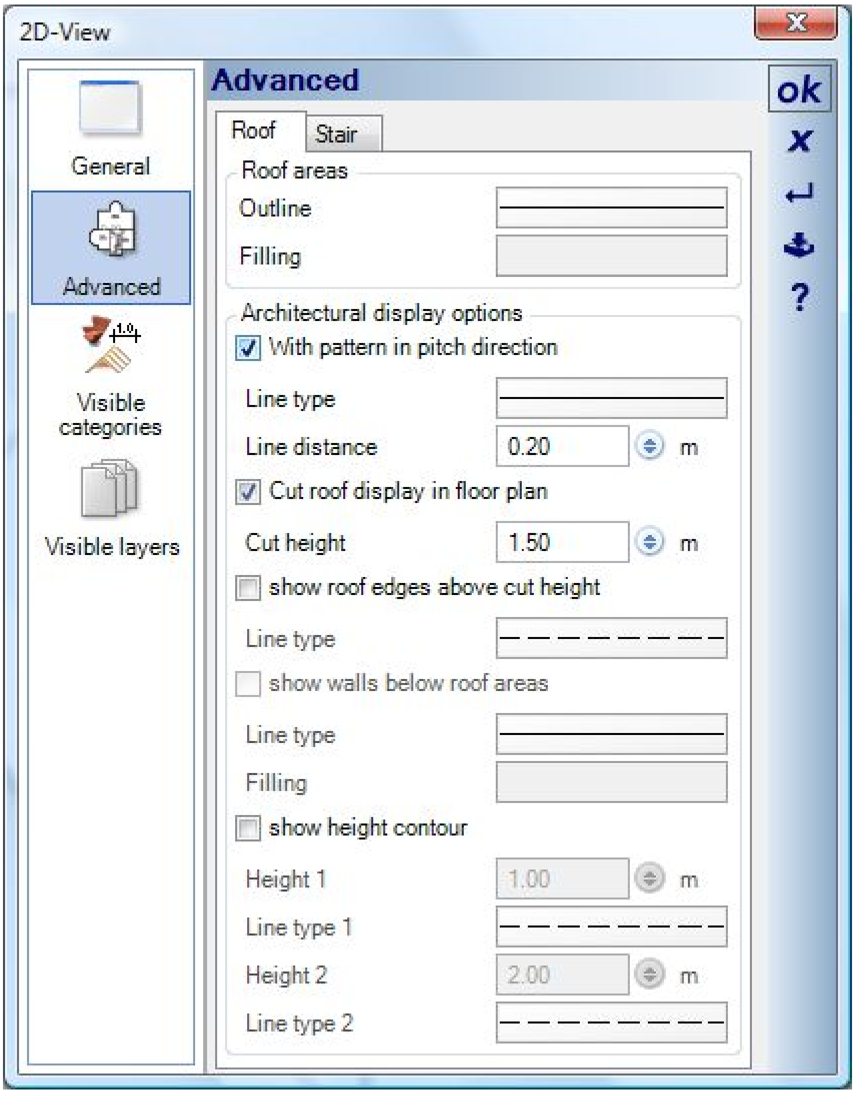
Bat leaf

Width : 2.00 m

☑ put wings

10.3 2D REPRESENTATION OF ROOFS

Without additional options the 2D representation of roofs is determined by the contour of the roof itself. However, in some cases this form of representation is not sufficient. The options required to adjust the representation of a roof are part of the 2D view and are therefore located in the 'Extended' section of the properties dialog for the view itself. It can be activated over the context menu, opened with a right mouse-click in a 2D view.



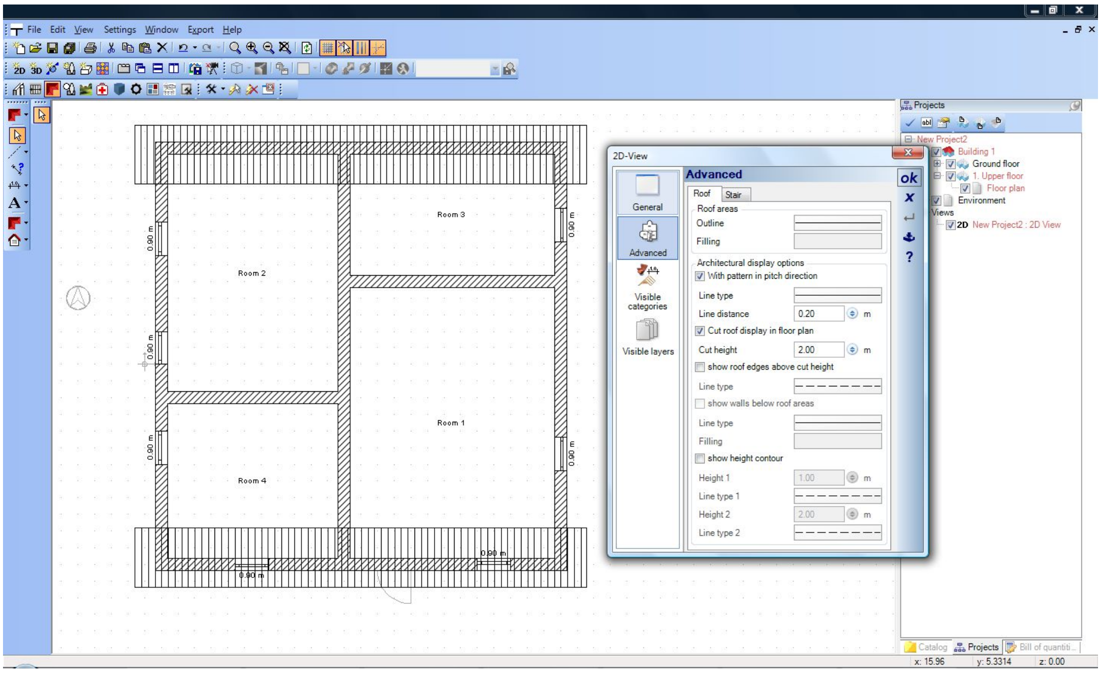
Roof areas
Outline
Filling

Architectural display options
☑ With pattern in pitch direction
Line type
Line distance 0.20 m
☑ Cut roof display in floor plan
Cut height 1.50 m
☐ show roof edges above cut height
Line type
☐ show walls below roof areas
Line type
Filling
☐ show height contour
Height 1 1.00 m
Line type 1
Height 2 2.00 m
Line type 2

Basically, options for following representations can be found in this section of the dialog:

- filled representation of a roof
- representation using hatching
- cut-off representation, i.e. only the parts of a roof area up to a defined height are drawn
- representation using contour lines

All options only affect the current 2D view.



2D-View

Advanced

Roof | Stair

Roof areas

Outline

Filling

Architectural display options

☑ With pattern in pitch direction

Line type

Line distance 0.20 m

☑ Cut roof display in floor plan

Cut height 2.00 m

☐ show roof edges above cut height

Line type

☐ show walls below roof areas

Line type

Filling

☐ show height contour

Height 1 1.00 m

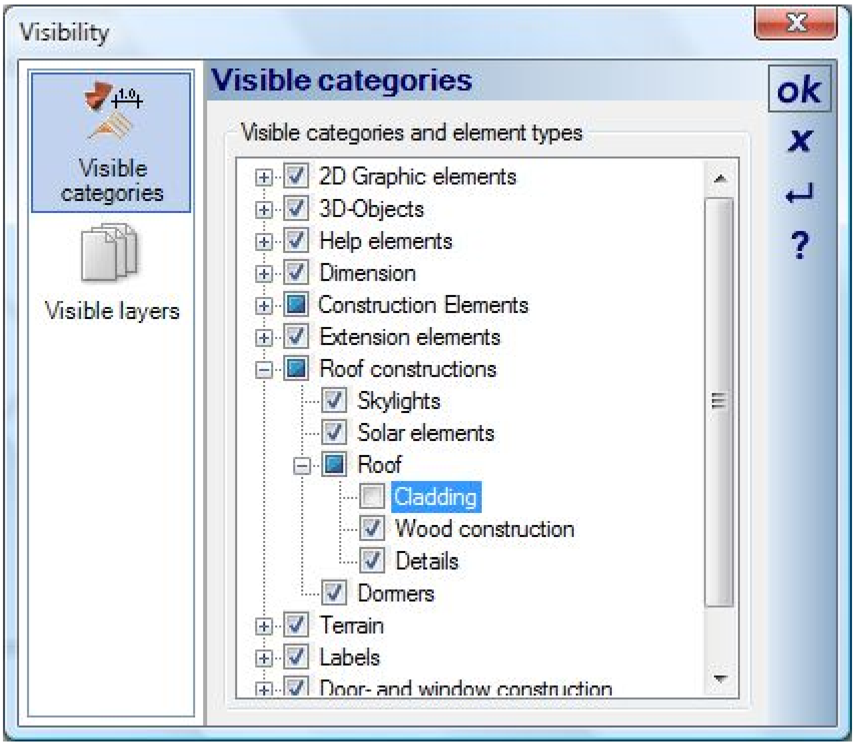
Line type 1

Height 2 2.00 m

Line type 2

10.4 VISIBILITY OF ROOF DETAILS

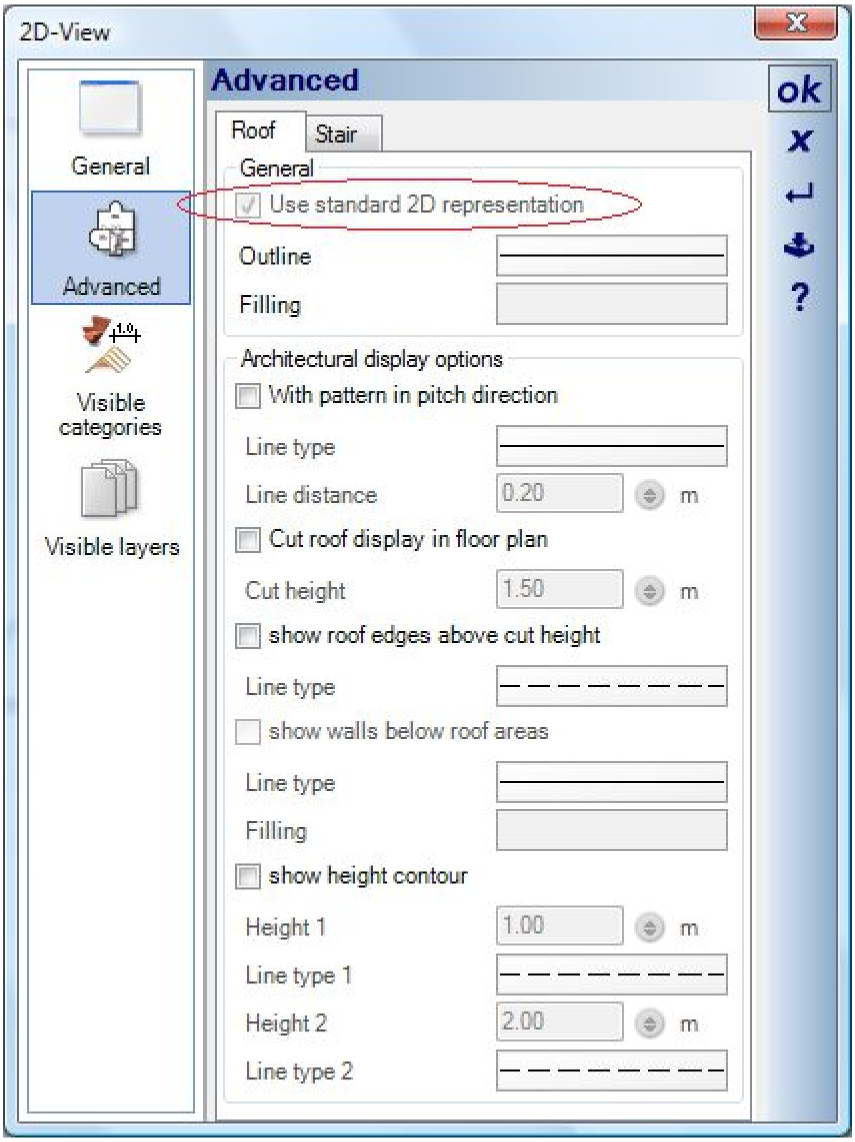
For all views, certain details of the roof can set as invisible in the 'Visible categories' section, for example to remove the cladding so that the timber frame is visible.



Visible categories and element types

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension
- ■ Construction Elements
- ☑ Extension elements
- ■ Roof constructions
  - ☑ Skylights
  - ☑ Solar elements
  - ■ Roof
    - ☐ Cladding
    - ☑ Wood construction
    - ☑ Details
  - ☑ Dormers
- ☑ Terrain
- ☑ Labels
- ☑ Door- and window construction

However, the representation in 2D views is only active if the standard 2D representation used by the program is deactivated. This can be done in the 'Advanced' section of the properties dialog for the 2D view by unticking the 'Use standard 2D representation' option.



General

☑ Use standard 2D representation

Outline

Filling

Architectural display options

☐ With pattern in pitch direction

Line type

Line distance 0.20 m

☐ Cut roof display in floor plan

Cut height 1.50 m

☐ show roof edges above cut height

Line type

☐ show walls below roof areas

Line type

Filling

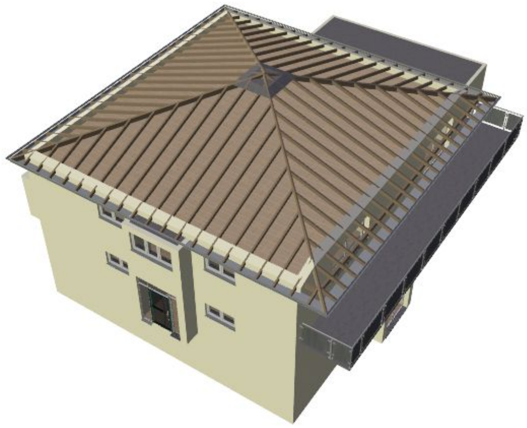
☐ show height contour

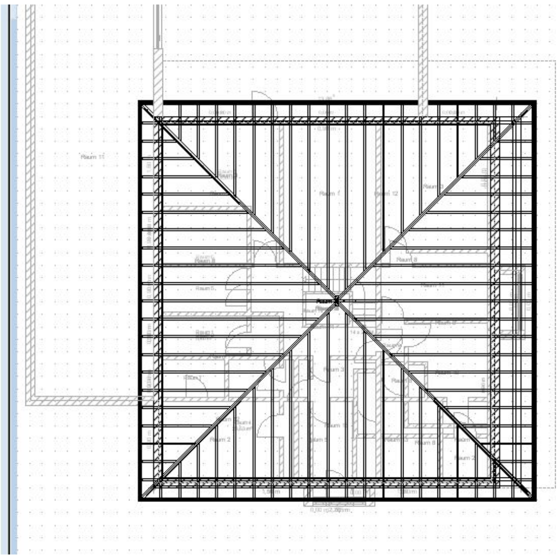
Height 1 1.00 m

Line type 1

Height 2 2.00 m

Line type 2



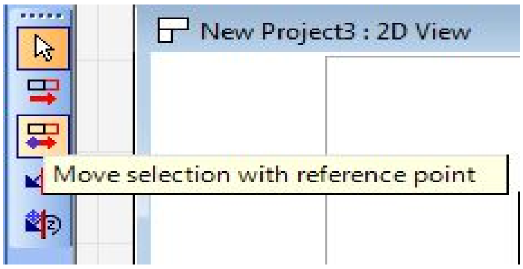


11 ADVANCED ROOF FEATURES

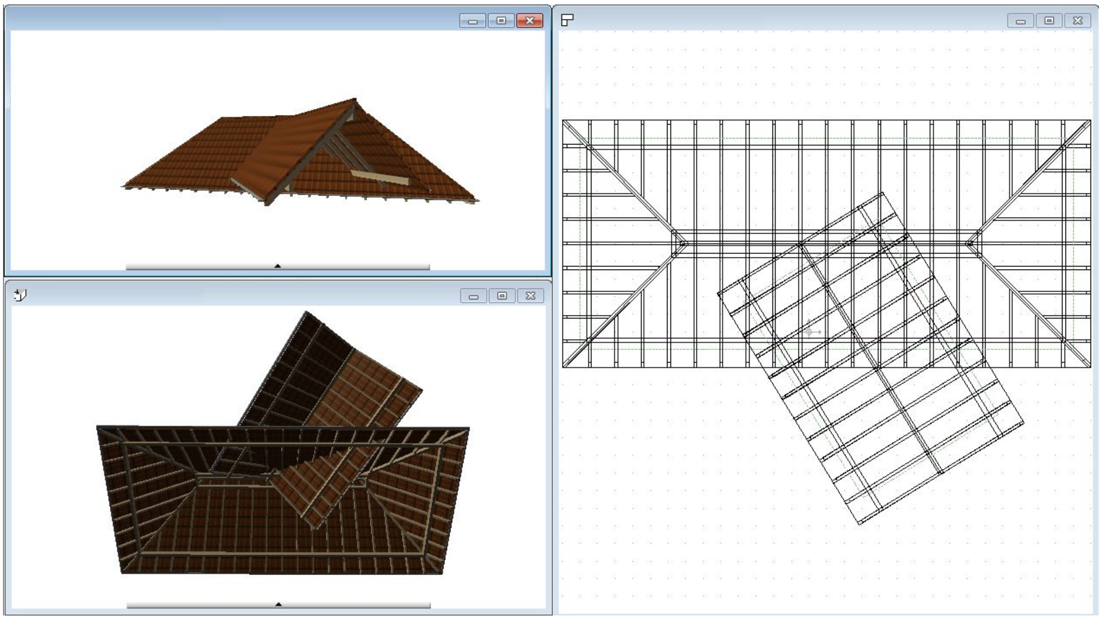
Note: the plug-in "Advanced Features Roof" is not a standard feature for all versions. The availability of this feature functions depends on its release. If necessary. ask your dealer.

11.1 MERGE ROOFS

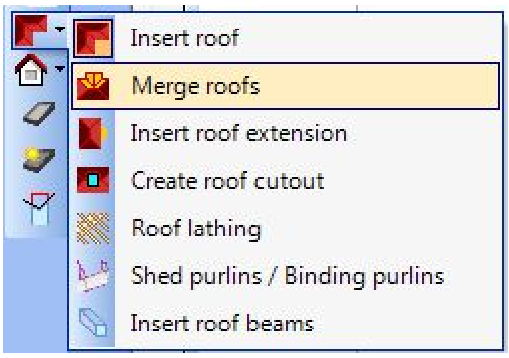
After merging, individual roof structures become interconnected. This includes both the outer roof contour and the wood construction. However, the original individual roofs remain editable. The individual roofs are first entered using the normal input methods. You then position the two roof sections together, selecting each roof and using the move and rotate functions on the left side.



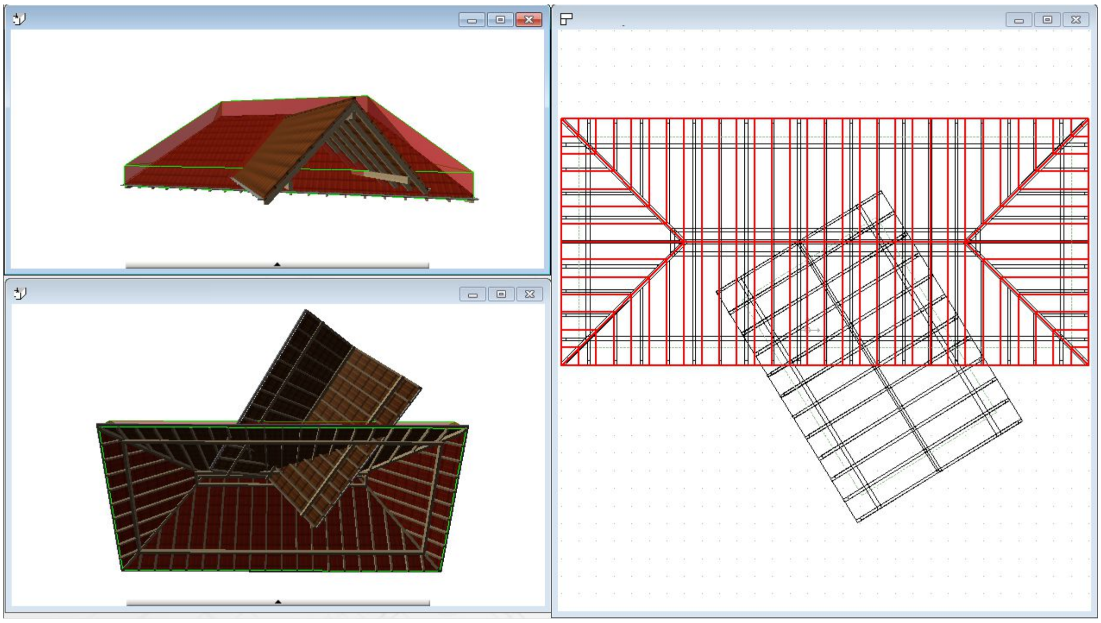
The following image shows an example of a situation in which two separate roofs lie inside one another and intersect.



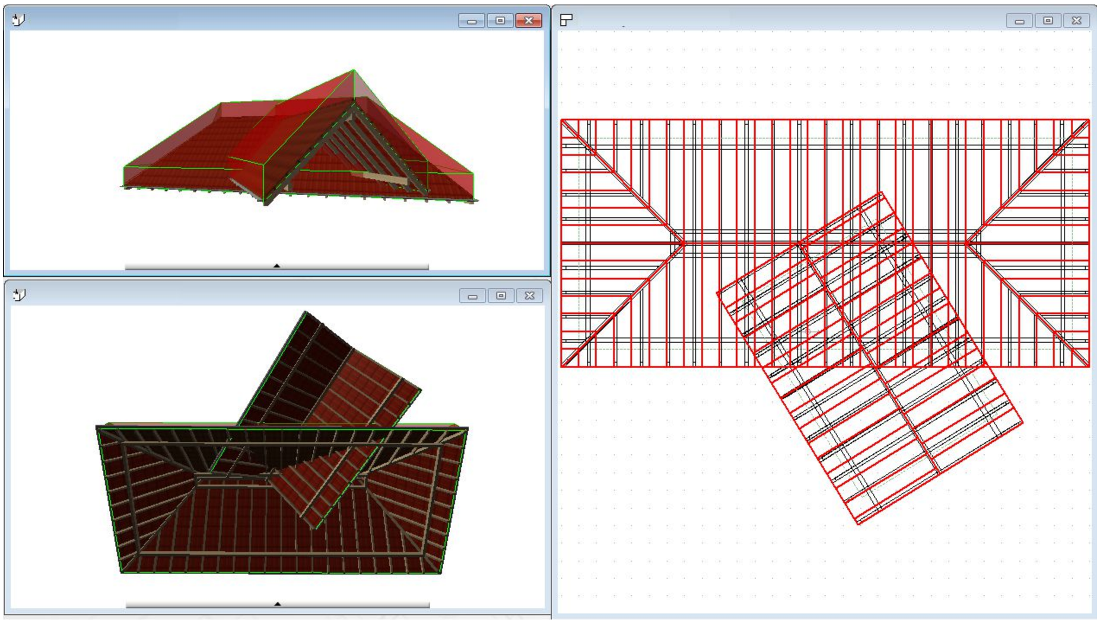
To merge, use the Merge roofs function in the extended roof-plugin.



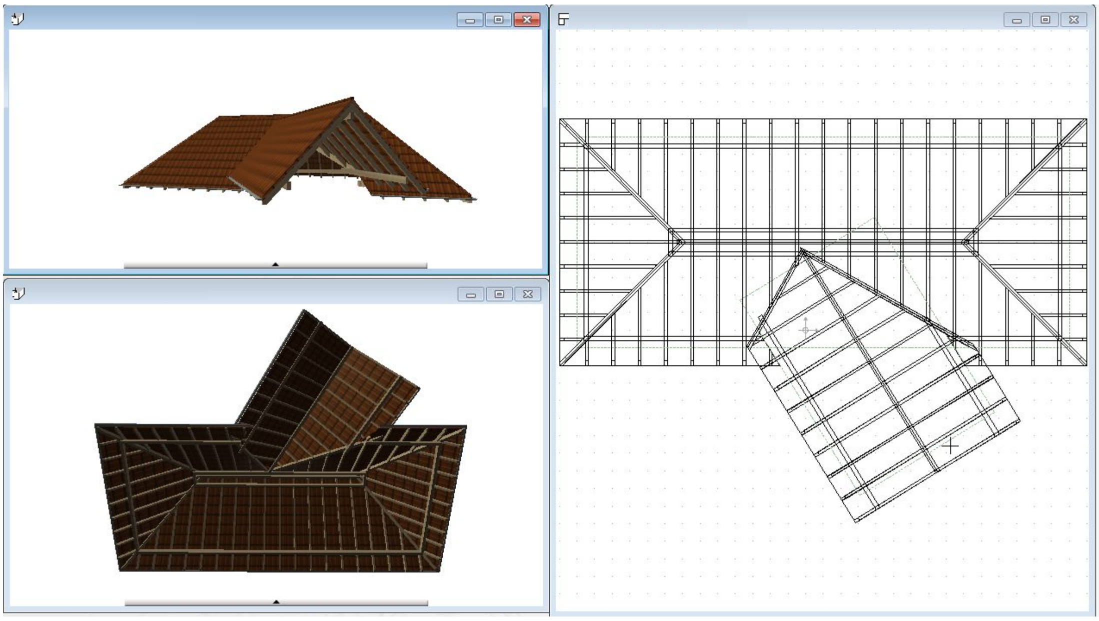
The function now expects a click on the first of the merging roof sections. In the view the selected roof section is indicated in red.



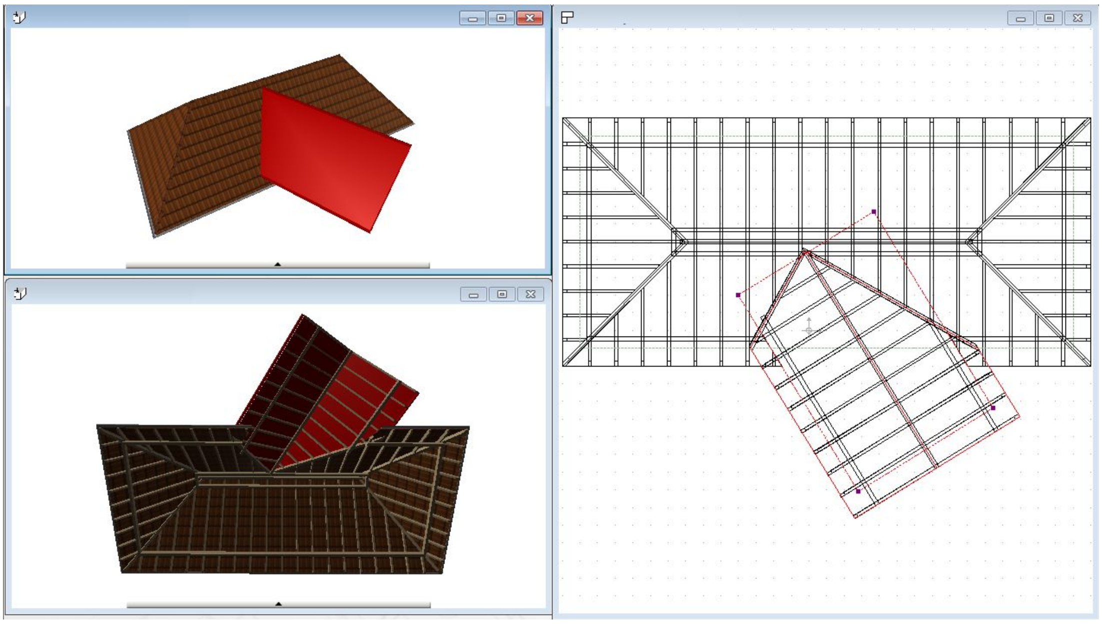
After a few seconds, move your mouse over the second of the two roof sections. The red section is then added to the preview.



With the next click you will complete the merge process. The calculation of the resulting merged roof is automatic.



The two original roof sections are still editable as individual components and you can move, rotate, and change the contour or the properties of each. Select one of the merged roof sections and you will see no difference in the selection of a "normal" roof. Only when updating, after changing the merged roofs is the merged result automatically recalculated.



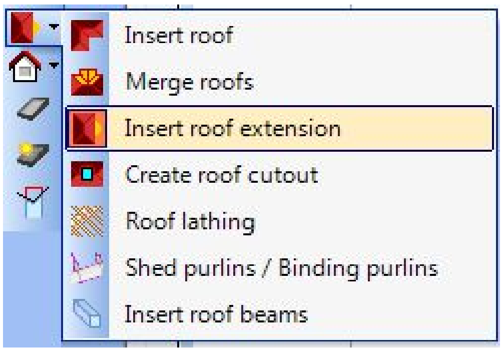
11.2 ROOF EXTENSIONS AND ROOF OPENINGS

Roof extensions are areas that can be added to an existing roof side. Entering an extension is achieved in the followings steps with a mouse:

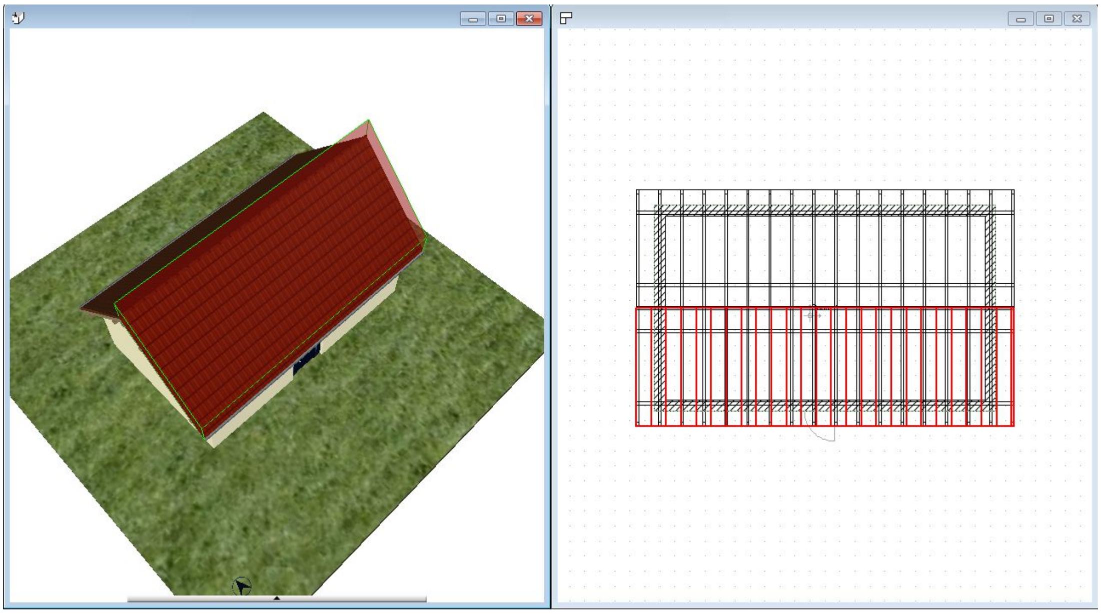
- Select the roof side to be extended
- Specify the start and end point of the extension
- Determine the length of the extension
- If necessary add additional extensions or modify existing ones with opening elements

11.2.1 Inserting a Roof Extension

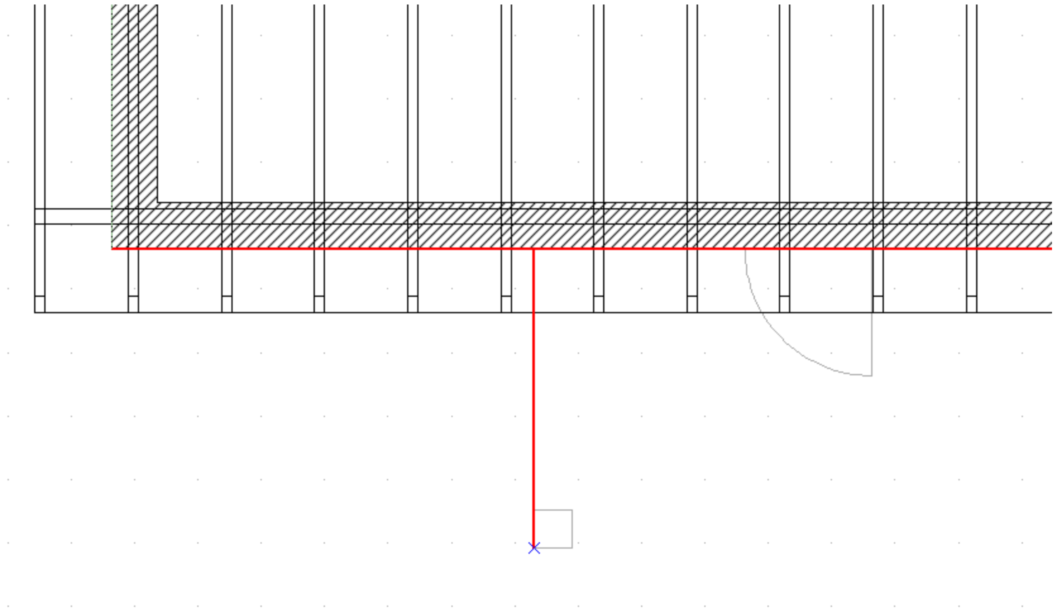
The roof extension is started by selecting the Insert roof extension function buttons on extended roof plug-ins.



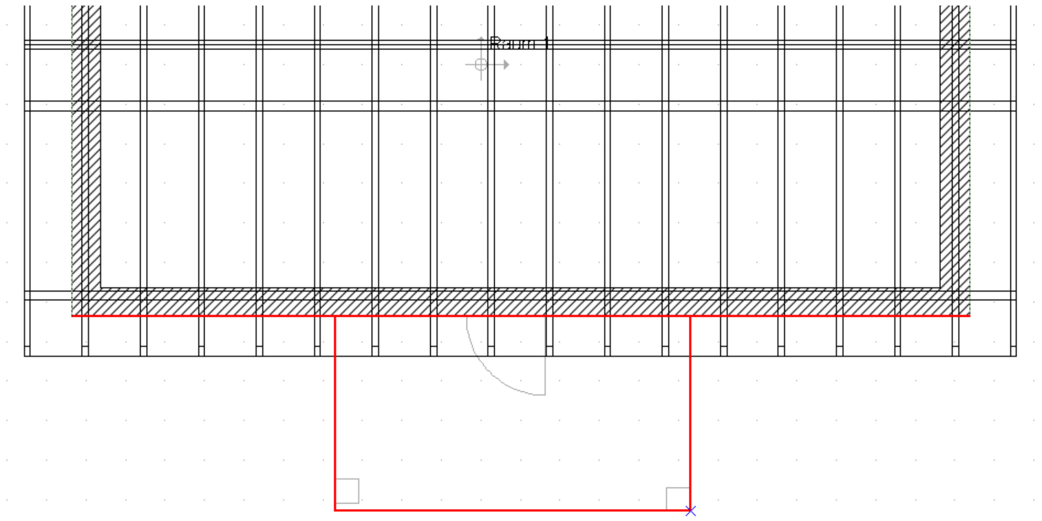
Then, move the mouse over the side of the roof, you want to extend. The roof side will be recognized and highlighted in red in all views.



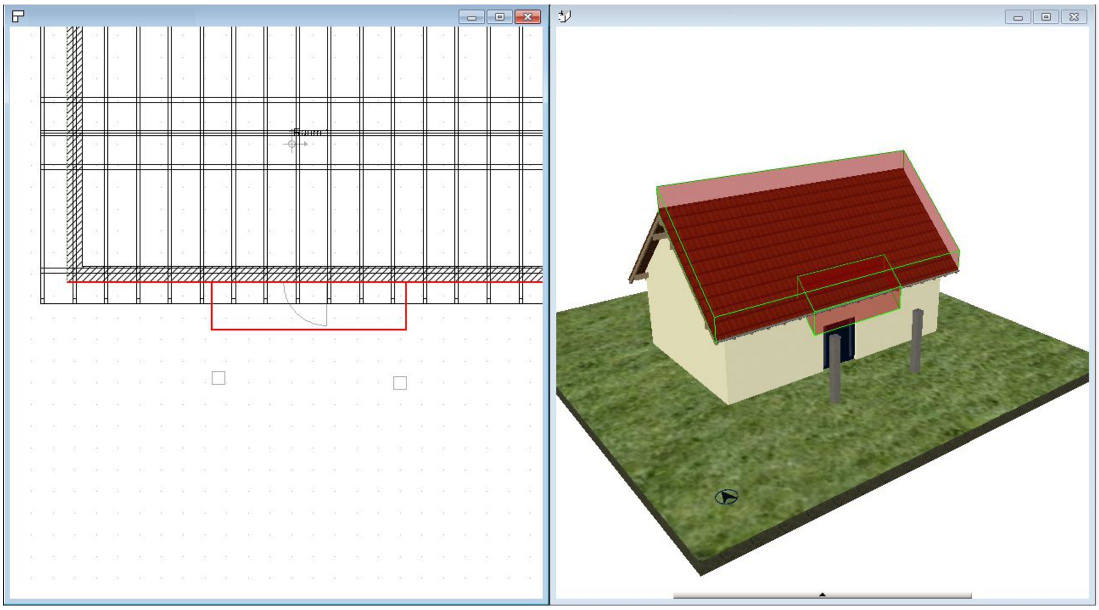
With a left mouse click, select the side of the roof. Then you set the starting point of the new surface.
While adding a new surface you will be supported by a red cursor.
It also shows a red line as an extension to the entry point on the side of the roof line, regardless of where you click. So you can for example take the corner as a reference point, without having to create additional temporary points.



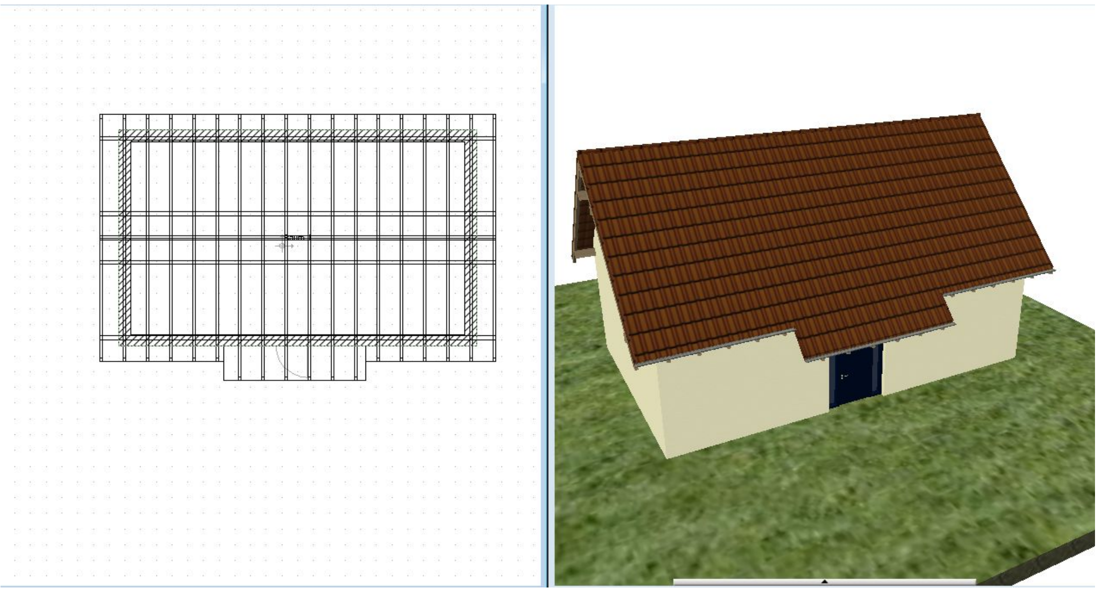
With a second point, you specify the width of the extension, and the cursor takes the shape of a rectangle. At this time the rectangle does not indicate the depth of the extension surface.



Finally, you complete the extension by setting the depth. Again, you are supported by a preview in all views.

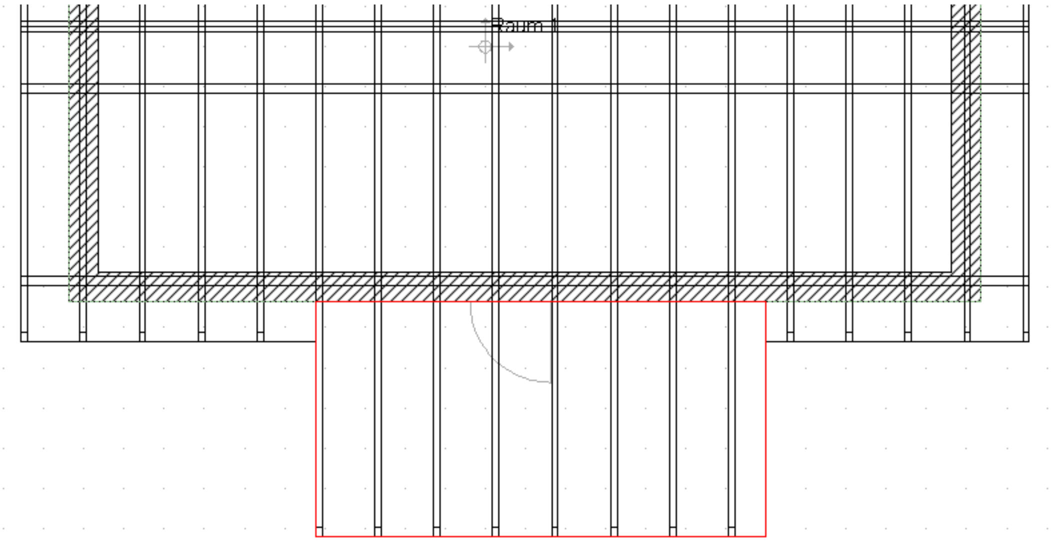


The input is terminated with the ENTER key or by the appropriate function from the context menu activated with a right mouse click.



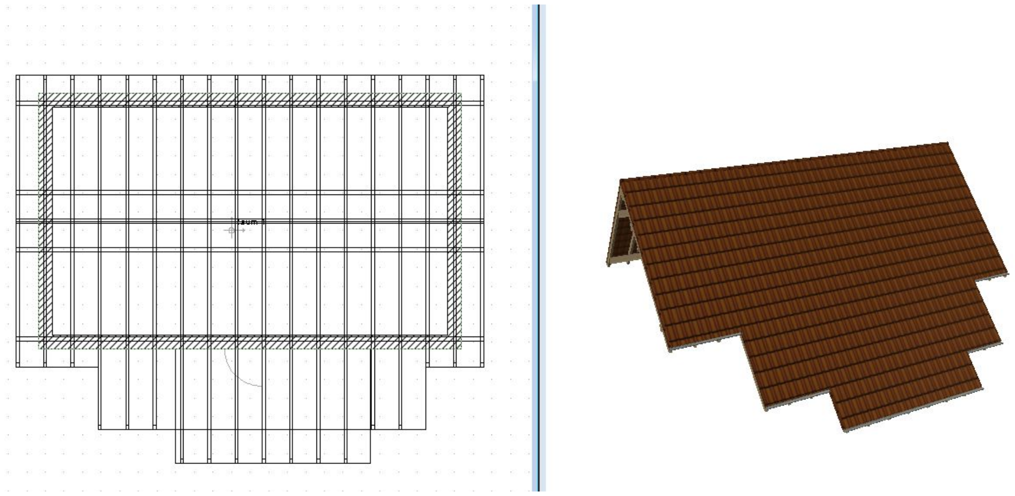
11.2.2 Deleteing a Roof extension

Roof extensions can be selected independently. In a 2D view, click twice on the extension area. When you first click the roof is selected, and with the second the extension area itself a selected. Delete the roof extension with the DEL key or the Delete button in the top toolbar.

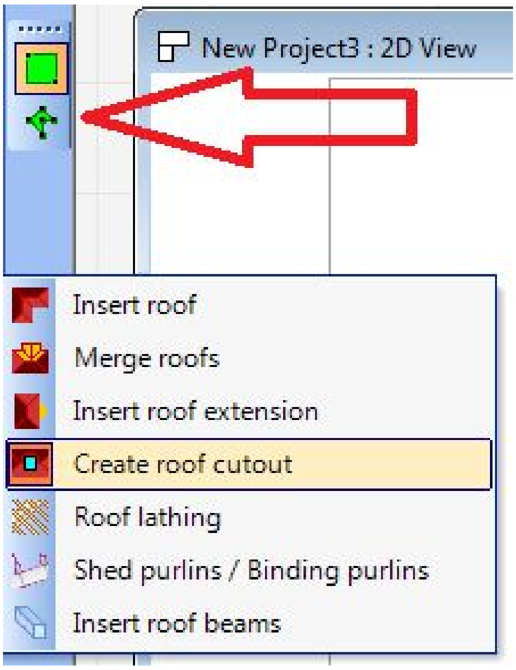


11.2.3 Edit Roof Extensions / Roof Cutout

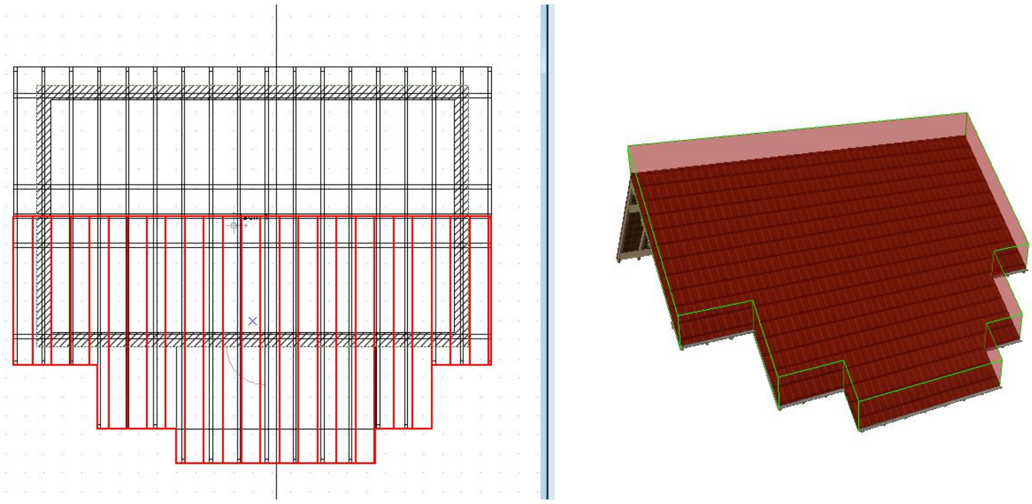
You can enter multiple successive rectangular roof extensions succession such as:



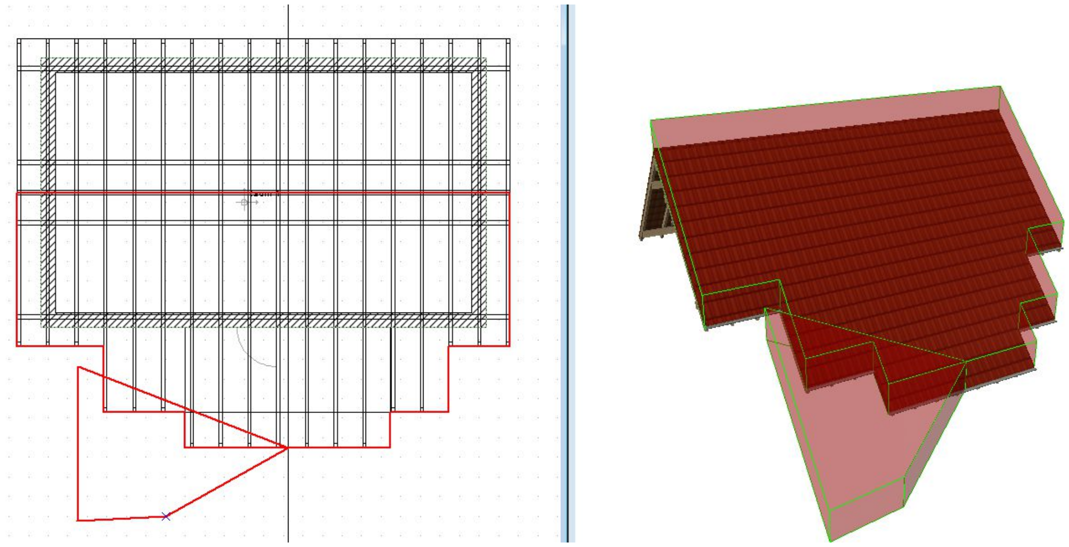
You can also remove unwanted sections of a roof. You can enter a rectangular or polygonal cutout using the Create roof cutout tools.



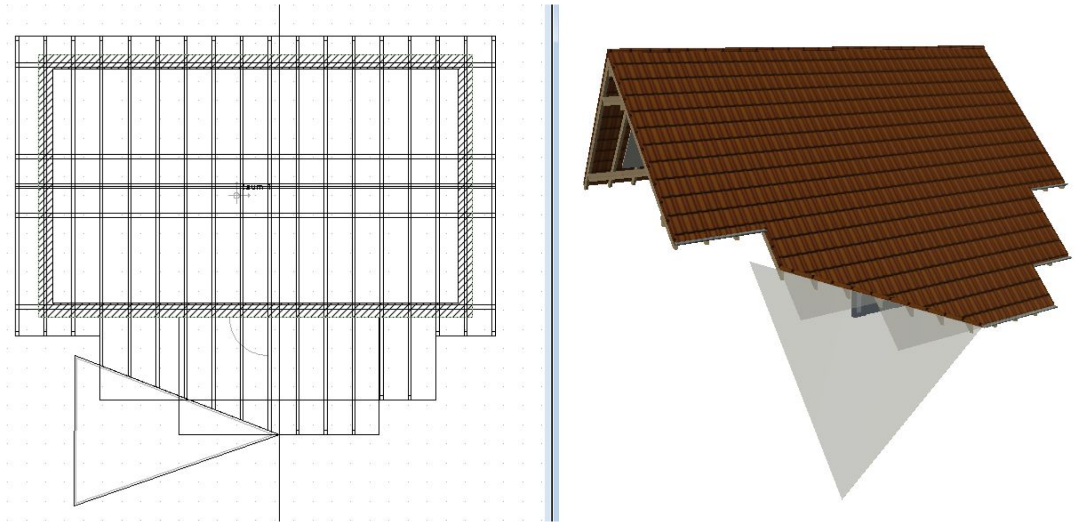
To enter a roof cutout first select the roof, to which the cutout is to be inserted.



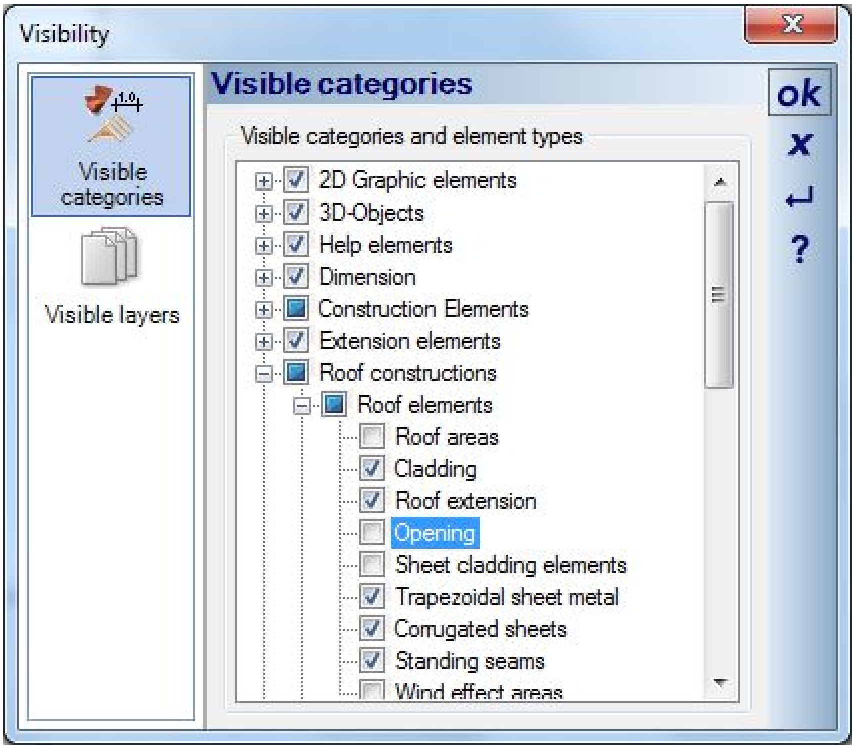
Then enter the cutout using the selected input method. The points of the cutout can be outside of the roof surface.



End the cutout input using the Enter key or the context menu. The cut is automatically displayed in the roof immediately. The 2D contour of the cutout and a transparent surface in 3D is displayed, allowing you to select the cutout and delete if necessary.



The roof cutouts can also be accessed via the Visibility dialog. In the 2D view, right click to activate the context menu and select Visibility. In the visibility tree locate the roof cutout and deselect.



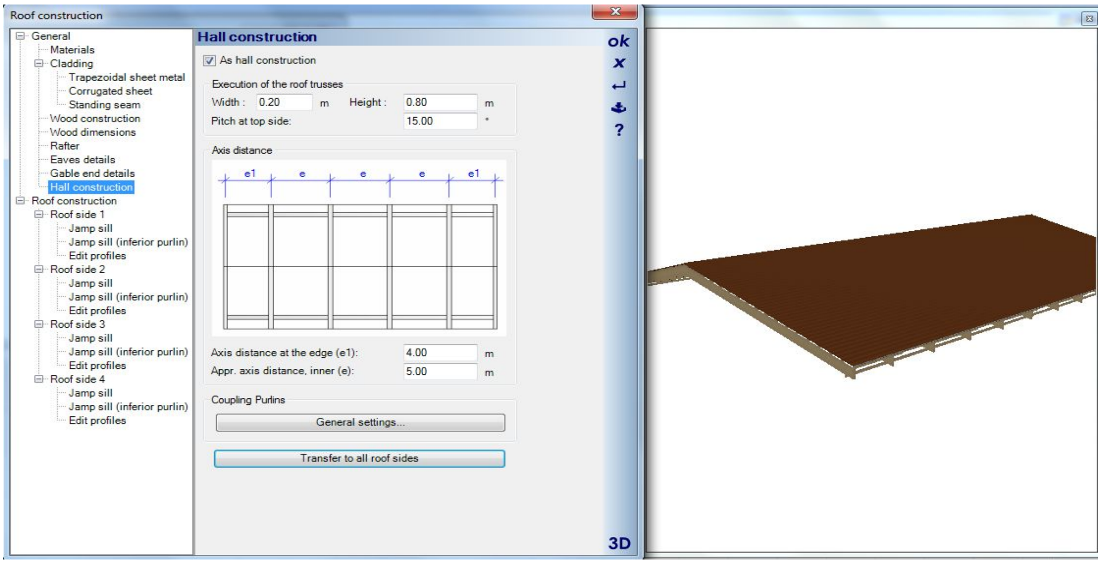
Visible categories

Visible categories and element types

- ☑ 2D Graphic elements
- ☑ 3D-Objects
- ☑ Help elements
- ☑ Dimension
- ■ Construction Elements
- ☑ Extension elements
- ■ Roof constructions
  - ■ Roof elements
    - ☐ Roof areas
    - ☑ Cladding
    - ☑ Roof extension
    - ☐ Opening
    - ☐ Sheet cladding elements
    - ☑ Trapezoidal sheet metal
    - ☑ Corrugated sheets
    - ☑ Standing seams
    - ☐ Wind effect areas

11.3 HALL CONSTRUCTION / PURLINS

Roofs with constructed purlins on a truss structure are widely used in buildings. The roof dialog lists in the tree view, the required settings in the property page "Hall construction" option.



Hall construction

☑ As hall construction

Execution of the roof trusses

Width : 0.20 m Height : 0.80 m

Pitch at top side: 15.00 °

Axis distance

Axis distance at the edge (e1): 4.00 m

Appr. axis distance, inner (e): 5.00 m

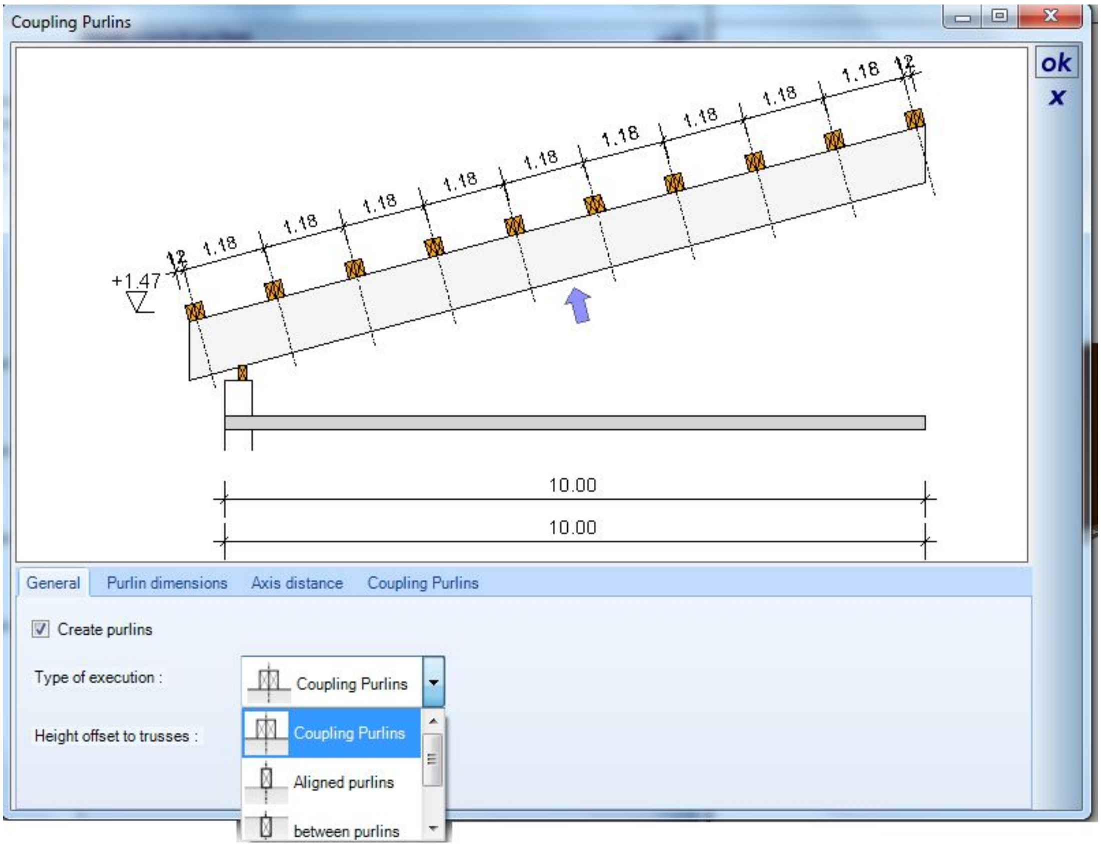
Coupling Purlins

Purlins tie the rafters, suitable for indoor constructions basically exclusively with gabled roofs. Entering a hall with roof purlins is as follows:

- Insert a rectangular roof
- Adapt roof sides to create a saddle roof, with the two opposite sides defined as GABLE
- Activate the hall construction
- Adjust the dimensions of the roof trusses and the spacing of the trusses Customise the purlins
- Transfer the settings to all sides of the roof
- Exit the dialog with OK

11.3.1 *Adjust Purlin settings*

Click on the General settings button to open the dialog for the Purlin settings..



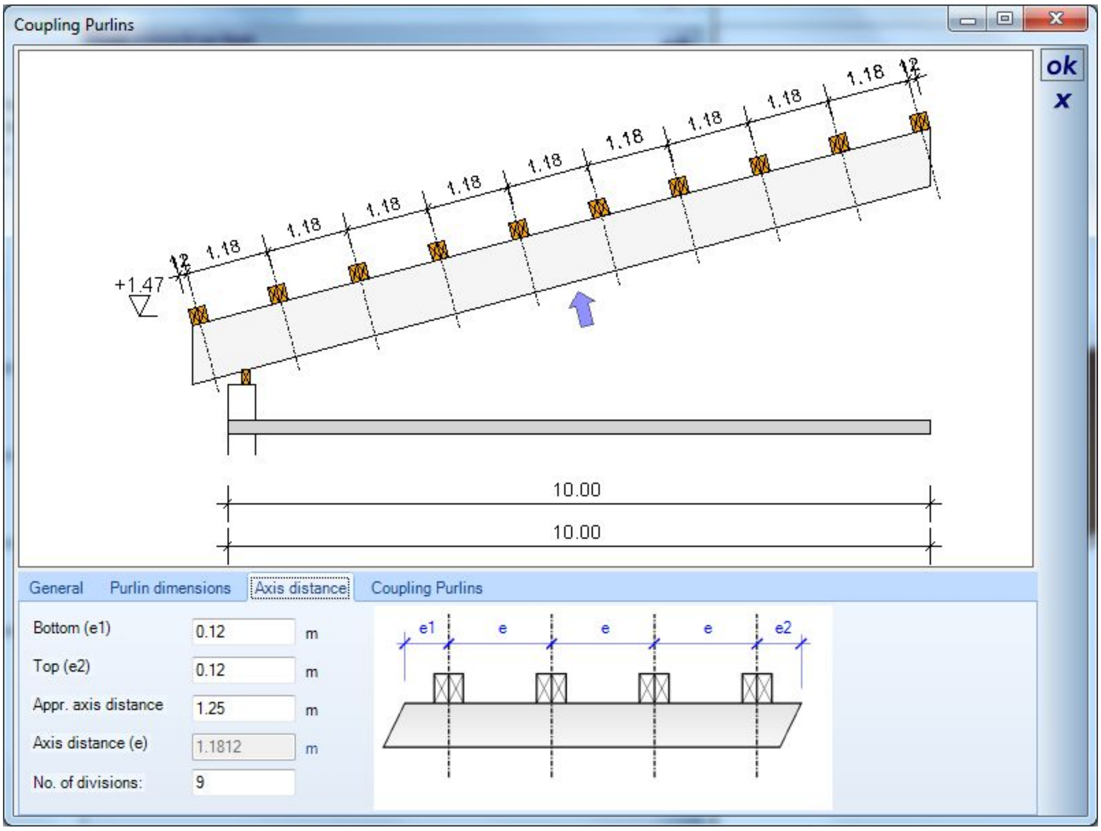
☑ Create purlins

Type of execution : Coupling Purlins

Height offset to trusses :

In the upper part of the dialog you can see an interactive diagram that changes depending on the settings and represents the current design. Within the sketch, you can also zoom, scroll with the mouse and using the normal keyboard shortcuts as with a 2D view in the software.

At the bottom of the dialog you can see various tabs for the corresponding settings. On the General tab you first define the type of purlin construction.
The Axis distance tab illustrates via an additional sketch the dimensions relating to each input field. It should be noted that the actual distance between the purlins is variable and is formed from the uniform distribution over the surface. Only the distances above and below are fixed in place. The Axis distance is thus the maximum distance that actually results.



Bottom (e1) 0.12 m
Top (e2) 0.12 m
Appr. axis distance 1.25 m
Axis distance (e) 1.1812 m
No. of divisions: 9

After closing the dialog, the changes will update the 2D and 3D roof views.

12 STAIRS PLUG-IN

12.1 INSERTING DIFFERENT TYPES OF STAIRS

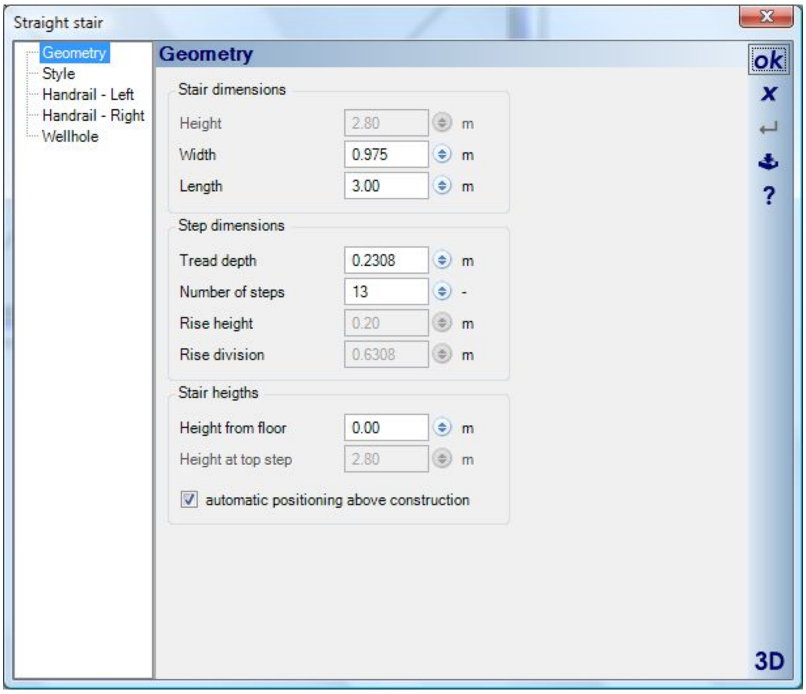
The software provides three types of staircase and three different ways of inserting staircases.

- Straight staircase
- geometrical stair
- Landing staircase

For all types of staircase, input is terminated with ‘Enter’ or over the item ‘Complete with’ in the context menu activated with a right mouse click. When input is terminated, the properties dialog is immediately opened for that particular type of staircase.

For types of staircase which are entered as a polygon, you can recognize from the ‘staircase cursor’, i.e the representation of the staircase during input, whether a valid staircase can be created from the current sections, or not. For instance, if the angle of the last section of the staircase is too acute, the last segment will disappear, if calculation is not possible due to the current position of the cursor,.

12.2 GEOMETRY



Geometry

Stair dimensions

Height 2.80 m
Width 0.975 m
Length 3.00 m

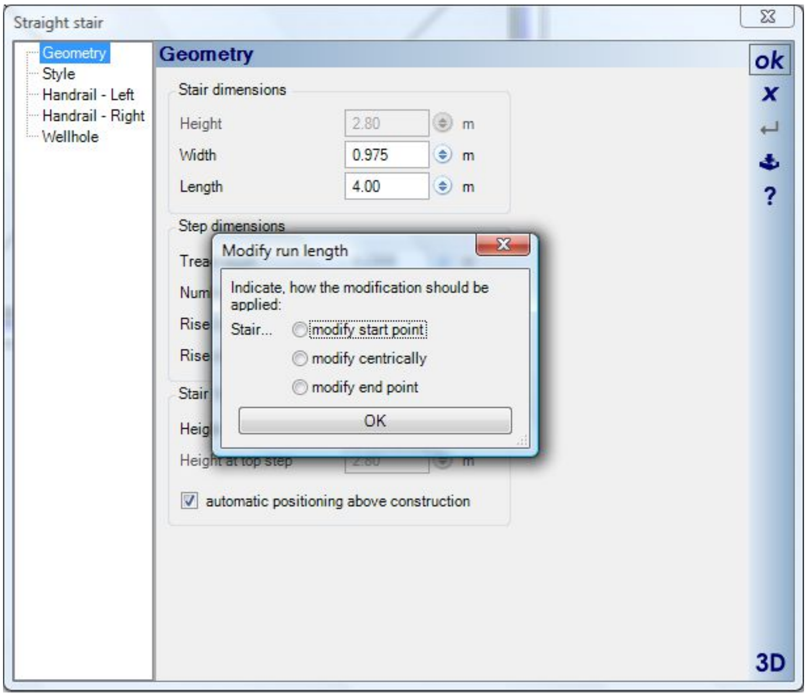
Step dimensions

Tread depth 0.2308 m
Number of steps 13 -
Rise height 0.20 m
Rise division 0.6308 m

Stair heigths

Height from floor 0.00 m
Height at top step 2.80 m
☑ automatic positioning above construction

The program calculates automatically within certain tolerances, using the step dimensions of the stairs, a reasonable relationship between rise and tread depth (note: gradient/ = two steps + one tread; the ideal gradient based on the length a person’s step is 63 cm). If for example, you change the length of the run of the stairs and then switch to another input field, the ‘Modify run length’ dialog appears. Here you have the choice of three options as to how the stairs should be adapted to suit the new length.



Stair dimensions

Height 2.80 m

Width 0.975 m

Length 4.00 m

Height at top step 2.80 m

☑ automatic positioning above construction

Indicate, how the modification should be applied:

Stair... ○ modify start point

○ modify centrically

○ modify end point

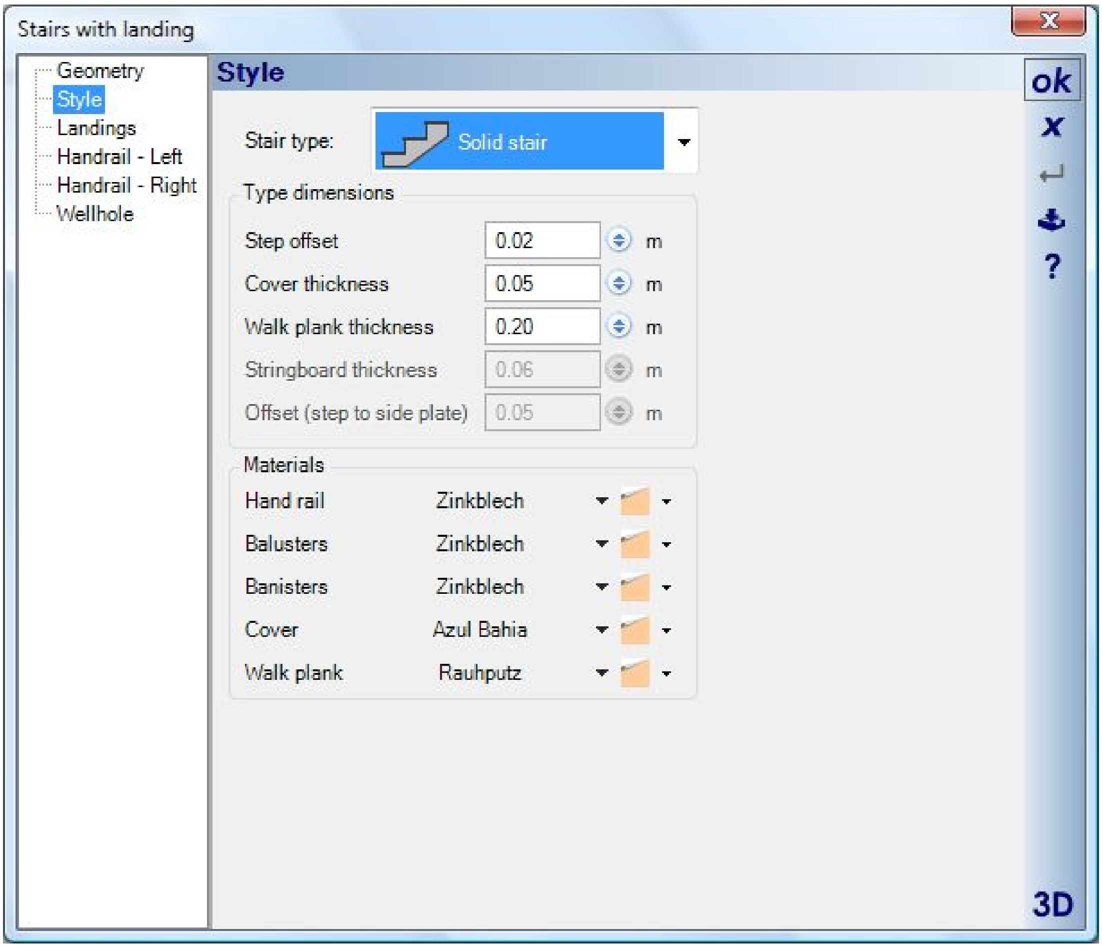
In this case the number of steps remains constant and the tread depth is changed. If the tread depth is increased, then the length of the run of the stairs changes. If you change the number of steps, the length of the run changes but the tread remains the same. The value 'Height of starting step' allows you to set the height of the stairs above the finished floor. If you uncheck the box 'automatic positioning above construction', then the height of the staircase can be adjusted to suit your specific requirements. In this case only the unit rise of the staircase changes.

Changes to the measurements of the staircase and the steps are so designed that you can specify the settings for the staircase to meet your specific requirements, without being hindered by automatic functions. Therefore, you have to be aware yourself, as to what extent the gradient adheres to the rule for the length of a person's step.

12.3 TYPE OF CONSTRUCTION, SOLID- AND WOODEN STAIRCASES

The type of staircase construction can be changed at any point during insertion of the the staircase and can also be changed later over the properties dialog, whereby either a solid staircase or a wooden staircase can be specified.
Depending on the type of construction, different input fields are provided for steps, stringers etc. and also different construction materials are offered.
Under 'Type dimensions' you can set the 'step offset' for the staircase, i.e. the distance from the front edge of a tread to the rear edge of the tread below. You can also change the 'Cover thickness' and the 'Thickness of walk planks', i.e. the

thickness of the concrete slab under the treads, measured at right-angles to the inclination of the stairs.
Each change to the staircase is processed immediately, and is shown optionally in the 3D preview.



Stair type: Solid stair

Type dimensions
Step offset 0.02 m
Cover thickness 0.05 m
Walk plank thickness 0.20 m
Stringboard thickness 0.06 m
Offset (step to side plate) 0.05 m

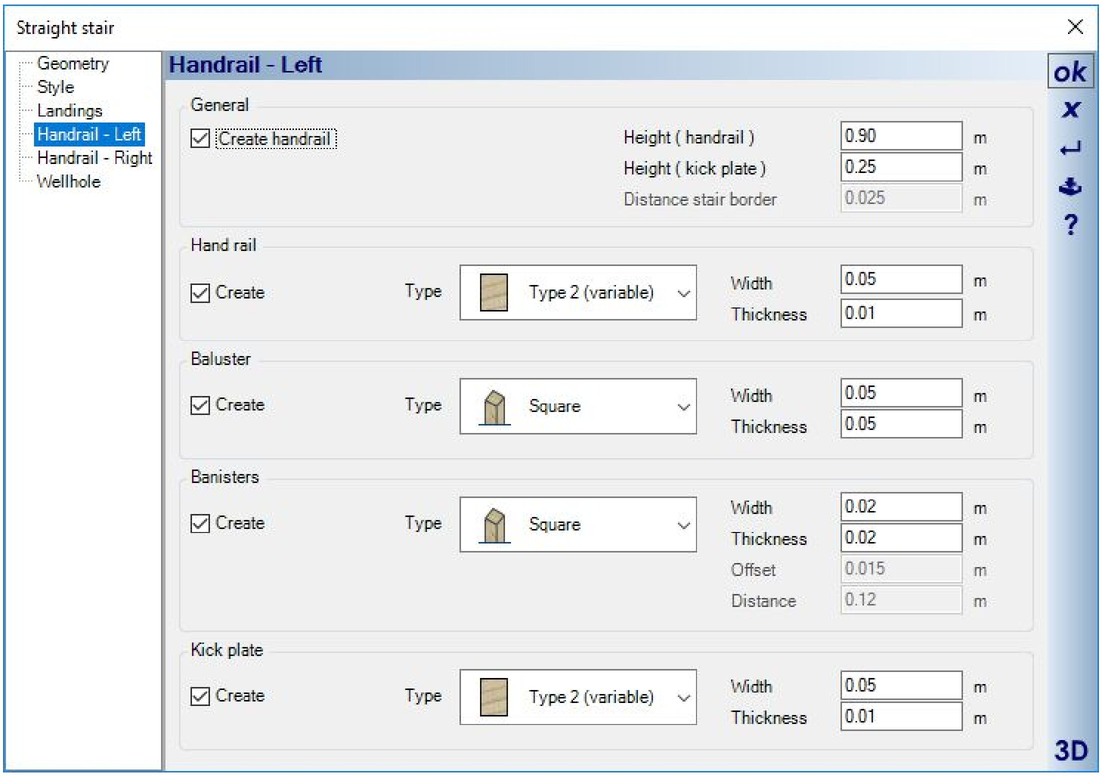
Materials

Hand rail	Zinkblech
Balusters	Zinkblech
Banisters	Zinkblech
Cover	Azul Bahia
Walk plank	Rauhputz

If you select ‘Wooden stairs’ under ‘Stairs type’, the input fields under ‘Type dimensions’ also change. ‘Tread thickness’ is shown instead of ‘Facing thickness’, and ‘Stringer width’ instead of ‘Cover thickness’. In addition, there are input fields for ‘Stringer thickness’ and the distance between a tread and the bottom edge of the stringer (the so-called ‘Margin’). The ‘Nosing’ is again the distance from front edge of a tread to rear edge of the tread below. The ‘Step thickness’ is the thickness of the tread, the ‘Stringer width’ is the width measured at right-angles to the inclination of the stairs. The ‘Stringboard thickness’ is the thickness of the stringer and the ‘Distance tread to stringer’ specifies the distance between the front, top edge of a tread and the top edge of the stringer.

12.4 HANDRAILS

Common to all staircases is that the handrails on the right and left can be modified. The changes not only apply to the dimensions of the handrail components, such as ‘Handrail’, ‘Balusters’ und ‘Kick plates’, but also the shape of a component can be selected from a number of predefined shapes.



Handrail - Left

General
☑ Create handrail
Height (handrail) 0.90 m
Height (kick plate) 0.25 m
Distance stair border 0.025 m

Hand rail
☑ Create
Type: Type 2 (variable)
Width 0.05 m
Thickness 0.01 m

Baluster
☑ Create
Type: Square
Width 0.05 m
Thickness 0.05 m

Banisters
☑ Create
Type: Square
Width 0.02 m
Thickness 0.02 m
Offset 0.015 m
Distance 0.12 m

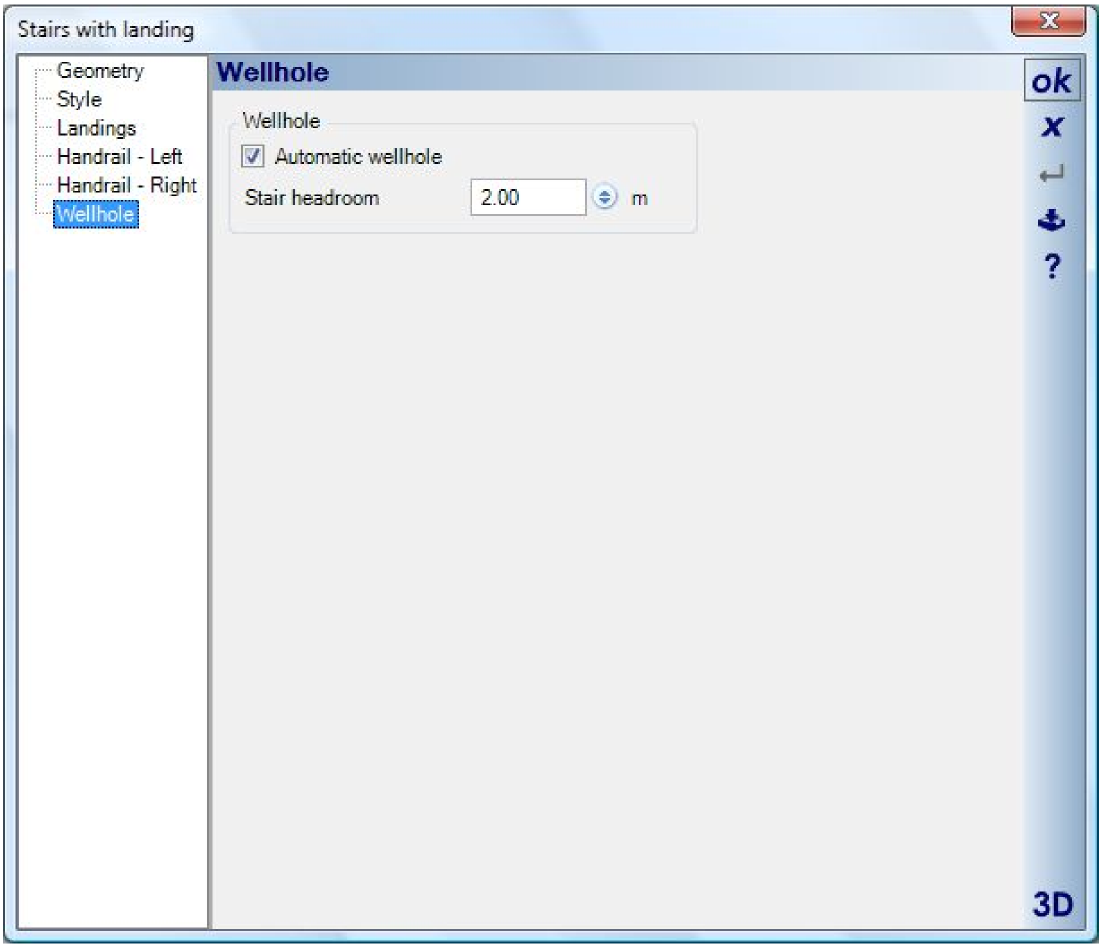
Kick plate
☑ Create
Type: Type 2 (variable)
Width 0.05 m
Thickness 0.01 m

12.5 WELLHOLES

Here you can define wellholes or openings, which staircases automatically, if desired, create in the floors and ceilings of the floors above.

If you uncheck the box ‘Automatic wellhole’, then no openings are created in floors and ceilings. In this case you have to manually insert a wellhole in the ceiling. This one can have any shape and size, and also retains its properties even if changes to the staircase or to the height of a floor cause the staircase to be recalculated, which would not be the case for an automatically created wellhole, which would be adjusted appropriately.

‘Headroom’ defines the clearance between the stairs and the ceiling, and thus also determines the size of the opening.



Wellhole

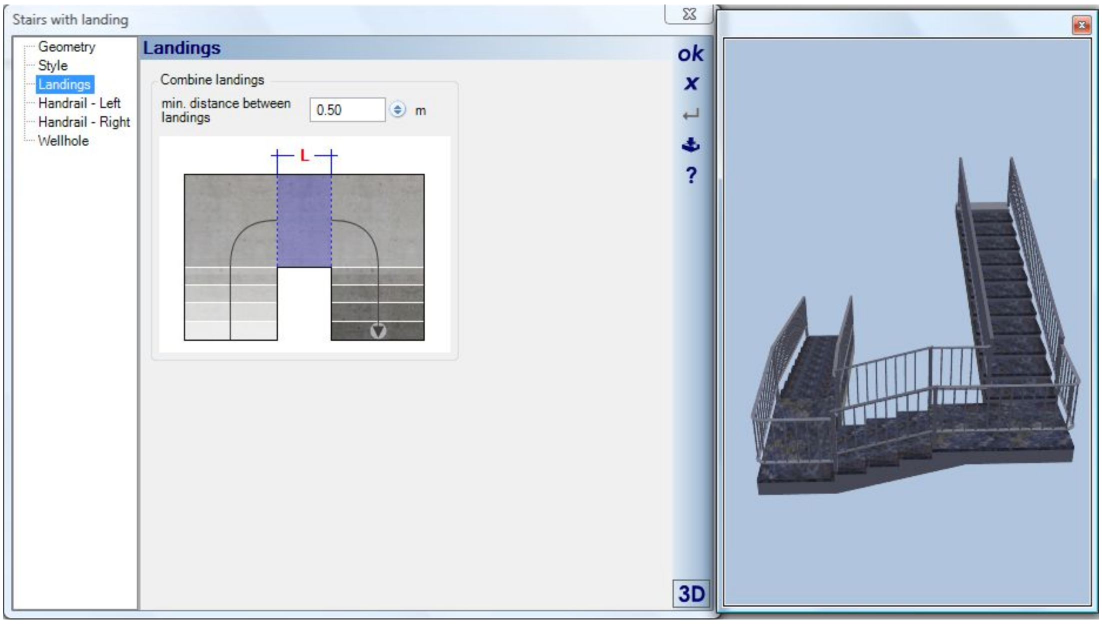
Wellhole

☑ Automatic wellhole

Stair headroom 2.00 m

12.6 COMBINE LANDINGS

When inserting a landing staircase, individual landings are created automatically at each corner of the polygon. The setting for a minimum distance between landings, which can be specified in the properties dialog under ‘Landings’, determines at which point the software creates stairs between the two landings.

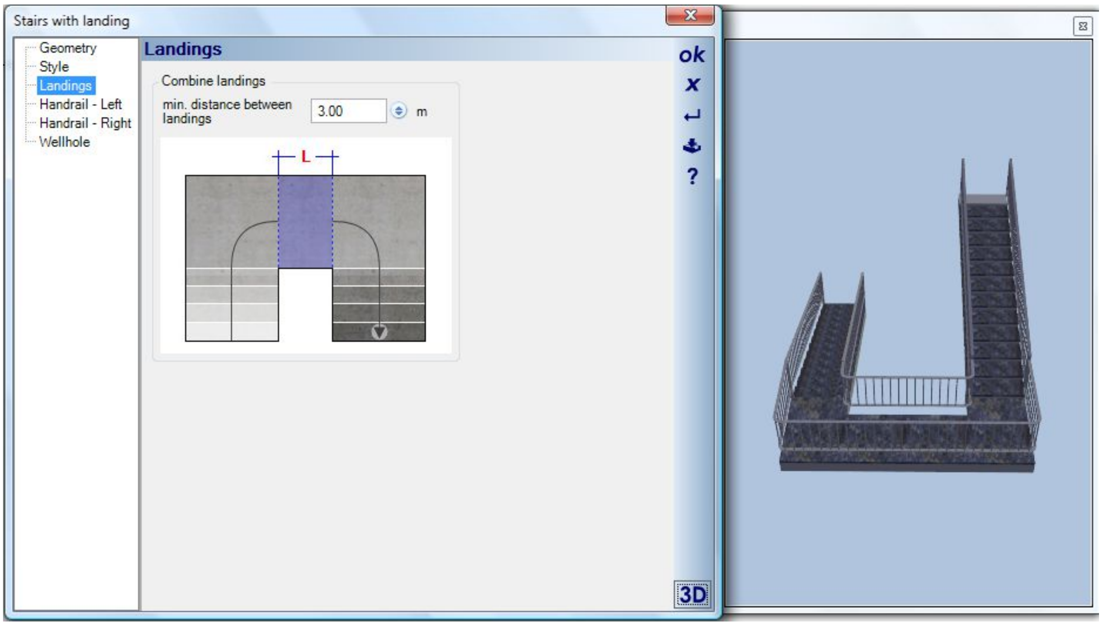


Landings

Combine landings

min. distance between landings 0.50 m

It can be seen in the following example, that a distance of only 0.5 m is sufficient to connect the landings with three steps. If on the other hand only one landing is desired, then by increasing the minimum distance in the example to 1.5 m, after a recalculation (i.e. with ↵), the steps are removed and only one landing instead of two is created.



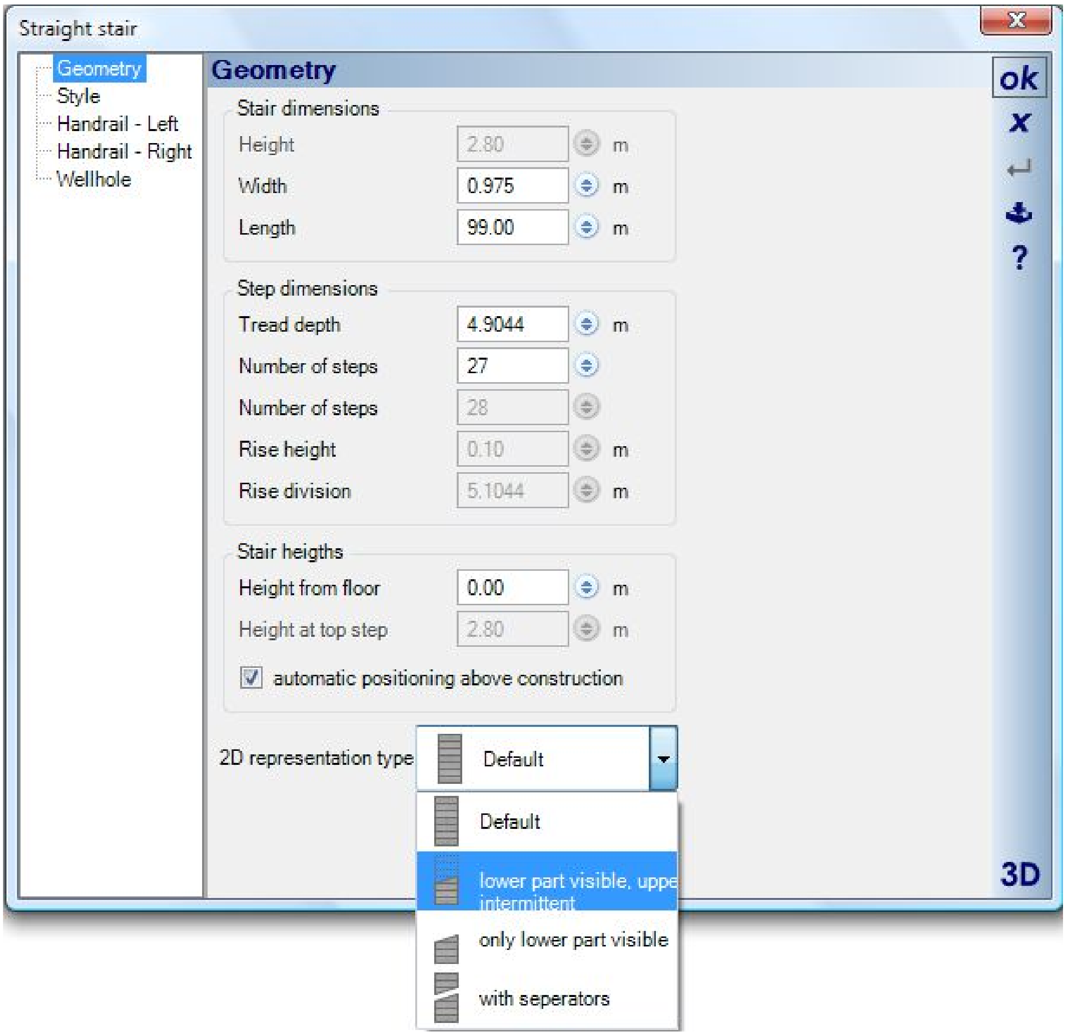
Landings

Combine landings

min. distance between landings 3.00 m

12.7 2D REPRESENTATION OF STAIRS

The type of 2D representation of stairs is always selected individually for each stairs over the property in the 'Stairs' dialog.



Geometry

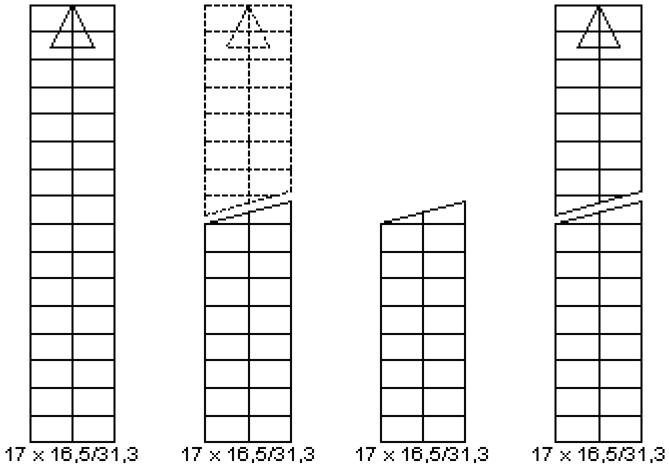
Stair dimensions
Height 2.80 m
Width 0.975 m
Length 99.00 m

Step dimensions
Tread depth 4.9044 m
Number of steps 27
Number of steps 28
Rise height 0.10 m
Rise division 5.1044 m

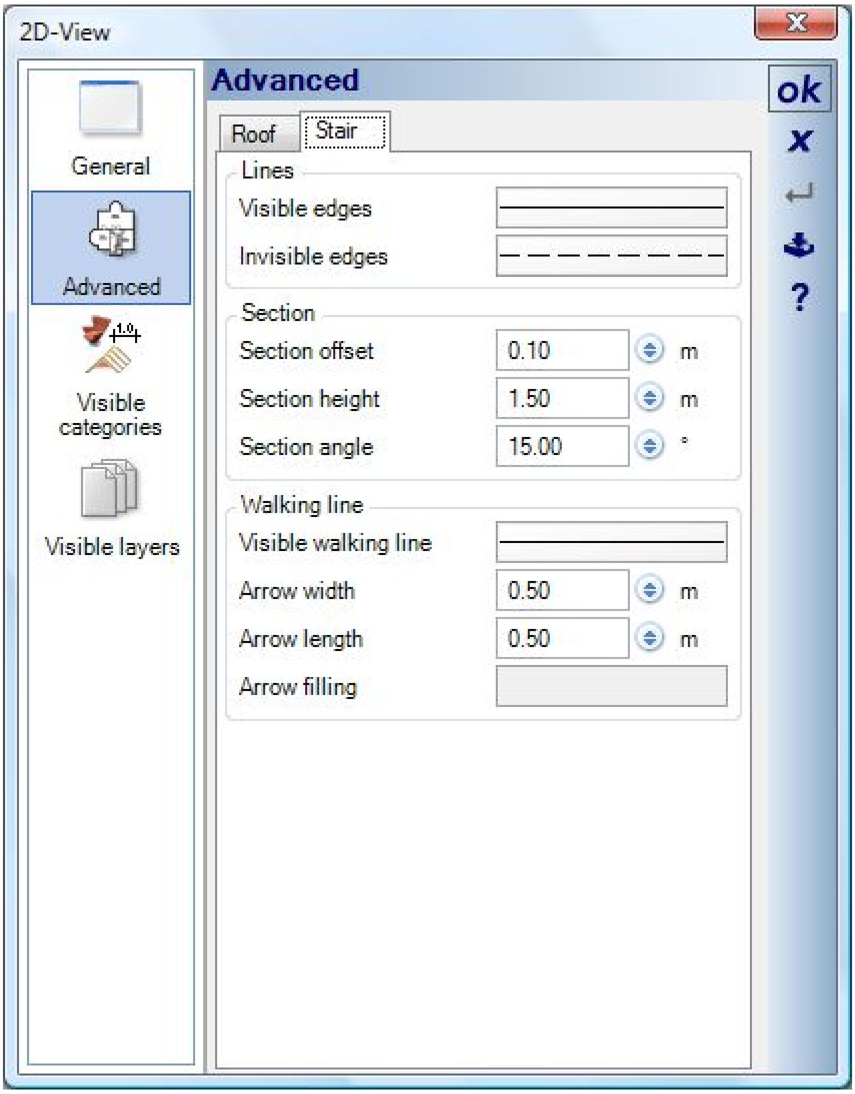
Stair heigths
Height from floor 0.00 m
Height at top step 2.80 m
☑ automatic positioning above construction

2D representation type: Default

As an example, an overview of different types of representation and their effects.



Additionally, the properties of a 2D view contain various further options, which have a common affect on the representation of all stairs in this view. The dialog can be activated over the context menu, opened with a right mouse-click, in the 'Advanced section.



Advanced

Lines
- Visible edges
- Invisible edges

Section
- Section offset: 0.10 m
- Section height: 1.50 m
- Section angle: 15.00 °

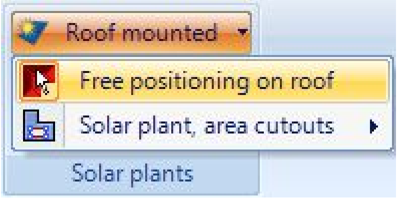
Walking line
- Visible walking line
- Arrow width: 0.50 m
- Arrow length: 0.50 m
- Arrow filling

13 SOLAR PLANTS

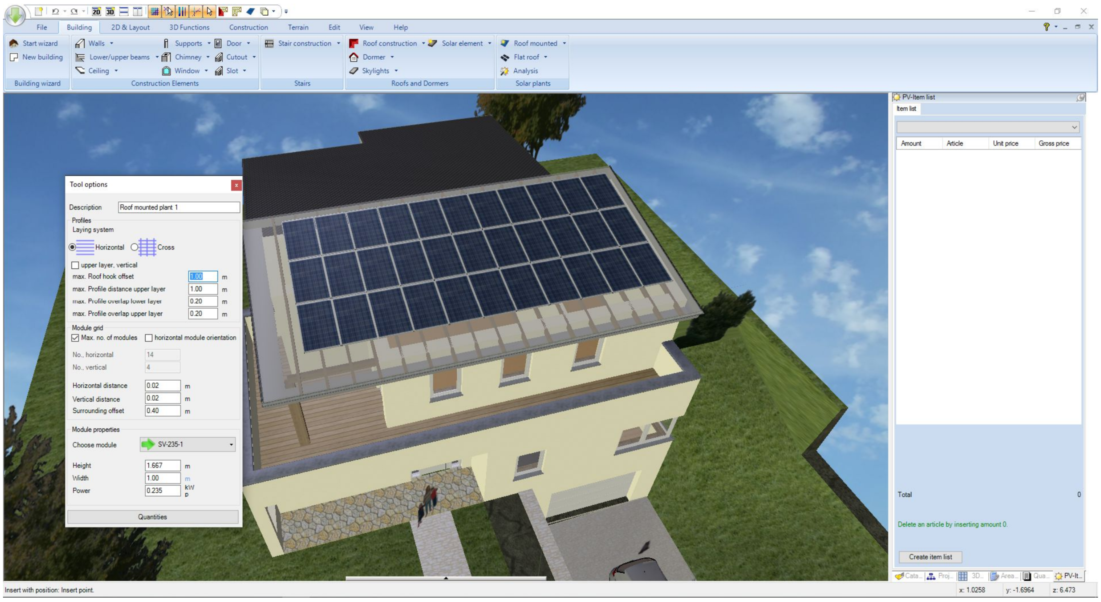
Note: solar plants are not a standard feature for all versions. The availability of this feature functions depends on its release. If necessary. ask your dealer..

13.1 ROOF-MOUNTED SOLAR PLANTS

First, start the tool to insert a roof-mounted solar plant.



Move your cursor in 3D over the roof surface on which the solar plant should be inserted.Once the software identifies a valid area it automatically collects the needed properties like roof pitch, contour and timber constructions and marks the roof surface with transparency. At the same time a preview of the solar plant appears and shows the module positions depending on your settings of the tool options dialog. The solar plant doesn't yet exist in your planning and can be modified with the properties of the tool options dialog. A final left mouse click in 3D creates the solar plant in your project.



Tool options

Description: Roof mounted plant 1

Profiles

Laying system

● Horizontal ○ Cross

☐ upper layer, vertical

max. Roof hook offset 1.00 m

max. Profile distance upper layer 1.00 m

max. Profile overlap lower layer 0.20 m

max. Profile overlap upper layer 0.20 m

Module grid

☑ Max. no. of modules ☐ horizontal module orientation

No., horizontal 14

No., vertical 4

Horizontal distance 0.02 m

Vertical distance 0.02 m

Surrounding offset 0.40 m

Module properties

Choose module SV-235-1

Height 1.667 m

Width 1.00 m

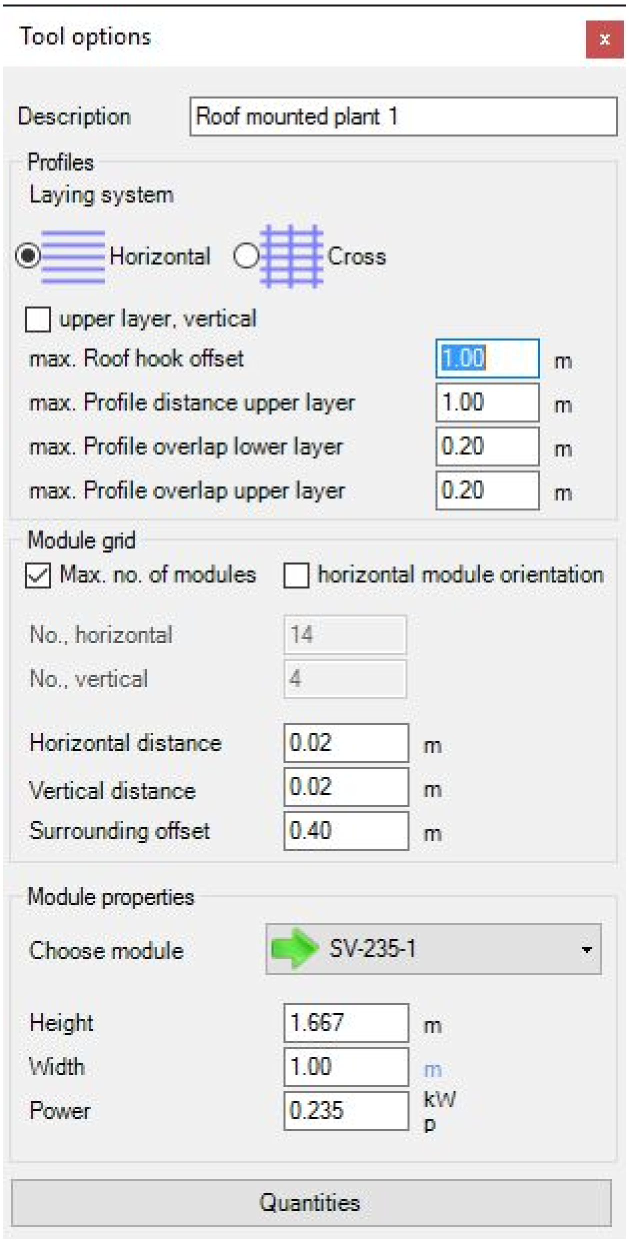
Power 0.235 kWp

Insert with position: Insert point.

Any changes in the tool option dialog immediately update the preview of the solar system. You can give the plant a unique name for later identification in the reports and bills of quantities and influence the positioning of modules and the mounting system.

In the group module grid the "Maximum number of modules" option is active by default, so the software automatically attempts to place the maximum number of modules within the available area. Since this is not always desired, you can specify the number of modules in horizontal and vertical direction instead. This number is never exceeded, but can be reduced if the available space is not sufficient to place the predetermined amount of modules.

Installation is made within an installation area, which normally corresponds to the roof contour, minus an adjustable surrounding offset distance. You can change the polygon of the module area later, if necessary.



Description: Roof mounted plant 1

Profiles

Laying system

● Horizontal ○ Cross

☐ upper layer, vertical

max. Roof hook offset: 1.00 m

max. Profile distance upper layer: 1.00 m

max. Profile overlap lower layer: 0.20 m

max. Profile overlap upper layer: 0.20 m

Module grid

☑ Max. no. of modules ☐ horizontal module orientation

No., horizontal: 14

No., vertical: 4

Horizontal distance: 0.02 m

Vertical distance: 0.02 m

Surrounding offset: 0.40 m

Module properties

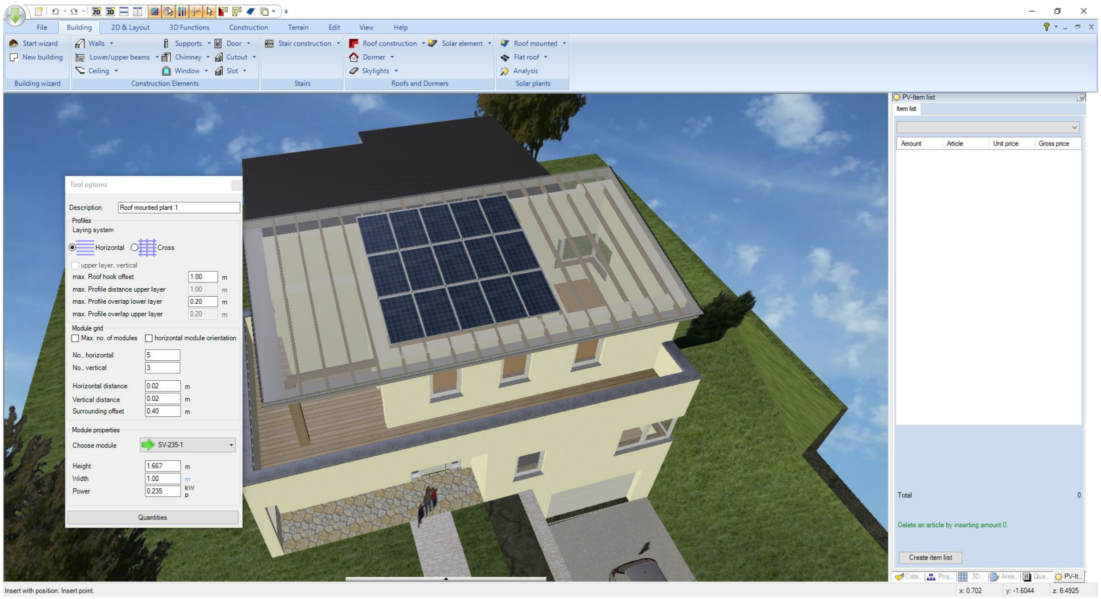
Choose module: SV-235-1

Height: 1.667 m

Width: 1.00 m

Power: 0.235 kWp

Example with individual setting of a 5 x 3 module grid.



Tool options

Description: Roof mounted plant 1

Profiles

Laying system

● Horizontal ○ Cross

☐ upper layer, vertical

max. Roof hook offset: 1.00 m

max. Profile distance upper layer: 1.00 m

max. Profile overlap lower layer: 0.20 m

max. Profile overlap upper layer: 0.20 m

Module grid

☐ Max. no. of modules ☐ horizontal module orientation

No., horizontal: 5

No., vertical: 3

Horizontal distance: 0.02 m

Vertical distance: 0.02 m

Surrounding offset: 0.40 m

Module properties

Choose module: SV-235-1

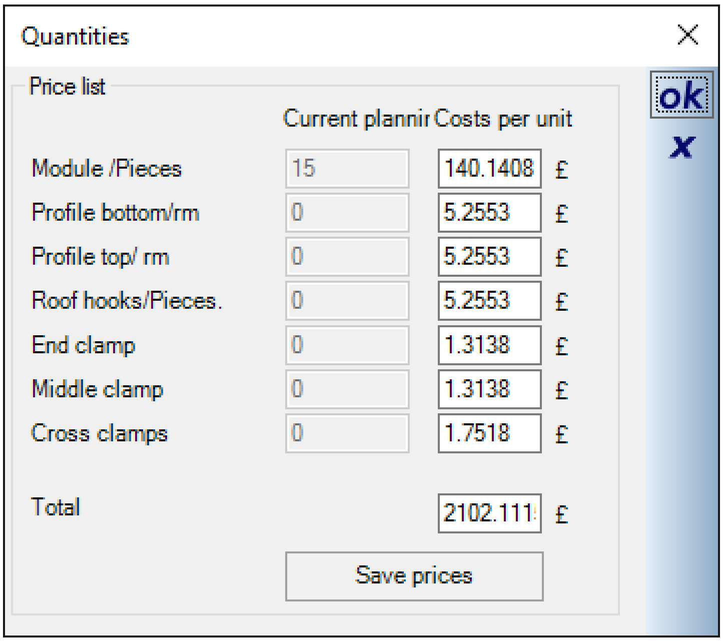
Height: 1.667 m

Width: 1.00 m

Power: 0.235 kWp

Quantities

You can perform a rough cost estimate using the button Quantities. The use of prices should however be determined on a daily basis. Default values should be overwritten and saved in each case.



Quantities

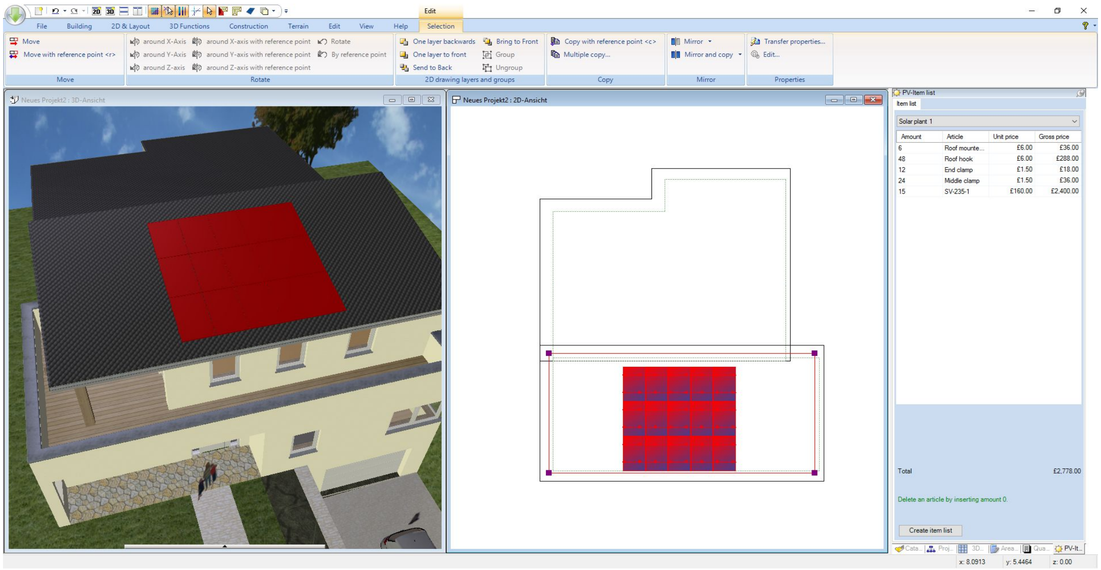
Price list

	Current plannir	Costs per unit	
Module /Pieces	15	140.1408	£
Profile bottom/rm	0	5.2553	£
Profile top/ rm	0	5.2553	£
Roof hooks/Pieces.	0	5.2553	£
End clamp	0	1.3138	£
Middle clamp	0	1.3138	£
Cross clamps	0	1.7518	£
Total		2102.111	£

Save prices

13.1.1 *Module areas of solar plants and area cut-outs*

As already mentioned, a module area is automatically generated at the input corresponding to the roof contour minus a surrounding offset. When you click in a 2D view in this area or on the modules, the solar plant is marked in red and the polygon points are highlighted as usual. With the standard functions, you can now individually move the polygon points or the sides of the area via the context menu. The solar plant is automatically recalculated and no longer placeable modules are removed.



Solar plant 1

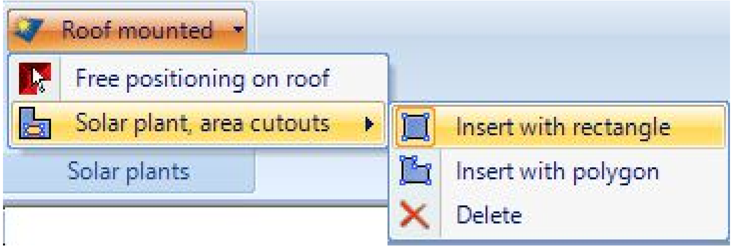
Amount	Article	Unit price	Gross price
6	Roof mounte...	£6.00	£36.00
48	Roof hook	£6.00	£288.00
12	End clamp	£1.50	£18.00
24	Middle clamp	£1.50	£36.00
15	SV-235-1	£160.00	£2,400.00

Total £2,778.00

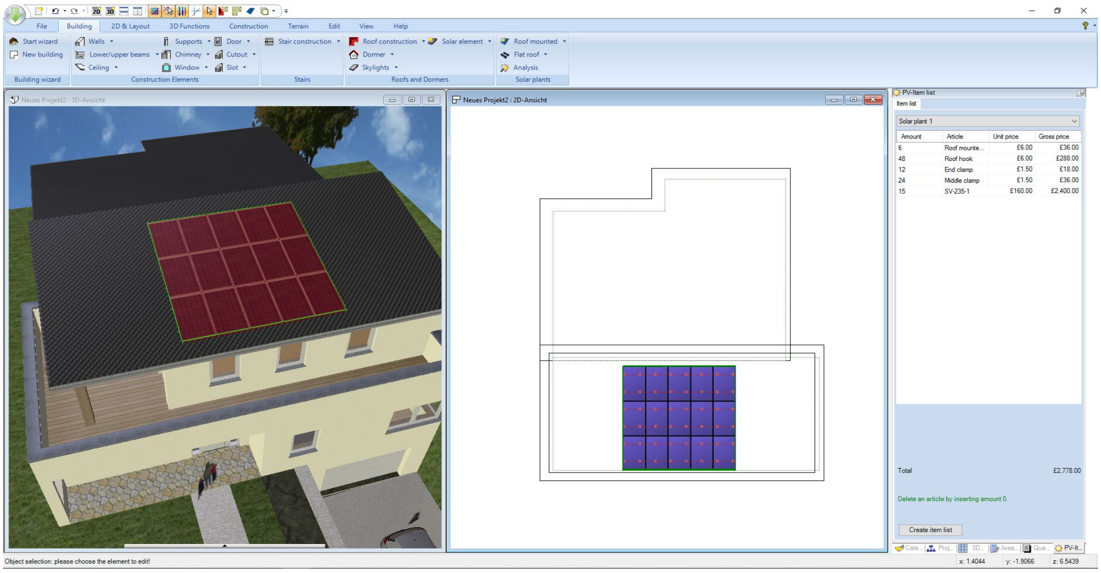
Delete an article by inserting amount 0.

x: 8.0913 y: 5.4464 z: 0.00

Often, however, it is necessary to create a cut-out within a module area, in which the placement of modules for structural reasons is not possible. For this purpose, you can use the tool "Area cut-outs".



Start the required tool and move the mouse over a module area, which is then labeled and boxed. With a left mouse click in 2D or 3D, select the area and enter the cut-out with your mouse. This action is then only made in 2D views.



Solar plant 1

Amount	Article	Unit price	Gross price
6	Roof mounte...	£6.00	£36.00
48	Roof hook	£6.00	£288.00
12	End clamp	£1.50	£18.00
24	Middle clamp	£1.50	£36.00
15	SV-235-1	£160.00	£2,400.00

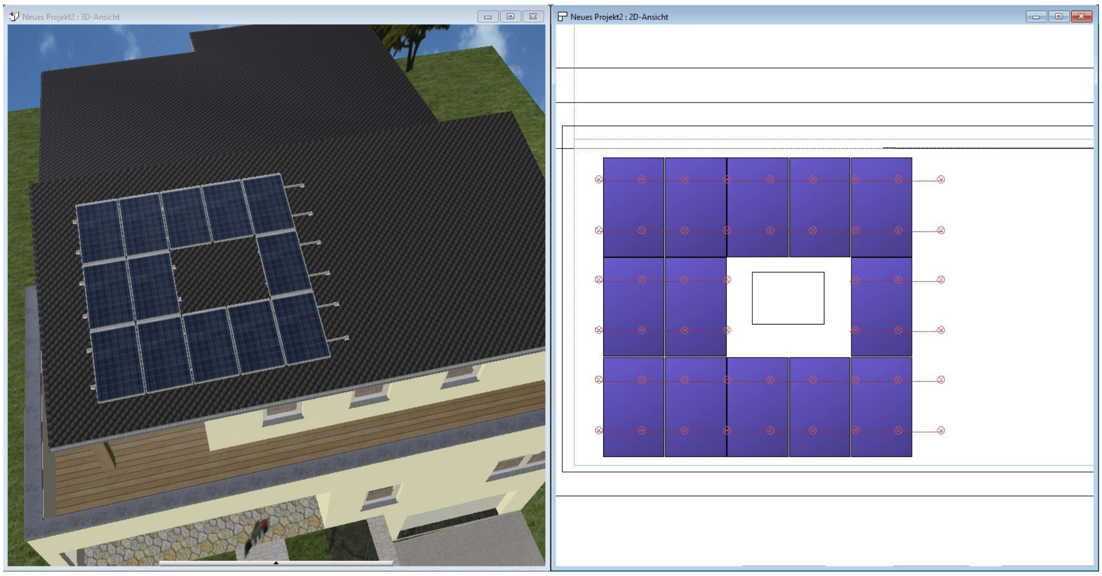
Total £2,778.00

Delete an article by inserting amount 0.

Object selection: please choose the element to edit!

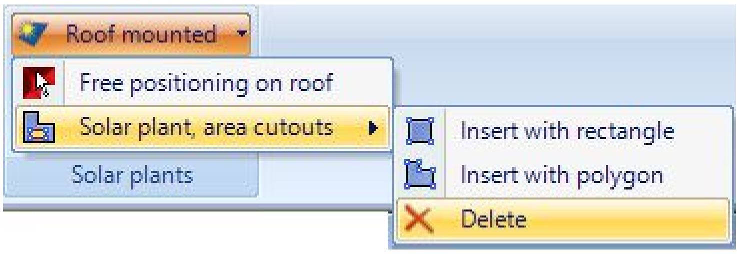
x: 1.4044 y: -1.9066 z: 6.5439

All modules that are wholly or partially within the cut-out, are then removed and the mounting system is recalculated.

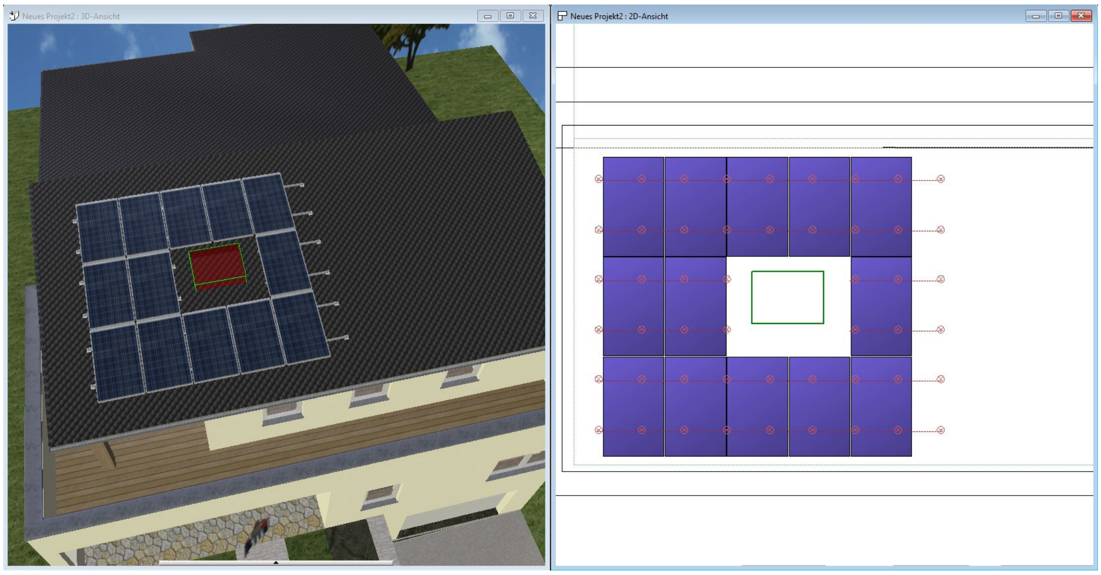


13.1.1.1 Delete module area cut-outs

Since area cut-outs are not separate elements, they can not be selected and deleted as usual. There is a special “delete” tool for this purpose.



As a module area may contain more than one cut-out, you now need to move the mouse over the desired cut-out which is automatically highlighted. A left mouse click removes it and recalculates the solar plant again.

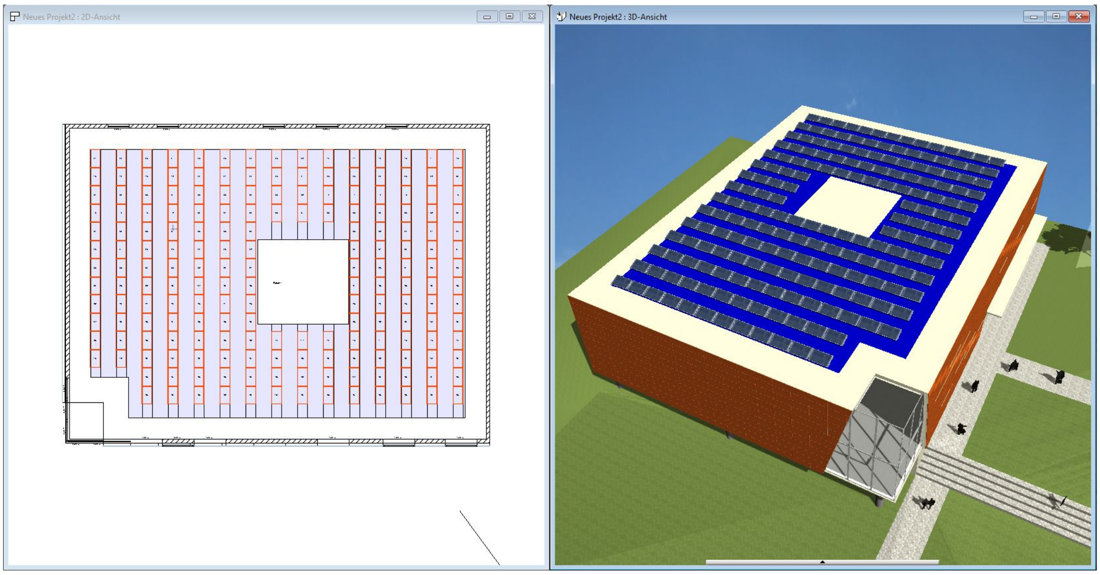


13.2 FLAT ROOF SOLAR PLANTS

Flat roof solar plants are here all those who are not necessarily placed on a roof and in which the modules are mounted elevated. but flat roof systems can also be placed on inclined surfaces, for example, on a roof with a slight pitch that requires elevated modules.

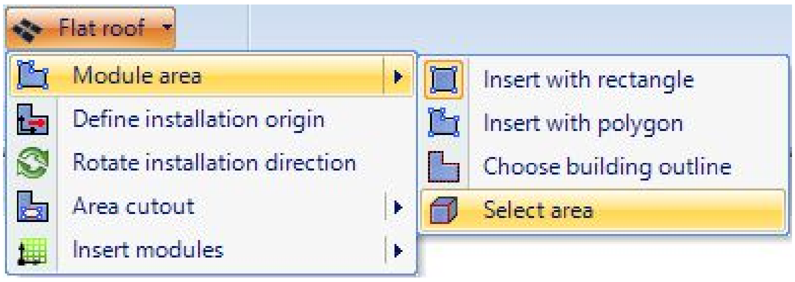
The modules are placed within the so-called module areas and arranged in rows. First, a module area is produced and edited, in terms of its contour and cut-outs in its surface.

Then, the modules are placed, rotated, row spacings are changed and the installation origin is updated, if needed.

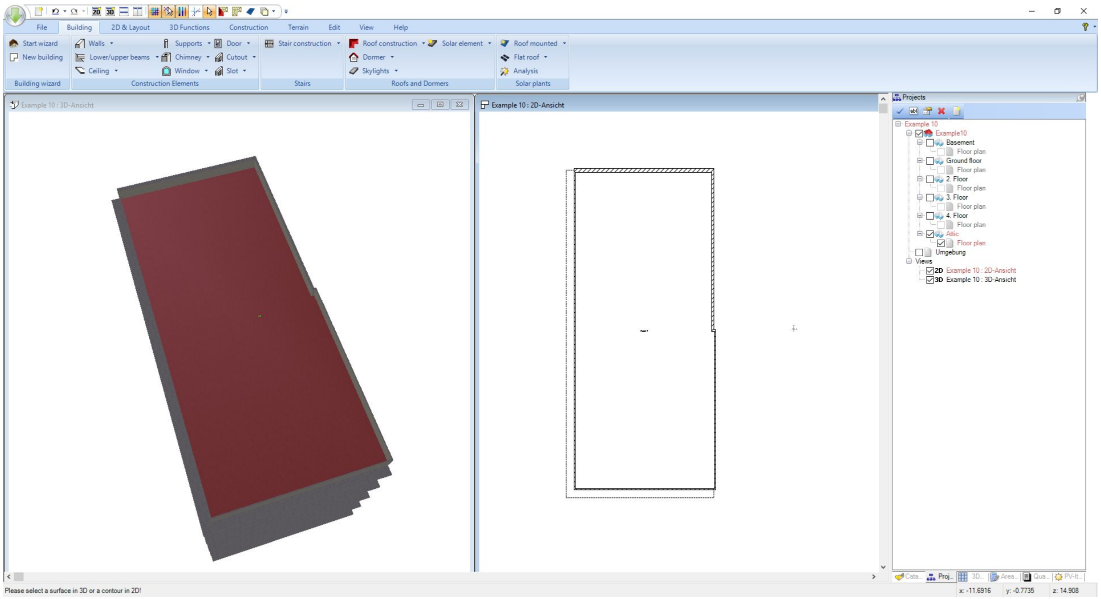


13.2.1 Insert module areas

To insert module areas different input methods are available.

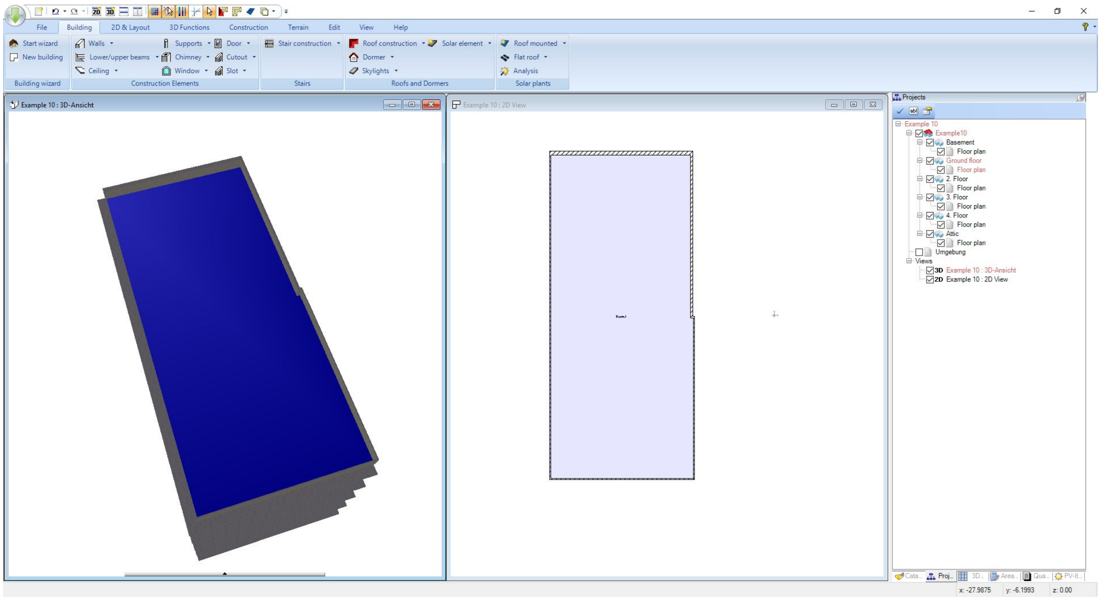


Basically, it is better to determine the area in which the flat roof system should be placed in a 3D view with a left mouse click, and only then insert the exact contour in 2D if needed. By "picking" the plane in 3D you automatically get in each case, the correct level and the correct slope of the surface.
In the following steps, we use the tool "select area" that allows you to identify with a single click the surface of a ceiling or another element. The other input options are standard features and are used in various places in the software.
After starting the tool, move the mouse in 3D over the element on which the flat roof plant is to be built, in this case the ceiling.
The detected area is marked in red and with a left mouse click the corresponding module area is inserted.

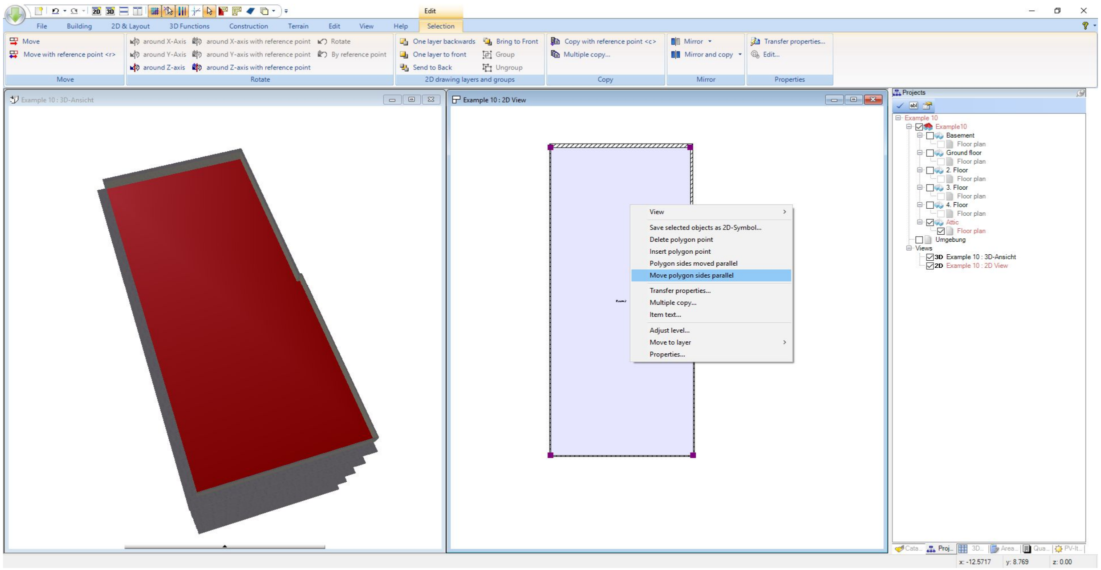


Please select a surface in 3D or a contour in 2D!

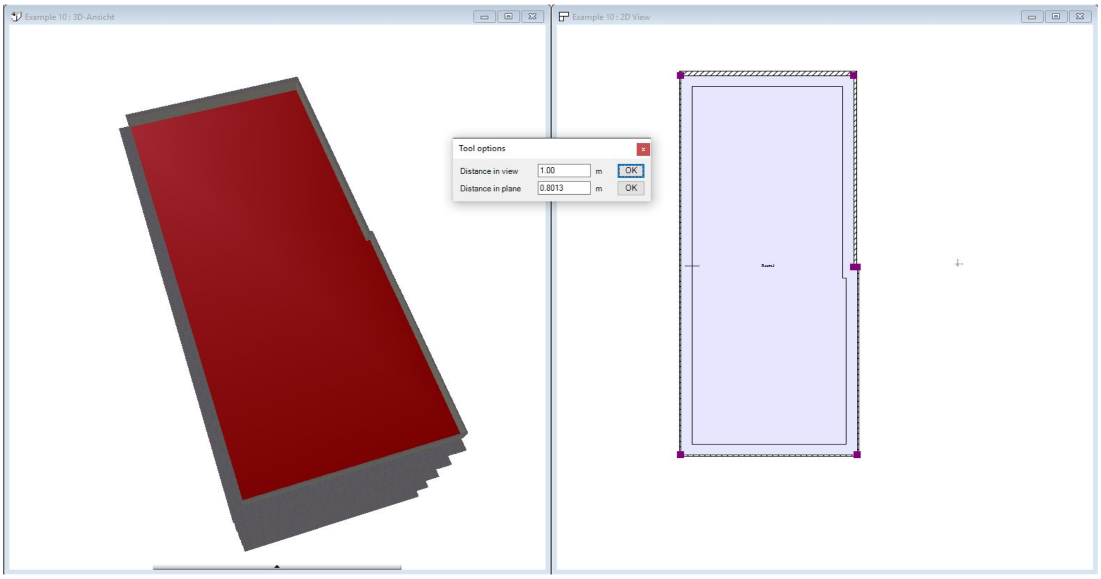
The module area has been inserted with one click and follows in this case automatically the contour of the ceiling, which was used as the starting level. Module areas are displayed in blue and can later be set invisible, when the system is fully configured.



The next step is to decrease the area so that it does not reach to the surrounding walls and to avoid that modules are possibly shaded.
For this purpose select the module area and choose one of the tools from the context menu, "Move polygon sides parallel" in our example.

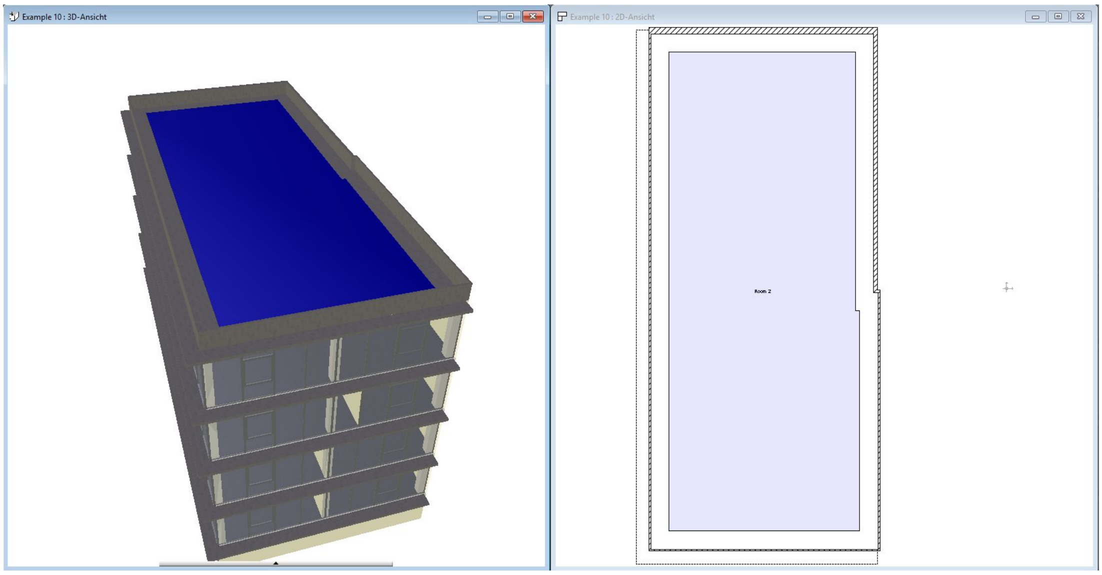


Change the polygon using the mouse or numerically with the tool options dialog. In our example we enter 1.0 m and thus change all sides of the polygon and we get a module area, which now is 1.0 m away from the edges of the ceiling, which we used as a starting point.



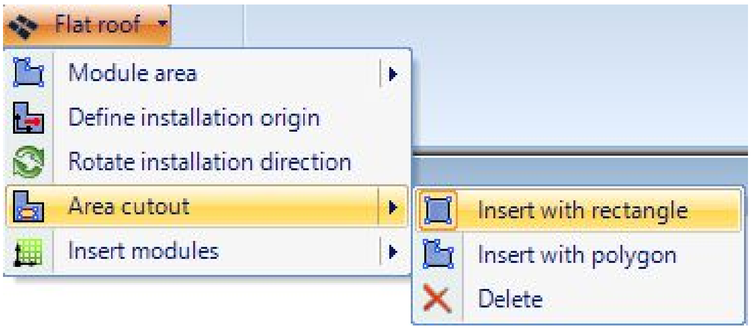
Distance in view 1.00 m
Distance in plane 0.8013 m

The resulting module area:

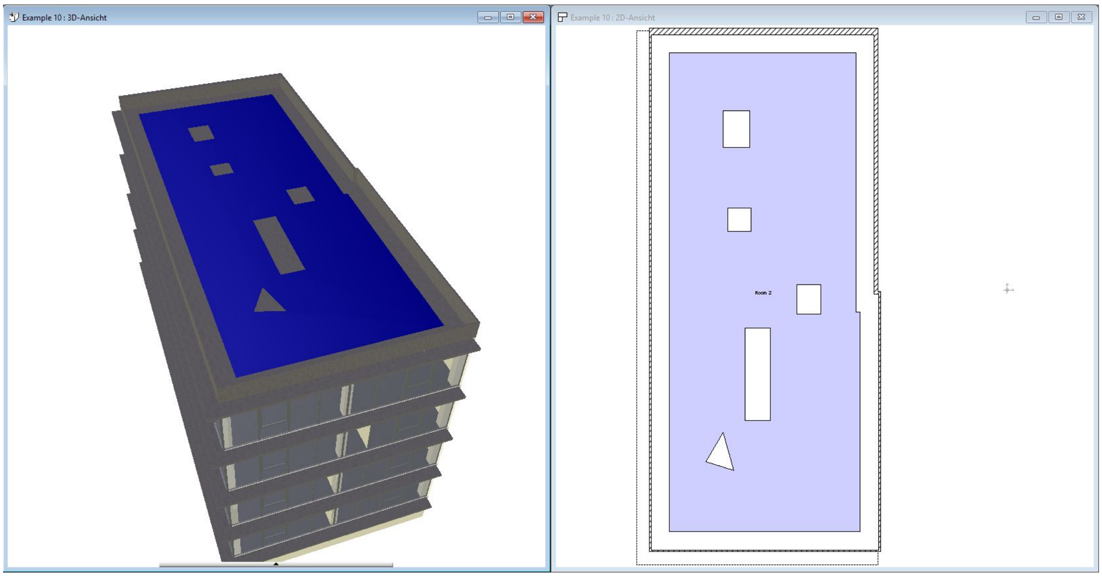


13.2.2 Create cut-outs in module areas

The input variants of the cut-outs and also for deleting are identical with those for roof-mounted systems

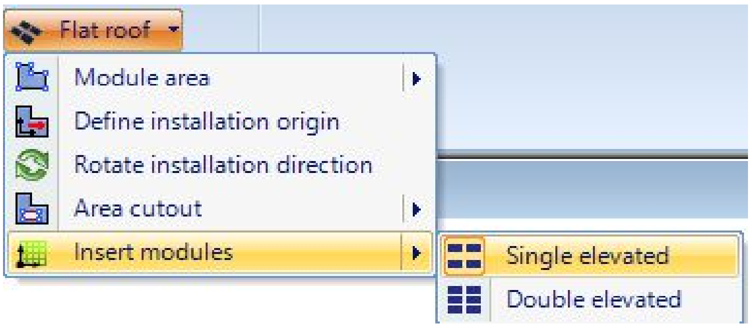


Area cut-outs should be used wherever modules for structural reasons can not be placed, for example, with skylights, chimneys, antennas etc .. They should not be used to create horizontal paths between module rows. For these changes the row spacing would be more appropriate.

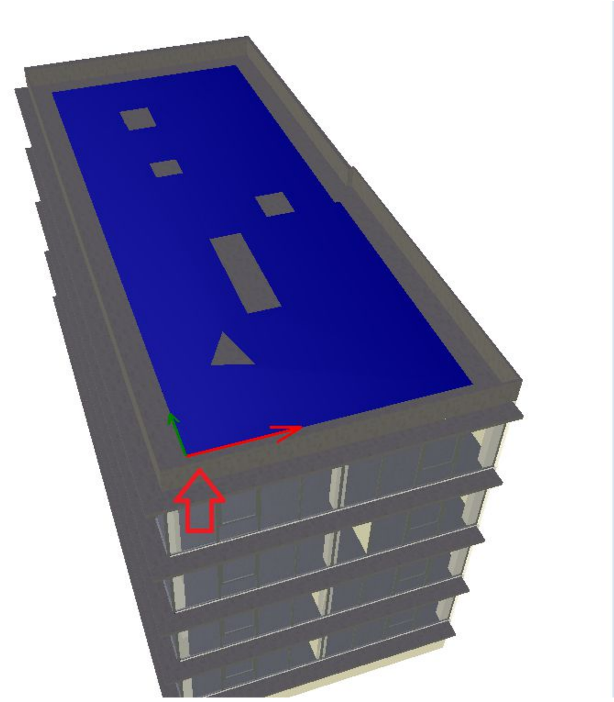


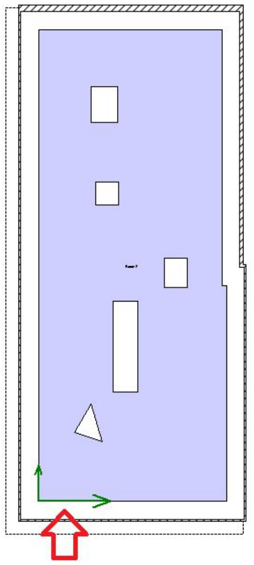
13.2.3 *Insert modules*

Once the contour of the module area and the cut-outs are fixed, the modules can be placed. There are two predefined variants.

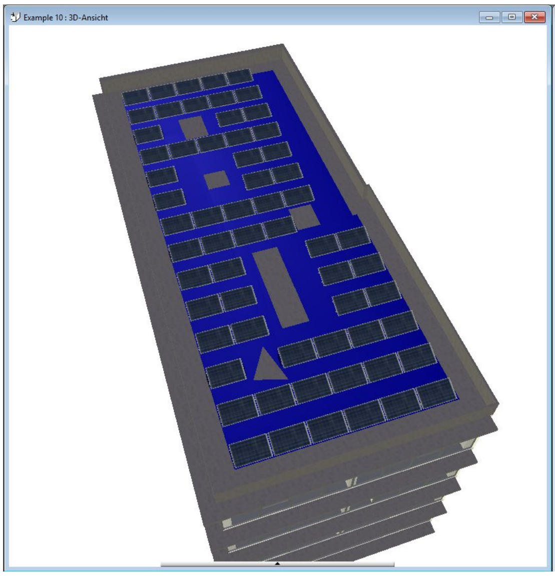


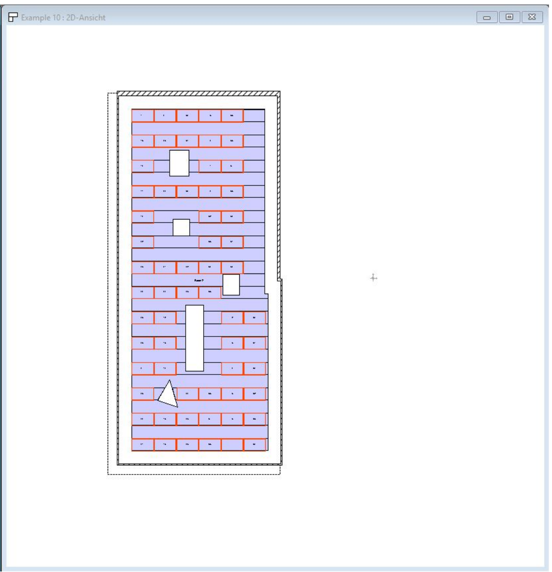
Each time you fill a module area with modules, it will be completely recalculated and previous settings and row spacings are lost.
After the desired installation type has been selected, move the mouse over the module area and select it with a left mouse click. Then move the mouse to the corners, a cursor with the direction of positioning is automatically indicated.
The positioning always starts in one of the corners of the area and in the direction which is indicated by the cursor. When it is necessary to subsequently define a different starting point or a different orientation, this is done with the tools "Define Installation Origin" and "Rotate installation direction".



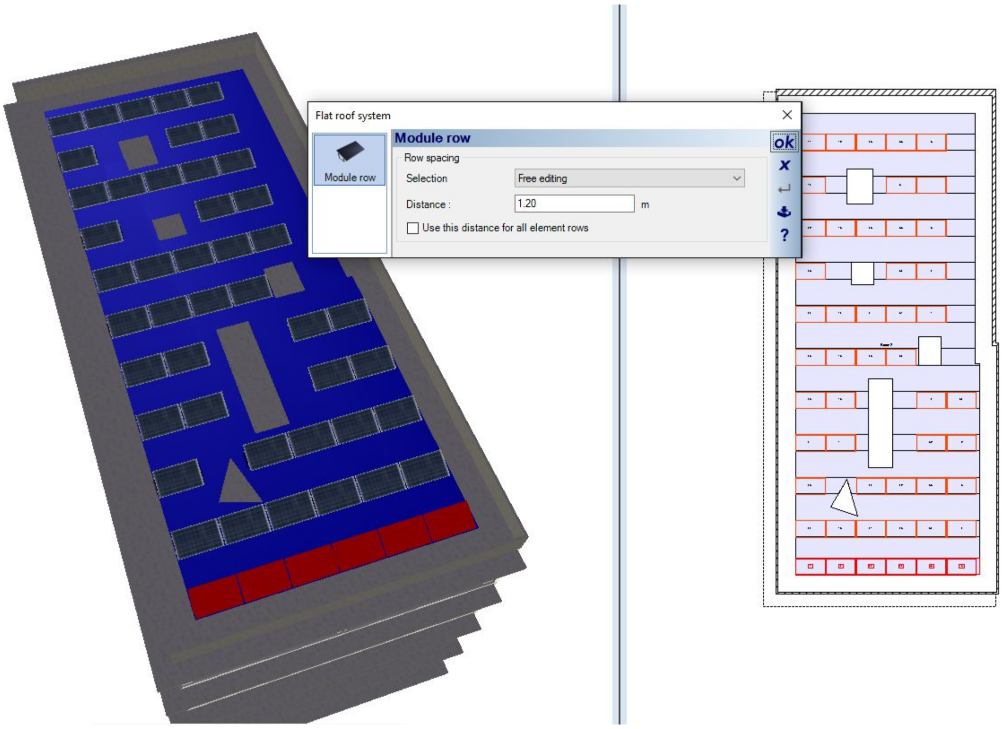


A left mouse click fills the area with modules.





Afterwards you can specify the row spacings, either for the entire area or individually for a row the distance to the next, always beginning from the start point.



Module row

Row spacing

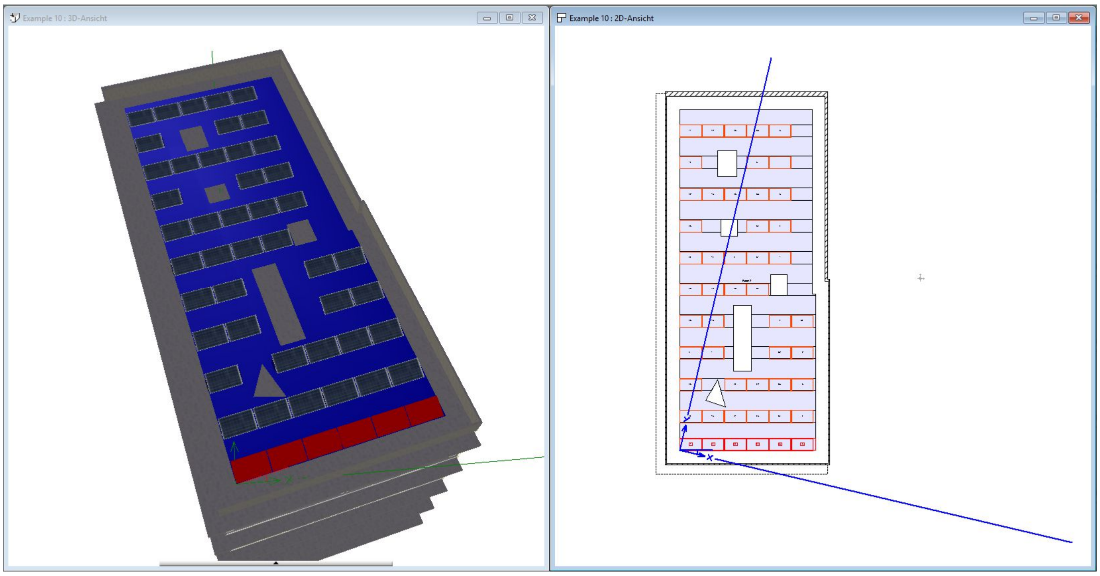
Selection: Free editing

Distance : 1.20 m

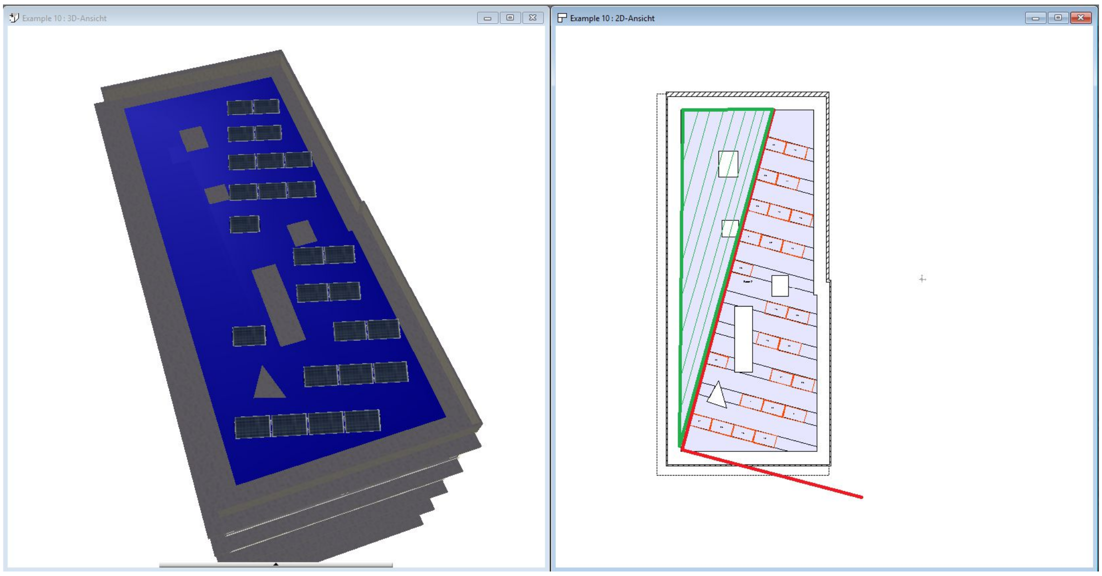
☐ Use this distance for all element rows

13.2.3.1 Rotate modules and set installation origin

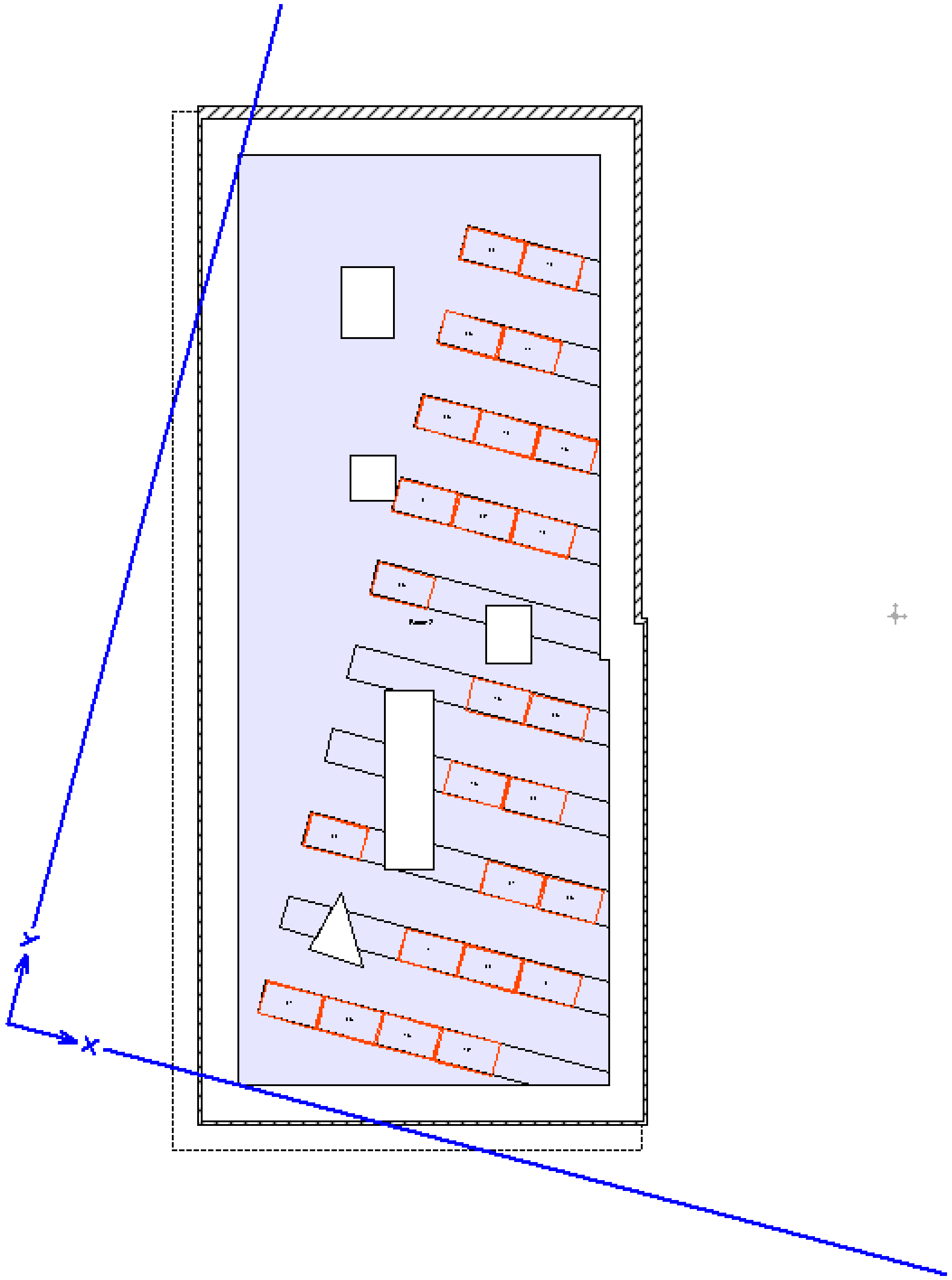
Should it be necessary, not to align the modules at the corners of the installation area, they can be rotated and then the start point needs to be reset. The rotation is always for the whole region, so you can not rotate individual rows of modules.
After selecting the tools you select as usual the module area and then usually one of the corners, ideally the one that was used as a starting point in the beginning.
You will then receive a cursor that shows the x and y axis and with which you can already visually assess the subsequent rotation. When you have completed the rotation with the mouse, you can still accurately adjust the angle of rotation in the resulting dialog.

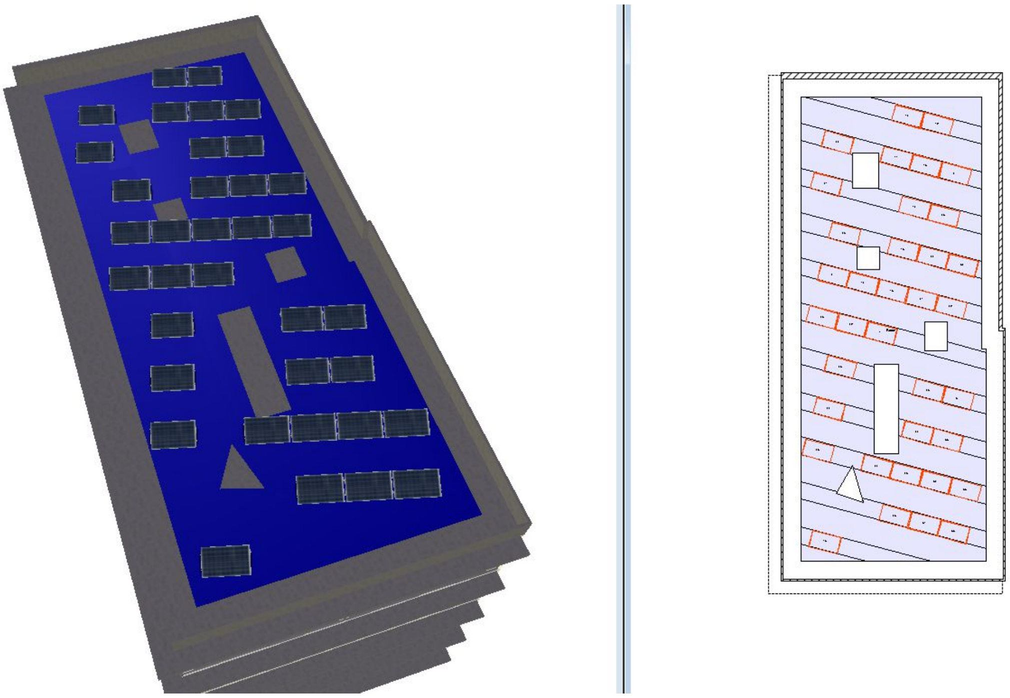


After rotation you will see the following effect. All module rows were realigned, but the green shaded area is left empty. The cause is that the starting point of the laying direction on both axes is still the original starting point of the placement. To fill the green area with modules, you must set a new origin of the installation now.



After starting the input tool you select the module area again and get the x / y cursor. You now need to place it in a way that all parts of the module area are within the x / y range. Only then the whole surface of the module area will be used.


Y
X

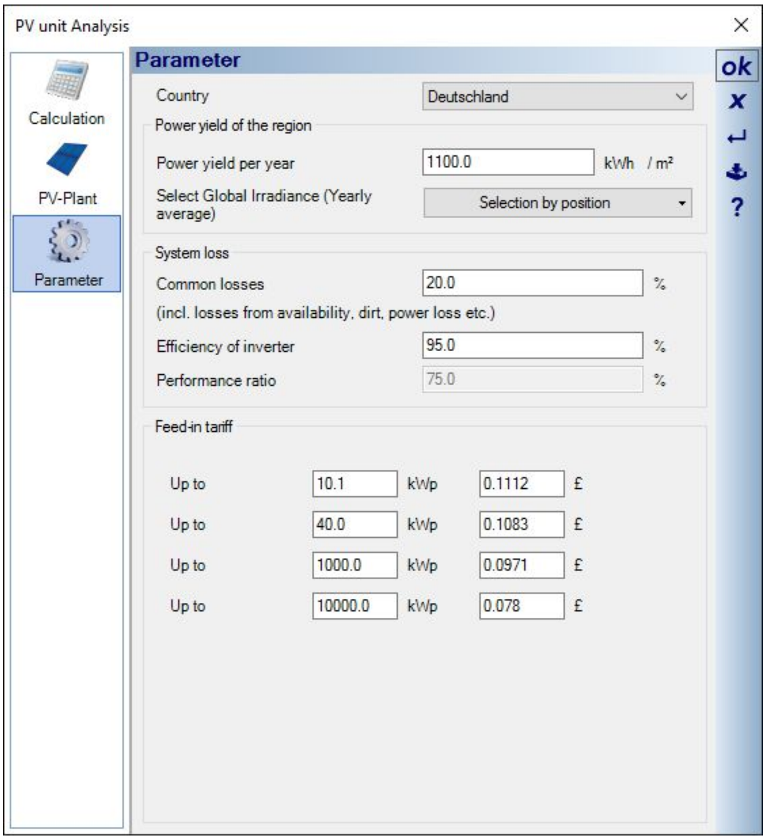


13.3 ANALYSIS

The analysis provides you with a series of auto-detected values and power calculations and the ability to obtain an assessment of the saved energy costs and a possible feed-in tariff.

On the parameter page you must first select the country and expected global radiation in your region. An indication of the global radiation might come from the supplied map. Exact values should be researched for your community. System losses and typical inverter efficiencies of course depend on the manufacturer of the future plant and the components used therein.

Since the feed-in tariff may change constantly, a current typical graduation in four steps is provided, but should be adjusted as necessary, as well as the revenue coming from the feed-in tariff.



Parameter

Country: Deutschland

Power yield of the region

Power yield per year: 1100.0 kWh / m²

Select Global Irradiance (Yearly average): Selection by position

System loss

Common losses: 20.0 %

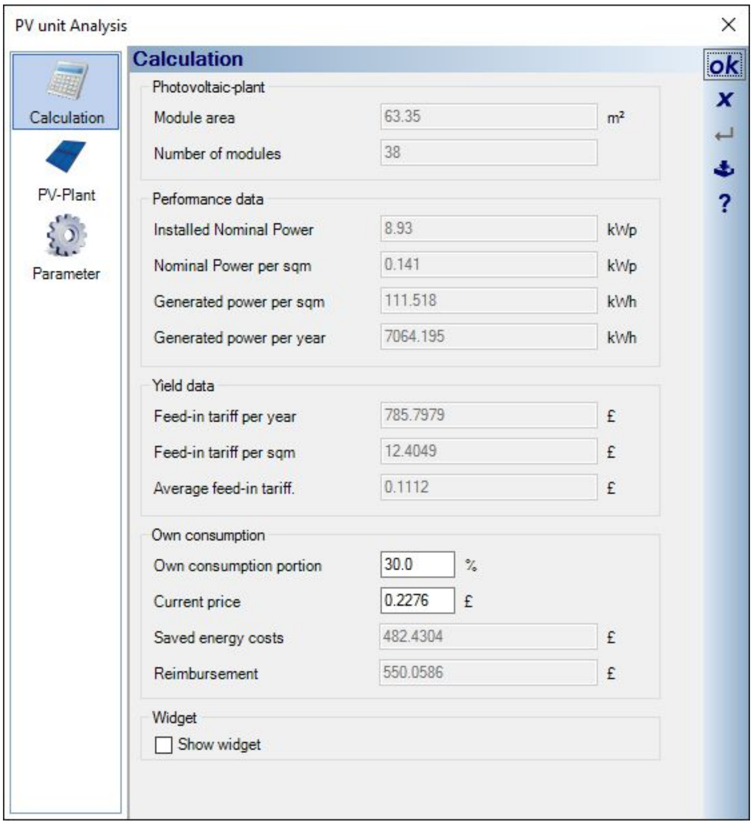
(incl. losses from availability, dirt, power loss etc.)

Efficiency of inverter: 95.0 %

Performance ratio: 75.0 %

Feed-in tariff

Up to	10.1	kWp	0.1112	£
Up to	40.0	kWp	0.1083	£
Up to	1000.0	kWp	0.0971	£
Up to	10000.0	kWp	0.078	£



Calculation

Photovoltaic-plant

Module area: 63.35 m²

Number of modules: 38

Performance data

Installed Nominal Power: 8.93 kWp

Nominal Power per sqm: 0.141 kWp

Generated power per sqm: 111.518 kWh

Generated power per year: 7064.195 kWh

Yield data

Feed-in tariff per year: 785.7979 £

Feed-in tariff per sqm: 12.4049 £

Average feed-in tariff.: 0.1112 £

Own consumption

Own consumption portion: 30.0 %

Current price: 0.2276 £

Saved energy costs: 482.4304 £

Reimbursement: 550.0586 £

Widget

☐ Show widget

14 2D GRAPHICS PLUG-IN

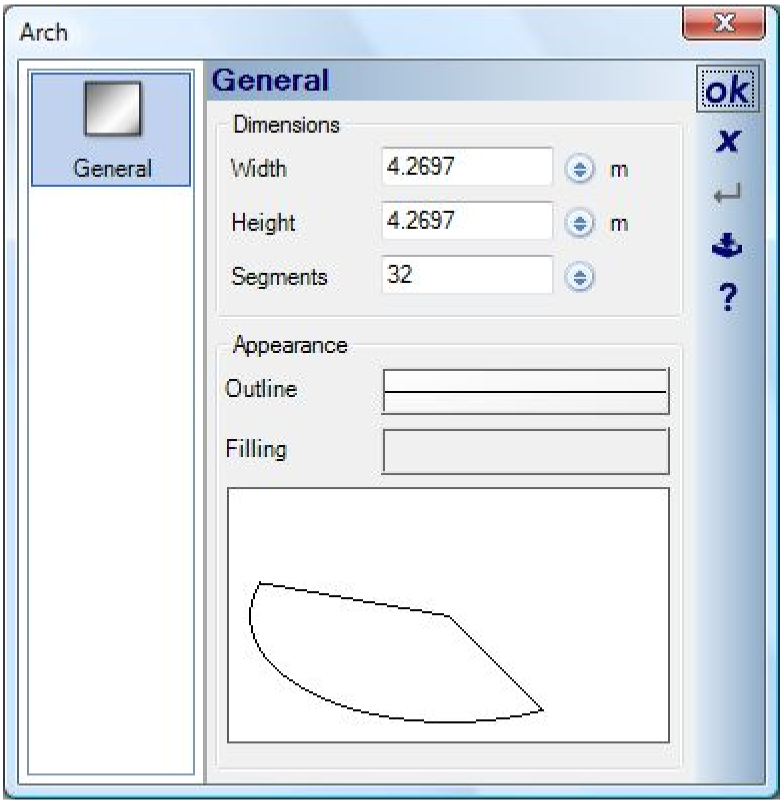
The 2D graphics plug-in offers a range of 2D graphic elements and various ways to input them.

- Line
- Circle
- Rectangle
- Elipse
- Arc
- Polygon
- Bitmap

All elements have a properties dialog, which is opened by a double click on the selected element, or over the ‘Properties’ entry in the context menu.

14.1 REPRESENTATION

The properties for the representation of an element can be demonstrated with an example for an arc. Basically, closed figures such as circles, rectangles etc., are automatically created filled in. By default, this does not apply to arcs, but they can be assigned properties for fill-in nevertheless. The ‘Properties’ dialogs for ‘Outline’ and ‘Filling’ under ‘Appearance’ are opened if you click on the field next to the respective name.



Dimensions

Width 4.2697 m

Height 4.2697 m

Segments 32

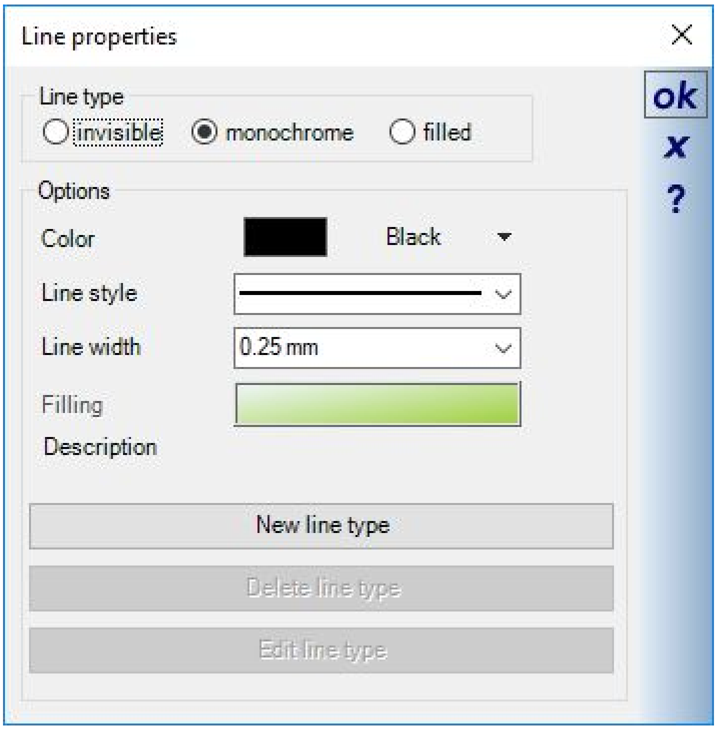
Appearance

Outline

Filling

14.1.1 Outlines

Since with outlines we are dealing with the properties of lines, the corresponding dialog is identical to the properties dialog for lines, which is often found in other dialogs.



Line properties

Line type
○ invisible ● monochrome ○ filled

Options

Color: Black

Line style

Line width: 0.25 mm

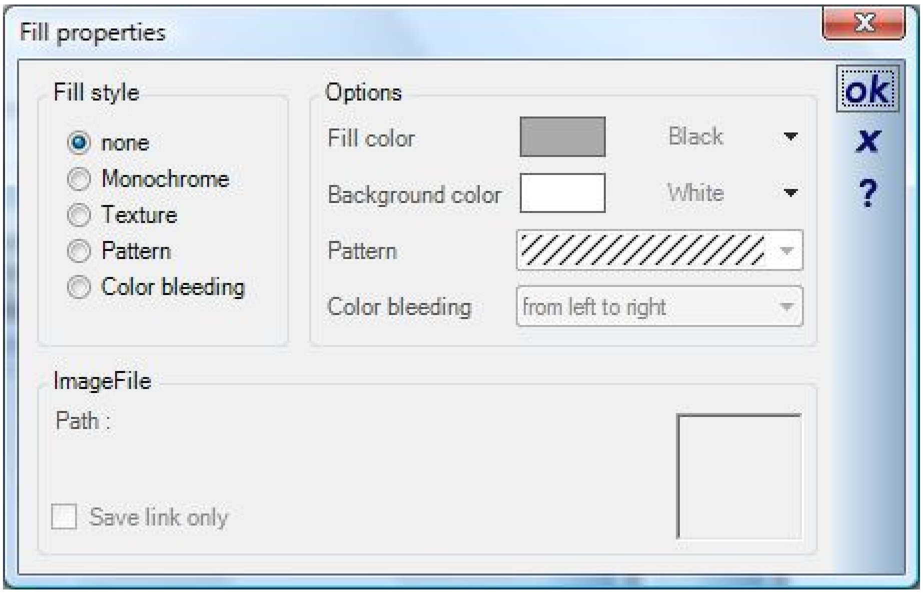
Filling

Description

For borders you have the option ‘invisible’ i.e. without a border, or ‘monochrome’ with the usual line properties.

14.1.2 Filling

The fill styles provided are monochrome, texture, pattern and colour gradient. For each of the usual fill styles the appropriate options are also provided. For textures however, the associated image in one of the supported bitmap formats must first be loaded. A mouse click in the preview box under ‘Image file’ opens the standard dialog for ‘Open file’. The selected image is automatically scaled to fit the fill area. Using the ‘Save link only’ option, you can decide whether the image, or only the path to the image, should be saved directly in the project file. Saving the image in the project naturally affects the file size, according to the size of the image file. If you only save the path, you should ensure that the image is always accessible over this path. If you change the directory structure, or pass on the project to someone else without the image and path, then the image will no longer be displayed.



● none
○ Monochrome
○ Texture
○ Pattern
○ Color bleeding

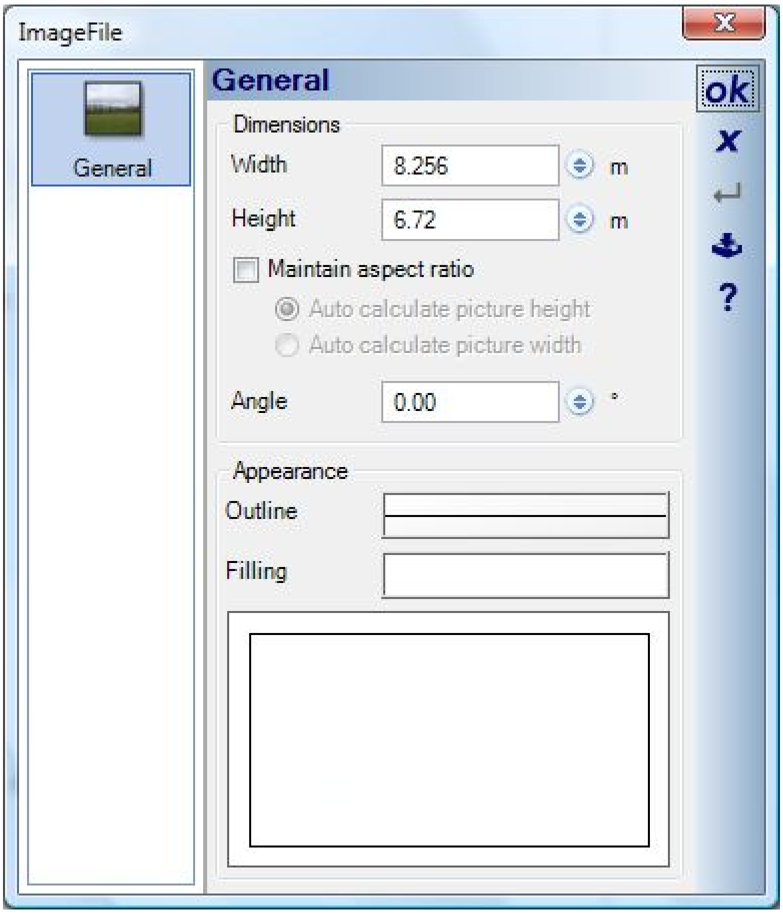
Fill color Black
Background color White
Pattern
Color bleeding from left to right

Path :
☐ Save link only

In many cases, which are beyond the possibilities for fillings, it is better to insert an image using the ‘Insert image’ function.

14.2 INSERTING IMAGES

When the function for ‘Insert image’ is selected, the standard dialog for ‘Open file’ is opened, in which you can choose the desired image file. Following this, the software expects a rectangle to be entered, which is then filled with the image. The properties of the image and the surrounding rectangle can be changed subsequently if desired over the properties dialog, which is opened with a double click, or over the context menu.



ImageFile

General

Dimensions

Width 8.256 m

Height 6.72 m

☐ Maintain aspect ratio

● Auto calculate picture height

○ Auto calculate picture width

Angle 0.00 °

Appearance

Outline

Filling

It should be noted that if the dimensions of the image are changed, the image will be distorted, if the values for height and width are adjusted manually without retaining the original width-to-height ratio. The 'Maintain aspect ratio' option prevents distortion, by allowing only one of the two values for width and height to be entered, the other value is then adjusted automatically.
If a value for 'Angle' is specified, the image and its surrounding rectangle are rotated in the plan.

14.3 VISIBILITY OF 2D ELEMENTS

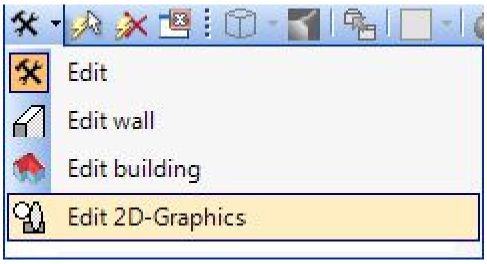
As already mentioned, 2D graphic elements are generally visible in all 2D plan views. Detailed settings for each plan view can be specified over the visible categories in the 'Visibilities' dialog, activated over the context menu.
2D graphic elements are inserted exclusively in the current view for 2D views and cross-sections.

14.4 DISPLAY PRIORITY

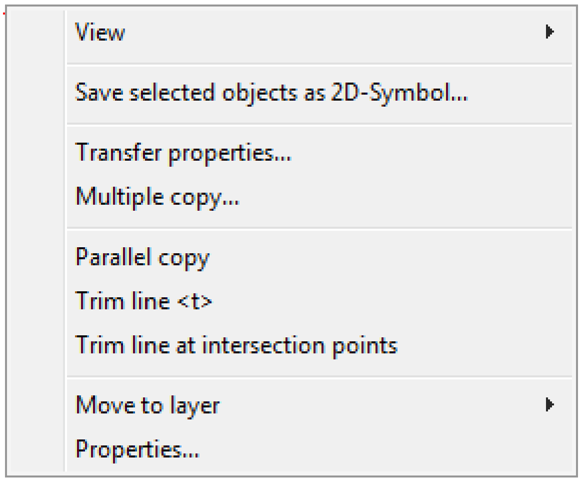
Basically, the order in which elements are inserted also determines the order in which they are displayed. For instance, a filled in rectangle which is drawn over text that was inserted previously, will cover the text, which is then no longer visible. This default setting can be changed subsequently with the buttons for display priority, which are always shown in the toolbar when an element is selected. This enables you to specify the order in which elements are displayed, to suit a particular case, e.g. inserting text over a filled in rectangle when creating a title block.

14.5 EDITING 2D ELEMENTS

The following functions for editing 2D graphic elements can be found in the appropriate 'Edit 2D Graphics' toolbar.

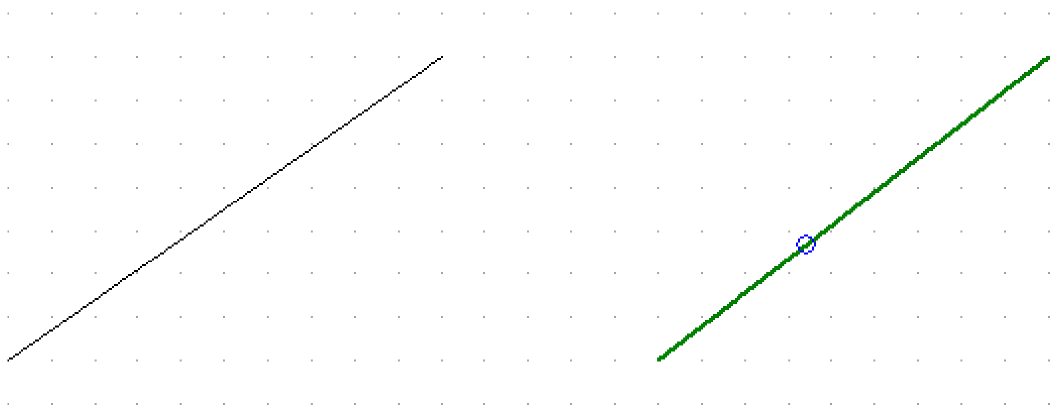


Alternatively, the tools can be activated over the context menu, as soon as a line or polygon has been selected.

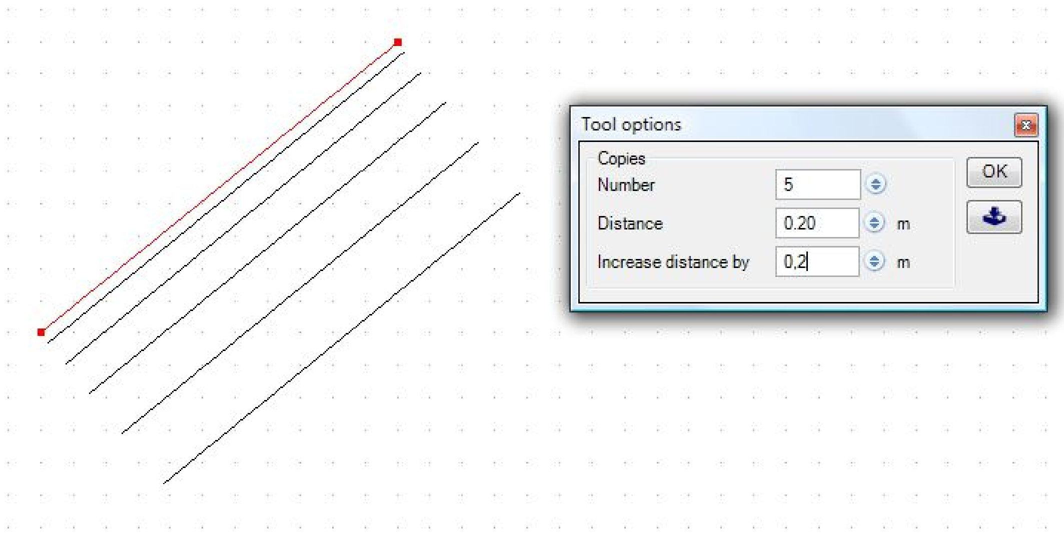


14.5.1 *Parallel Copy*

With this tool you can create parallel copies of lines or polygons. In the ‘Tool options’ dialog you can specify the number of copies and the spacing between copies. All copies are shown first of all only as a preview. They are only inserted into the plan when the settings are confirmed with ‘OK’. Activate the tool and position the mouse cursor over the object you wish to copy. As soon as an object is detected it is highlighted in the preview. In the following illustration a normal line is shown on the left, and on the right a line which has been highlighted by the tool.



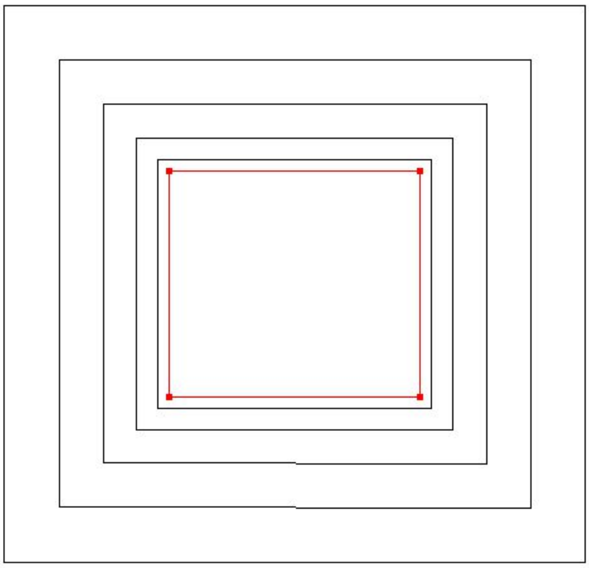
Now click on the object. As a result the ‘Tool options’ dialog appears.

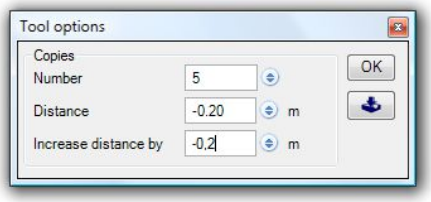


Copies
Number 5
Distance 0.20 m
Increase distance by 0,2 m

To create parallel copies in the opposite direction a negative distance must be specified.

The following example shows a closed polygon, for which concentrical copies have been created by specifying a negative distance with a constant increase in the distance between copies.





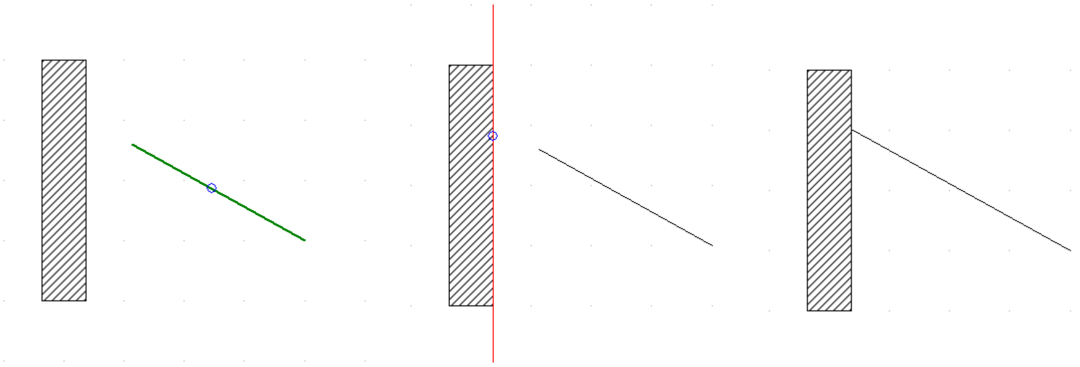
Copies
Number 5
Distance -0.20 m
Increase distance by -0,2 m

14.5.2 Trimming Lines

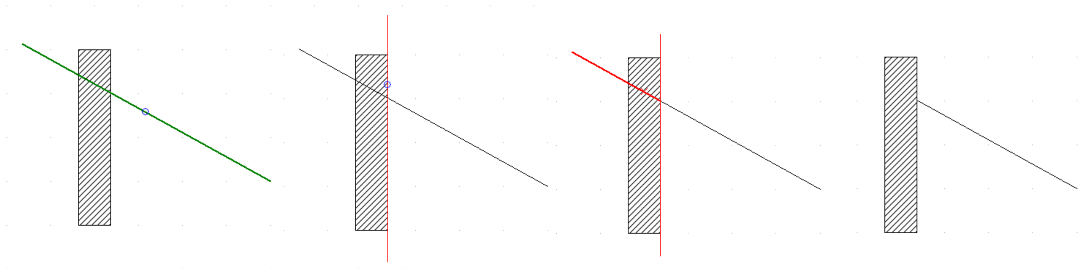
The tool can also be used to trims lines. Activate the tool and then select the line to be processed. When a line is detected under the mouse cursor it is highlighted and can be selected with a left mouse-click. Next a reference line must be selected against which the line is to be trimmed. Move the cursor to the edge of a construction element, to another line or a guideline. A valid reference line is immediately marked with a red line and can be selected with a left mouse-click.
Below we consider two different cases:

- The line is extended to meet the reference line.
- The line intersects the reference line.

In the case of the line being extended, this is performed immediately and the line is extended to meet the reference line. In the following illustration the necessary steps are shown from left to right together with the final result.



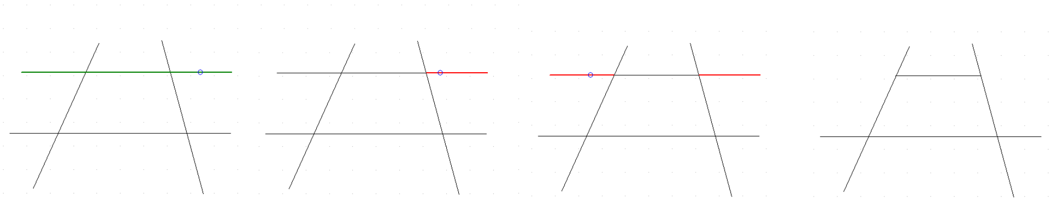
If the line intersects the reference line an intermediate step is necessary. You must first specify which part of the line, which is split by the reference line, is to be removed. The part of the line to be deleted is highlighted in red when the cursor is positioned over it, and can then be deleted with a left mouse-click. The following illustration shows, from left to right, the necessary steps and the final result.



Note: The ‘line trimming’ tool can also be activated directly with the ‘T’ key.

14.5.3 *Trimming a Line at an Intersection*

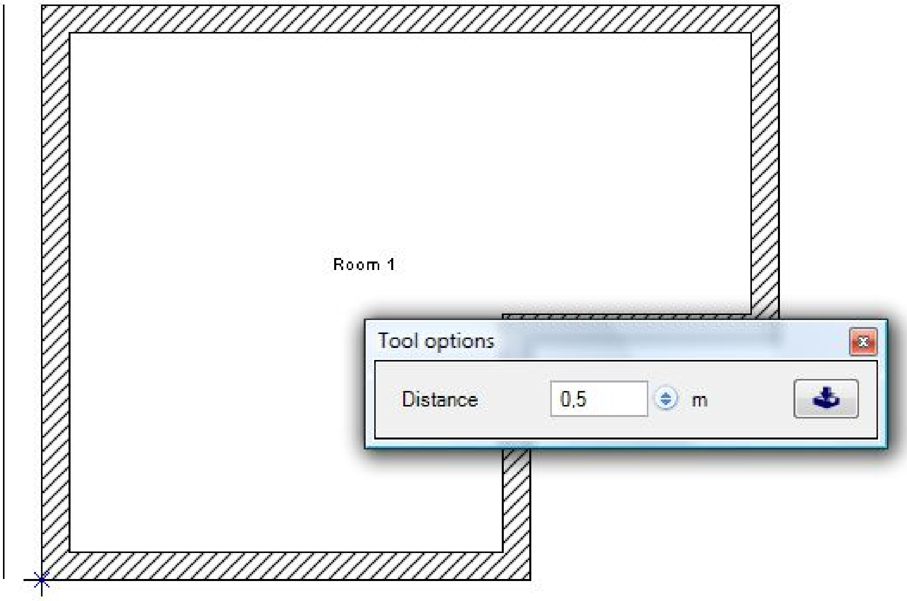
Trimming lines at an intersection is performed without the need to select a reference line, since all intersections with other lines or guidelines are automatically detected along the line. However, the edges of construction elements are ignored. The illustration shows the necessary steps from left to right; using the mouse first select the line, and then the parts of the line to be removed. With this tool you can select several parts of the line by keeping the ‘Shift’ key pressed. The second diagram from the right illustrates this option. Once the selection of the ‘line sections’ is complete, the selected sections can be removed by pressing the ‘Enter’ key.



14.5.4 *Tools for Inputting Parallel Lines and Polygons*

In addition to the normal tools, there is an option for lines and polygons which automatically creates the appropriate objects with a specified lateral spacing. If a positive distance is specified, the line is created to the right of the mouse cursor relative to input direction, and to left if a negative distance is specified in the ‘Tool options’ dialog.

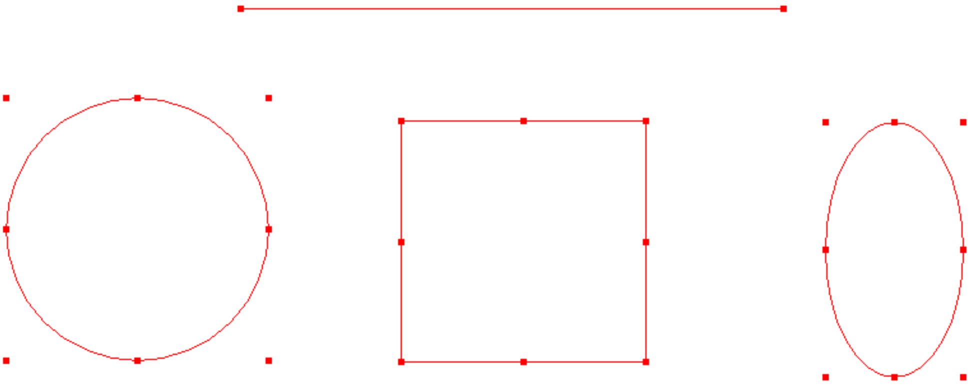
In the example shown, the line is input automatically parallel to the wall between corners.



Distance 0,5 m

14.5.5 Scaling 2D-Elements

Selected 2D graphic elements show ‘grips’ at the ends of lines and on the rectangles surrounding them, which can be used to position or change the dimensions of the element.

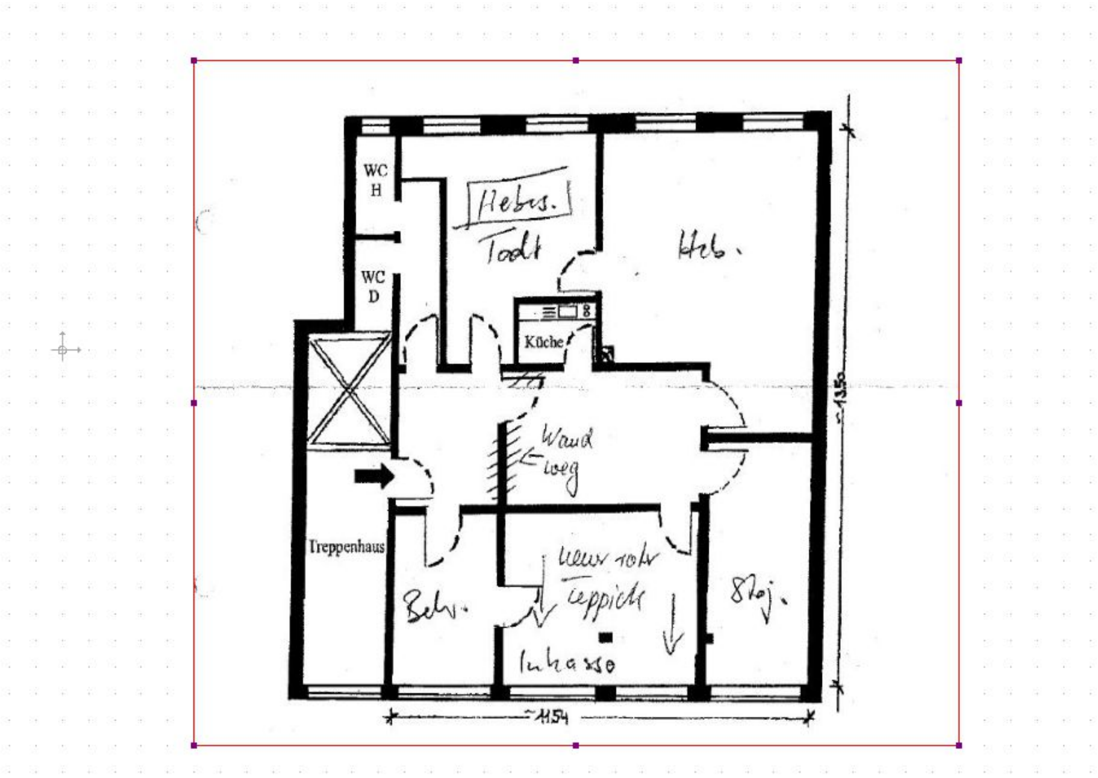


Select one of the ‘grip’ points with a left mouse-click. For a line you can now reposition the point, or in the case of a surrounding rectangle you can change the size of the complete element. A second mouse-click terminates the operation.
Note: If you keep the ‘Shift’ key pressed while repositioning a point then the previous direction of a line remains fixed, and rectangles are only changed proportionally, i.e. the width-to-height ratio is retained. For lines you can thus select a point away from a line as a reference point for the new length of the line.

14.5.6 Scaling Images and 2D Elements numerically

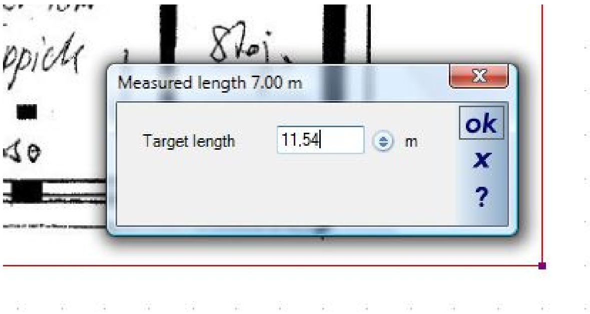
Images and 2D Elements can be scaled very accurately. This allows images of floor plans to be inserted and used as a blueprint over which the 3D model of the building can be constructed.

To achieve this, the image must first be scaled to the correct dimensions, as undefined dimensions and incorrect proportions result on insertion.
First select the image and then choose the ‘Adjust scaling’ function from the context menu.



The next step is to enter a dimension from the image as a reference dimension for subsequent scaling. In this case we choose the horizontal value shown as 11.54 and define the length with two mouse-clicks on the dimension in the image. Hereby, keep the ‘Ctrl’ key pressed to activate the angle grid and thus guarantee an exact

horizontal measurement of the length. On the second mouse-click a dialog box appears in which the current measurement is shown and allows input of the value from the drawing.
A click on 'OK' ends the dialog and the image is scaled to the new dimensions. The floor plan can now be inserted, although the measurements should be checked beforehand.



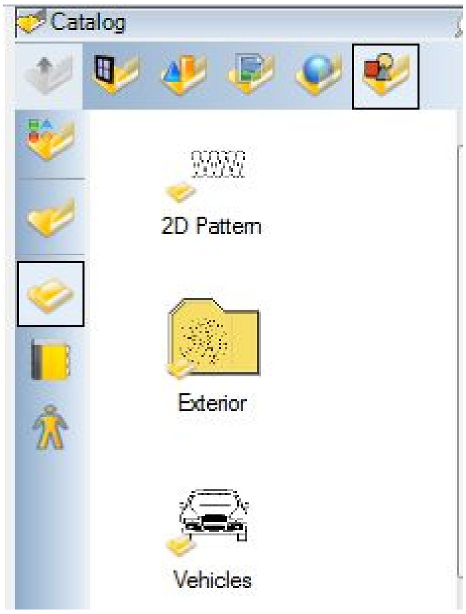
Measured length 7.00 m

Target length 11.54 m

15 ADVANCED 2D LINES, 2D PATTERNS AND HATCHING

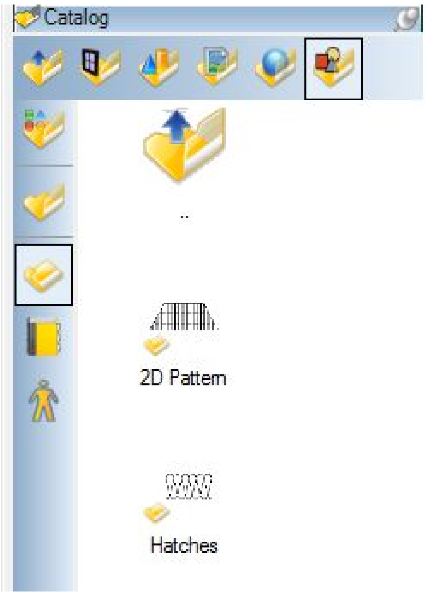
Note: The functions described in this section are not included in all versions and remain are mainly specific to the professional products. If in doubt, please ask your sales partner.

In the standard versions the 2D pattern or hatching was limited to that provided by the Windows operating system drawing functions. With the advanced 2D patterns you now have the option to draw your own pattern as a 2D symbol to be stored in the catalog and from there use with additional properties as a fill pattern for the display in 2D views. In addition, the catalog of 2D symbols found in the 2D SAMPLES directory, already contains a directory with pre-made patterns.



Within that directory you will find more folders with cross-hatching and patterns. This contains the hatching patterns that you can assign to 2D elements such as walls, pillars or terrain elements by adding to the building material properties, or in the case of terrain elements this can be used to represent vegetation. Thus, these hatches contain patterns that can be used in CAD drawings.

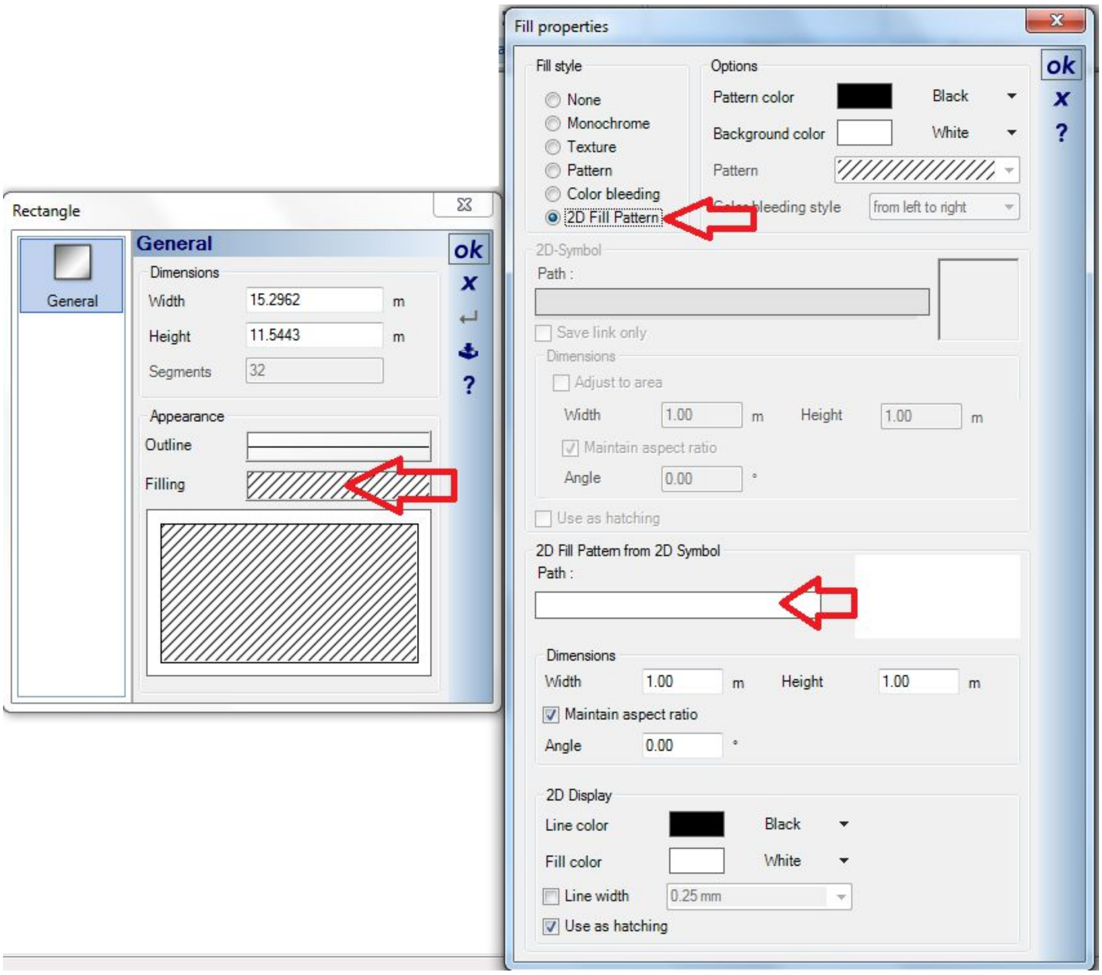
The list includes mainly 2D PATTERN files that you can use as a design element in your 2D plans, such as roof tiles for external roof views, brick or other composite patterns for the design of walls, paved areas, etc....



In addition, you can use it as a filling etc. and scale accordingly, and so adjust its size with the advanced features and textures from the catalog, say for example pictures of tiles or parquet flooring.

15.1 THE DIALOGUE FILLING PROPERTIES

If your version has these advanced features, you get the advanced dialog for the selection of fill properties. There are small differences depending on the drawing element. If you have a 2D element of the 2D graphics plugin, you can directly activate the fill properties via the corresponding field in the Properties dialog. For other elements, such as structural elements, walls, columns, etc. the presentation is provided via the materials properties. You would then click on the Material button and then on the resulting dialog 2D Display property page.
Example rectangle:



Dimensions
Width 15.2962 m
Height 11.5443 m
Segments 32

Appearance
Outline
Filling

Fill style: ● 2D Fill Pattern

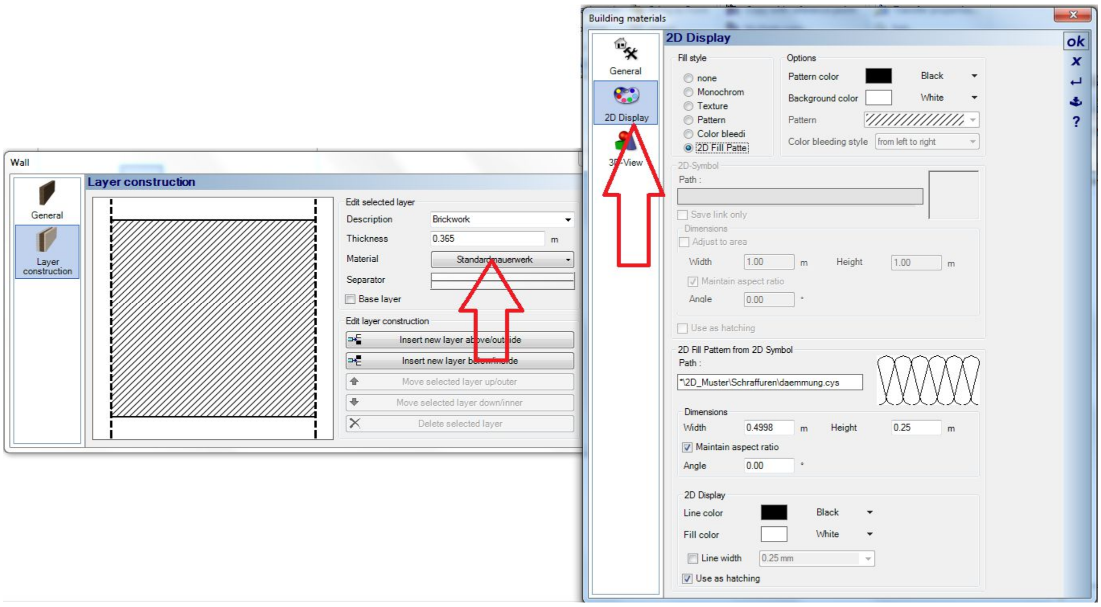
Pattern color: Black
Background color: White
Color bleeding style: from left to right

Dimensions
☐ Adjust to area
Width 1.00 m Height 1.00 m
☑ Maintain aspect ratio
Angle 0.00 °

Dimensions
Width 1.00 m Height 1.00 m
☑ Maintain aspect ratio
Angle 0.00 °

Line color: Black
Fill color: White
☐ Line width 0.25 mm
☑ Use as hatching

Example for building material within a wall layer:



Edit selected layer
Description: Brickwork
Thickness: 0.365 m
Material: Standardmauerwerk
Separator
☐ Base layer

2D Display
Fill style: ● 2D Fill Patte
Pattern color: Black
Background color: White
Color bleeding style: from left to right

Dimensions
☐ Adjust to area
Width 1.00 m Height 1.00 m
☑ Maintain aspect ratio
Angle 0.00 °

2D Fill Pattern from 2D Symbol
Path : *\2D_Muster\Schraffuren\daemmung.cys

Dimensions
Width 0.4998 m Height 0.25 m
☑ Maintain aspect ratio
Angle 0.00 °

2D Display
Line color: Black
Fill color: White
☐ Line width 0.25 mm
☑ Use as hatching

15.2 2D PATTERN SETTINGS

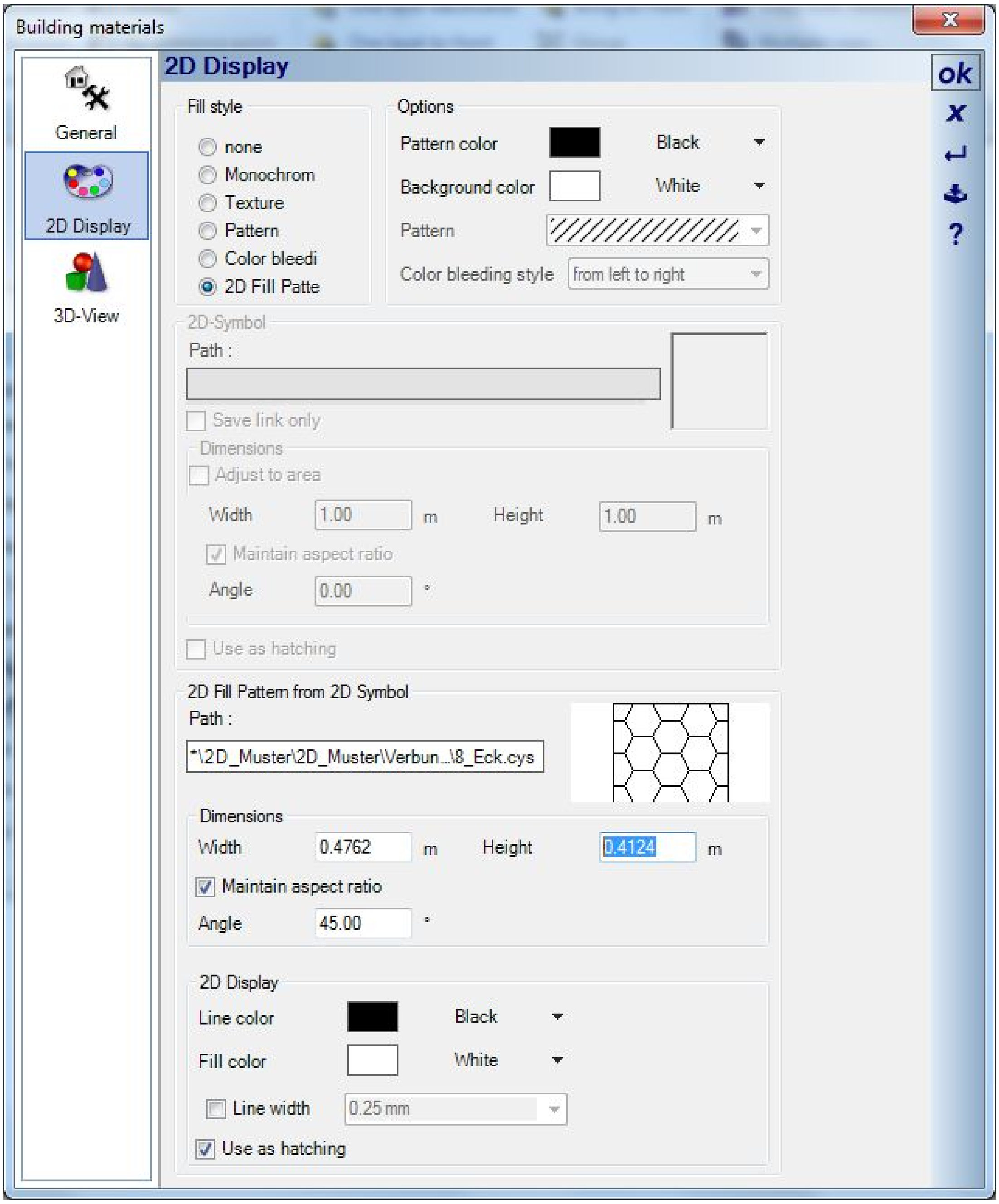
If you select 2D Fill Pattern, you can then edit the settings at the bottom of the extended dialog.
First, there is the selection of the desired pattern on the existing catalog control.
Once you have selected the pattern, you will see its original dimensions displayed in the width and height fields. These dimensions are defined from the drawing the 2D symbol, from which the pattern is created. You can change these dimensions at any time as required.
For a 1 m thick wall layer, you would have to adjust the pattern to this thickness. You would set the Height filed to 1 m, so that the pattern extends over the wall entire thickness and is not tiled.

With the angle field you can "rotate" the pattern within the element.

In the lower area you set the colour of the pattern, the colour of the fill, and the background.

By setting the line width you can define the line width for all lines within the pattern.

Do not use this setting if the original line strengths are used within the 2D symbol. In the sample patterns provided, the line thickness "hairline" was used.



Building materials

2D Display

Fill style

○ none
○ Monochrom
○ Texture
○ Pattern
○ Color bleedi
● 2D Fill Patte

Options

Pattern color: Black
Background color: White
Pattern
Color bleeding style: from left to right

2D-Symbol

Path :

☐ Save link only

Dimensions

☐ Adjust to area

Width 1.00 m Height 1.00 m

☑ Maintain aspect ratio

Angle 0.00 °

☐ Use as hatching

2D Fill Pattern from 2D Symbol

Path :

*\2D_Muster\2D_Muster\Verbun...\8_Eck.cys

Dimensions

Width 0.4762 m Height 0.4124 m

☑ Maintain aspect ratio

Angle 45.00 °

2D Display

Line color: Black
Fill color: White

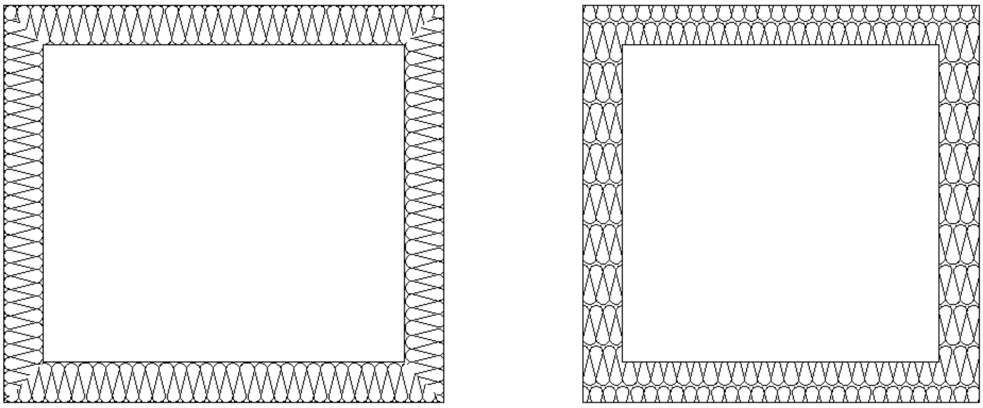
☐ Line width 0.25 mm

☑ Use as hatching

The option “Use as hatching", which is disabled by default and must be activated only in a few cases, for example:

In the left image you see the fill pattern used in walls with the option “Use as hatching" disabled. (Also without having an angle defined in the dialog). The pattern then follows the alignment of the wall, and always starts in a corner of the drawing area, usually in the upper left.

On the right image you see the same drawing but with “Use as hatching" enabled. The pattern is now tiled without reference to the element and is centered on the screen and spread over all the elements in an identical manner. This functions in the same way as the standard “standard Windows hatching".



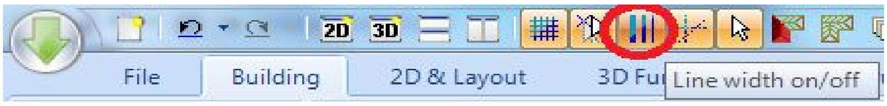
15.3 DRAW YOUR OWN FILL PATTERNS AND HATCHES

You can always add your own hatching designs to the catalogue. All hatches and patterns consist of 2D symbols, using our own native 2D file format. You could import your own samples, eg from DXF files, or draw graphics using the drawing functions of the 2D plugin tool. Then select the items you want to belong to the 2D symbol and save using the context menu, activated with the right mouse button selecting "Save selected objects as 2D Symbols" and save in the directory \ installation directory \ Graphics2D \ 2D_Muster \ .....

An exemplary procedure:

Draw a bounding rectangle and enter the dimensions exactly as you require for the pattern. These dimensions are also displayed in the Fill Properties dialog and can be changed later for each fill there.

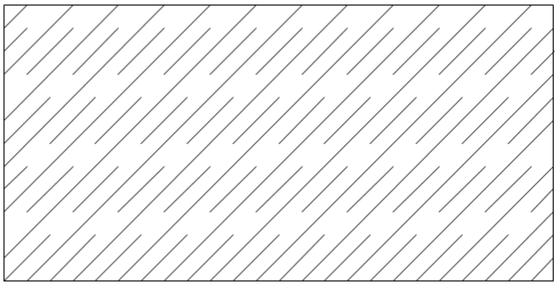
Then draw inside the rectangle your pattern using the functions of the 2D Graphics plug-in such as lines, arcs, circles etc.. While drawing, it often makes sense to turn off the line widths in the 2D view. In our example patterns, we have also used the “hair line” line width setting to increase clarity.

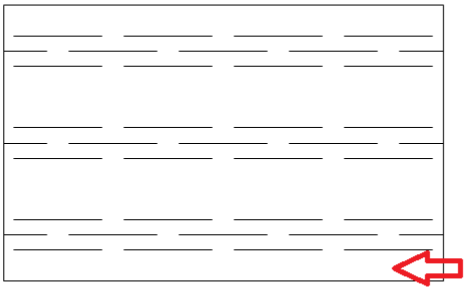


Please take into consideration when drawing the pattern any tiling in when displayed both vertically and horizontally, otherwise you will see a tiled effect very clearly in the drawing.

The initial bounding rectangle is used for the orientation and is automatically stripped when the 2D symbol is used as a pattern. Therefore, you can also create patterns without this bounding rectangle.

But there are also cases where the bounding rectangle is imperative, namely, whenever the elements of the pattern must have a distance from the edge, as shown in the figure below right. If the rectangle is missing, the uppermost and lowermost lines would form the absolute dimensions of the pattern and the overall the pattern would look very different.





Of course you can also take existing patterns as the basis for further editing. Just drag the icon into a 2D view, select it and then choose "2D symbols separate to base objects…" from the context menu. Now you can select the components of the former symbol individually and edit or remove a single element and replace with others. Then save the new symbol / pattern in the catalog.

15.4 ADVANCED 2D-LINES

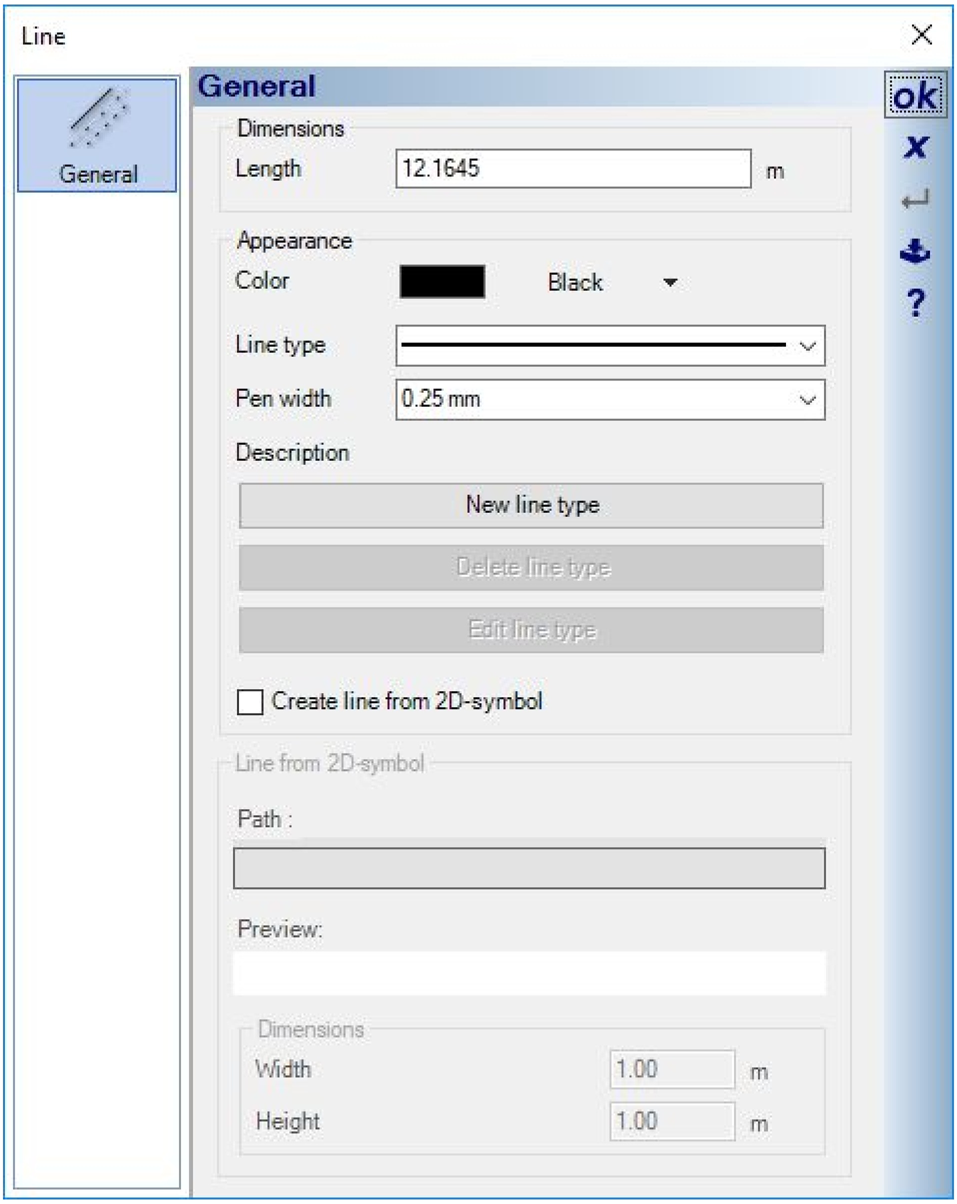
15.4.1 General

Two variants are available for advanced 2D-lines:

- Parametric dash lines
- individual lines from 2D symbols

For line settings in 2D views, further line types are now available. The previous windows standard lines in the selection list have been extended by a further dozen self - defined "dash - dot" line combinations.

The properties dialog of a 2D line also offers the possibility to define your own lines.



Length 12.1645 m

Color Black

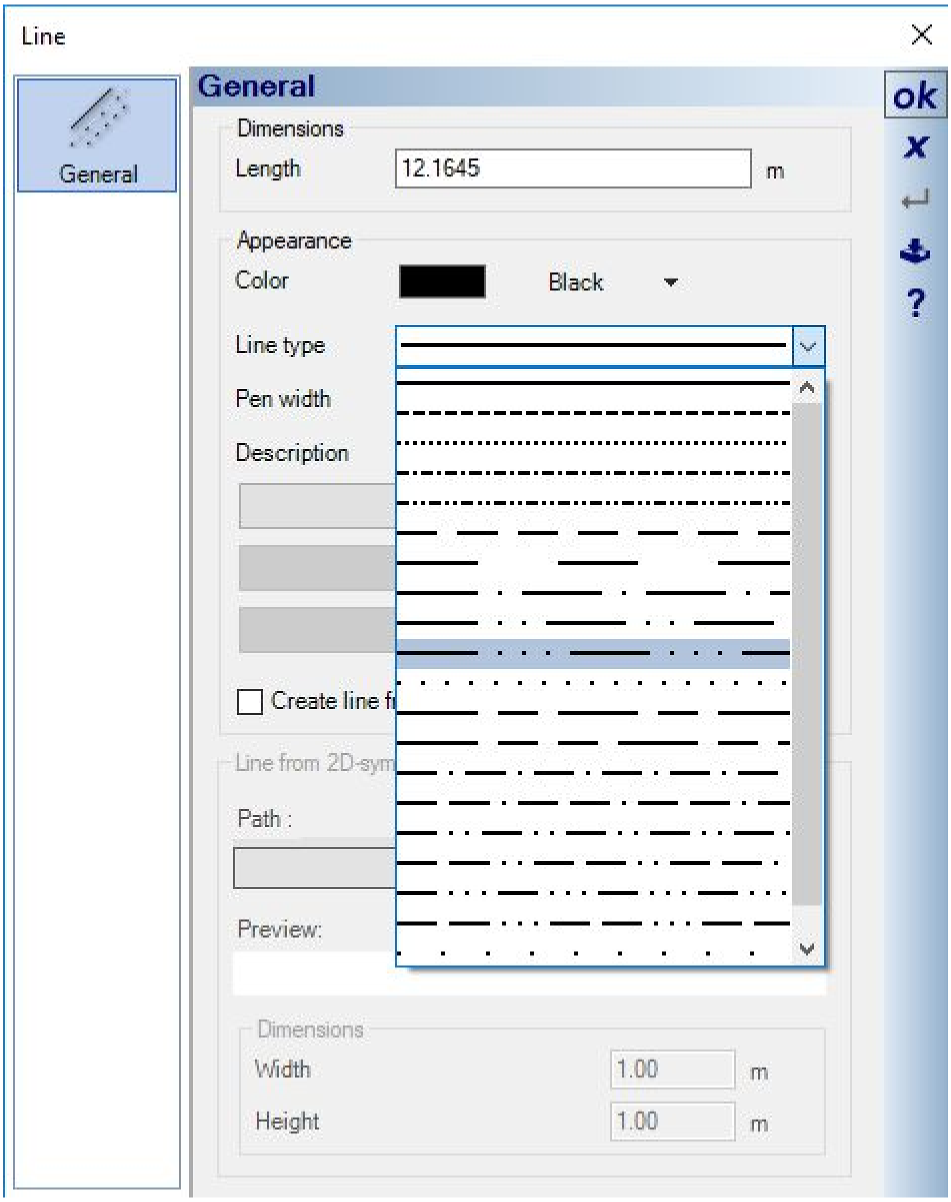
Pen width 0.25 mm

☐ Create line from 2D-symbol

Width 1.00 m

Height 1.00 m

The list of lines now shows the previous 5 Windows standard lines, followed by the advanced “dash-lines”. In addition, self-generated lines would automatically be appended to the end of the list.



Length: 12.1645 m

Color: Black

Path :

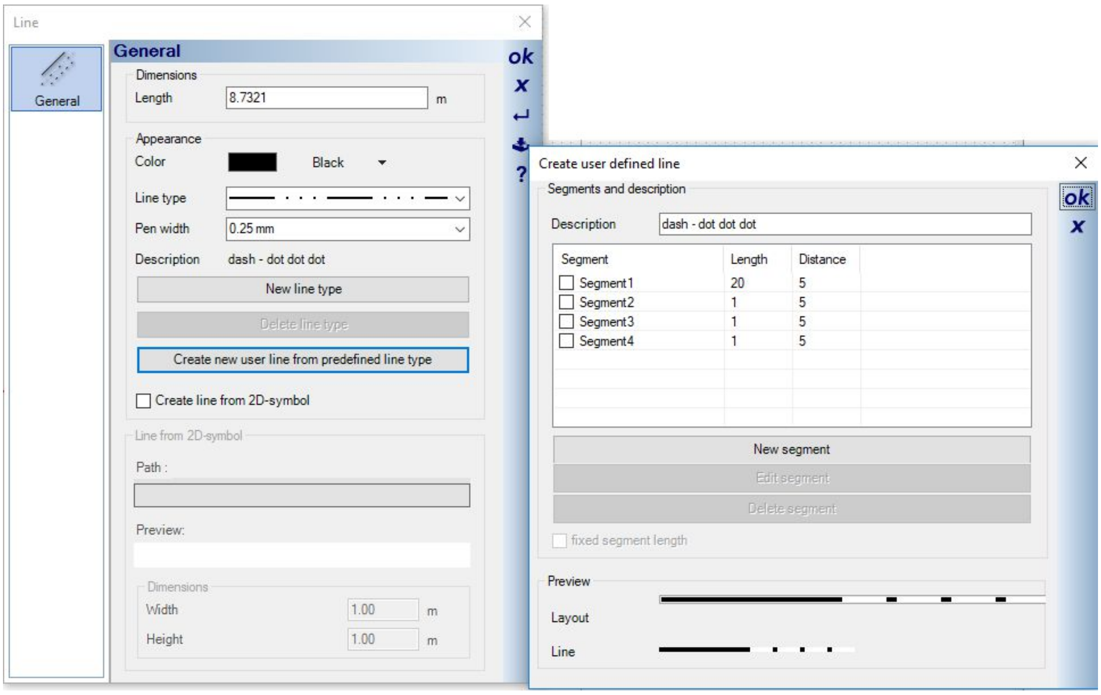
Width: 1.00 m

Height: 1.00 m

Note: The new line types and their definition are stored in XML files. The included standard lines in the LineTypes.xml in the respective language subdirectory of your version, e.g. "C: \ installation directory \ PROGRAM \ en-GB". The self-created lines are stored in an additional UserLineTypes.xml file in your user directory, ie. C: \ Users \ your_user_name \ Documents \ Your_CAD_Version \. If you use custom lines in a project and switch to a different computer, you must transfer the UserLineTypes.xml as well, otherwise unrecognized lines would be replaced by windows standard lines when loading the project on the new computer.

15.4.2 Creating your own „2D dash-lines“

When you create your own lines, you can start with a completely new, empty line and describe it with segments and distances ("new line type") or use an existing line and change only their settings ("New user line from predefined line type ").
In the Create user defined line dialogue, you can specify the length of the segments, the distance to the next segment, and the logical name of the new line.



Dimensions
Length 8.7321 m

Appearance
Color Black
Line type
Pen width 0.25 mm
Description dash - dot dot dot

☐ Create line from 2D-symbol

Dimensions
Width 1.00 m
Height 1.00 m

Description dash - dot dot dot

Segment	Length	Distance
☐ Segment1	20	5
☐ Segment2	1	5
☐ Segment3	1	5
☐ Segment4	1	5

☐ fixed segment length

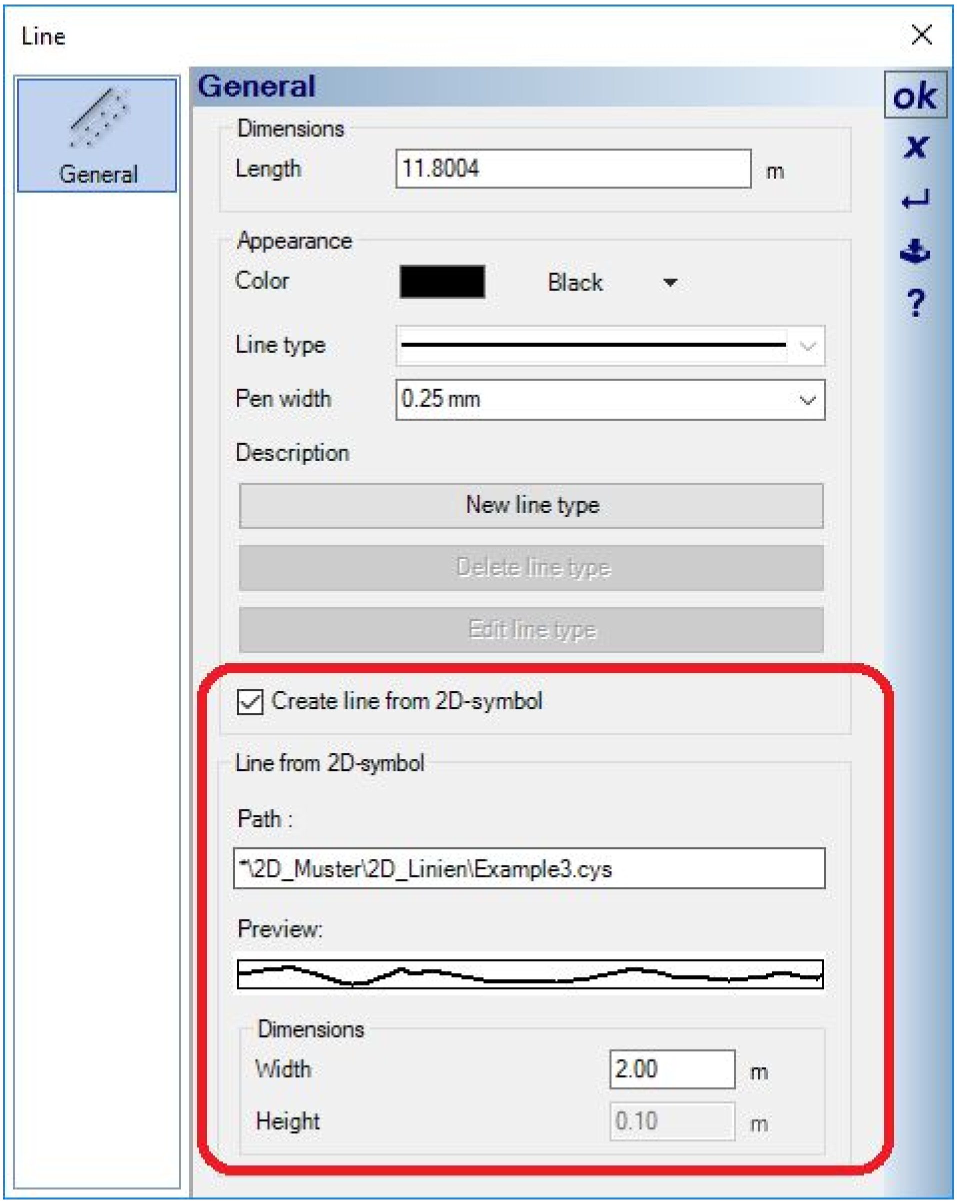
Layout

Line

The values for length and distance are no absolute values, not in mm for example. They depend in the printed line result on the scale and the pen width. A segment of length 40 would e.g. in a scale of 1:100 and a pen width of 0.25 mm, result in a length of about 10 cm on the paper.
Measuring segments in a 2D view of the software is senseless, because the current view zoom factor also influences the appearance. You can control the result only on printed paper.

15.4.3 Individual lines from 2D-symbols

As already in a similar form with the patterns and hatches from 2D symbols, you have the possibility to draw lines yourself and to store them in the catalogue of the 2D symbols for further use as new 2D line.



Dimensions
Length 11.8004 m

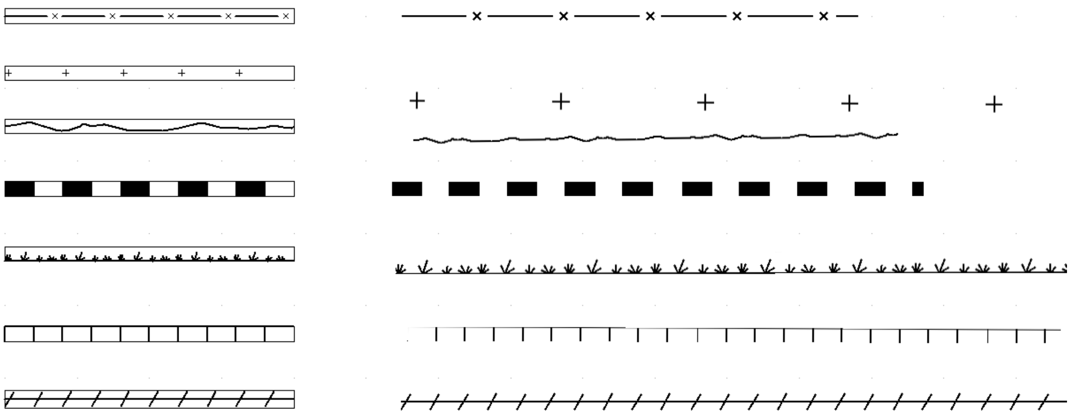
Appearance
Color Black
Line type
Pen width 0.25 mm

☑ Create line from 2D-symbol

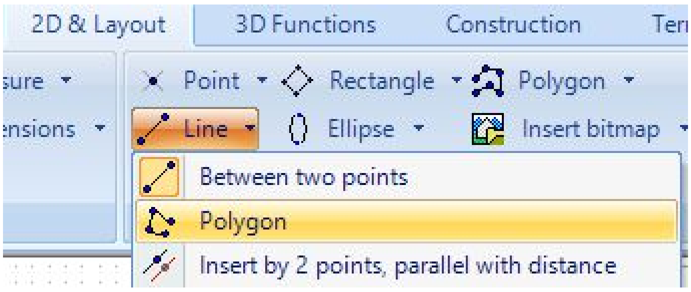
Path : *\2D_Muster\2D_Linien\Example3.cys

Dimensions
Width 2.00 m
Height 0.10 m

For the 2D symbol you draw with the conventional 2D drawing functions like lines, polygons, etc. the later representation of the line, surrounded by a rectangle. The rectangle is removed later when the line is drawn, and the contents of the symbol are arranged along the line (tiled). In the "Dimensions" section you can also scale length of the line later. The height is adjusted proportionally and the line becomes longer and wider.
The principle of drawing 2D symbols for lines corresponds with the one for patterns and hatching, please see the previous chapters.
We have added some line type types in our 2D symbol catalogue, directory "2D Patterns \ 2D Lines". Here are some examples of the 2D symbols and the resulting lines.



You can only create polygonal lines from 2D symbols with the "Polygon" tool of the 2D line element.



16 FIRE ESCAPE PLANS

Note: The functions described in this section are not included in all versions. If in doubt, please ask your sales partner.

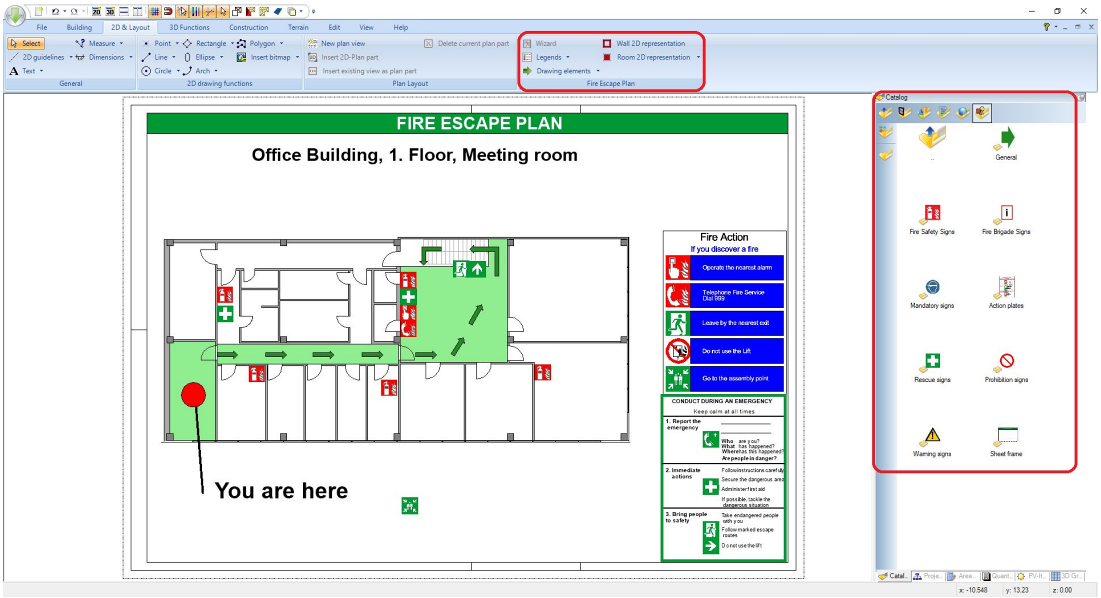
The functions for the planning of Fire Escape plans allow you to create escape and rescue plans as well as fire safety plans according to DIN EN ISO 7010, DIN 4844-2, DIN 14034-6.

Further information on these standards can be found at the German Institute for Standardization http://www.din.de and Beuth Verlag, http://www.beuth.de.
Since these functions are not included in all versions or can be installed as an additional PlugIn, there is a separate manual with descriptions of the functionality and handling that will be installed with your version. Usually found in the installation directory \ Manuals \ FuR.pdf and in your Windows Start menu.

16.1.1 General

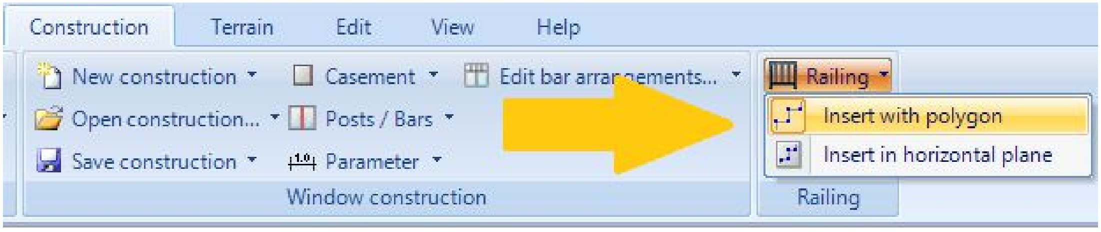
When you start with a Fire Escape plan, we assume that you have created the basic structure of the building with the normal functions for the input of walls, windows and doors, columns, stairs, etc.. Of all constructional elements that need to be displayed in the Fire Escape plan
Once you have such a project or building you can design a Fire Escape Plan with the following functions.

- Wizard for creating the fire escape plan view: the wizard supports you by presetting the right scale for your "target format", usually for printing on paper or in a PDF file. Additionally, with placing a drawing frame. With the settings made, a special 2D view is automatically generated and the building floor plan is inserted.
- Drawing functions for arrows and for marking the location
- Create legends using the placed 2D symbols or from predefined templates
- Simple colour representation of walls and rooms
- 2D Symbol catalogue with all necessary 2D symbols. 280 2D symbols are available.


File
Building
2D & Layout
3D Functions
Construction
Terrain
Edit
View
Help
Select
Measure
2D guidelines
Dimensions
Text
General
Point
Rectangle
Polygon
Line
Ellipse
Insert bitmap
Circle
Arch
2D drawing functions
New plan view
Insert 2D-Plan part
Insert existing view as plan part
Delete current plan part
Plan Layout
Wizard
Legends
Drawing elements
Wall 2D representation
Room 2D representation
Fire Escape Plan
FIRE ESCAPE PLAN
Office Building, 1. Floor, Meeting room
You are here
Fire Action
If you discover a fire
Operate the nearest alarm
Telephone Fire Service Dial 999
Leave by the nearest exit
Do not use the Lift
Go to the assembly point
CONDUCT DURING AN EMERGENCY
Keep calm at all times
1. Report the emergency
Who are you?
What has happened?
Where has this happened?
Are people in danger?
2. Immediate actions
Follow instructions carefully
Secure the dangerous area
Administer first aid
If possible, tackle the dangerous situation
3. Bring people to safety
Take endangered people with you
Follow marked escape routes
Do not use the lift
Catalog
General
Fire Safety Signs
Fire Brigade Signs
Mandatory signs
Action plates
Rescue signs
Prohibition signs
Warning signs
Sheet frame
x: -10.548
y: 13.23
z: 0.00

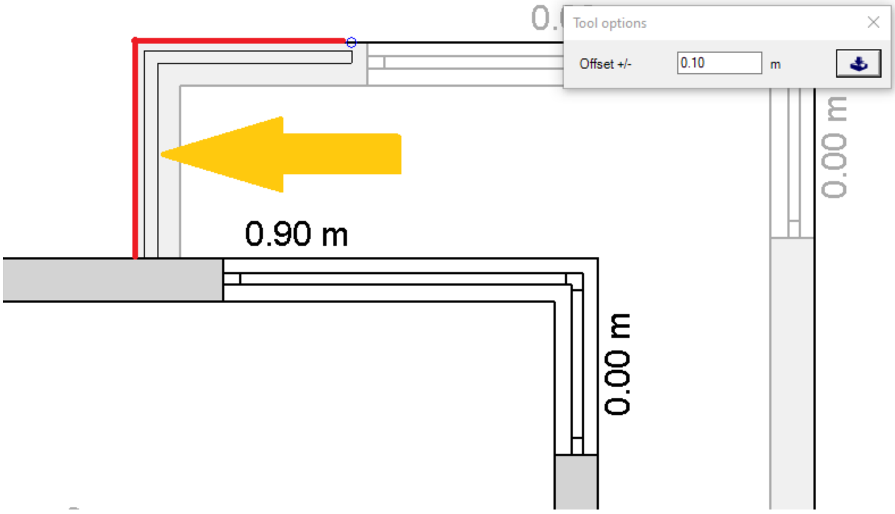
17 RAILINGS

The functions for inserting and designing railings can be found on the CONSTRUCTION ribbon, since railing constructions can also be saved, loaded and, if necessary, edited further.



17.1 INSERTING RAILINGS

A railing is inserted using a polyline. When you have reached the end point of the railing, complete the process with ENTER or via the context menu. The railing dialog then appears.
In most cases, the path of the railing should be based on the existing building construction, e.g. along the outer edge of a balcony. However, since the railing is not usually in the middle of the outside of the balcony, there is an option of defining an offset to the input polygon while you insert the railing.
In the following screenshot, the path of the polygon is red and the offset railing cursor is marked with the arrow at a distance of 10 cm. The direction in which the offset takes place depends on the input direction of the polygon, i.e. it differs depending on whether you enter the polygon to the left or to the right.
Therefore, positive and negative values such as "- 0.1" are allowed.



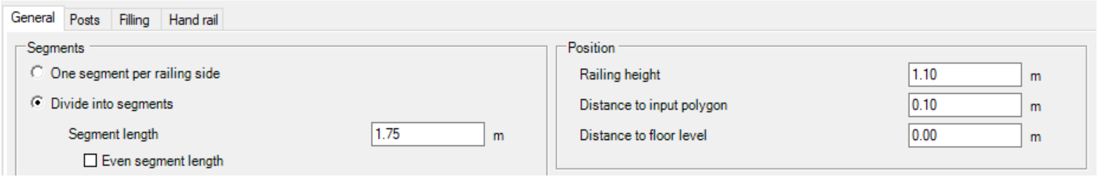
Offset +/- 0.10 m

You can also set the polygon offset for existing railings any time later in our properties dialog. And as usual, you can also move the polygon points of a railing manually.

17.2 LEVEL OF A RAILING

There are two variants when inserting railings, one as a normal polyline or as a polyline in a horizontal plane.

In the normal polyline tool, railings are inserted by default at the zero level of the active layer. Changing the level is done numerically in our properties dialog on the GENERAL page.



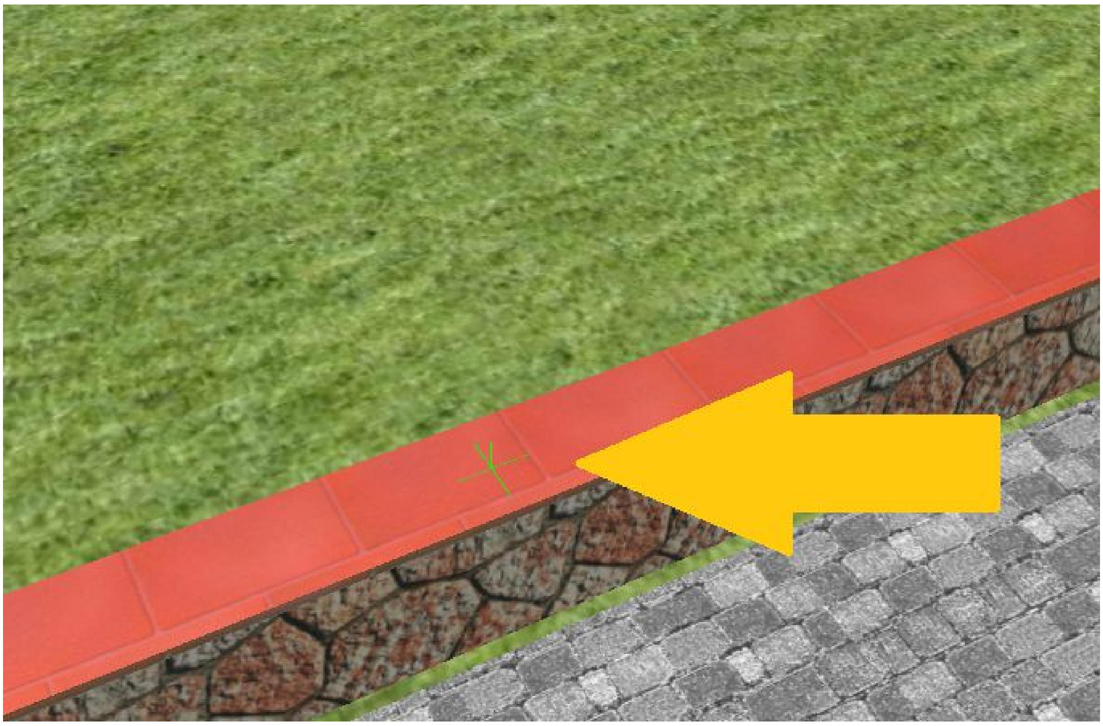
Segments
○ One segment per railing side
● Divide into segments
Segment length 1.75 m
☐ Even segment length

Position
Railing height 1.10 m
Distance to input polygon 0.10 m
Distance to floor level 0.00 m

As an input aid and so that you don't always have to measure the necessary level from the 3D building model there is an alternative variant in horizontal plane.

As with other input tools, the level alias distance to floor level is preset by picking a level in a 3D view.

To do this move the mouse cursor over an area in the 3D view once you have started the tool. If a surface is recognized under your cursor it is marked in red and another left mouse click picks the shown plane.



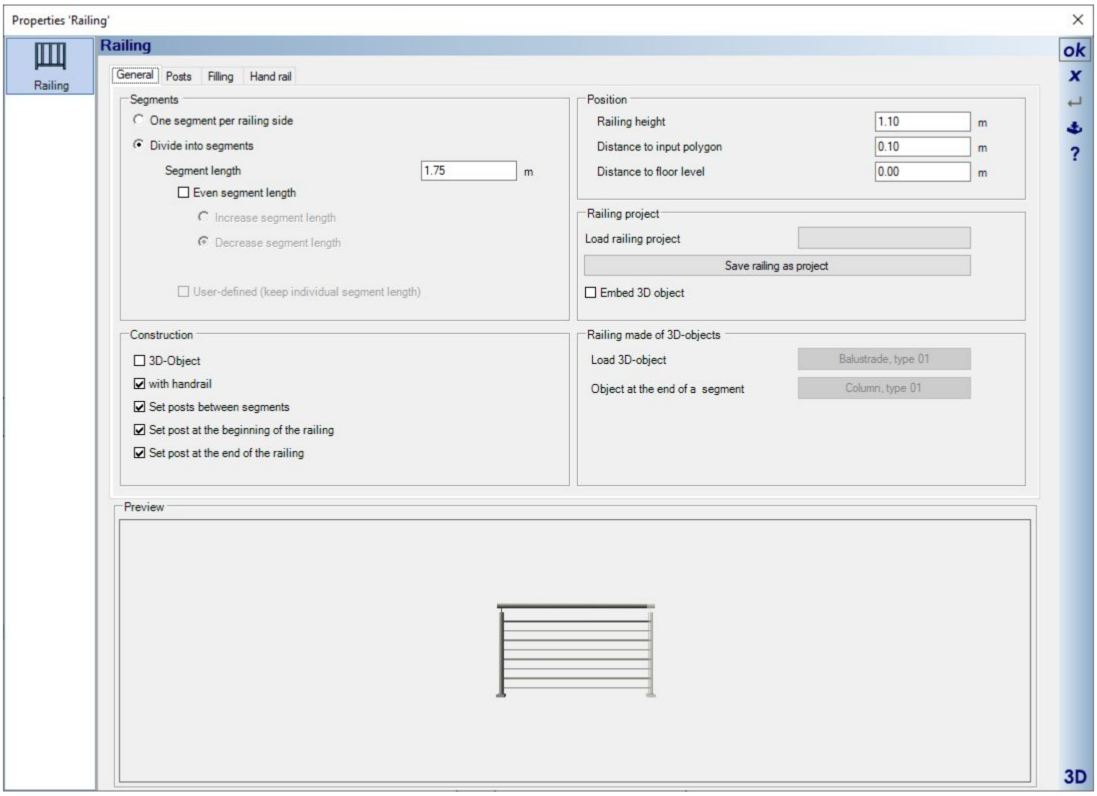
The polygon is then inserted in a 2D view in order to guarantee the required accuracy.
Note: as the name of the input tool already suggests, the railing always runs horizontally, even if the determined plane was inclined. Sloping railings are currently not available.

17.3 RAILING DIALOG AND SETTINGS

17.3.1 General settings

On the general page of the railing dialog, you essentially determine the subdivision of the railing, the design and the position. There is also an option of loading a previously saved railing project or saving the currently configured railing for further use. That allows you to create your own railing catalog with different basic types.

In the lower area you see a 3D preview of the railing, but only one segment of it. Therefore, the subdivision does not play a role here. It is more about the visual control of the properties such as posts, handrail, filling, etc..
The 3D preview behaves exactly like a 3D view in our main software, i.e. you can zoom or rotate in it.



Segments
○ One segment per railing side
● Divide into segments
Segment length 1.75 m
☐ Even segment length
○ Increase segment length
● Decrease segment length
☐ User-defined (keep individual segment length)

Position
Railing height 1.10 m
Distance to input polygon 0.10 m
Distance to floor level 0.00 m

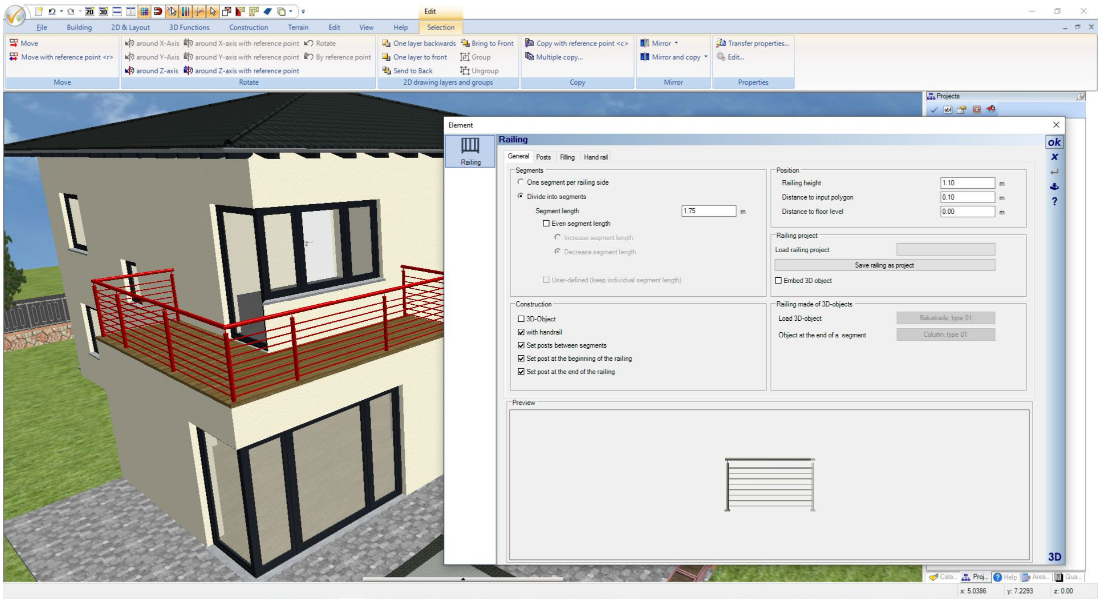
Railing project
Load railing project
☐ Embed 3D object

Construction
☐ 3D-Object
☑ with handrail
☑ Set posts between segments
☑ Set post at the beginning of the railing
☑ Set post at the end of the railing

Railing made of 3D-objects
Load 3D-object Balustrade, type 01
Object at the end of a segment Column, type 01

17.3.2 The subdivision of a railing

By default, railings are divided into so-called segments with a specified length for each polygon side.
The division in input direction of the railing begins with exactly this dimension and at the end a shorter segment of any length is automatically created to complete the railing side.



Element

Railing

General | Posts | Filling | Hand rail

Segments

○ One segment per railing side
● Divide into segments
Segment length 1.75 m
☐ Even segment length
○ Increase segment length
● Decrease segment length
☐ User-defined (keep individual segment length)

Position

Railing height 1.10 m
Distance to input polygon 0.10 m
Distance to floor level 0.00 m

Railing project

Load railing project
Save railing as project
☐ Embed 3D object

Construction

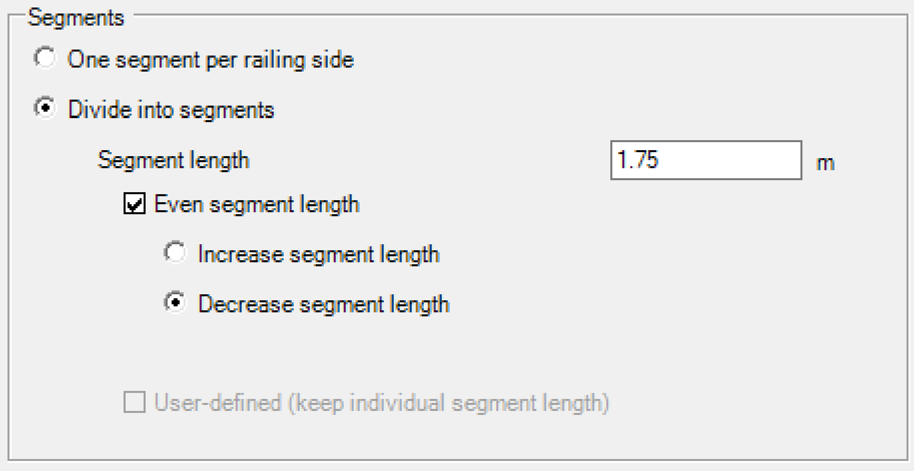
☐ 3D-Object
☑ with handrail
☑ Set posts between segments
☑ Set post at the beginning of the railing
☑ Set post at the end of the railing

Railing made of 3D-objects

Load 3D-object: Balustrade, type 01
Object at the end of a segment: Column, type 01

Preview

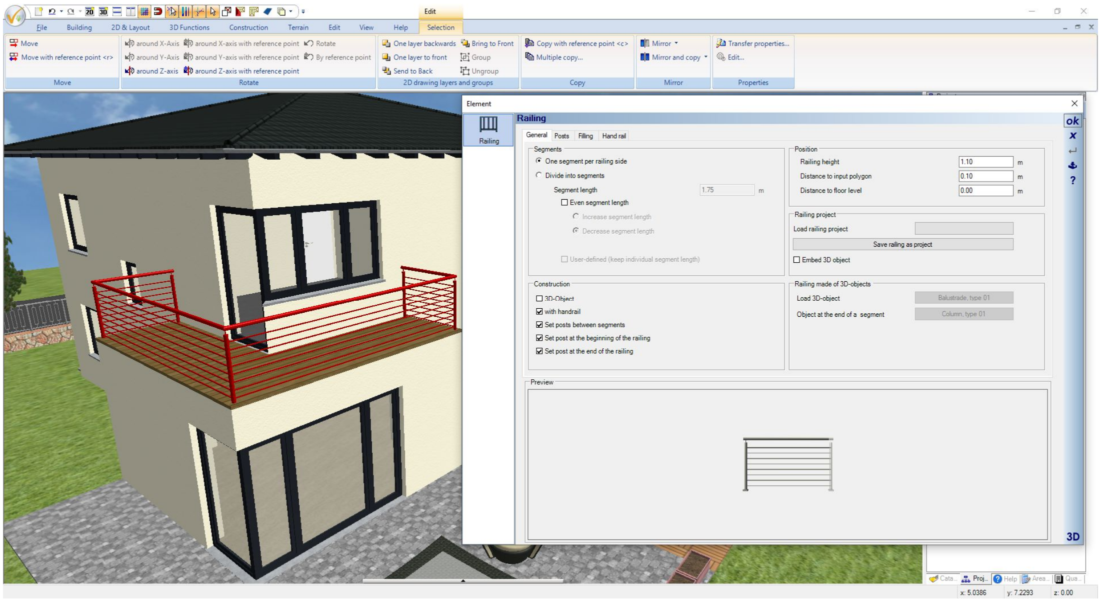
Alternatively, you can create segments of even length along the railing sides, either decrease or increase each segment.
Segments of the same length are then automatically calculated. The number of segments remains the same when reducing the length, segments only become shorter and when increasing the value, one segment is removed and the remaining ones become longer than the specified length, here in our example 1.75 m



Segments

○ One segment per railing side
● Divide into segments
Segment length 1.75 m
☑ Even segment length
○ Increase segment length
● Decrease segment length
☐ User-defined (keep individual segment length)

The "Only one segment per railing side" option suppresses the division into segments and creates a railing side with a single segment.



General | Posts | Filling | Hand rail

Segments
● One segment per railing side
○ Divide into segments
Segment length 1.75 m
☐ Even segment length
○ Increase segment length
● Decrease segment length
☐ User-defined (keep individual segment length)

Position
Railing height 1.10 m
Distance to input polygon 0.10 m
Distance to floor level 0.00 m

Railing project
Load railing project
Save railing as project
☐ Embed 3D object

Construction
☐ 3D-Object
☑ with handrail
☑ Set posts between segments
☑ Set post at the beginning of the railing
☑ Set post at the end of the railing

Railing made of 3D-objects
Load 3D-object: Balustrade, type 01
Object at the end of a segment: Column, type 01

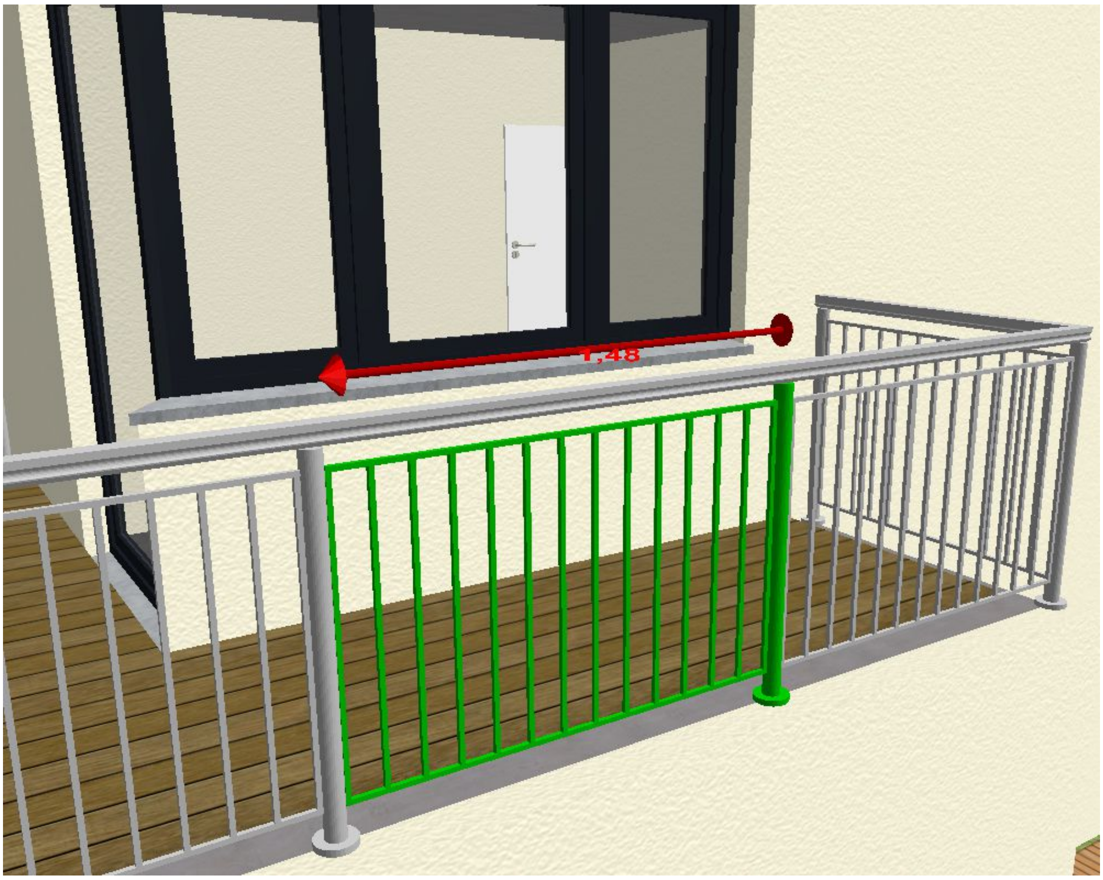
Preview

17.4 EDITING A RAILING SEGMENT INDIVIDUALLY

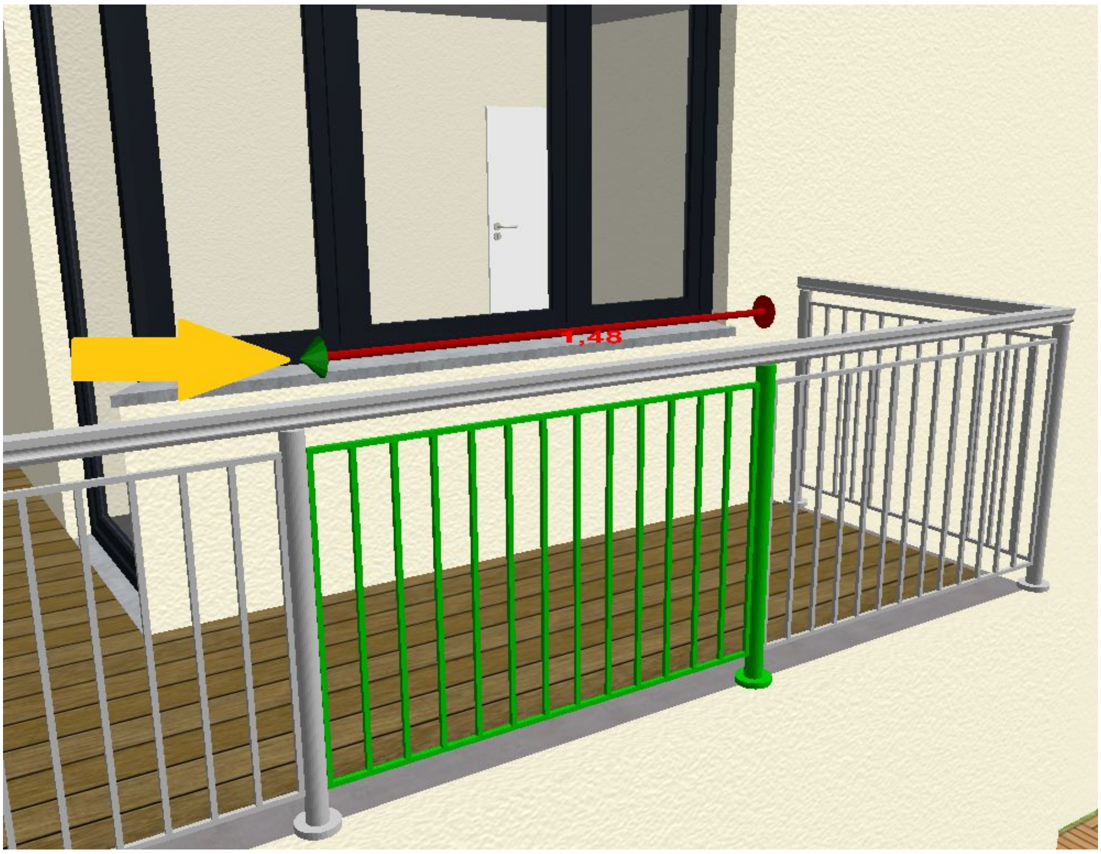
Railing segments can be individually selected and edited. In this case, editing means giving a segment a length that deviates from the usual division or using other filling properties.
Other railing elements such as posts or handrail apply to the entire railing instead and cannot be changed for a segment.

17.4.1 *Changing the length of a railing segment*

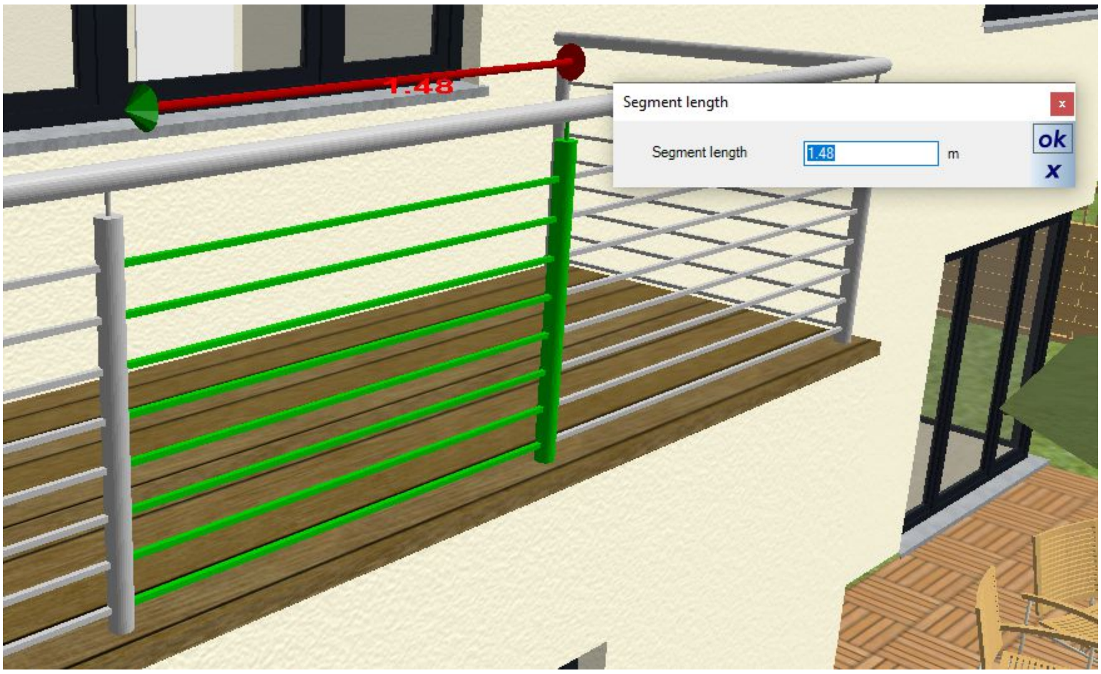
If you click on the filling area of a segment in a 3D view, not the entire railing will be selected but only this single segment.
And a 3D dimension appears showing the current length.



Since changing the length needs a direction in which it should apply, you must first define this direction with a left mouse click on the 3D end of the dimension line.
The end of the dimension line also changes its color.



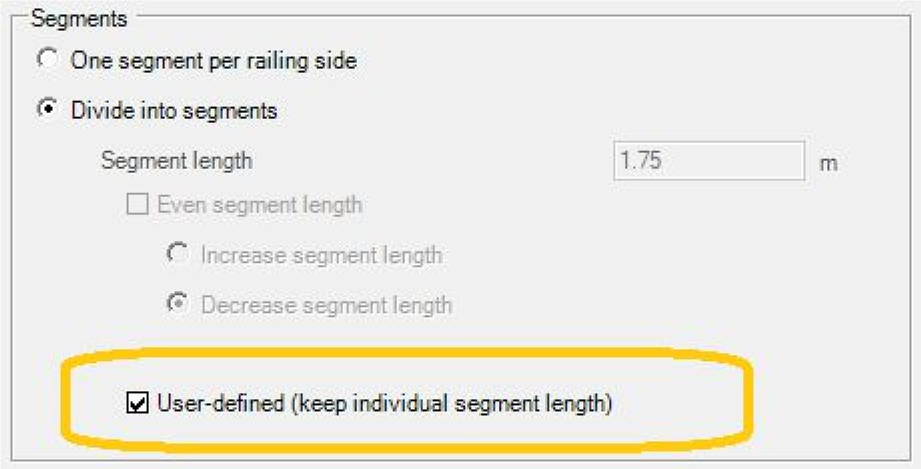
Double-click on the cone to open the dialog for entering the length numerically.



Segment length

Segment length 1.48 m

If a segment of a railing has been individually modified, the normal dividing options are disabled and the "User-defined" checkbox shows this status.
If you want to go back to normal segment division, you must first deactivate the checkbox.



Segments

○ One segment per railing side

● Divide into segments

Segment length 1.75 m

☐ Even segment length

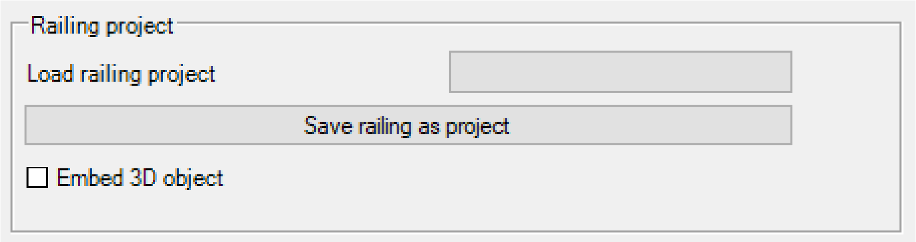
○ Increase segment length

● Decrease segment length

☑ User-defined (keep individual segment length)

17.5 SAVING AND LOADING RAILING SETTINGS

In our "Railing Project" group, you can load and save a predefined railing. We have created some sample types in our standard catalog.
Basically you will design your own railings and save them there. This applies both for using the same type in future projects or as a template for multiple railings within the same building project.
Saving and loading railing project allows you to make the settings for the design and filling once, save the railing project and then simply read these settings in for the next railing.



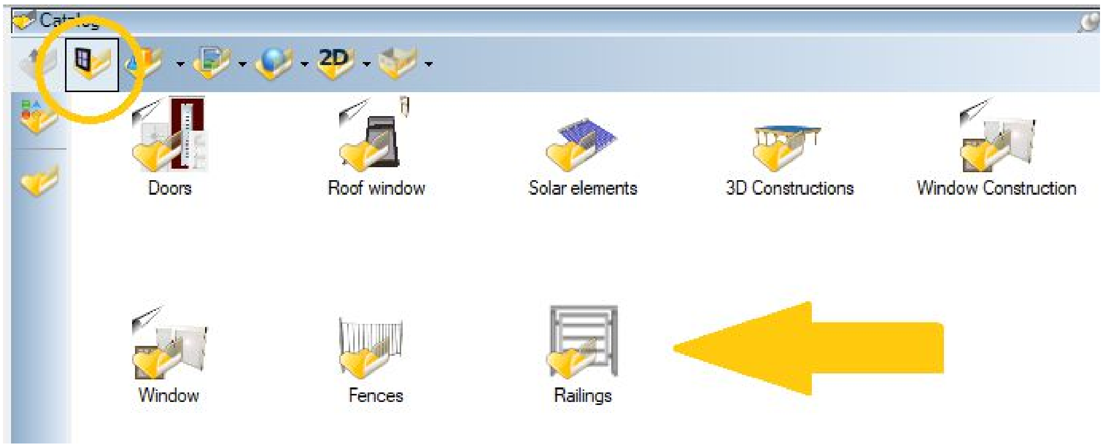
Railing project

Load railing project

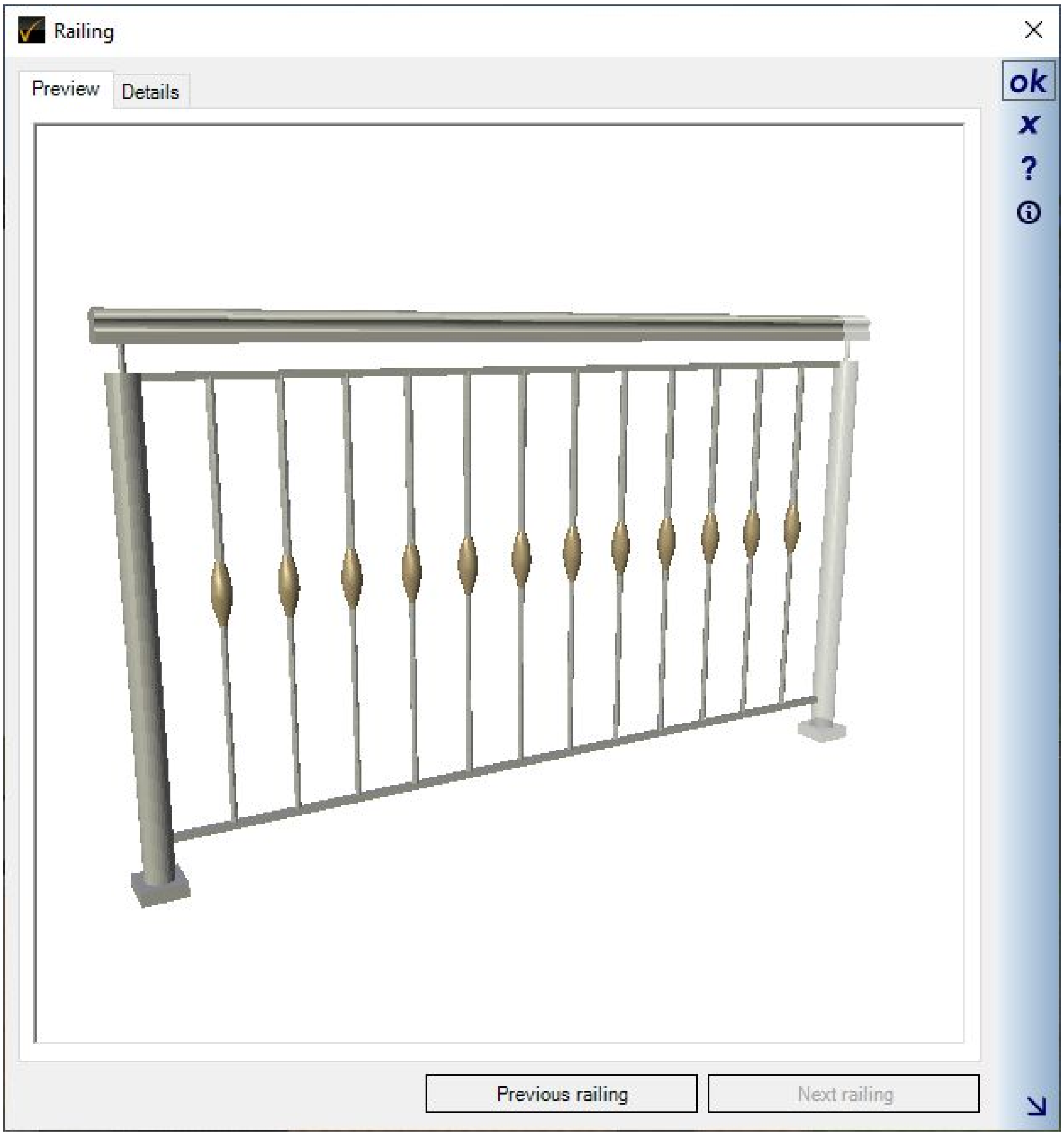
☐ Embed 3D object

The default location for the railing projects is the \AEC\Z-Railings directory in your version's installation directory. Railings use their own file type and extension (*.cyr).
Unlike most other elements in our catalog, railing projects cannot be dragged and dropped into a planning. Since these files only contain the settings for a railing segment, they need an existing railing path inserted with a polyline.

Railing projects can only be read in via the properties dialog. General settings such as offset to the polygon or distance to the layer are not part of a railing project either. It's basically about fill properties.
Note: on some computers, access to the installation directory may be restricted due to a lack of user rights on your Windows System.
Our software cannot overwrite these restrictions. So if you save a railing and you don't see the file in your catalog, that's probably the reason.
In this case save the railing file in a directory where you should have the necessary rights, on your desktop for example. And then copy the *.cyr file manually in your Windows Explorer to the required target directory.
Alternatively, you could extend your user rights to the installation directory in your Windows Explorer.
Railing folder in our AEC catalog:



Within the catalog you can see the railing projects and, as usual, you can open a preview dialog with a double-click.

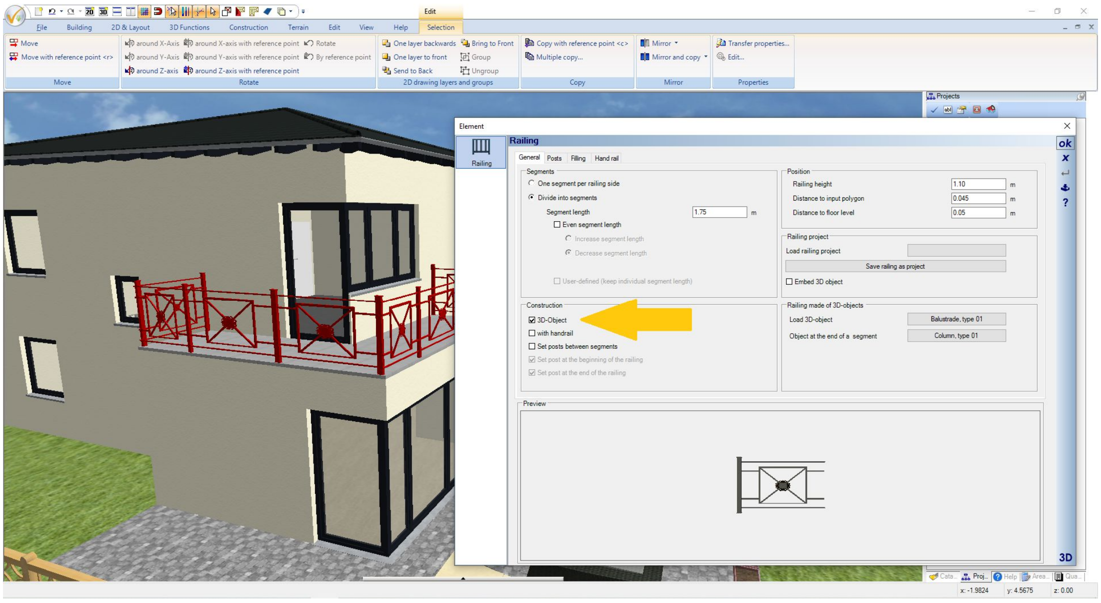


17.6 CHANGING RAILING MATERIALS

The easiest way to change materials on railing components is to add a new texture or a material in a 3D view via drag and drop from the catalog.
All components of the same type of railing, i.e. posts, fillings, bars change their properties together. All others remain as they are.

17.7 RAILINGS MADE FROM CATALOG 3D-OBJECTS

Instead of the configurable railings, you can also use ready-to-use 3D objects from the catalog via the dialog and follow the course of the railing.
You will find this option in the CONSTRUCTION group and next to it buttons for the selection of 3D objects.
As in the predefined example, the 3D object for a segment should only have one post, otherwise two posts would always appear directly next to each other on the railing path.
And the final object is a single post that is placed at the end of the railing, where the last segment would be missing the post of the main object.
If you use 3D objects, they are scaled distorted to the segment length. In order for this to look reasonably appropriate, you would have to an even segment length, ideally with the width of the finished 3D object, which you can find in our preview dialog in the catalog of 3D objects.
Here is an example of how distorted 3D objects would look like:



Railing

General | Posts | Filling | Hand rail

Segments
○ One segment per railing side
● Divide into segments
Segment length 1.75 m
☐ Even segment length
○ Increase segment length
● Decrease segment length
☐ User-defined (keep individual segment length)

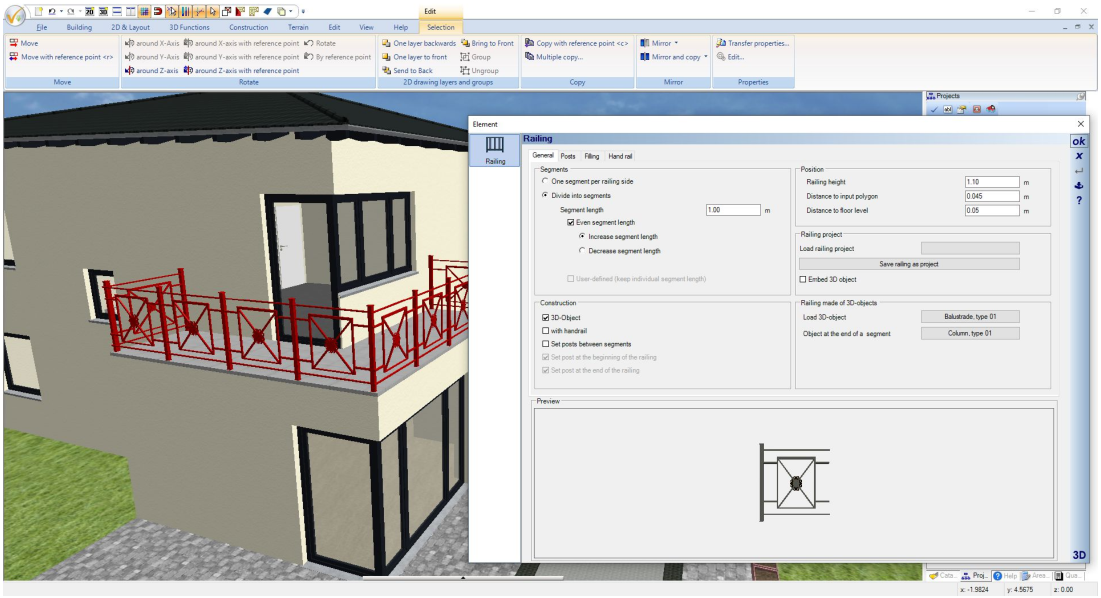
Position
Railing height 1.10 m
Distance to input polygon 0.045 m
Distance to floor level 0.05 m

Railing project
Load railing project
Save railing as project
☐ Embed 3D object

Construction
☑ 3D-Object
☐ with handrail
☐ Set posts between segments
☑ Set post at the beginning of the railing
☑ Set post at the end of the railing

Railing made of 3D-objects
Load 3D-object: Balustrade, type 01
Object at the end of a segment: Column, type 01

Here the railing with the same 3D object, but with an even segment length in the width of the 3D object.



Railing

General | Posts | Filling | Hand rail

Segments
○ One segment per railing side
● Divide into segments
Segment length 1.00 m
☑ Even segment length
● Increase segment length
○ Decrease segment length
☐ User-defined (keep individual segment length)

Position
Railing height 1.10 m
Distance to input polygon 0.045 m
Distance to floor level 0.05 m

Railing project
Load railing project
Save railing as project
☐ Embed 3D object

Construction
☑ 3D-Object
☐ with handrail
☐ Set posts between segments
☑ Set post at the beginning of the railing
☑ Set post at the end of the railing

Railing made of 3D-objects
Load 3D-object: Balustrade, type 01
Object at the end of a segment: Column, type 01

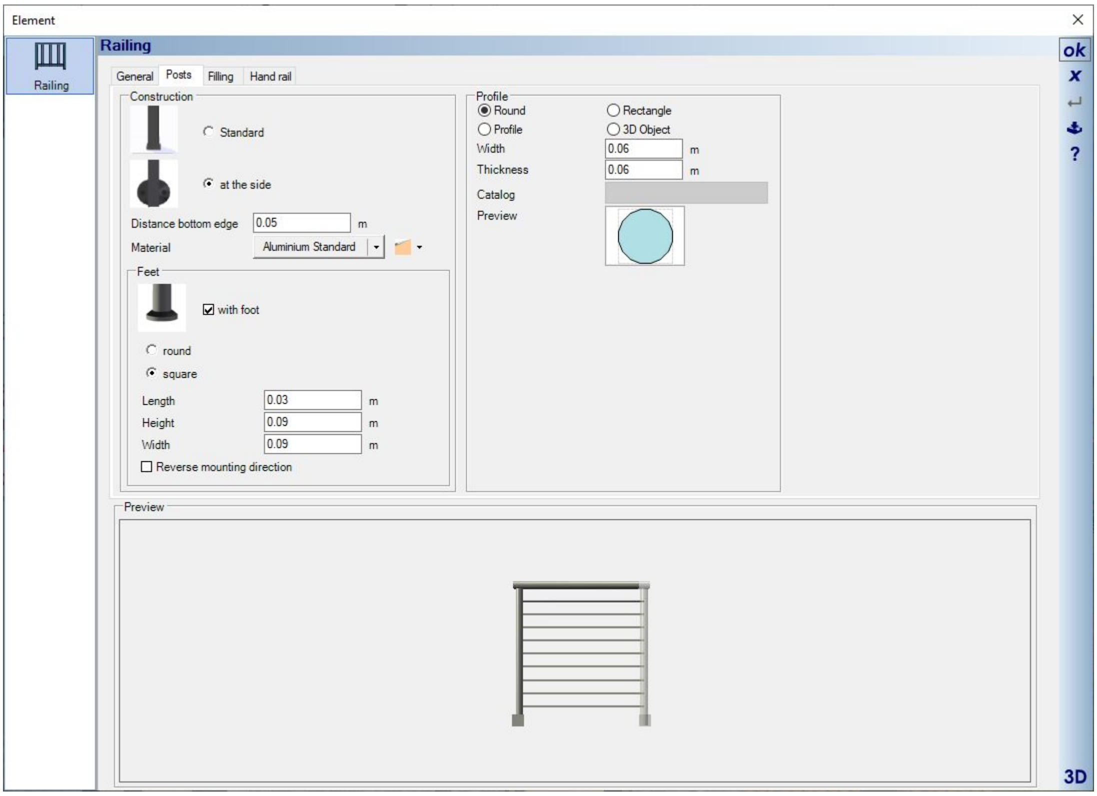
17.7.1 Materials for railings made from catalog 3D objects

Normally you can change materials on 3D objects by dragging and dropping textures and materials from the catalog.
This is not possible with railings, at least not beyond saving and loading the project. When loading, the original 3D objects are retrieved from the catalog and assembled into a railing based on the parameters.

So if you want the railing 3D objects in other colors, you would have to change the original 3D object or create a new 3D object and add it to the catalog.

17.8 POSTS

On the Posts property page, you have the option of determining the type of attachment for the railing, i.e. standing as standard or on the side.
The lower edge distance extends the post downwards, the railing height remains the same.
The posts are created from profiles, of which a round or rectangular variant is predefined as an option. Alternatively, you could choose a different profile from the profiles catalog, or draw your own profile, save it in the catalog, and use it to adjust the outline of the posts.
Instead of posts made from profiles, you can also use a ready-to-use 3D object. We have added some examples in the catalog of 3D objects, in the Components\Railing\Posts directory. The catalog button also refers to this directory.



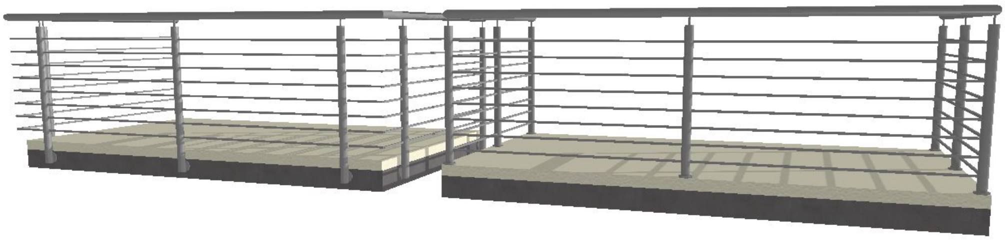
Construction
○ Standard
● at the side
Distance bottom edge 0.05 m
Material Aluminium Standard

Feet
☑ with foot
○ round
● square
Length 0.03 m
Height 0.09 m
Width 0.09 m
☐ Reverse mounting direction

Profile
● Round
○ Rectangle
○ Profile
○ 3D Object
Width 0.06 m
Thickness 0.06 m
Catalog
Preview

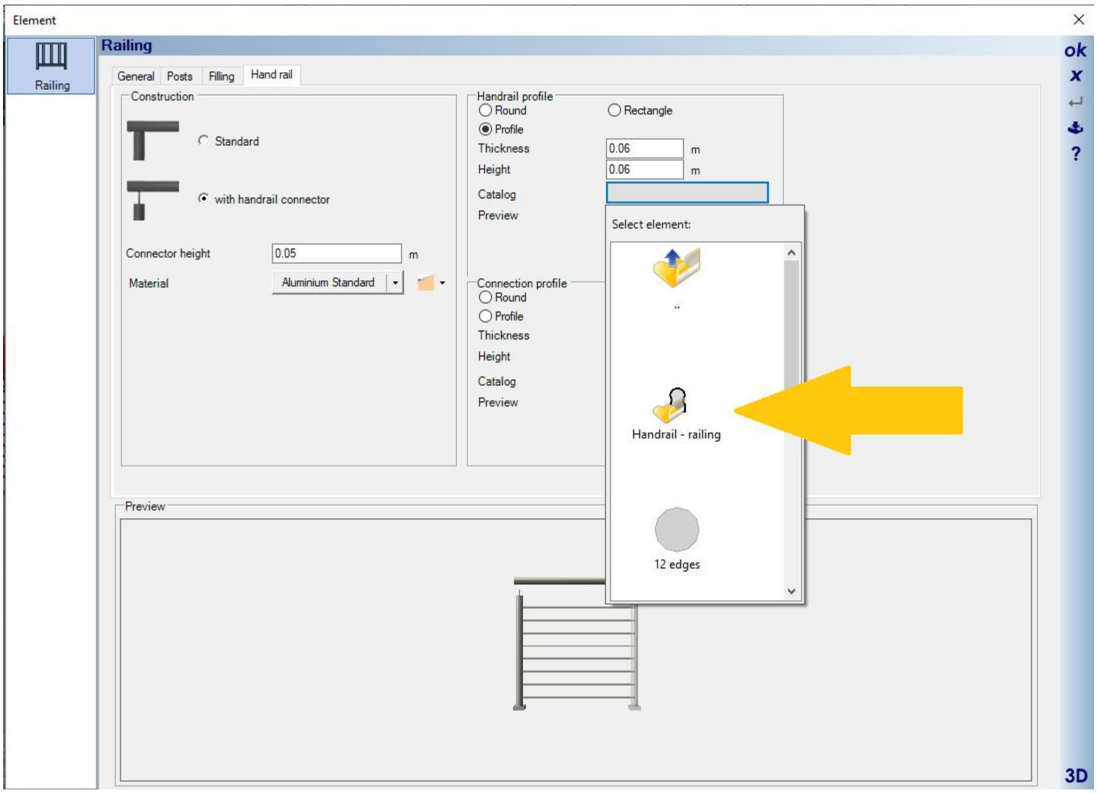
Below is a screenshot showing both mounting options. In the case an attachment at the side, it is not clear to which side the attachment must point when inserting the railing polygon.
In order to reverse the mounting direction, i.e. so that the feet point to the other side, the corresponding option is activated.

Incidentally, the railing of the example balcony on the left side of the following figure consists of 5 individual railings, so that no posts and fasteners are placed in the corners.
It consists of three straight railings and two over the corners and for these two the options to create posts at the beginning, at the end and between the segments have been deactivated.



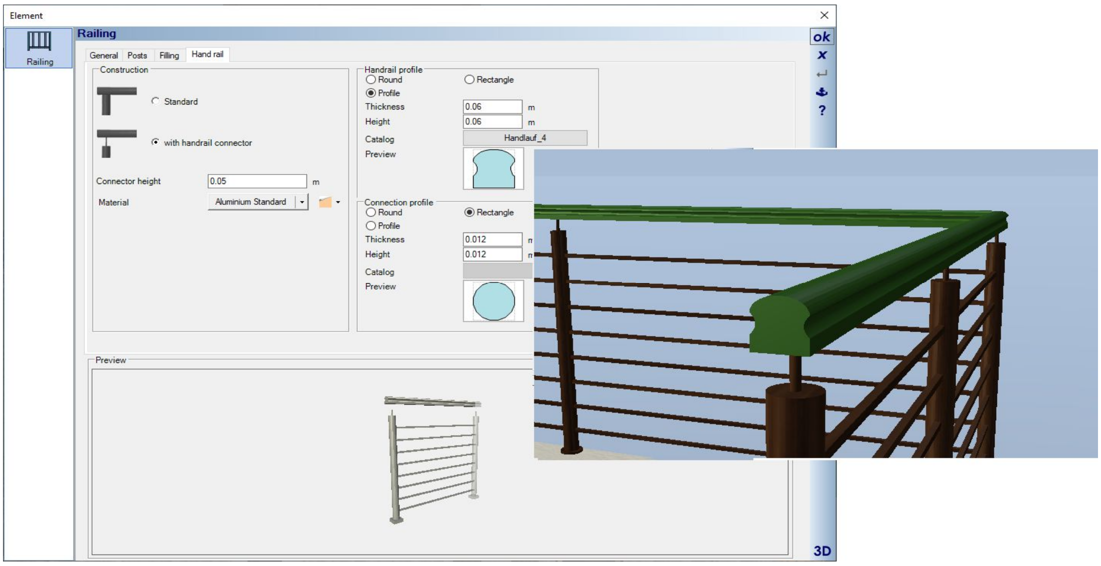
17.9 HANDRAIL

Handrails are created from profiles along the entire length of the railing. They consist of sweep solids like in our 3D constructions plug-in and just like these, the shape can also be adjusted using a 2D profile from the profile catalog.
We have added some handrail examples to the catalog, which can be found in the directory \AEC\PROFILES\Basic forms\Handrail.
Of course you can also draw your own profiles from closed 2D polygons and use them in the catalog.



Standard ○
with handrail connector ●
Connector height 0.05 m
Material Aluminium Standard
Handrail profile: Round ○ Rectangle ○ Profile ●
Thickness 0.06 m
Height 0.06 m
Connection profile: Round ○ Profile ○
Thickness
Height

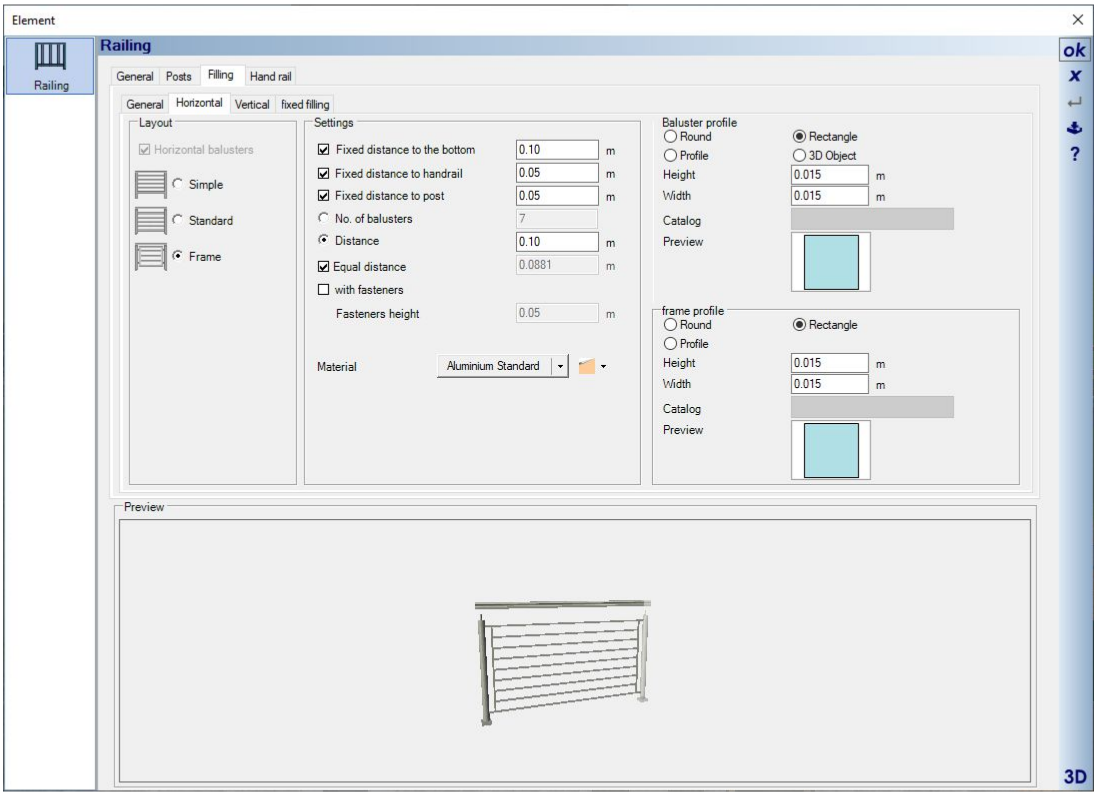
An example of a handrail profile with the associated representation in 3D.



Standard ○
with handrail connector ●
Connector height 0.05 m
Material Aluminium Standard
Handrail profile: Round ○ Rectangle ○ Profile ●
Thickness 0.06 m
Height 0.06 m
Catalog Handlauf_4
Connection profile: Round ○ Profile ○ Rectangle ●
Thickness 0.012 m
Height 0.012 m
Catalog

17.10 FILLINGS

There are basically three variants of fillings, with vertical or horizontal bars or with so-called fixed fillings, which represent glass, for example. You specify which type of construction is used either on the GENERAL page or via the checkbox on the respective properties page.



☑ Horizontal balusters
○ Simple
○ Standard
● Frame

☑ Fixed distance to the bottom 0.10 m
☑ Fixed distance to handrail 0.05 m
☑ Fixed distance to post 0.05 m
○ No. of balusters 7
● Distance 0.10 m
☑ Equal distance 0.0881 m
☐ with fasteners
Fasteners height 0.05 m
Material Aluminium Standard

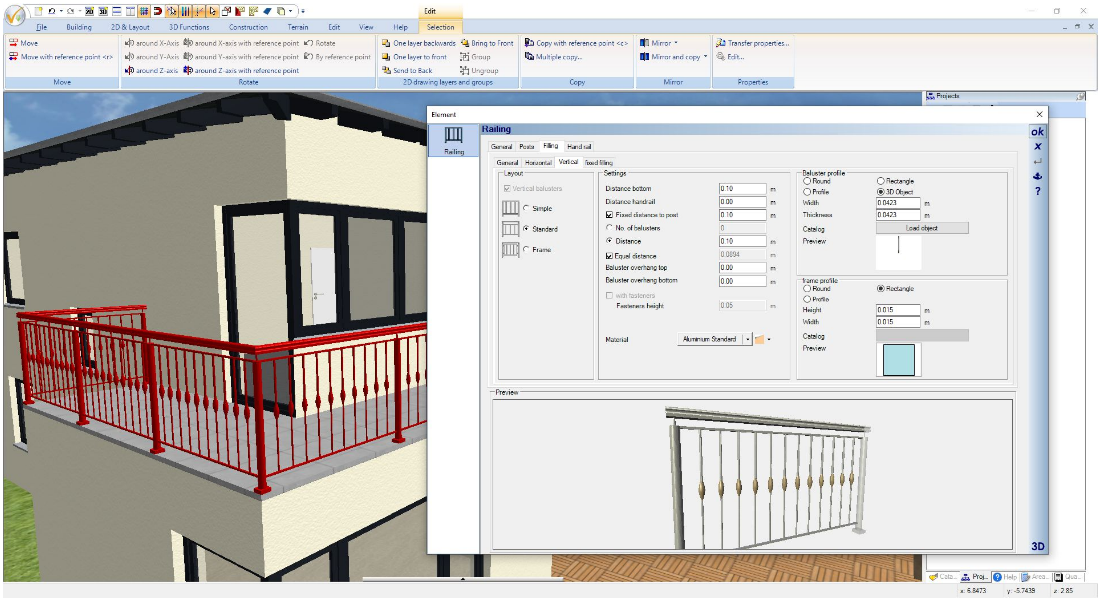
Baluster profile
○ Round ● Rectangle
○ Profile ○ 3D Object
Height 0.015 m
Width 0.015 m
Catalog
Preview

frame profile
○ Round ● Rectangle
○ Profile
Height 0.015 m
Width 0.015 m
Catalog
Preview

In addition to the parameterized components of a filling you can also use 3D objects from the catalog as bars.

We have prepared a small catalog for this as an example, each for vertical and horizontal elements.

The directory with the 3D objects is in our object catalog under COMPONENTS - RAILINGS - BARS.... You could also save your own 3D objects there.



Railing

General | Posts | Filling | Hand rail

General | Horizontal | Vertical | fixed filling

Layout
☑ Vertical balusters
○ Simple
● Standard
○ Frame

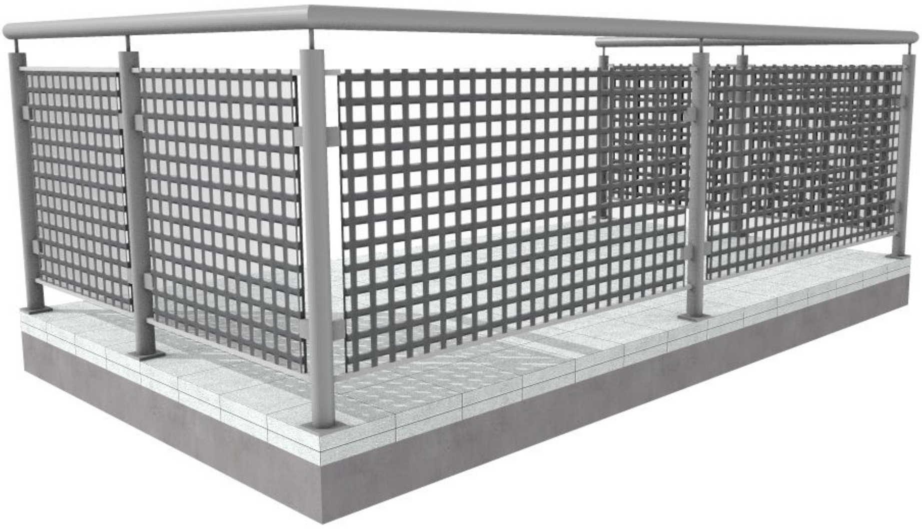
Settings
Distance bottom 0.10 m
Distance handrail 0.00 m
☑ Fixed distance to post 0.10 m
○ No. of balusters 0
● Distance 0.10 m
☑ Equal distance 0.0894 m
Baluster overhang top 0.00 m
Baluster overhang bottom 0.00 m
☐ with fasteners
Fasteners height 0.05 m
Material Aluminium Standard

Baluster profile
○ Round ○ Rectangle
○ Profile ● 3D Object
Width 0.0423 m
Thickness 0.0423 m
Catalog Load object
Preview

frame profile
○ Round ● Rectangle
○ Profile
Height 0.015 m
Width 0.015 m
Catalog
Preview

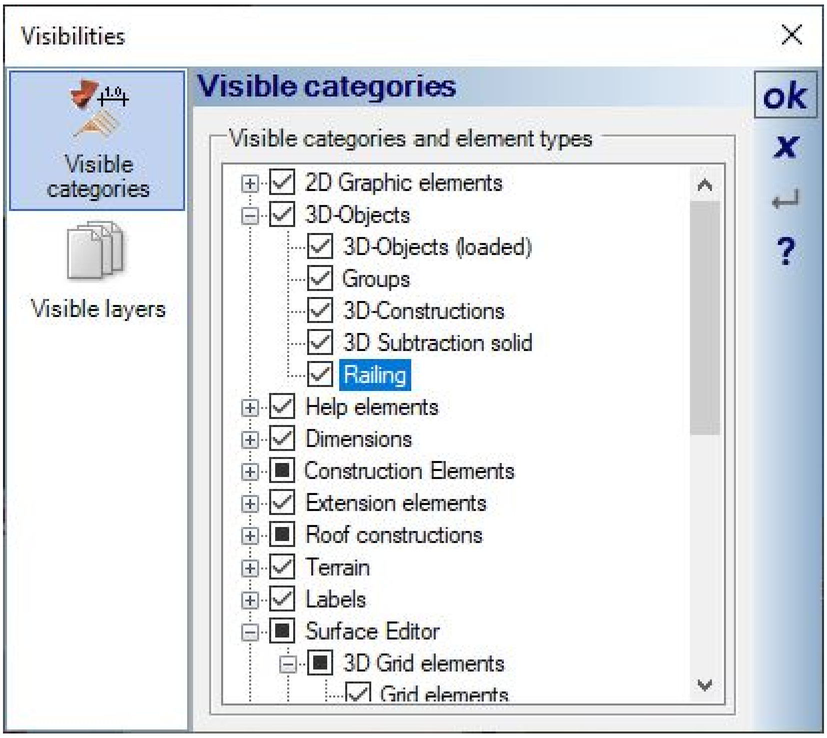
Preview

Fixed fillings, simple 3D solids with a glass material by default on it, can also be designed with other materials by dragging and dropping them from the texture or material catalog.
This also includes so-called mask textures, some of which can be found in the mTextur - metal directory.
With such a mask texture, you can simply make a solid filling appear like a wire mesh, only with the texture image, which is much more performant than creating each wire as a 3D element.



17.11 VISIBILITY OF RAILINGS

As standalone elements, railings also have their own visibilities. These can be found in the 3D Objects – Railings category.



- ☑ 2D Graphic elements
- ☑ 3D-Objects
  - ☑ 3D-Objects (loaded)
  - ☑ Groups
  - ☑ 3D-Constructions
  - ☑ 3D Subtraction solid
  - ☑ Railing
- ☑ Help elements
- ☑ Dimensions
- ■ Construction Elements
- ☑ Extension elements
- ■ Roof constructions
- ☑ Terrain
- ☑ Labels
- ■ Surface Editor
  - ■ 3D Grid elements
    - ☑ Grid elements

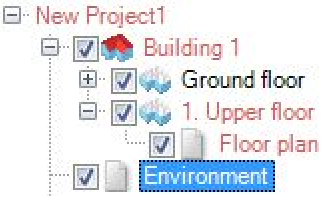
17.12 USING RAILINGS IN GROUPS, E.G. FOR READY-TO-USE BALCONIES

Railings can be saved individually but also in combination with other building components in our groups catalog and easily reinserted from there using drag and drop.
This can be useful if you need several identical railings in the project. Then you would not have to enter the path and make the settings in each individual case, but only create the railing once and then use it as a group as usual.
In this case both the 2D and the 3D representation are identical to the standard planning display.
We have added various combinations of 3D constructions and railings as balconies to our catalogue.

18 TERRAIN PLUG-IN

18.1 GENERAL

For each new project the software automatically creates a terrain with the dimensions 100 x 100 m. The terrain is also assigned its own layer entitled ‘environment’, which can be displayed, for instance, using the project viewer.



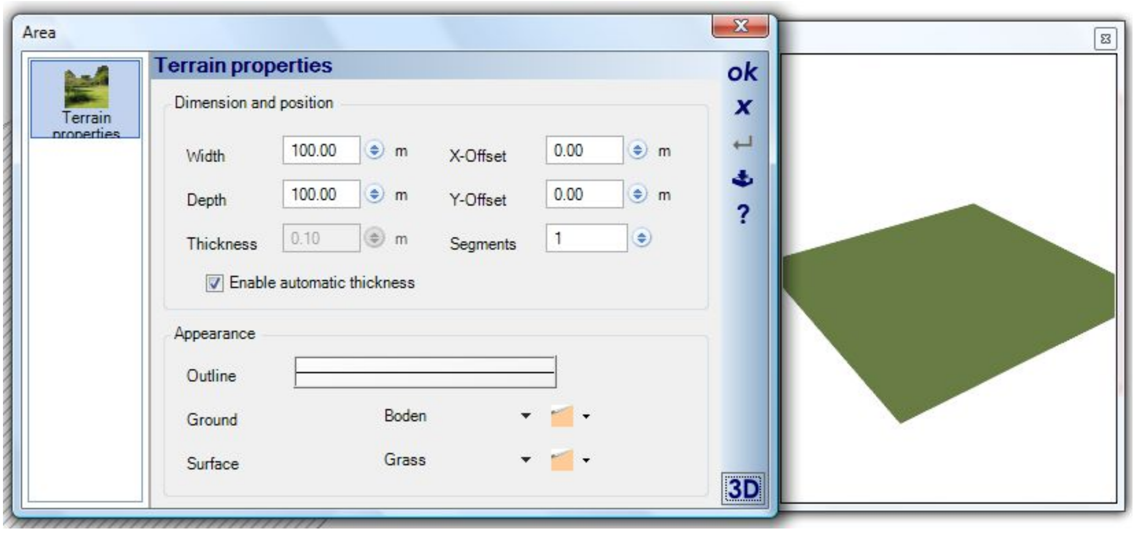
The terrain is set by default as visible, which means that if the ‘Show all’ button or the ‘HOME’ key is pressed, the software zooms out of the view until all of the terrain is completely shown. For normal planning it may therefore be advantageous to make the layer for the environment, together with the terrain, invisible. The easiest way to do this is in the project viewer by unchecking the box for the ‘Environment’ layer. Alternatively, the standard method using visible categories / visible layers is of course also possible.

As opposed to the way the software normally behaves, i.e. elements are always inserted in the current layer, all elements entered in the ‘Terrain’ plug-in, e.g. terrain forms, terrain areas etc. are internally always assigned to the ‘Environment’ layer, which as a rule is not active. This also means that the terrain elements can only be selected and edited, if beforehand the ‘environment’ layer is set as an active layer in the project viewer.

The terrain, and the terrain areas and forms which are situated on it, are proper 3D bodies, and not just surfaces for better orientation. This gives us basically the possibility of calculating not only surface areas but also the volume of areas and openings. Several further visible effects are explained in the following chapters.

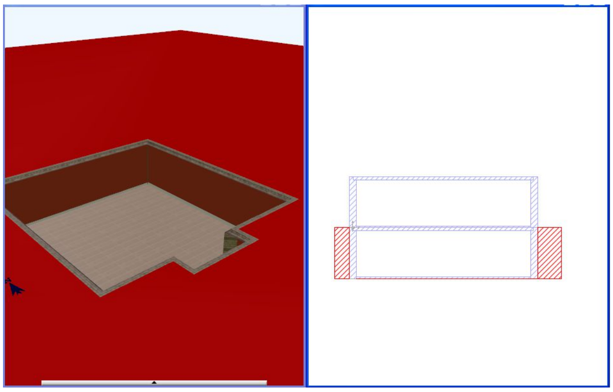
18.2 TERRAIN PROPERTIES

The ‘Terrain’ properties dialog is opened by a double click on the terrain, when the layer for environment is active.



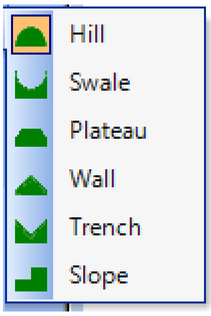
Width 100.00 m
Depth 100.00 m
Thickness 0.10 m
X-Offset 0.00 m
Y-Offset 0.00 m
Segments 1
☑ Enable automatic thickness
Ground Boden
Surface Grass

The terrain is always positioned about its origin. If required it can be repositioned by entering an offset in the x and y direction. If the terrain is 100 x 100 m, an offset of 50 m in the x and y direction would thus reposition the bottom left-hand corner in the direction of the origin.
Since the terrain is a 3D solid, as we have already mentioned, you can also specify a thickness. Alternatively, you can allow the terrain to be automatically adjusted if, for instance, a basement floor is created below the ground floor. In this case the terrain automatically assumes the thickness of the basement floor, and creates a opening in the ground to match the contour of the building, as can be seen in the following illustration.

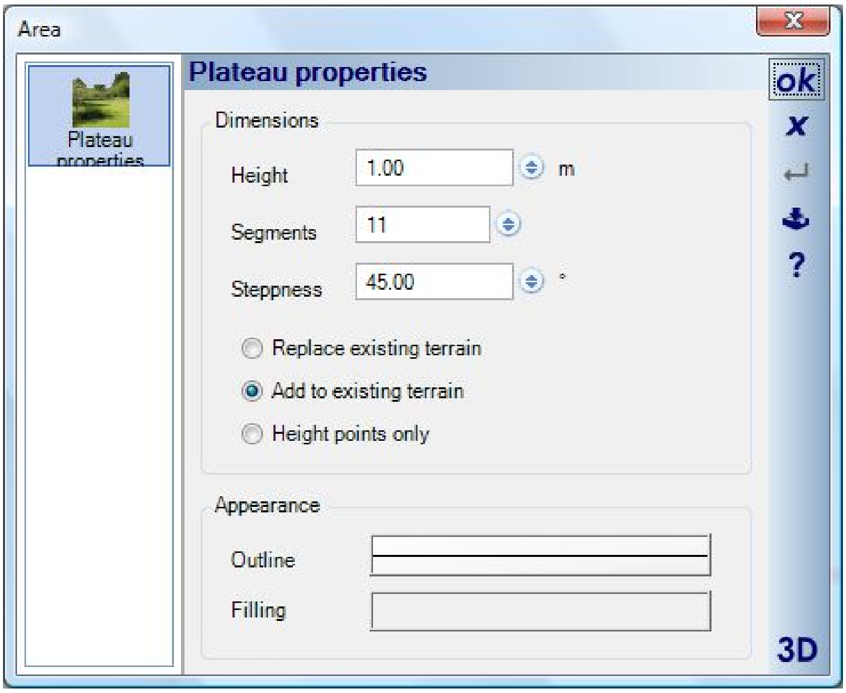


18.3 TERRAIN FORMS

The software provides a range of predefined landscape forms to enable you to landscape the terrain.



Suitable tools are provided for inserting the various landscape forms. For instance, to enter a slope, an area and a gradient must be defined, whereas a plateau only requires a rectangle to be entered. After an area has been defined for the landscape form, the corresponding dialog is opened. The possible settings in the dialogs for the various landscape forms are basically similar in all dialogs.



Plateau properties

Dimensions

Height 1.00 m

Segments 11

Steppness 45.00 °

○ Replace existing terrain

● Add to existing terrain

○ Height points only

Appearance

Outline

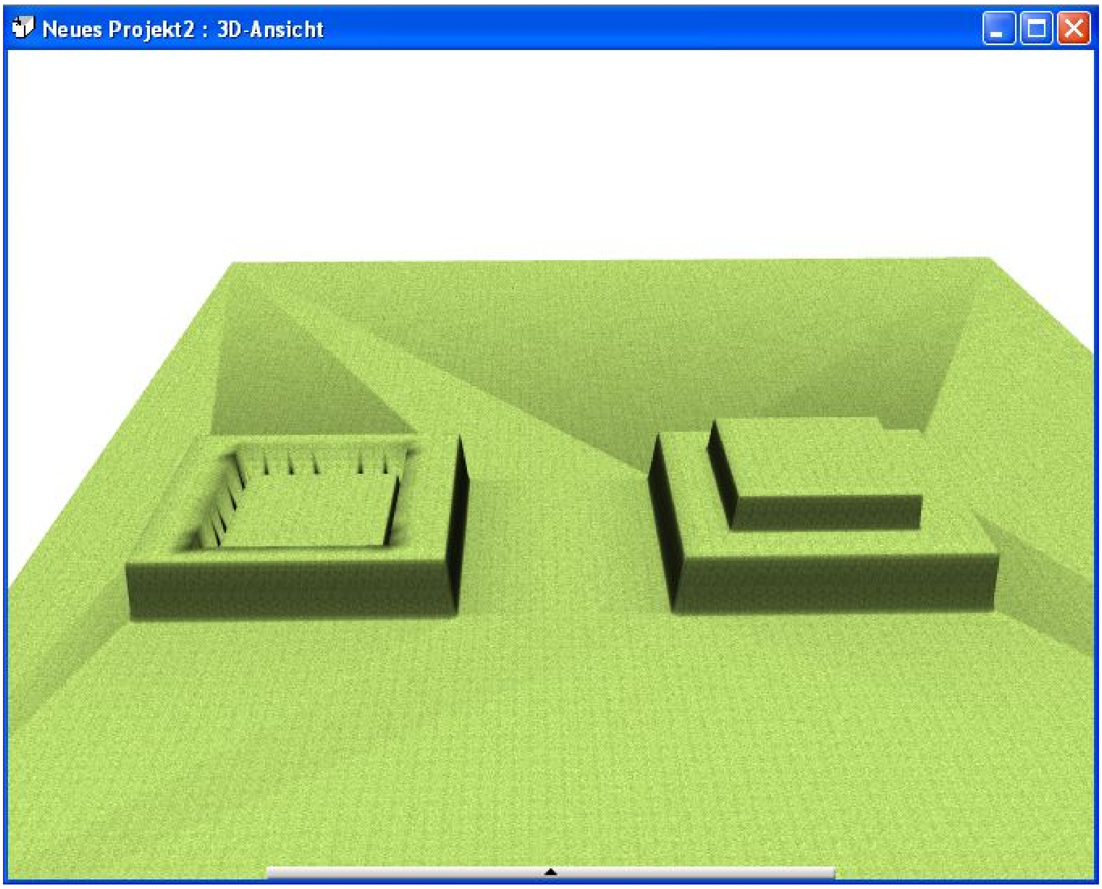
Filling

Worth mentioning are the options, ‘Replace existing terrain’, ‘Add to existing terrain’ and ‘Height points only’.

The option ‘Height points only’ causes the landscape form to lose its properties, and only individual height points, which can only be edited individually, are inserted for the project. Therefore, it is not possible later to simply change the height of a landscape form, but instead every single point must be adjusted.

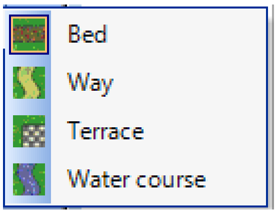
The ‘replace’ and ‘add’ options behave as illustrated in the following figure for two plateaus, which in both case are situated above each other. On the right, a small plateau was entered above an existing one and created with the ‘add’ option. The new plateau automatically assumed the height of the ground at this point and was inserted. Terraces result. On the left, the existing ground was replaced at this point.

The small plateau has assumed a height of zero and has created a hollow, corresponding to its shape, in the existing plateau.



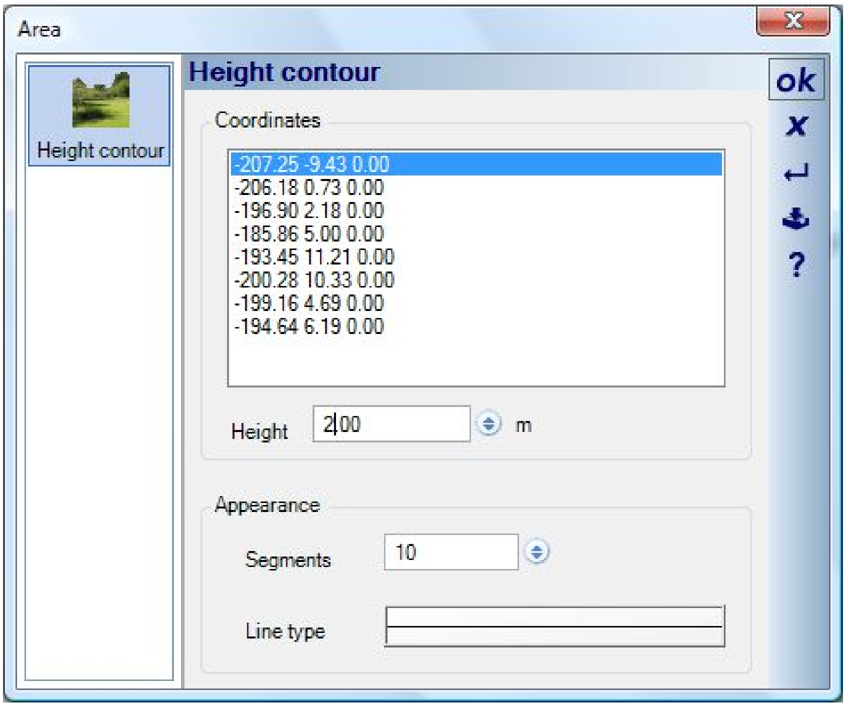
18.4 TERRAIN ELEMENTS

After the contour of the ground has been defined, further landscape features can be incorporated. The features available here are flower beds, ways, terraces and water features. The appropriate means of entering the feature are also provided, so that for instance, a path can be inserted as a polygon or as a spline, whereas a flower bed can only be inserted as a closed polygon. Landscape features are created as surfaces, which automatically conform to the contours of the ground and the defined landscape forms. Since landscape features are discrete surfaces, they have their own materials, and can, as opposed to the terrain as a whole, be allocated textures from the catalog.



18.5 TERRAIN CONTOURS

Apart from the predefined landscape forms, the contour of the ground can also be modified by entering individual height points or a spline shaped contour line.
When input for height points is terminated, a dialog is opened which enables coordinates for a height to be entered. A contour line is also resolved into individual height points along its course. The list of height points along a contour line are shown point for point in the following dialog.



Height contour

Coordinates

-207.25 -9.43 0.00
-206.18 0.73 0.00
-196.90 2.18 0.00
-185.86 5.00 0.00
-193.45 11.21 0.00
-200.28 10.33 0.00
-199.16 4.69 0.00
-194.64 6.19 0.00

Height 2.00 m

Appearance

Segments 10

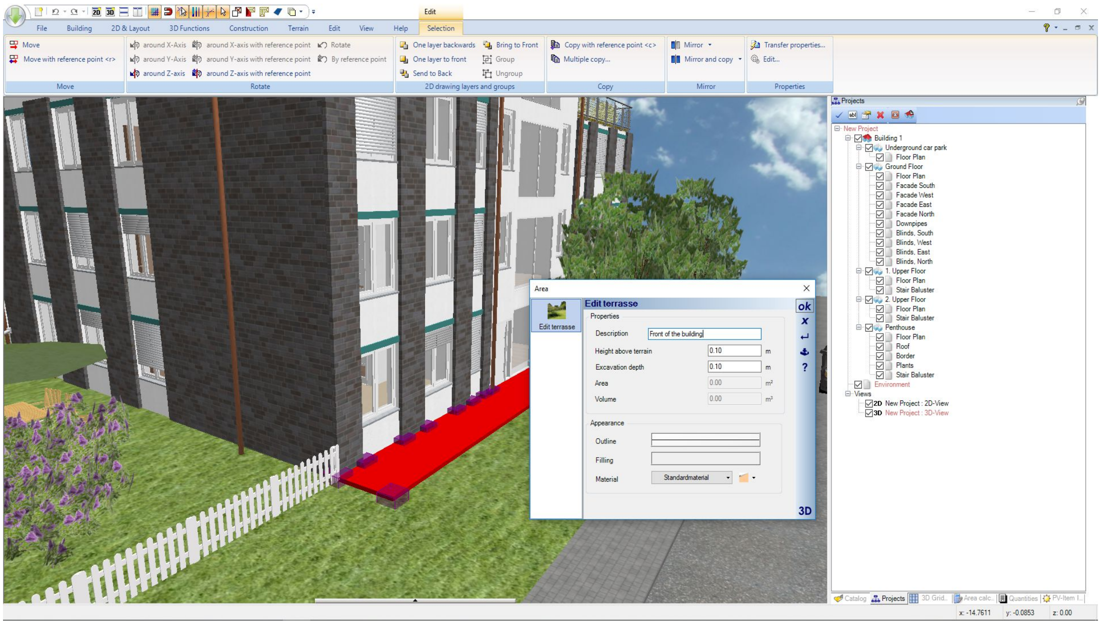
Line type

18.6 TERRAIN ELEMENTS, 3D SOLIDS, EXCAVATION AND ANALYSIS

Terrain elements such as paths, beds, terraces, etc. can now be given an adjustable height above the terrain and a setting for the excavation.

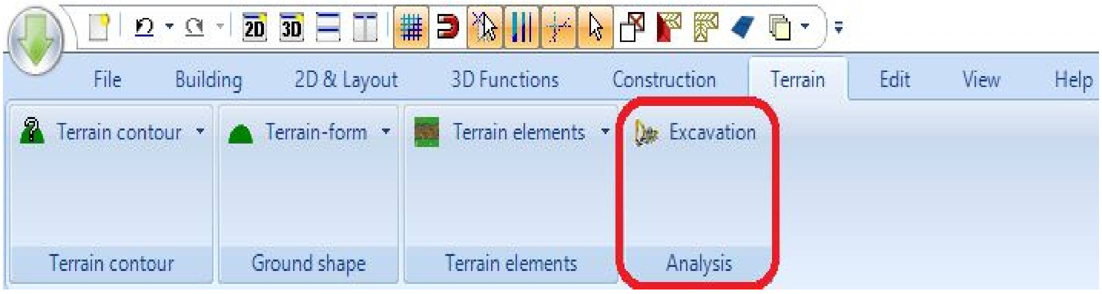
In addition, these elements can now also be selected in 3D views and edited via the polygon points. The contour can be changed as with other polygonal elements.

The name of the element, ie the logical name, is used for identification in the analysis dialog.

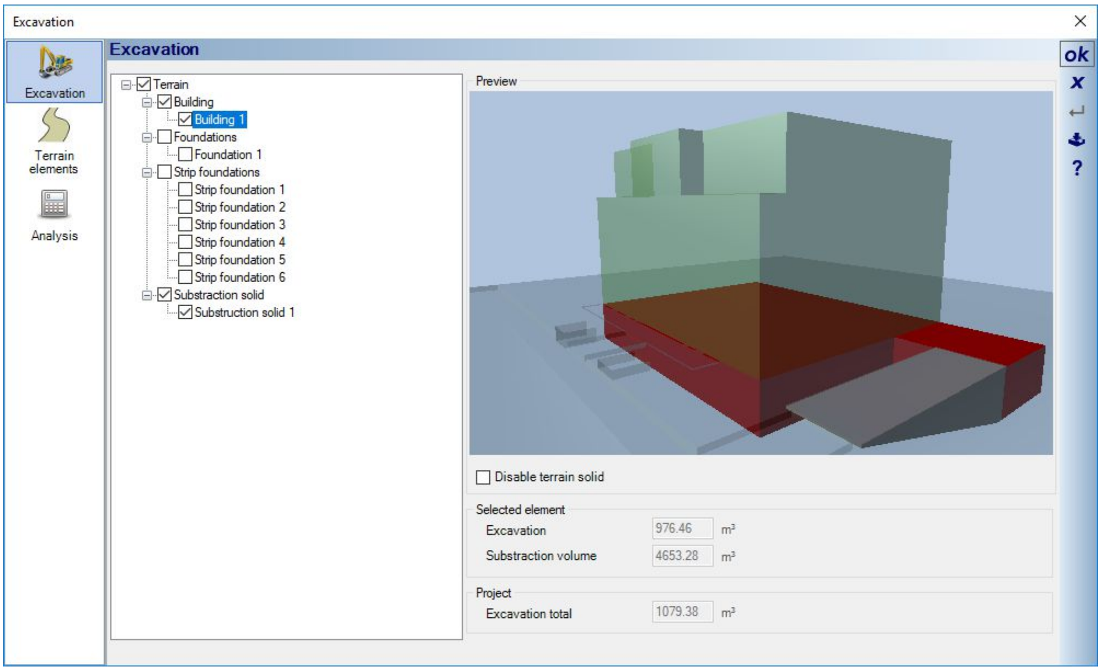


Description: Front of the building
Height above terrain: 0.10 m
Excavation depth: 0.10 m
Area: 0.00 m²
Volume: 0.00 m³
Material: Standardmaterial

18.7 TERRAIN, ANALYSIS OF EXCAVATION AND AREAS



The dialog offers various evaluation options on the three property pages.
On the excavation page, it lists all building solids and 3D substraction solids that cut the terrain. All others would not be displayed here.
Depending on your selection in the tree view, the 3D preview shows which solid it is. The part of the 3D solid, which forms an intersection with the 3D terrain, is shown in red and parts above it in green.



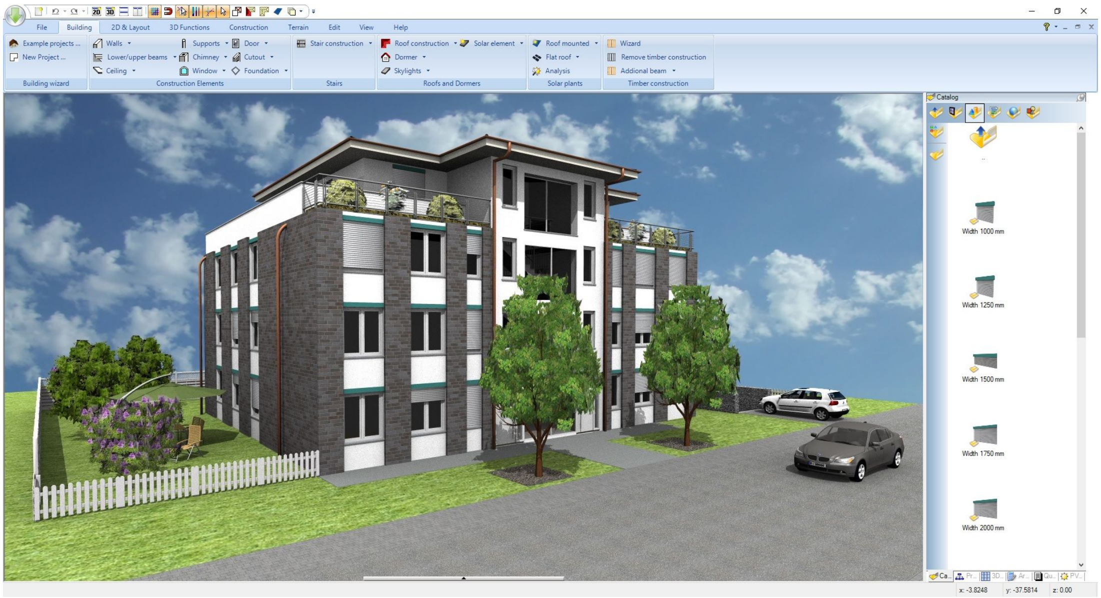
☑ Terrain
☑ Building
☑ Building 1
☐ Foundations
☐ Foundation 1
☐ Strip foundations
☐ Strip foundation 1
☐ Strip foundation 2
☐ Strip foundation 3
☐ Strip foundation 4
☐ Strip foundation 5
☐ Strip foundation 6
☑ Substraction solid
☑ Substruction solid 1

☐ Disable terrain solid

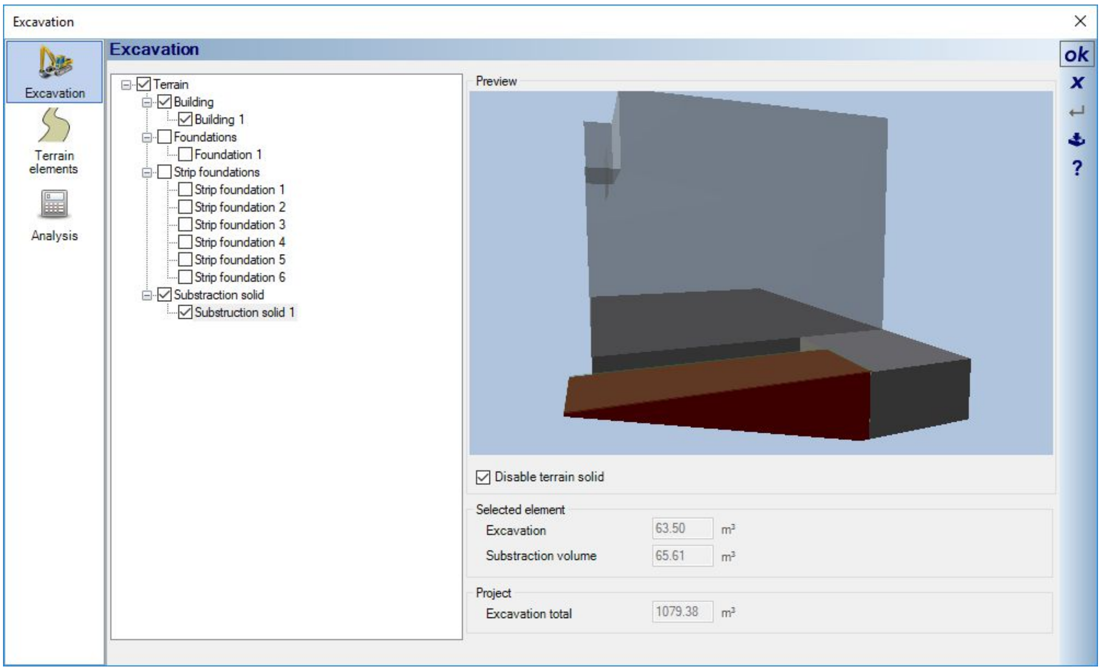
Selected element
Excavation 976.46 m³
Substraction volume 4653.28 m³

Project
Excavation total 1079.38 m³

The example project.



You see the building and the intersected volume in the terrain. as well as the 3D substraction solid from the PlugIn 3D Constructions, which creates the entrance to the underground car park at the right of the building.



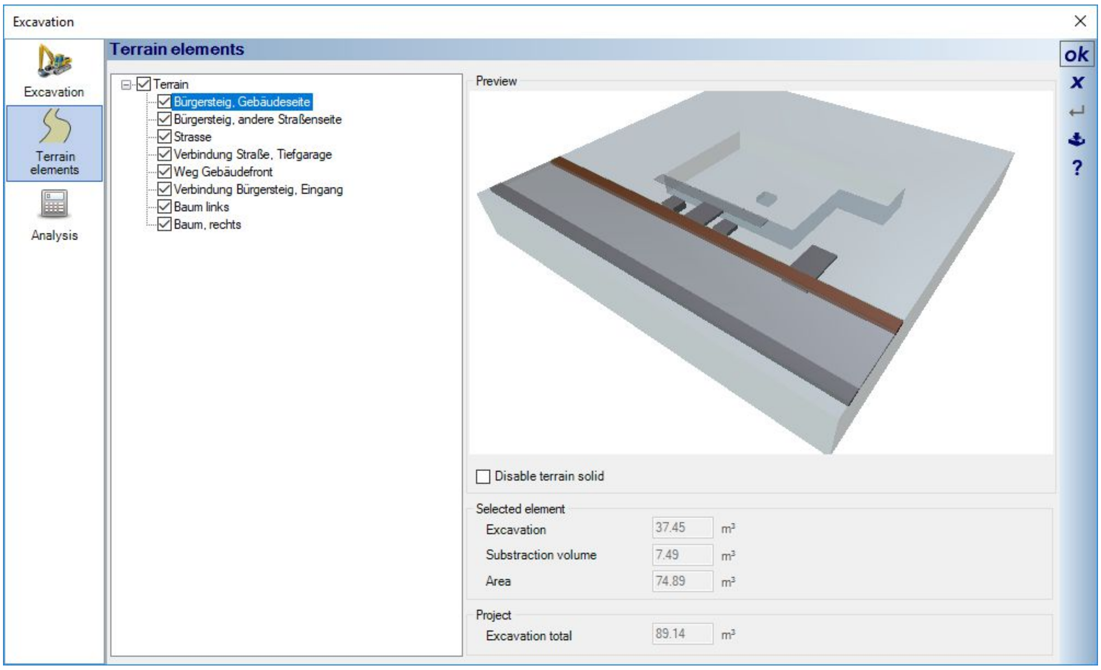
☑ Terrain
- ☑ Building
  - ☑ Building 1
- ☐ Foundations
  - ☐ Foundation 1
- ☐ Strip foundations
  - ☐ Strip foundation 1
  - ☐ Strip foundation 2
  - ☐ Strip foundation 3
  - ☐ Strip foundation 4
  - ☐ Strip foundation 5
  - ☐ Strip foundation 6
- ☑ Substraction solid
  - ☑ Substruction solid 1

☑ Disable terrain solid

Selected element
Excavation 63.50 m³
Substraction volume 65.61 m³

Project
Excavation total 1079.38 m³

In addition, you receive information about the terrain elements, so you can easily determine their surface, volume and excavation. The names of the elements come from the properties dialogs.



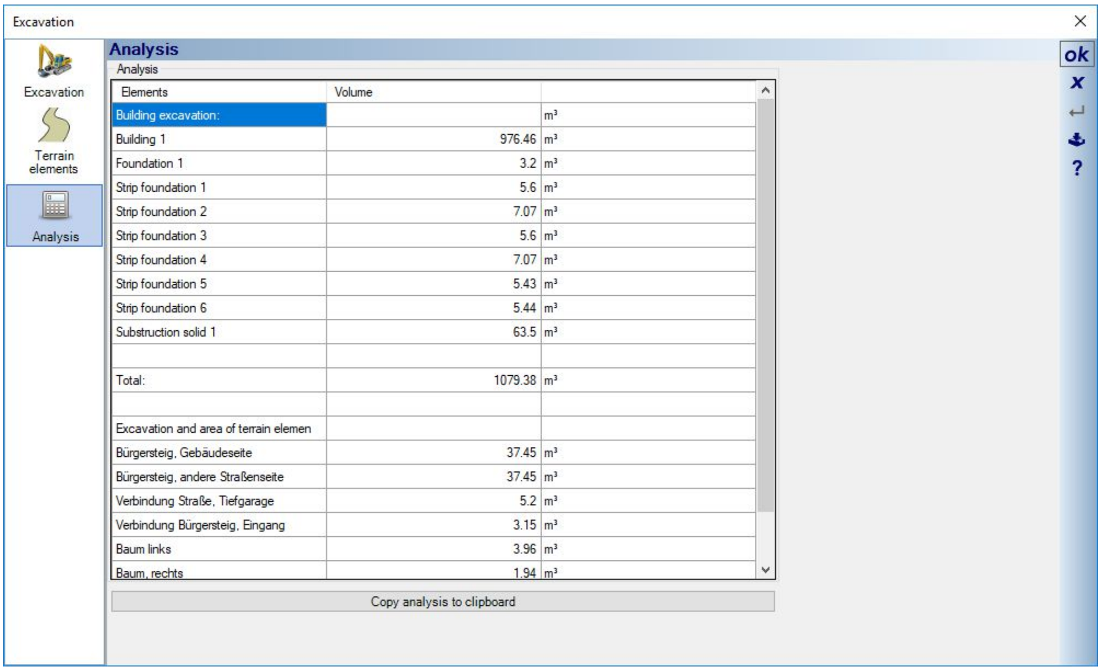
☑ Terrain
- ☑ Bürgersteig, Gebäudeseite
- ☑ Bürgersteig, andere Straßenseite
- ☑ Strasse
- ☑ Verbindung Straße, Tiefgarage
- ☑ Weg Gebäudefront
- ☑ Verbindung Bürgersteig, Eingang
- ☑ Baum links
- ☑ Baum, rechts

☐ Disable terrain solid

Selected element
Excavation 37.45 m³
Substraction volume 7.49 m³
Area 74.89 m³

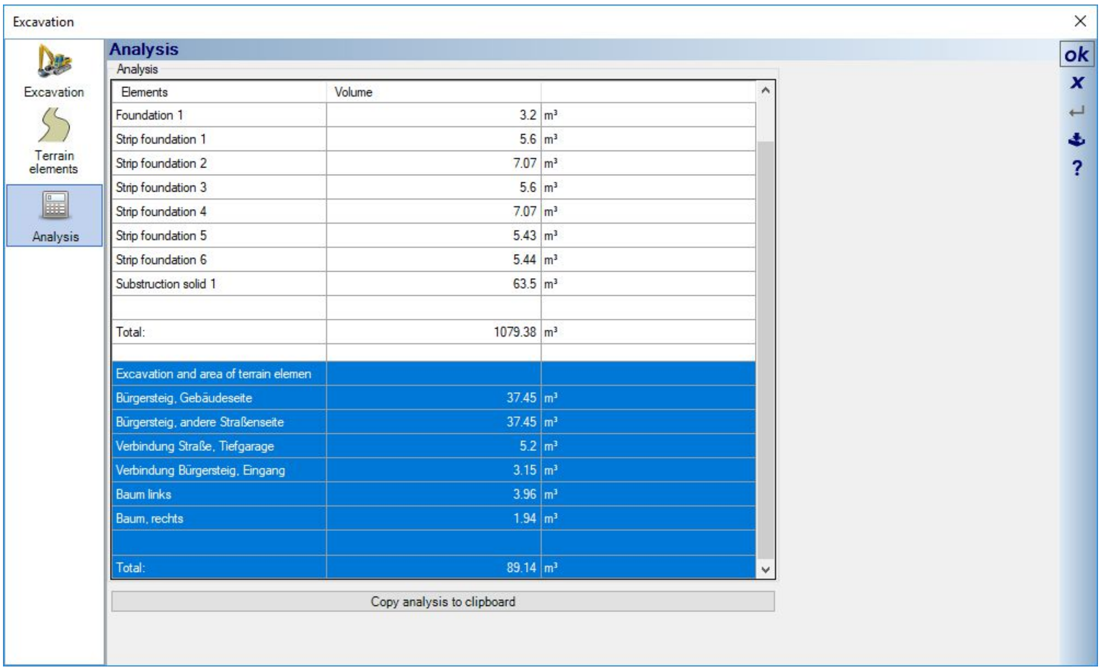
Project
Excavation total 89.14 m³

A summary of the values determined for further use can be found on the analysis page.



Elements	Volume	
Building excavation:		m³
Building 1	976.46	m³
Foundation 1	3.2	m³
Strip foundation 1	5.6	m³
Strip foundation 2	7.07	m³
Strip foundation 3	5.6	m³
Strip foundation 4	7.07	m³
Strip foundation 5	5.43	m³
Strip foundation 6	5.44	m³
Substruction solid 1	63.5	m³
Total:	1079.38	m³
Excavation and area of terrain elemen		
Bürgersteig, Gebäudeseite	37.45	m³
Bürgersteig, andere Straßenseite	37.45	m³
Verbindung Straße, Tiefgarage	5.2	m³
Verbindung Bürgersteig, Eingang	3.15	m³
Baum links	3.96	m³
Baum, rechts	1.94	m³

You can also select parts of the table with your mouse and copy values via CTRL+C / CTRL+V to other documents, in an Excel sheet for example..

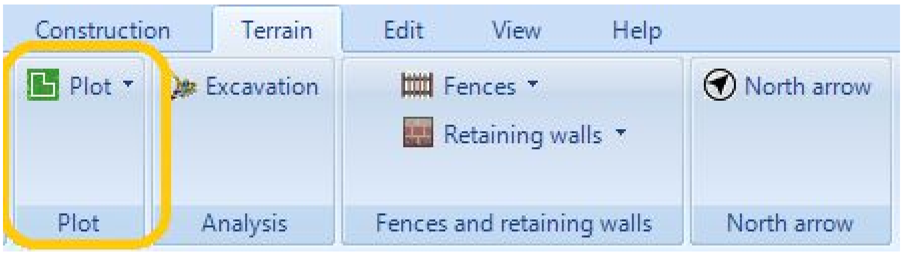


Elements	Volume	
Foundation 1	3.2	m³
Strip foundation 1	5.6	m³
Strip foundation 2	7.07	m³
Strip foundation 3	5.6	m³
Strip foundation 4	7.07	m³
Strip foundation 5	5.43	m³
Strip foundation 6	5.44	m³
Substruction solid 1	63.5	m³
Total:	1079.38	m³
Excavation and area of terrain elemen		
Bürgersteig, Gebäudeseite	37.45	m³
Bürgersteig, andere Straßenseite	37.45	m³
Verbindung Straße, Tiefgarage	5.2	m³
Verbindung Bürgersteig, Eingang	3.15	m³
Baum links	3.96	m³
Baum, rechts	1.94	m³
Total:	89.14	m³

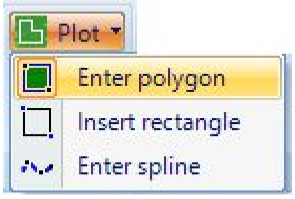
The button „Copy analysis to clipboard“ copies the entire table, which you can insert with CTRL +V elsewhere.

18.8 PLOTS IN 3D AND 2D WITH AUTOMATIC BORDER

On the terrain ribbon you will find, among other things, the functions for inserting a plot representing an area within the general terrain solid.



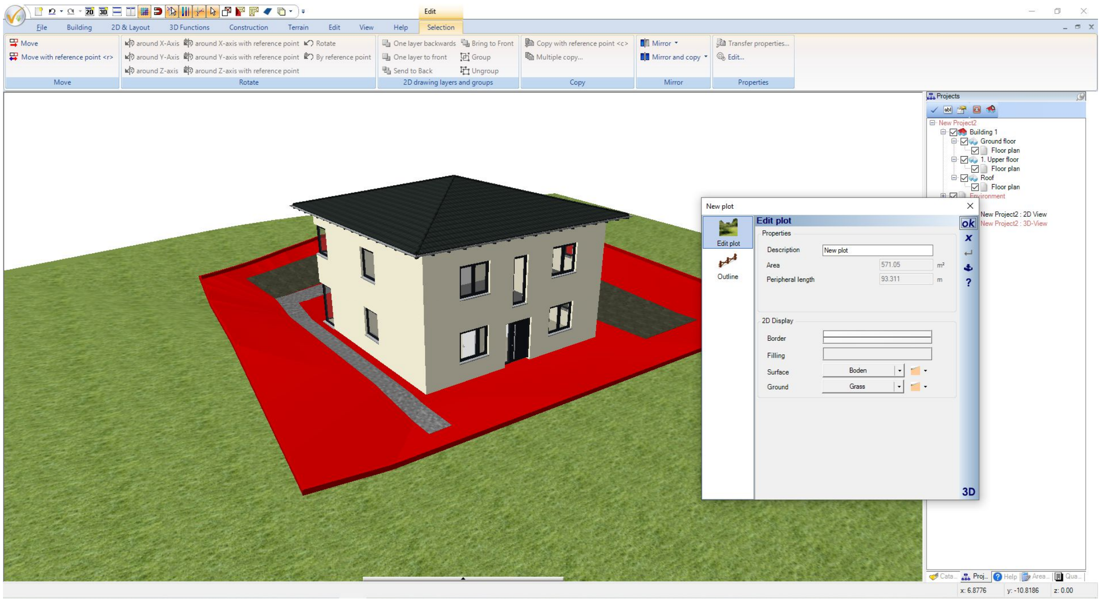
Three input variants are available, which always form a closed contour.



If no separate layer is active below the ENVIRONMENT layer, the terrain is automatically inserted on the ENVIRONMENT layer, regardless of which layer is actually active in the view.
As with the other terrain elements, it is therefore not intended and not possible to insert the plot at a different point in your project structure.
It is possible to create more than one plot within the terrain solid. Ideally, these plots should not be directly edge to edge, even if that should be the case in reality. Better leave a little gap between them.
Otherwise, collisions can occur when creating the 3D solids and when the 3D plots intersect with the 3D terrain.

18.8.1 Visibilities of 3D plots and 3D terrain

The plot always consists of a 3D solid whose surface follows the 3D terrain.
Since the surface follows the terrain, height points and heightlines outside the plot solid are also taken into account, but of course these points must remain inside the terrain as before.



New plot

Edit plot

Properties

Description: New plot

Area: 571.05 m²

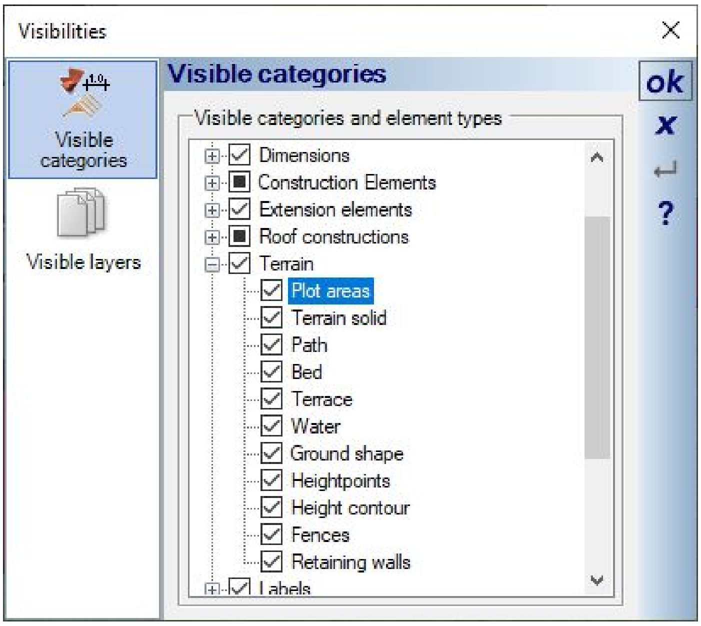
Peripheral length: 93.311 m

2D Display

Surface: Boden

Ground: Grass

Plot and terrain have separate visibility options.



Visible categories

Visible categories and element types

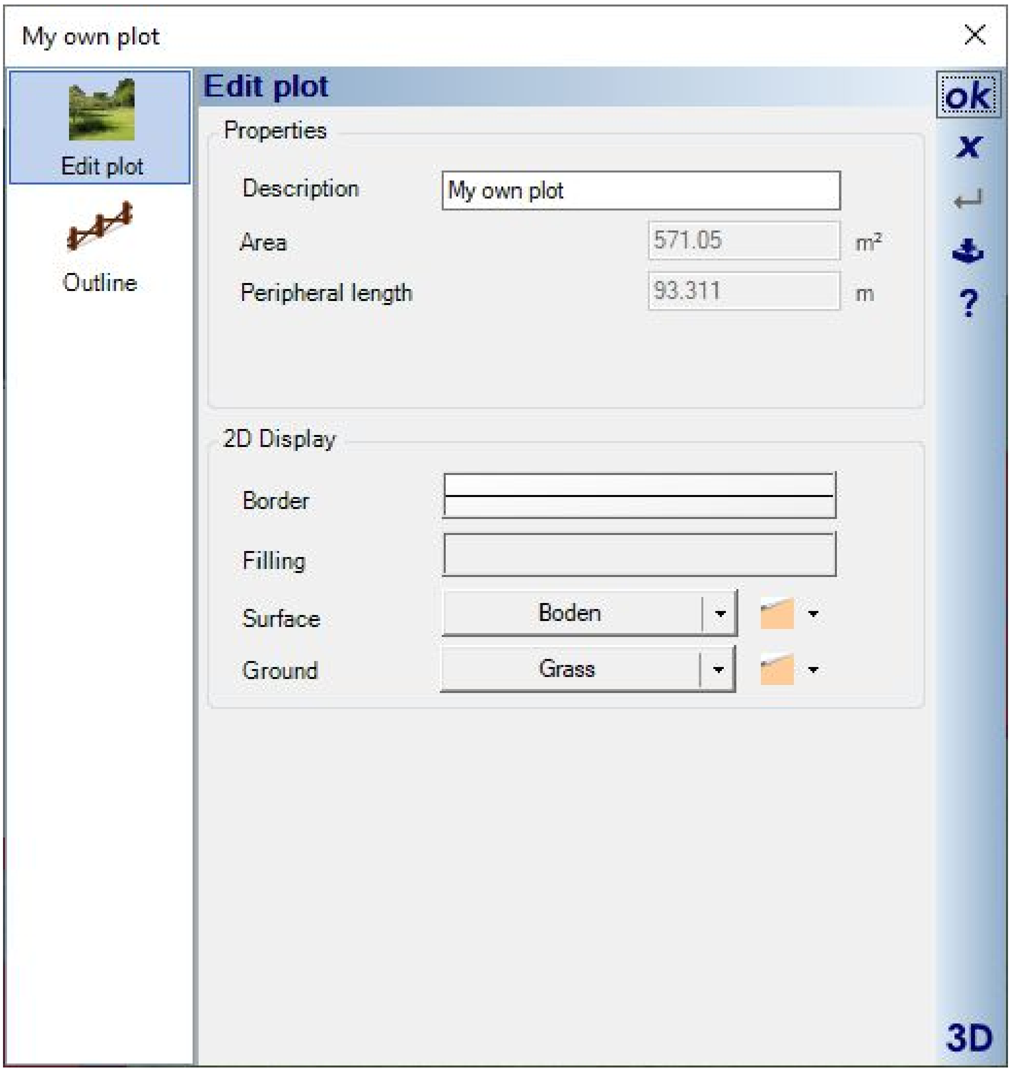
- ☑ Dimensions
- ■ Construction Elements
- ☑ Extension elements
- ■ Roof constructions
- ☑ Terrain
  - ☑ Plot areas
  - ☑ Terrain solid
  - ☑ Path
  - ☑ Bed
  - ☑ Terrace
  - ☑ Water
  - ☑ Ground shape
  - ☑ Heightpoints
  - ☑ Height contour
  - ☑ Fences
  - ☑ Retaining walls
- ☑ Labels

This allows you to switch the terrain off and leave only the plot visible. You will then receive such a display.

The plot forms a closed 3D solid downwards like the terrain itself. Also with the necessary depth. This prevents a basement, for example, from becoming visible below the surface of the plot.

18.8.2 Property dialog of plots

If necessary, you can assign a proper name to the property for identification purposes. The other options, such as the representation in 2D top views etc. correspond to the previously known terrain.



Edit plot

Properties

Description: My own plot

Area: 571.05 m²

Peripheral length: 93.311 m

2D Display

Border

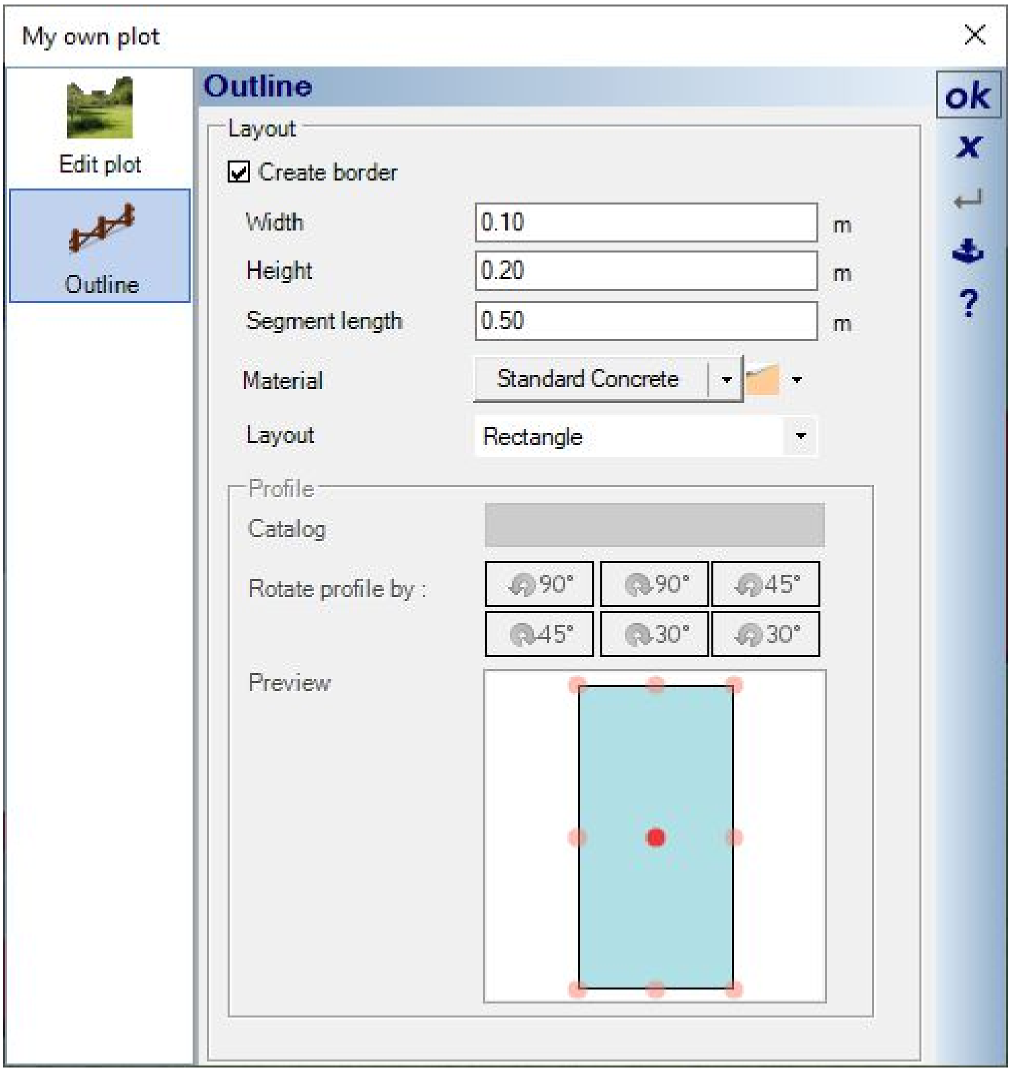
Filling

Surface: Boden

Ground: Grass

18.8.3 *Automatic border of a plot*

Sometimes it is necessary or desired to make the contour of the plot visible in 3D as well. For this purpose the dialog contains properties for an automatic border.



Layout

☑ Create border

Width 0.10 m

Height 0.20 m

Segment length 0.50 m

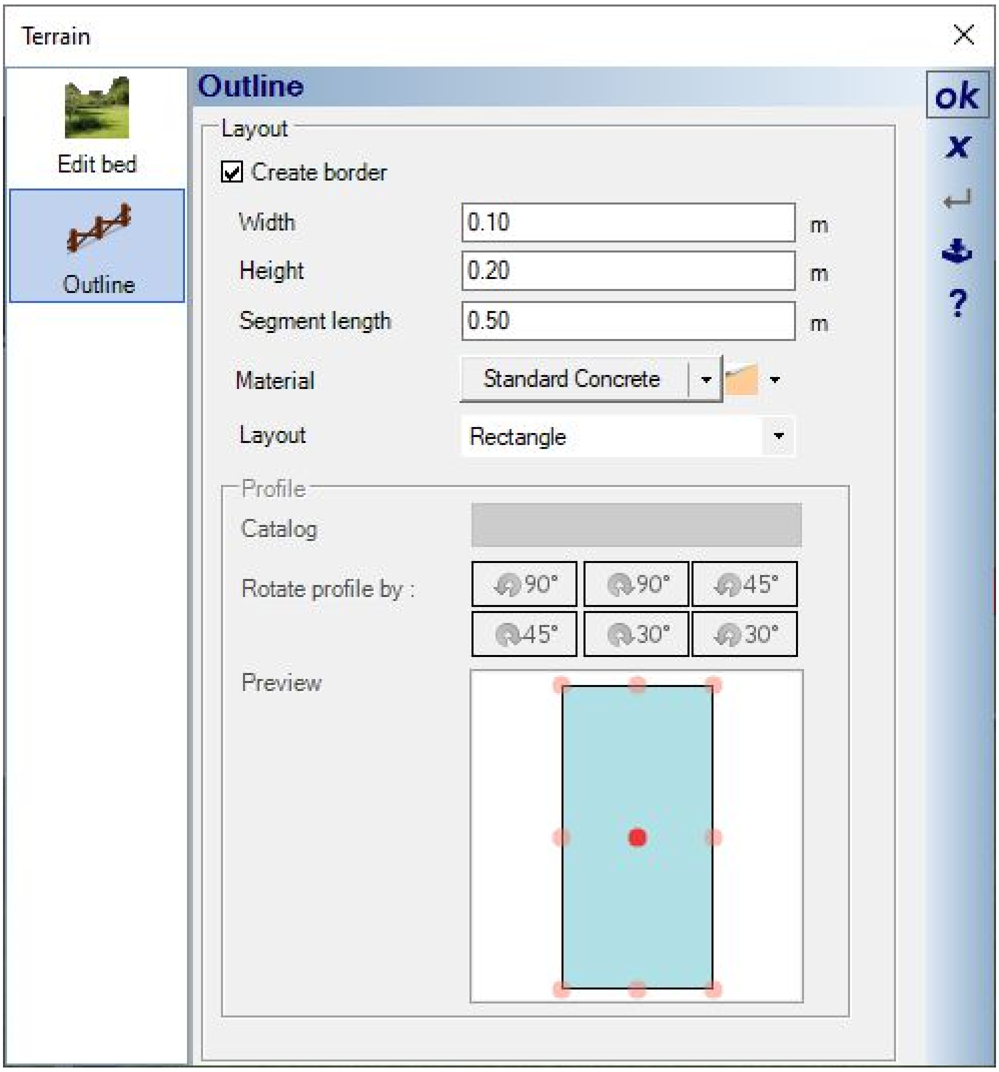
Material Standard Concrete

Layout Rectangle

The border is all the way around, leaving no gaps for driveways or ways into the plot. It is really only intended to show the plot contour in 3D.

18.9 BORDERS FOR TERRAIN ELEMENTS SUCH AS BEDS AND TERRACES

Similar to the plot, you can also have an automatic border created for beds and terraces, e.g. to display curbs.



Layout

☑ Create border

Width: 0.10 m

Height: 0.20 m

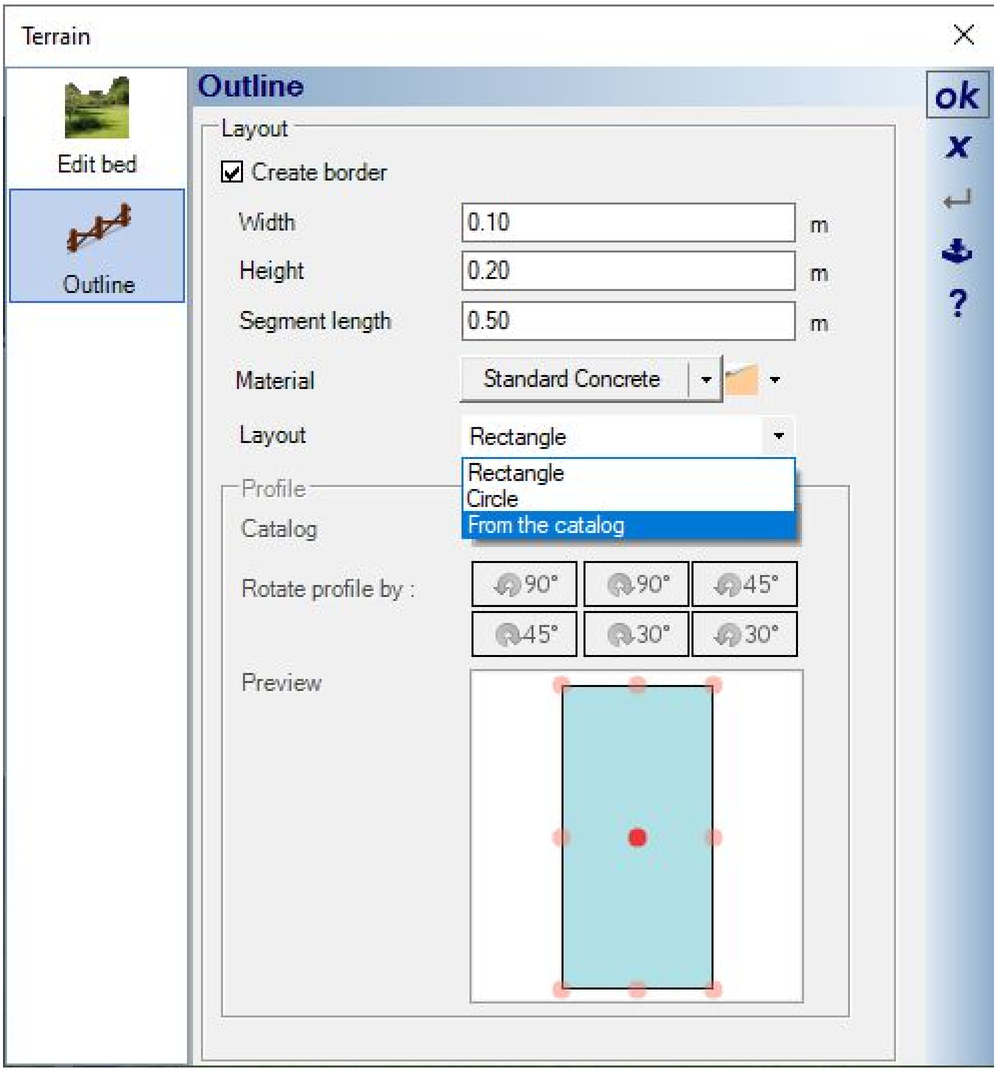
Segment length: 0.50 m

Material: Standard Concrete

Layout: Rectangle

Catalog

The contour of the border is almost arbitrary. Instead of the predefined variant rectangle, you can access the catalog of 2D profiles and either use one of the existing profiles or one of your own that you have previously drawn yourself and saved in the catalog.



Outline

Layout

☑ Create border

Width 0.10 m

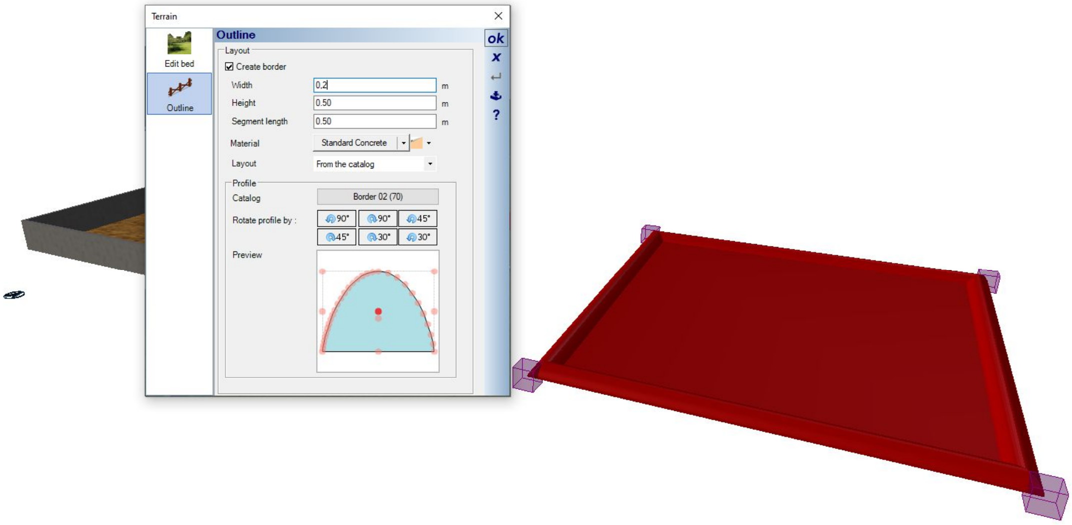
Height 0.20 m

Segment length 0.50 m

Material Standard Concrete

Layout Rectangle

As an example a border made of a half round edge profile.



Layout

☑ Create border

Width 0,2 m

Height 0.50 m

Segment length 0.50 m

Material Standard Concrete

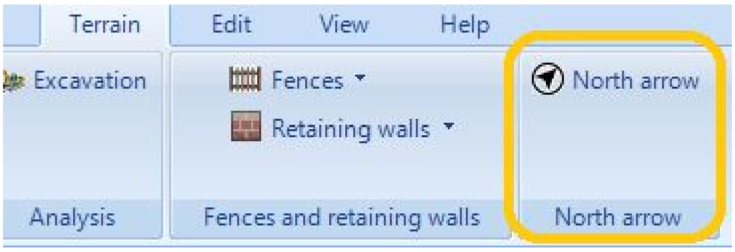
Layout From the catalog

Catalog Border 02 (70)

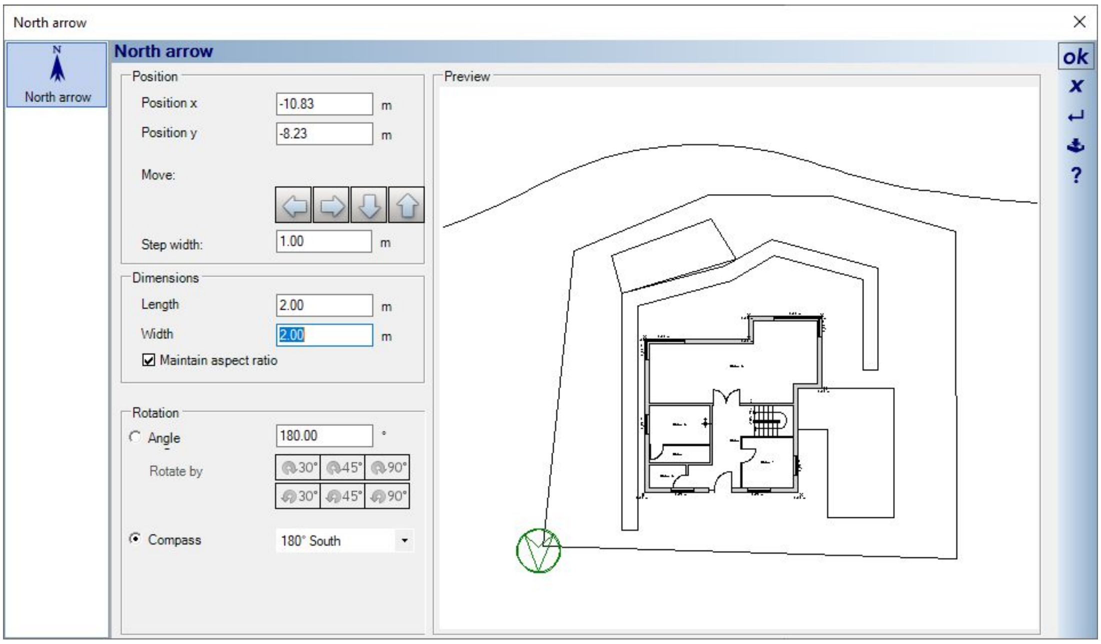
Rotate profile by : 90° 90° 45° 45° 30° 30°

18.10 NORTH ARROW DIALOG

Previously, the north arrow could only be rotated and moved manually via the dialog and only if the ENVIRONMENT layer on which it is located was activated beforehand.
The dialog for the properties of the north arrow can now also be started on the terrain ribbon.



In the dialog you see an preview of the currently active 2D view and the north arrow setting options.
You can use the move button to position the north arrow in the adjustable increment in relation to the drawing. The drawing in the preview area updates automatically. The scaling of the north arrow is also new.
The rotation of the north arrow also influences the shadow calculation in 3D views if you have determined the position of the building in the sun position settings of the 3D view. You can set the angle or use the predefined alignments in the compass list. 0 degrees would be the orientation to the north



Position
Position x: -10.83 m
Position y: -8.23 m
Step width: 1.00 m

Dimensions
Length: 2.00 m
Width: 2.00 m
☑ Maintain aspect ratio

Rotation
○ Angle: 180.00 °
Rotate by: 30° 45° 90° / 30° 45° 90°
● Compass: 180° South

18.11 RETAINING WALLS

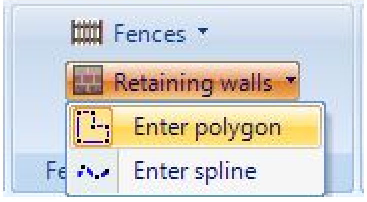
Retaining walls are used to design the exterior area of your planning, i.e. on the plot. Therefore, the function is also located on the Terrain Ribbon.
Unlike the other wall types of the building, retaining walls do not create rooms and will not allow windows or doors. A layer structure is also not provided. Basically, the retaining walls are sweep solids, i.e. pure 3D constructions.

18.11.1 Retaining walls or real walls?

Occasionally real walls were used to design the garden, but this is generally unfavorable. These walls, with the exception of our partition wall type, always try to intersect with other walls and thereby create rooms.
And the rooms are then used to create floors, etc. This can lead to problems with the entire room calculation and to other undesirable effects.
Whenever a wall is needed in the garden, a retaining wall should be used. Unless the wall needs to intersect under a roof, requires a layer structure for your 2D display, or must contain a door. Then you need a normal wall, preferably of the partition wall type, because these walls also do not intersect with other walls and side effects in room recognition are avoided.

18.11.2 Inserting retaining walls

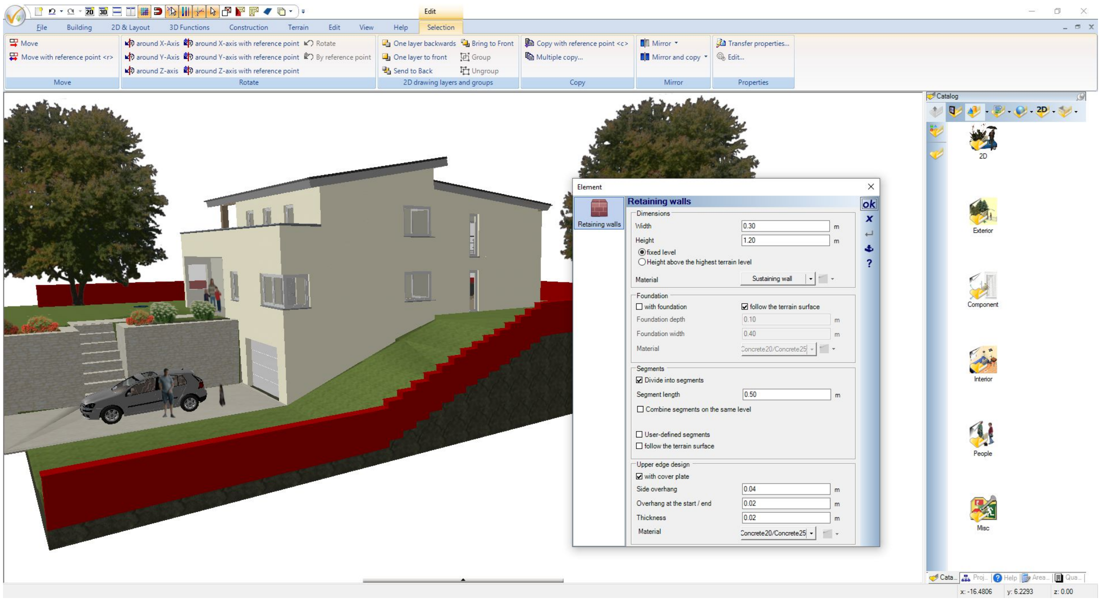
Retaining walls can be entered polygonally or via a spline.



While inserting retaining walls you can already open the properties dialog via the context menu and set the thickness.
This prevents you from making subsequent changes afterwards, especially with regard to the input polygon.
So set the starting point of the retaining wall, click with the right mouse button and open the properties dialog via the context menu.
Set the width of the retaining wall. This is the only property that affects the input. For example, if you insert a retaining wall on the plot outline and then change the thickness, it would protrude into the neighboring property.
Once the thickness is set, continue inserting. Use the key combination CTRL + W to change the reference side of the wall as usual. Each time you press CTRL + W, the wall side at the cursor switches from the axis to the sides.

18.11.3 Properties of retaining walls

Like railings and fences, retaining walls are created segment by segment. The default value of 0.5 m has a visual effect on inclines. As you can see in the screenshot below, there is a staircase effect with relatively small steps. This is the segment length.



Element

Retaining walls

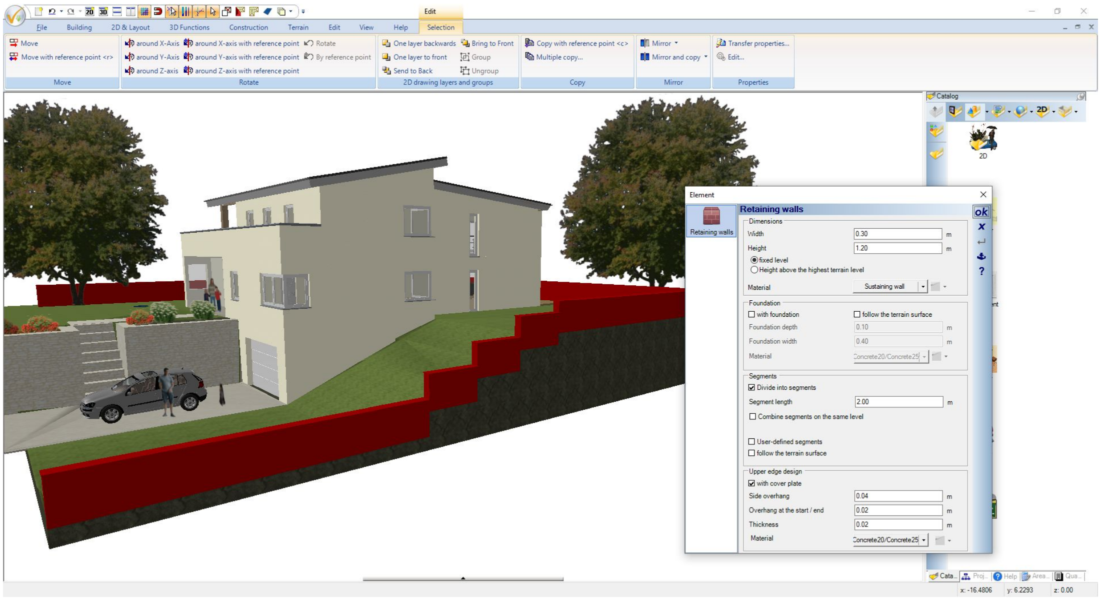
Dimensions
Width 0.30 m
Height 1.20 m
● fixed level
○ Height above the highest terrain level
Material Sustaining wall

Foundation
☐ with foundation
☑ follow the terrain surface
Foundation depth 0.10 m
Foundation width 0.40 m
Material Concrete20/Concrete25

Segments
☑ Divide into segments
Segment length 0.50 m
☐ Combine segments on the same level
☐ User-defined segments
☐ follow the terrain surface

Upper edge design
☑ with cover plate
Side overhang 0.04 m
Overhang at the start / end 0.02 m
Thickness 0.02 m
Material Concrete20/Concrete25

If you change the length of the segments to e.g. 2 m, the following wall is created



Element

Retaining walls

Dimensions
Width 0.30 m
Height 1.20 m
● fixed level
○ Height above the highest terrain level
Material Sustaining wall

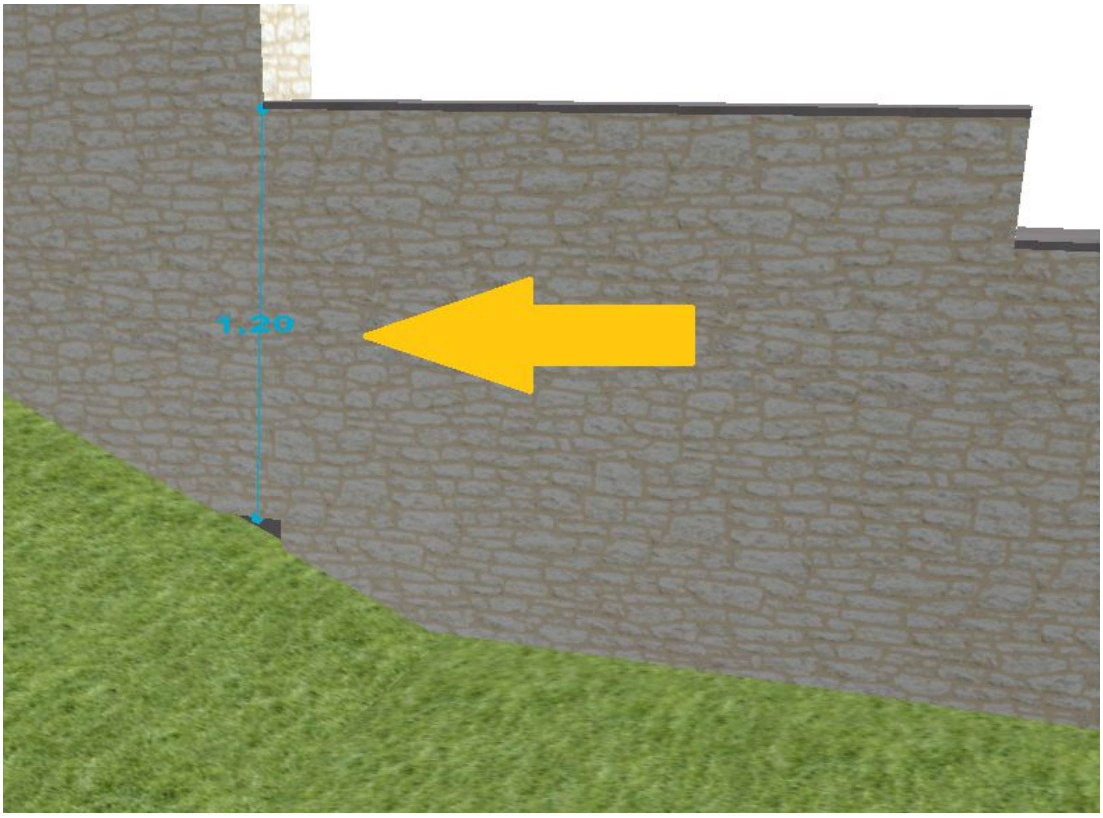
Foundation
☐ with foundation
☐ follow the terrain surface
Foundation depth 0.10 m
Foundation width 0.40 m
Material Concrete20/Concrete25

Segments
☑ Divide into segments
Segment length 2.00 m
☐ Combine segments on the same level
☐ User-defined segments
☐ follow the terrain surface

Upper edge design
☑ with cover plate
Side overhang 0.04 m
Overhang at the start / end 0.02 m
Thickness 0.02 m
Material Concrete20/Concrete25

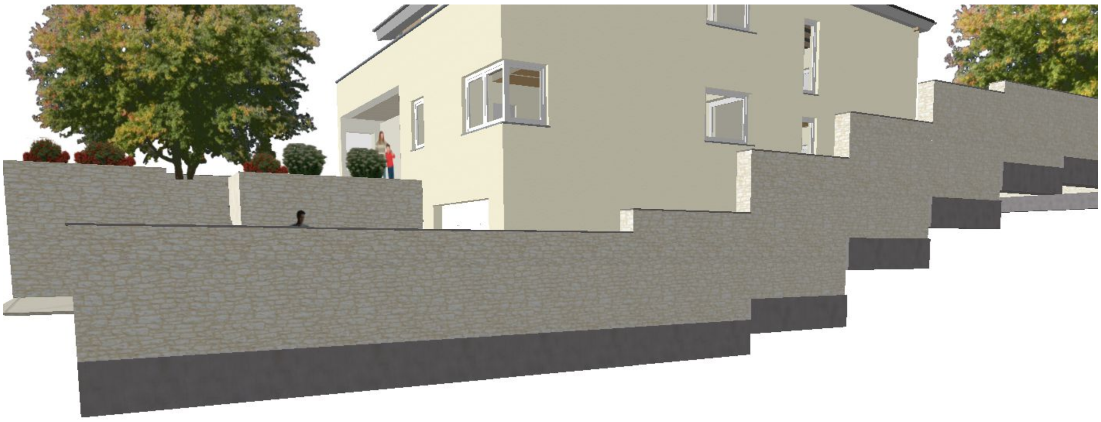
Retaining walls can have a fixed height, or a height that takes into account the terrain at the end of the segment and forces the segment to the specified value at that point. This also means that the height elsewhere is higher than specified in the dialog.

The figure below shows where the value of 1.2 m is measured at a height above the highest ground point (of the segment).



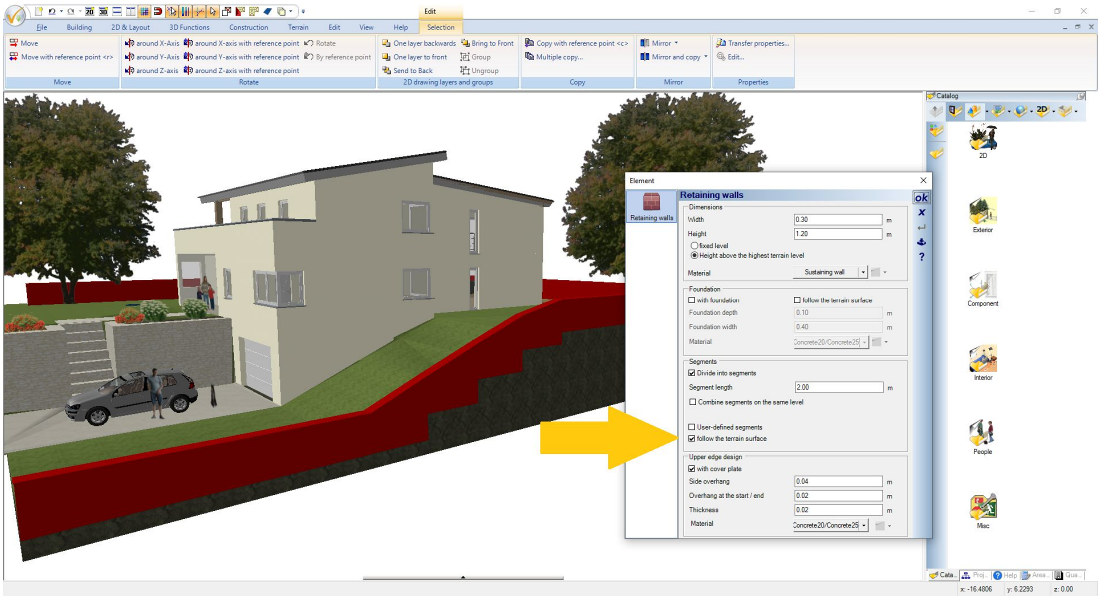
18.11.4 Foundations under retaining walls

You can create automatic foundations underneath the retaining walls. The option and parameters can be found in the properties dialog.



18.11.5 Retaining walls without a horizontal top edge

If you do not want the staircase effect shown along the retaining wall, you can use the "Follow the terrain surface" option to create a largely even progression that corresponds to the terrain surface. The finer the segmentation, the "smoother" the progression.



Element

Retaining walls

Dimensions
Width 0.30 m
Height 1.20 m
○ fixed level
● Height above the highest terrain level
Material Sustaining wall

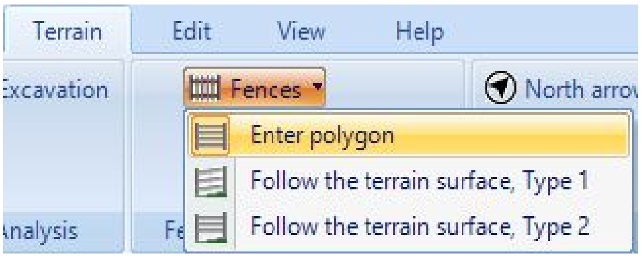
Foundation
☐ with foundation
☐ follow the terrain surface
Foundation depth 0.10 m
Foundation width 0.40 m
Material Concrete20/Concrete25

Segments
☑ Divide into segments
Segment length 2.00 m
☐ Combine segments on the same level
☐ User-defined segments
☑ follow the terrain surface

Upper edge design
☑ with cover plate
Side overhang 0.04 m
Overhang at the start / end 0.02 m
Thickness 0.02 m
Material Concrete20/Concrete25

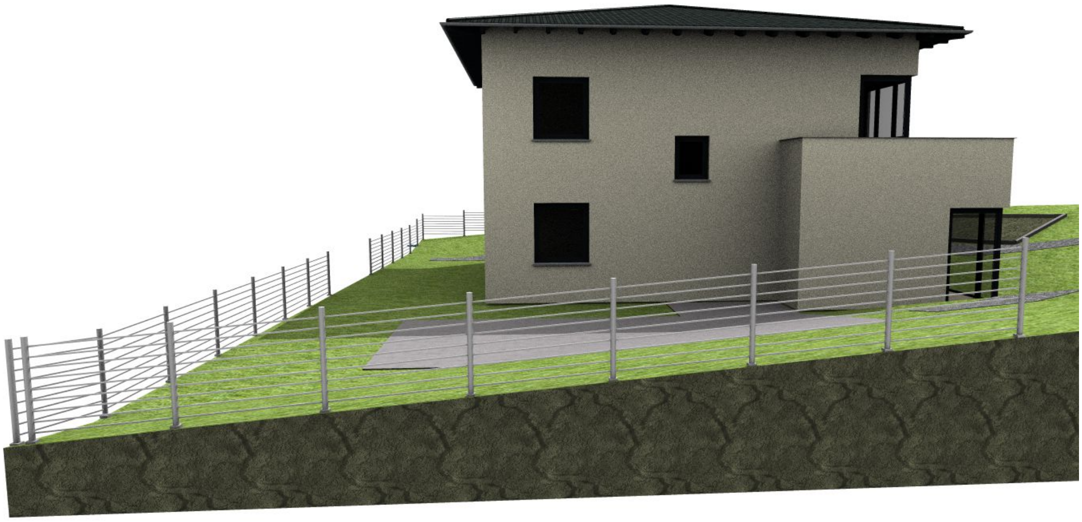
18.12 FENCES

Fences are basically a variant of railings. If necessary, you can find details about the properties in their description.
However, fences have other input tools and automatically follow the terrain surface depending on the input variant.

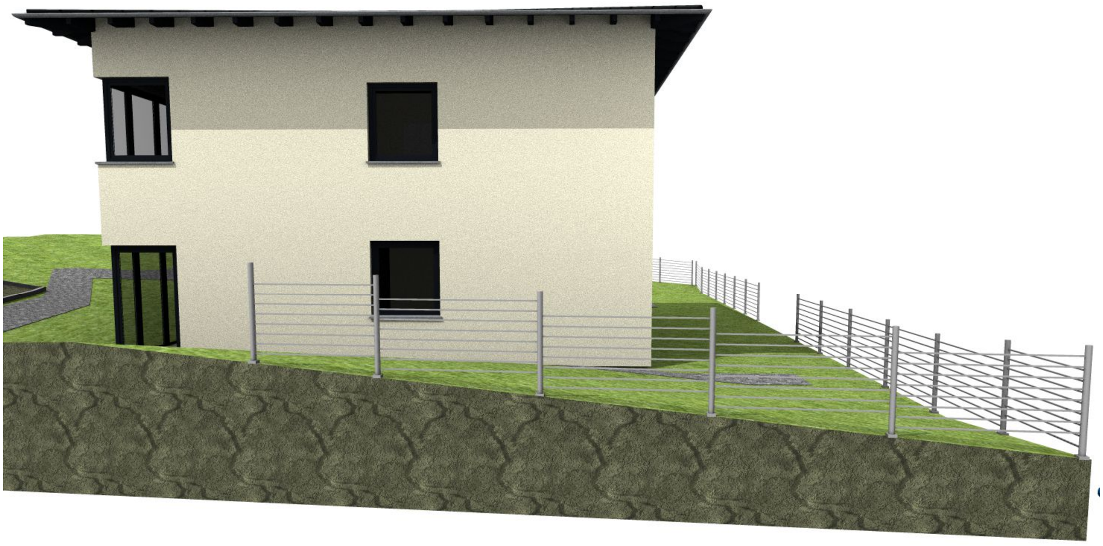

Terrain
Edit
View
Help
Excavation
Fences
North arrow
Enter polygon
Follow the terrain surface, Type 1
Follow the terrain surface, Type 2
Analysis

Fences are also created in segments whose length is adjustable, just like railings. At the end of each segment, i.e. where posts are typically placed, the fence determines the height of the terrain and adjusts the height accordingly. This is how the progression is created.

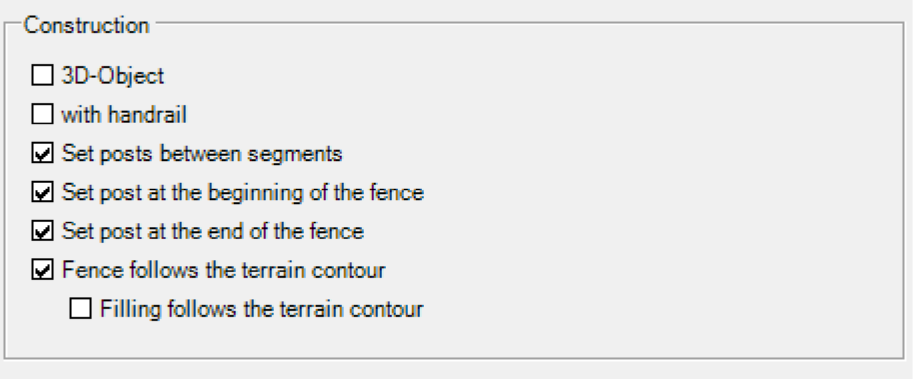
With variant 1, the fillings are calculated accordingly and are given a gradient from segment to segment, so that the height of the fence is measured at each post position and the spacing of the fillings fit at the top and bottom of the segment.



In variant 2, the filling remains horizontal and instead the posts are extended downwards and upwards. A stair-like look is the result.



The distribution of both variants on their own input tools is only a work simplification. The option responsible for this can be found in the properties dialog of the fences. You can therefore switch between the variants at any time without having to re-enter the fence.

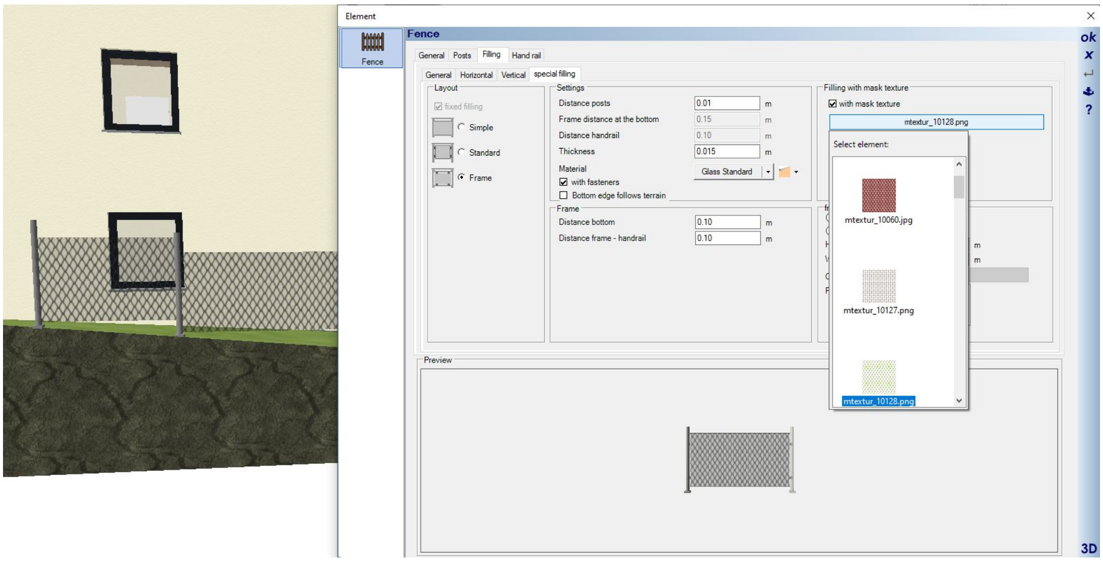


Construction

☐ 3D-Object
☐ with handrail
☑ Set posts between segments
☑ Set post at the beginning of the fence
☑ Set post at the end of the fence
☑ Fence follows the terrain contour
  ☐ Filling follows the terrain contour

18.12.1 Special fillings - wire mesh fence

As already mentioned for railings, mask textures are suitable for giving a filling the appearance of wire mesh, of course only in 3D.
For fences we have added an additional selection button for the texture catalog.



Layout
☑ fixed filling
○ Simple
○ Standard
● Frame

Settings
Distance posts 0.01 m
Frame distance at the bottom 0.15 m
Distance handrail 0.10 m
Thickness 0.015 m
Material Glass Standard
☑ with fasteners
☐ Bottom edge follows terrain

Frame
Distance bottom 0.10 m
Distance frame - handrail 0.10 m

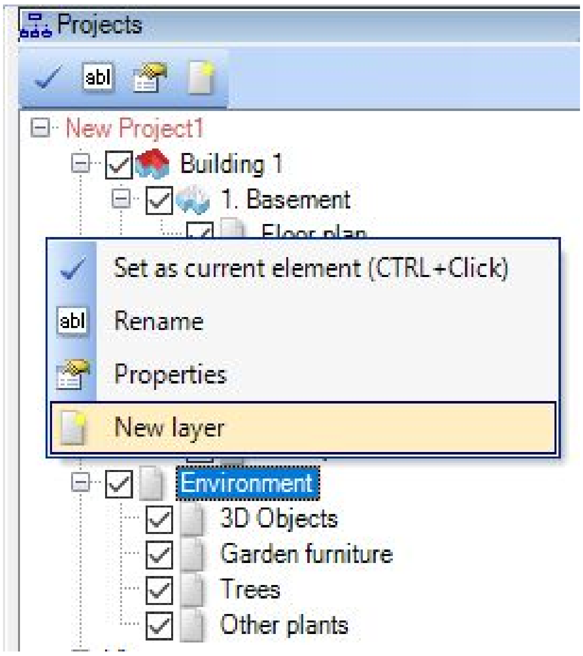
Filling with mask texture
☑ with mask texture
mtextur_10128.png

Select element:
mtextur_10060.jpg
mtextur_10127.png
mtextur_10128.png

18.13 CUSTOM LAYERS BELOW THE ENVIRONMENT LAYER

Below the Environment layer, you can create a hierarchy of other layers, for example to subdivide the design of your property.
This is primarily used to sort elements that have no constructive influence on the terrain design, such as 3D objects or self-modeled content with 3D constructions

Height points, heightlines, terrain areas as well as plots do not have to be sorted. The visibility of such elements should be handled as before via the view's visibilities settings and not via layers in the ENVIRONMENT.



19 SURFACE EDITOR PLUG-IN

The surface editor can be used to create 3D surfaces in any plane. A few examples of the use of such surfaces are façade cladding, tiled backsplashes for kitchens and bathrooms, work tops, and patios and other landscape features.

19.1 DEFINING SURFACE AREAS

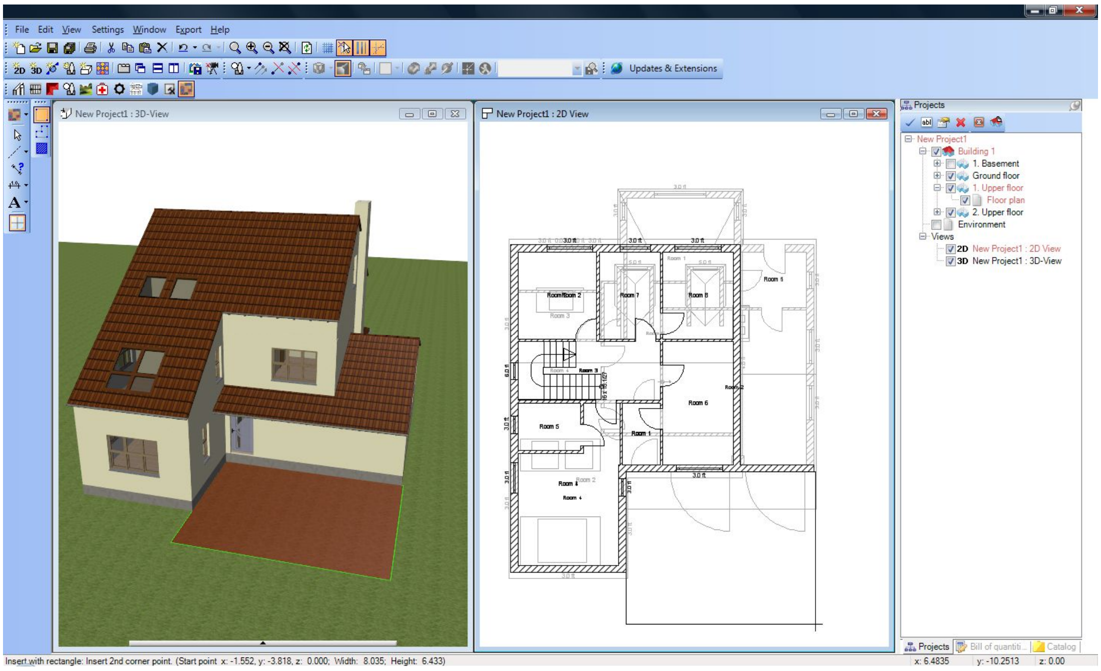
The surface editor first requires that a plane or surface area is selected in a 3D view. Only when an area has been defined can the surface be created. The definition can be performed in any view, so that, for example, tiled backsplashes can also be created in cross-sections. The surface area can be selected very simply with a left mouse-click. First choose one of construction tools, i.e. a rectangle, a polygon or a plane, and position the mouse cursor over the chosen element in a 3D view. When an element is detected, be it a wall, a roof plane, or a piece of furniture, its surface area is highlighted in red in the 3D view.

For the rectangle or polygon tool the first step is now complete and you can begin defining the surface area. For the plane option the ‘Surface’ dialog would now be automatically activated. If you wish to define several surface areas or planes using the plane option, for instance the complete façade as shown in the example below, then simply keep the ‘Shift’ key pressed and select further areas. The selection process is terminated with ‘Enter’.

Whenever a surface area is defined first all openings such as windows, doors or wall recesses, included in or under the surface, are detected and shown in the ‘Surface’ dialog.

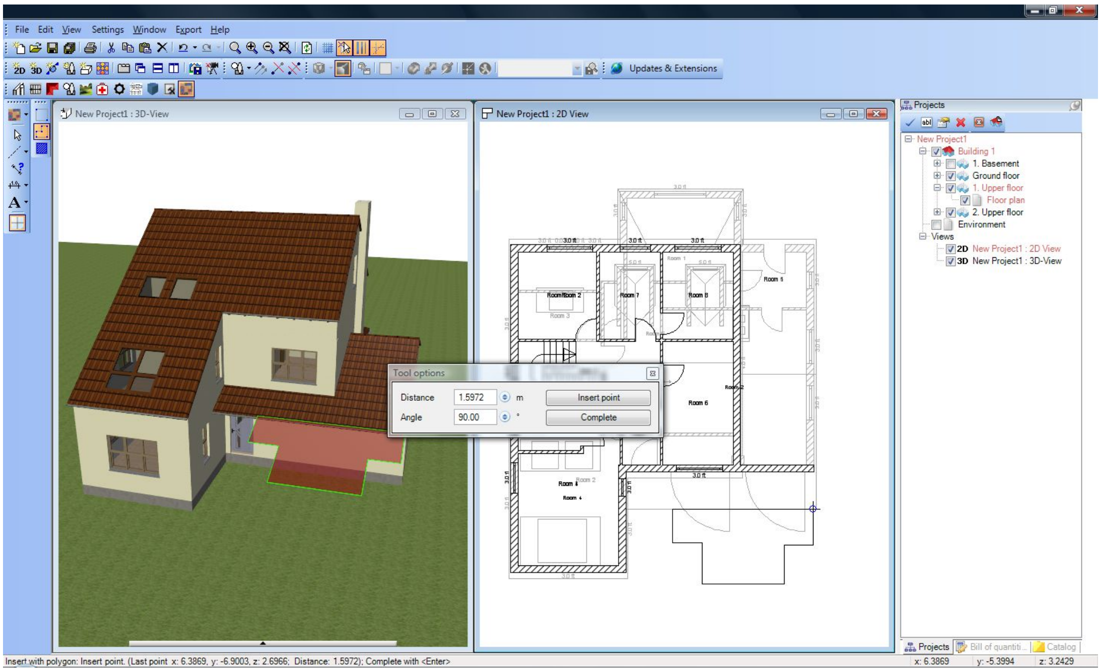
19.2 DEFINITION USING A RECTANGLE OR POLYGON

As already described, the first step in defining a surface area is to select a plane. Once this has been performed, the desired contour of the surface area can be entered in a view or using several views. In 3D views the surface area is shown as a transparent preview. During definition of the surface area you can swap between views. For example, you can set the first point of a rectangle in a 3D view and the second, for greater accuracy, in the 2D plan view.



Insert with rectangle: Insert 2nd corner point. (Start point x: -1.552, y: -3.818, z: 0.000; Width: 8.035; Height: 6.433)

x: 6.4835 y: -10.2513 z: 0.00



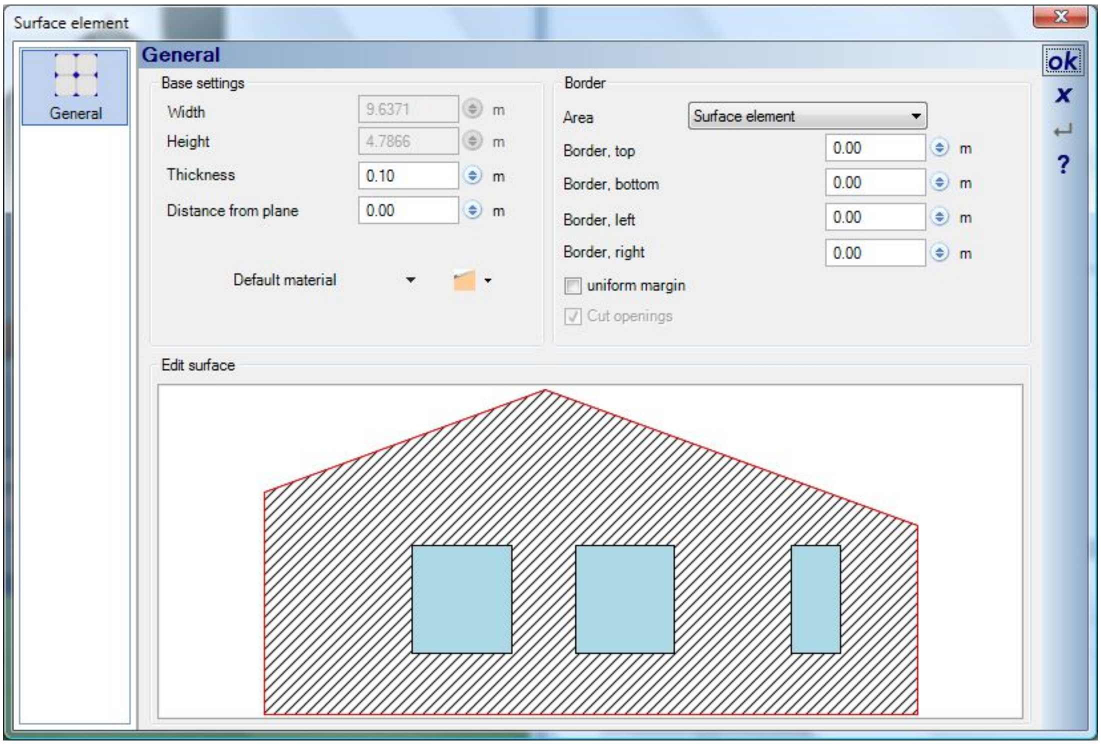
Distance 1.5972 m
Angle 90.00 °

Insert with polygon: Insert point. (Last point x: 6.3869, y: -6.9003, z: 2.6966; Distance: 1.5972); Complete with <Enter>

x: 6.3869 y: -5.3994 z: 3.2429

19.3 THE 'SURFACE' DIALOG

The 'Surface' dialog is activated as soon as the definition of a surface area has been completed.



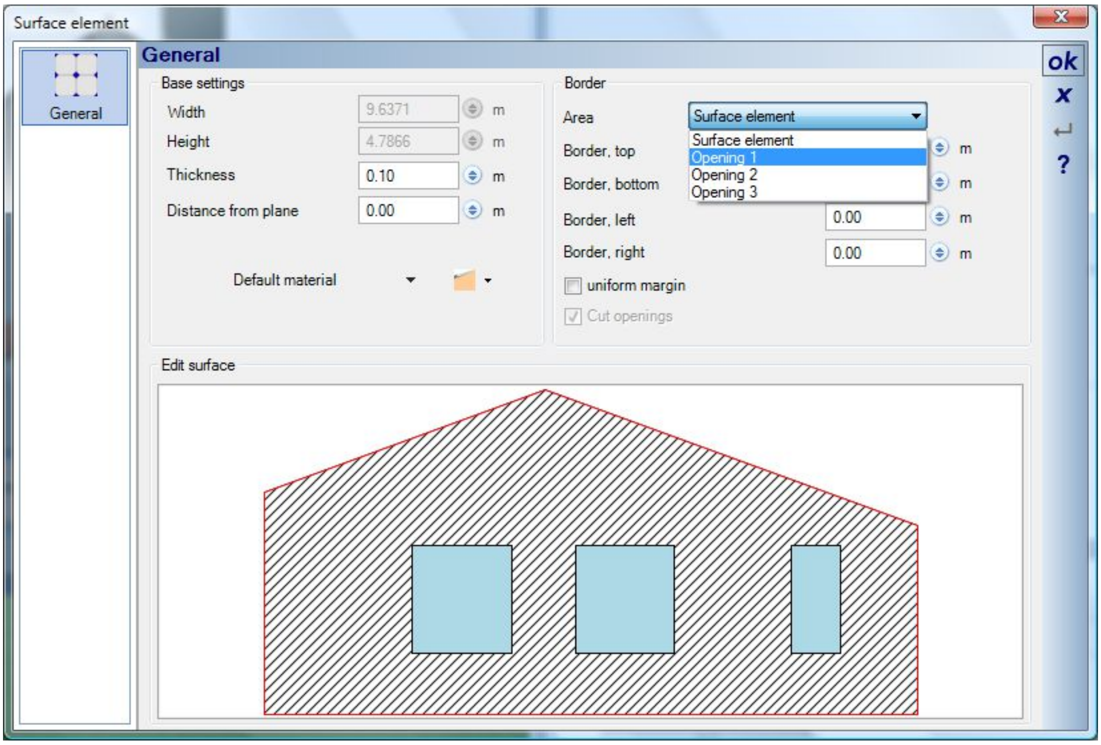
Base settings
Width 9.6371 m
Height 4.7866 m
Thickness 0.10 m
Distance from plane 0.00 m
Default material

Border
Area Surface element
Border, top 0.00 m
Border, bottom 0.00 m
Border, left 0.00 m
Border, right 0.00 m
☐ uniform margin
☑ Cut openings

Edit surface

In the ‘Base settings’ section you can specify the thickness of the surface and the distance from the selected plane. The distance from the plane can also be a negative value if the surface is to be set back from the plane.

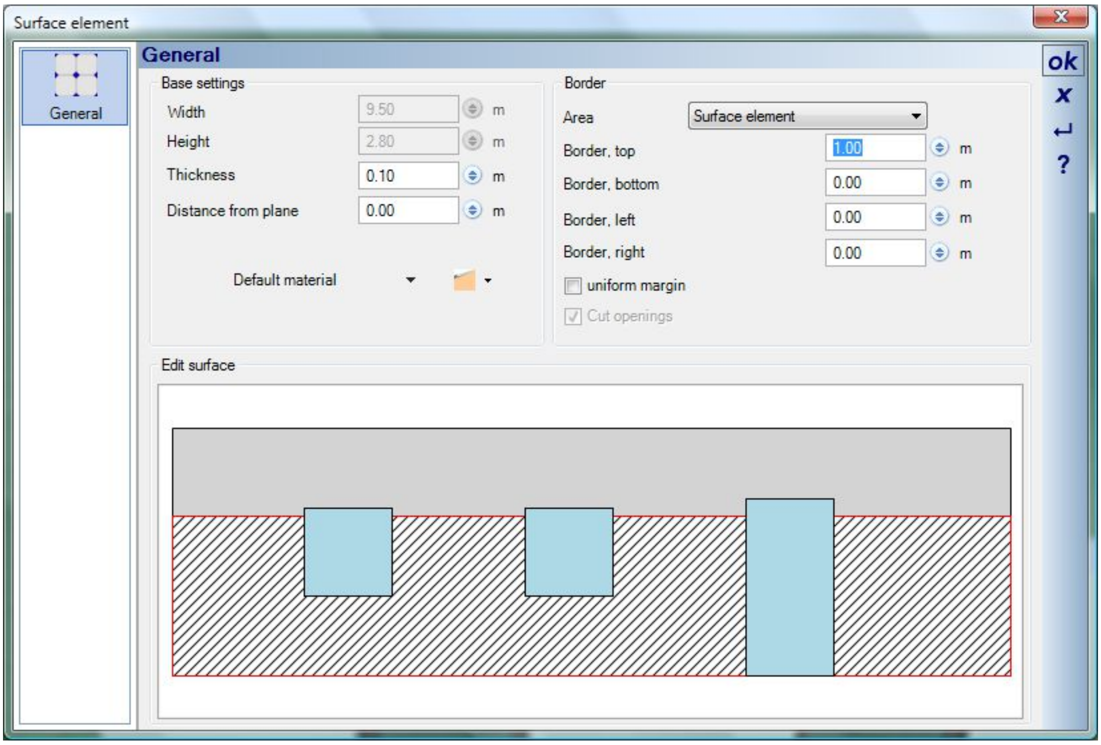
An important part of the dialog is the interactive sketch in which the current dimensions of the surface area are shown and in which, for example, you can select the various openings using the mouse. Alternatively, you can select the surface area and openings by means of the drop-down list for ‘Area’.



Base settings
Width 9.6371 m
Height 4.7866 m
Thickness 0.10 m
Distance from plane 0.00 m
Default material

Border
Area: Surface element
Surface element
Opening 1
Opening 2
Opening 3
Border, top m
Border, bottom m
Border, left 0.00 m
Border, right 0.00 m
☐ uniform margin
☑ Cut openings

The surface area itself and the openings can be modified using the settings for 'Border', which always apply to the active area, highlighted in red in the drawing.
An example: You would like to tile a wall but not to the full height of the room. You could define the area manually with a rectangle or alternatively use the 'Plane' construction aid and then limit the surface area using the settings for 'Border'.



Surface element

General

Base settings

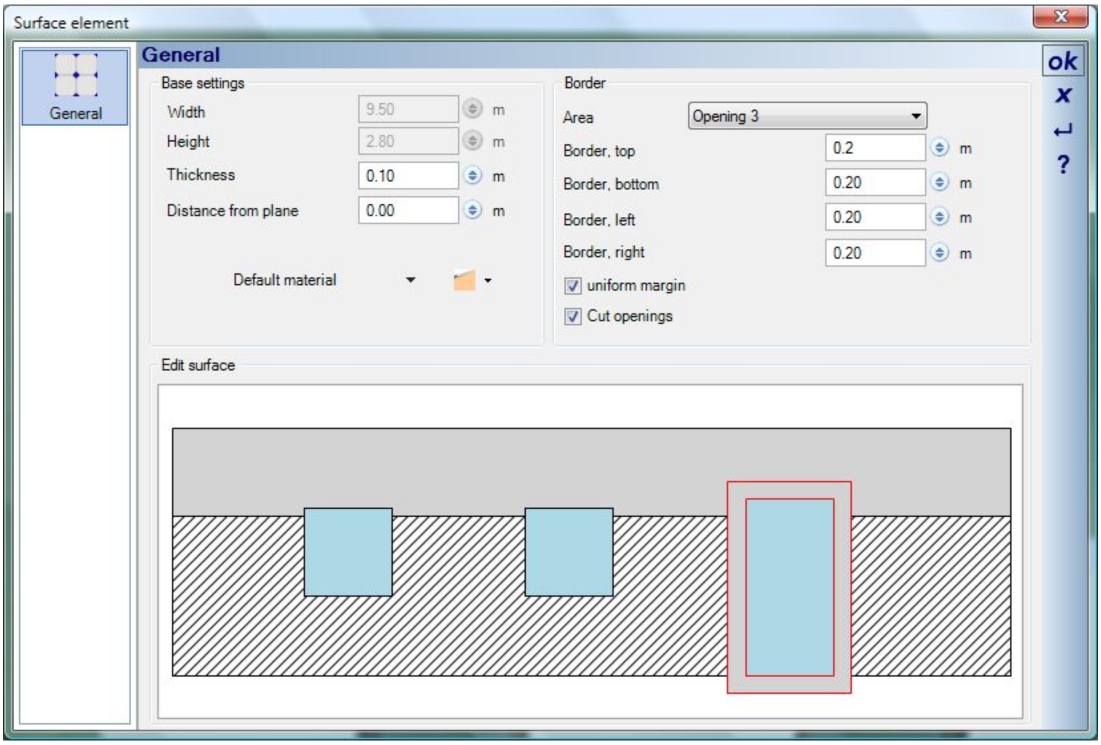
Width 9.50 m
Height 2.80 m
Thickness 0.10 m
Distance from plane 0.00 m
Default material

Border

Area Surface element
Border, top 1.00 m
Border, bottom 0.00 m
Border, left 0.00 m
Border, right 0.00 m
☐ uniform margin
☑ Cut openings

Edit surface

You can also create borders for openings. First select the desired opening and then define, for each side individually or as a uniform margin, the area which is to be excluded from the surface area.



Surface element

General

Base settings

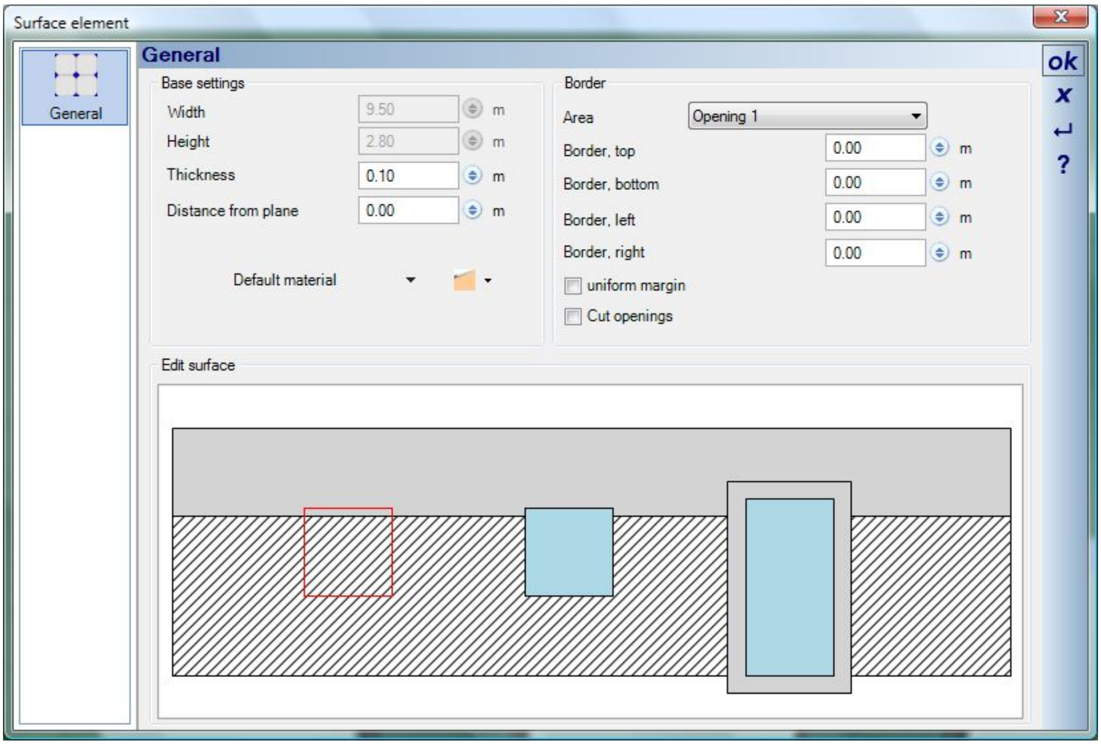
Width 9.50 m
Height 2.80 m
Thickness 0.10 m
Distance from plane 0.00 m
Default material

Border

Area Opening 3
Border, top 0.2 m
Border, bottom 0.20 m
Border, left 0.20 m
Border, right 0.20 m
☑ uniform margin
☑ Cut openings

Edit surface

In some cases it may be required that openings are not cut out of the surface area but instead are covered the surface. In this case deactivate the 'Cut openings' option.



Base settings
Width 9.50 m
Height 2.80 m
Thickness 0.10 m
Distance from plane 0.00 m
Default material

Border
Area Opening 1
Border, top 0.00 m
Border, bottom 0.00 m
Border, left 0.00 m
Border, right 0.00 m
☐ uniform margin
☐ Cut openings

Edit surface

19.4 MISCELLANEOUS

- Positioning surfaces: Surfaces can only be repositioned in the plane in which they were created.
- Representation in 2D views: the representation of a surface in 2D views, i.e. filling or hatching, is as always dependant on the building material used and can be modified by clicking on the setting for material, located above the drawing.
- Relationship to other objects: If a surface is created on a construction element, for example a wall, then the surface automatically reacts to changes in the position of the element. If the wall is repositioned, the surface moves with it, but not vice versa. However, if the wall is deleted the surface is retained, since it could be that the element was only created temporarily in order to define the plane of the surface.
- The scale of the texture on a surface can be changed in the dialog using the button.
- Other materials and textures from the catalog can be allocated to a surface in a 3D view in the usual way using drag and drop.

- Modifying surface area: Selected surfaces in 2D views show 'grips', with which the position and dimensions of the surface area can be changed, in the same way as with 2D elements.

19.5 3D-GRID ELEMENTS, FACADE CLADDINGS, ETC.

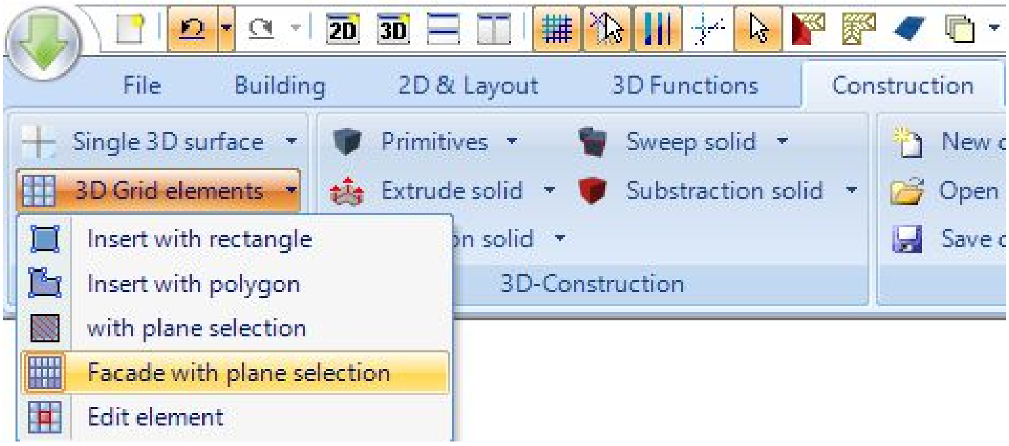
19.5.1 General

3D-Grid elements are an extension of the plug surface designer and allow the automatic generation of 3D elements in rows and columns. Single walls and surfaces up to whole building facades 3D elements can be added with some few clicks. This feature is kept neutral and so named because the possible applications are diverse.

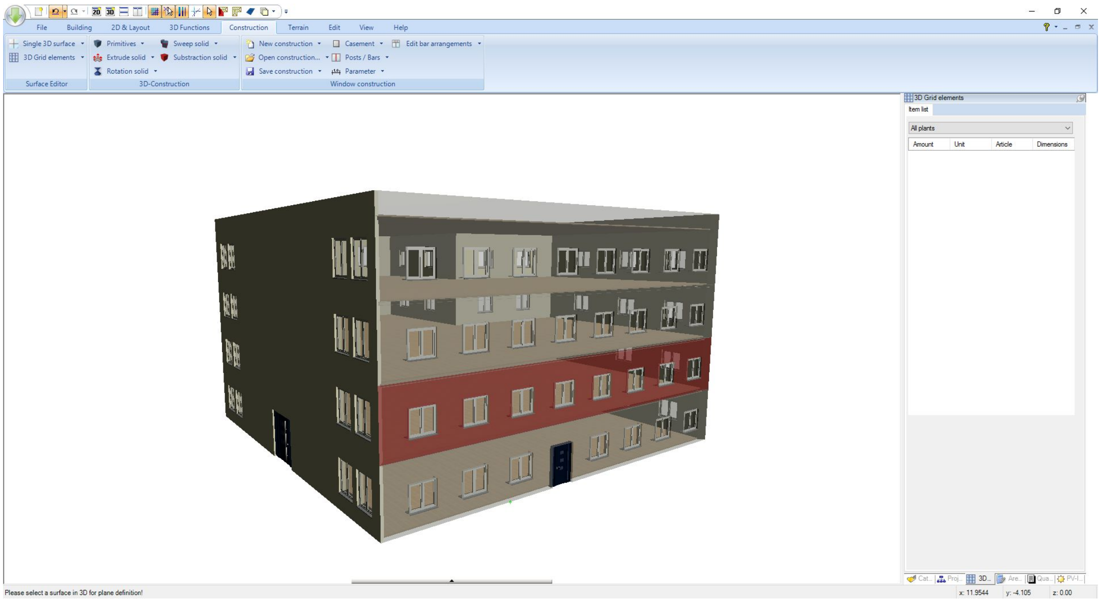
- In addition to pure design with 3D elements you also get item lists of 3D grid areas. Parts of the item lists are the individual 3D elements and the profiles that optionally can be generated for the rows and columns. Identical 3D elements are automatically grouped.
- Item lists can be exported as PDF, Excel or RTF file and then used as a basis to collect offers or for your own calculations.
- With a single click you will get your own 2D view of the entire area in which only the grid elements are displayed. These so-called front views, can be completed with text, dimensions or other 2D elements and used as assembly drawings. (This feature is not included in all versions questions. If necessary, ask your dealer)
- 3D grid elements are suitable for all cases where products and elements are placed in a uniform distribution, in columns and rows, e.g. for facade cladding, insulation, tiled floor panels, wood panels, etc .. With just a few clicks you get an indication and you do not have to look at all areas separately, especially if there are openings such as windows and doors in the fields.
- The generated 3D surfaces can be edited individually with different materials, but also in column and rows.
- Each element can be further divided as needed and Sub-areas manage various dimensions and materials.
- Between the rows and columns profiles can be generated automatically. The profiles themselves are obtained from 2D drawings, as already used for the sweep solids of the PlugIn 3D constructions. Profiles can also be self-drawn.

19.5.2 Insert 3D-Grid elements, example for a facade:

For 3D-Grid elements the normal input variants of the surface planner also apply. In addition there is the ability to capture all the walls of a facade with one click.
Start the tool "facade with plane selection"

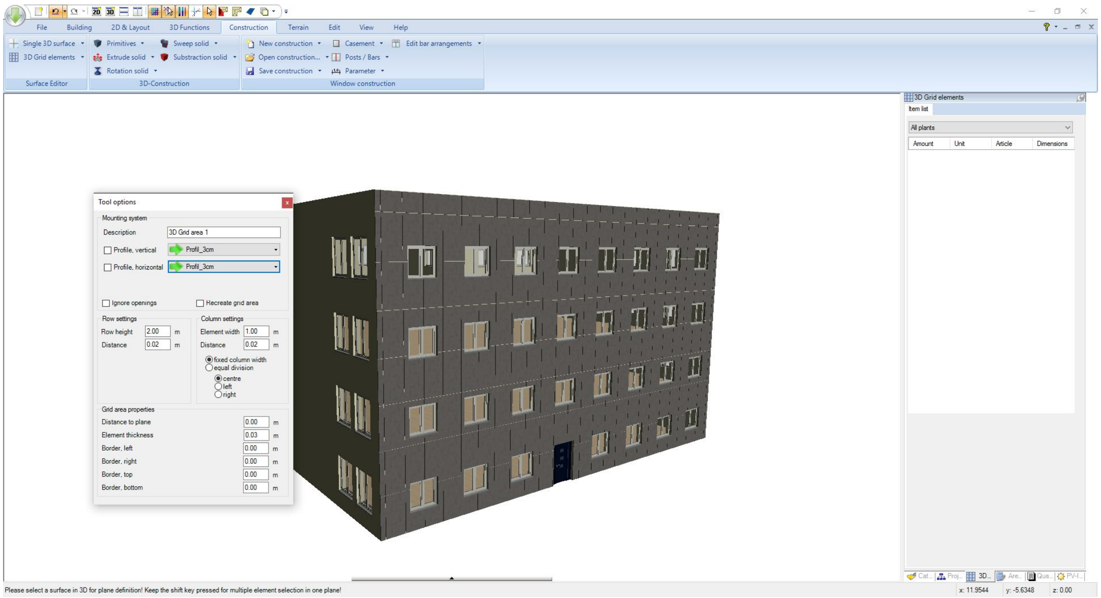


Then move the mouse on the side of the building / façade that you want to “fill” with 3D elements. All walls in a plane are searched and displayed transparently. The wall on which the mouse currently shows appears in red, but has at this point no further meaning.


Please select a surface in 3D for plane definition!

x: 11.9544 y: -4.105 z: 0.00

With a left mouse click, select the facade for entering the 3D-grid elements. First the tool options dialog appears and a preview of the possible 3D elements is presented.



Tool options

Mounting system

Description: 3D Grid area 1

☐ Profile, vertical: Profil_3cm

☐ Profile, horizontal: Profil_3cm

☐ Ignore openings ☐ Recreate grid area

Row settings

Row height 2.00 m

Distance 0.02 m

Column settings

Element width 1.00 m

Distance 0.02 m

● fixed column width
○ equal division
● centre
○ left
○ right

Grid area properties

Distance to plane 0.00 m

Element thickness 0.03 m

Border, left 0.00 m

Border, right 0.00 m

Border, top 0.00 m

Border, bottom 0.00 m

3D Grid elements

Item list

All plants

Amount	Unit	Article	Dimensions

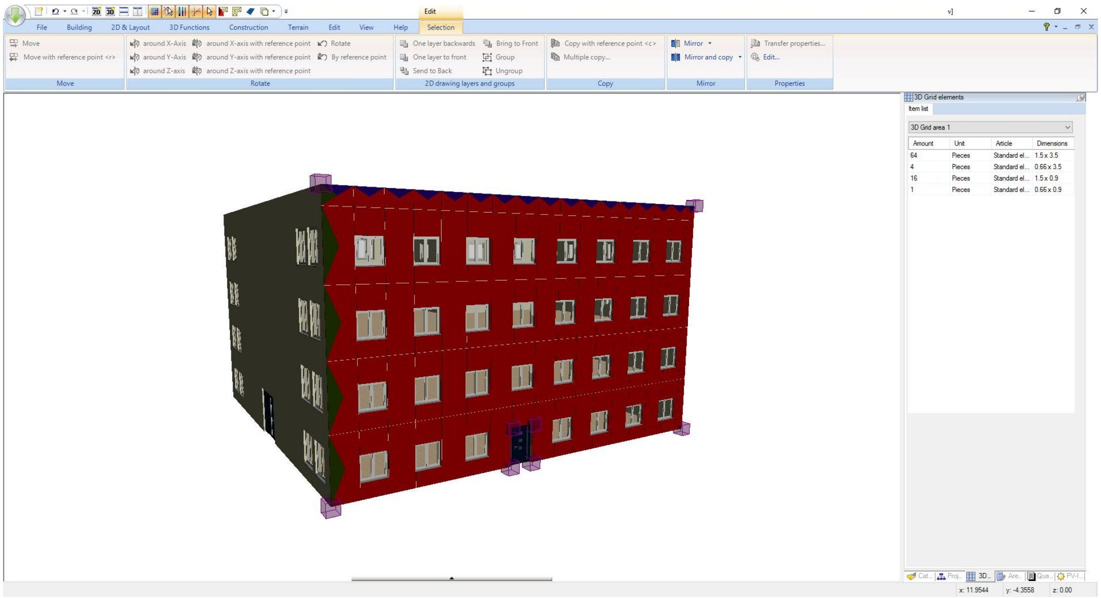
Please select a surface in 3D for plane definition! Keep the shift key pressed for multiple element selection in one plane!

x: 11.9544 y: -5.6348 z: 0.00

At this time, the shown grid does not yet exist in the project, but only as a preview. Any changes in the tool options dialog lead to an automatic recalculation of the facade elements. Set row and column dimensions and the starting point of the distribution. Once the facade is parameterized, a left mouse click in the 3D view inserts the entire grid to the project.

19.5.3 *Edit 3D-Grid elements*

The grid fields and elements can be edited in whole, in rows or columns, or even the individual elements. With a left mouse click, select the entire grid.



3D Grid elements

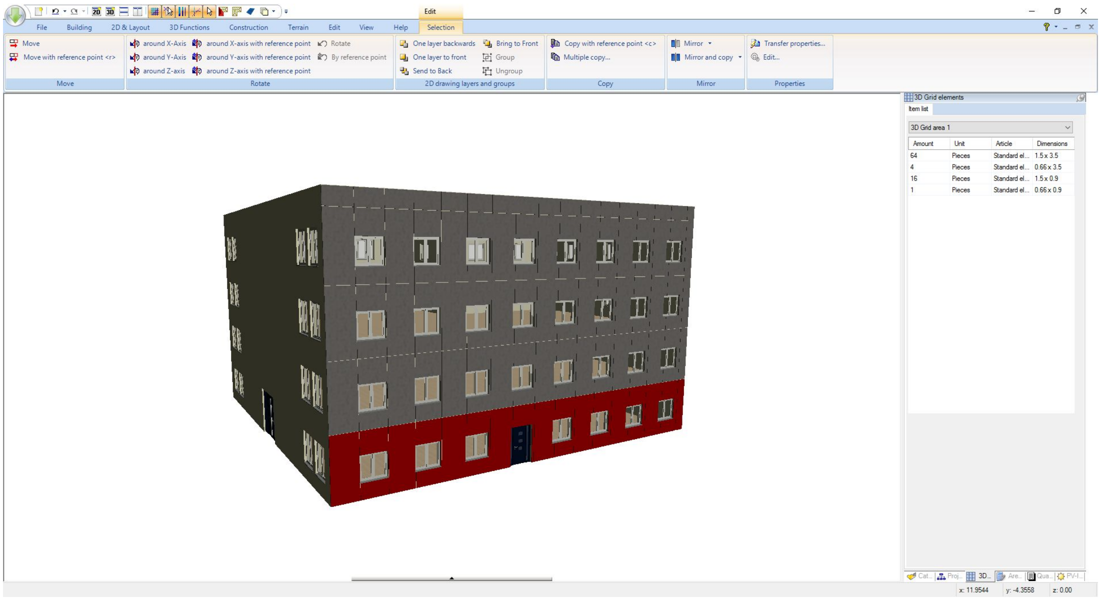
Item list

3D Grid area 1

Amount	Unit	Article	Dimensions
64	Pieces	Standard el...	1.5 x 3.5
4	Pieces	Standard el...	0.66 x 3.5
16	Pieces	Standard el...	1.5 x 0.9
1	Pieces	Standard el...	0.66 x 0.9

x: 11.9544 y: -4.3558 z: 0.00

In this case, the so-called row and column markers appear.
For a selected row, for example, double-clicking on this selection opens the properties dialog of the row / elements.

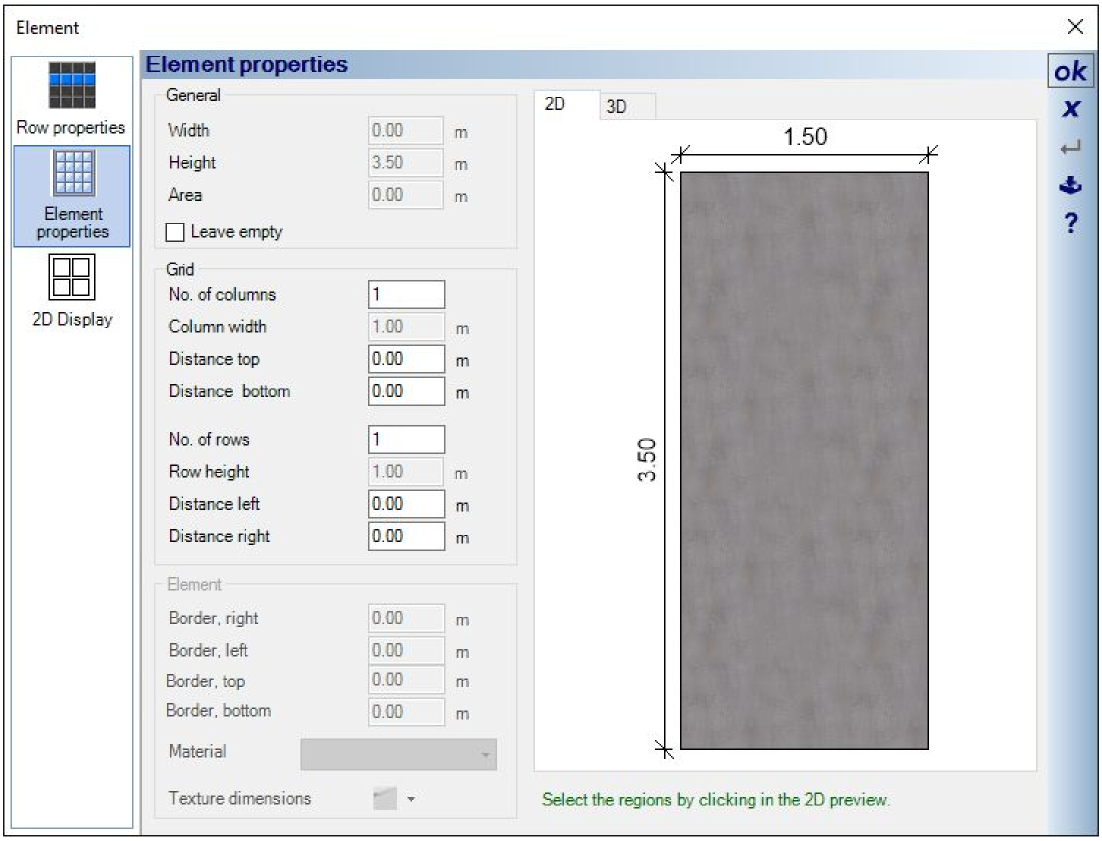


3D Grid area 1

Amount	Unit	Article	Dimensions
64	Pieces	Standard el...	1.5 x 3.5
4	Pieces	Standard el...	0.66 x 3.5
16	Pieces	Standard el...	1.5 x 0.9
1	Pieces	Standard el...	0.66 x 0.9

x: 11.9544 y: -4.3558 z: 0.00

On the property pages you can change the height of the row, either individually in this case or for all and also change the sub-division of the elements.



Element properties

General

Width 0.00 m
Height 3.50 m
Area 0.00 m
☐ Leave empty

Grid

No. of columns 1
Column width 1.00 m
Distance top 0.00 m
Distance bottom 0.00 m

No. of rows 1
Row height 1.00 m
Distance left 0.00 m
Distance right 0.00 m

Element

Border, right 0.00 m
Border, left 0.00 m
Border, top 0.00 m
Border, bottom 0.00 m

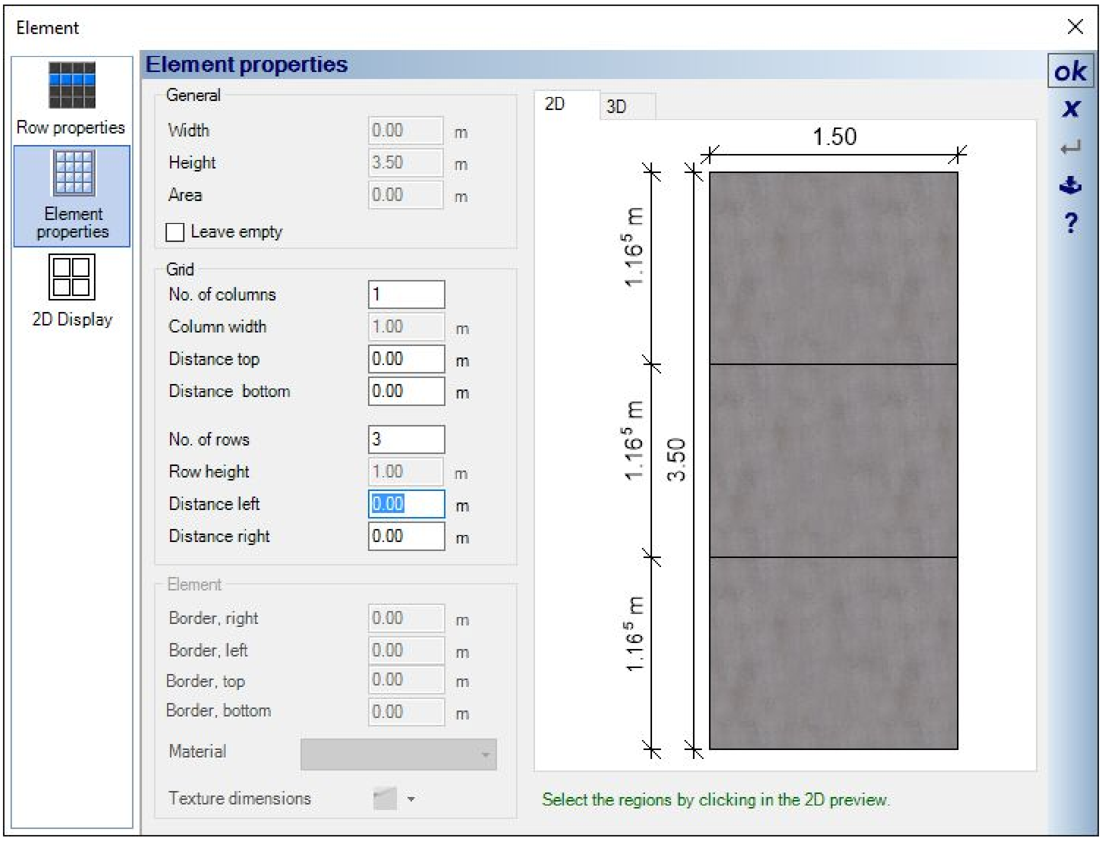
Material

Texture dimensions

Select the regions by clicking in the 2D preview.

19.5.4 3D-Grid Element properties dialog

The Properties dialog shows a sketch, which serves as a preview and for editing. The 3D elements can be subdivided in the "Grid" group in up to 3 x 3 fields. If devided into 3 rows the element changes as follows.



Element properties

General
Width 0.00 m
Height 3.50 m
Area 0.00 m
☐ Leave empty

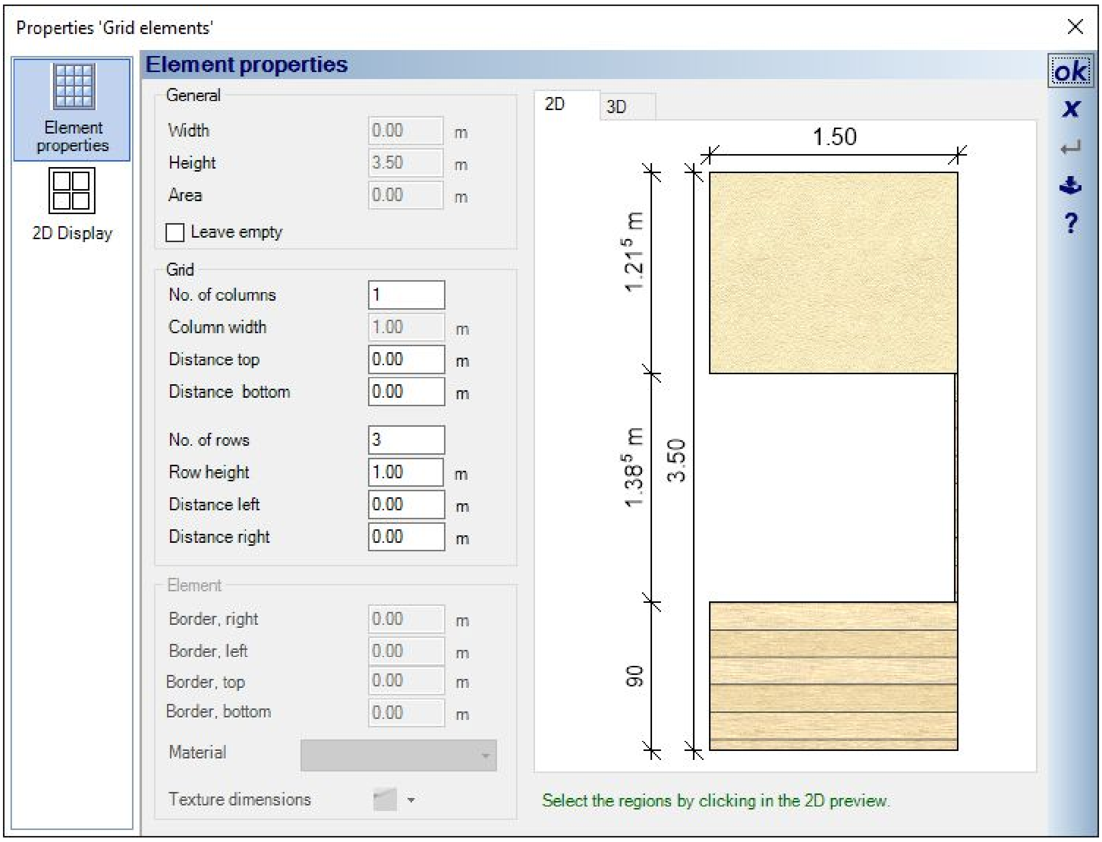
Grid
No. of columns 1
Column width 1.00 m
Distance top 0.00 m
Distance bottom 0.00 m

No. of rows 3
Row height 1.00 m
Distance left 0.00 m
Distance right 0.00 m

Element
Border, right 0.00 m
Border, left 0.00 m
Border, top 0.00 m
Border, bottom 0.00 m
Material
Texture dimensions

Select the regions by clicking in the 2D preview.

For further editing, you can select a single field in the sketch and modify its properties, for example, a floor-high element the lower row with the sill height of a window, the middle with the window height, etc .. Each sub-element may take its own material.



Element properties

General

Width	0.00	m
Height	3.50	m
Area	0.00	m

☐ Leave empty

Grid

No. of columns	1	
Column width	1.00	m
Distance top	0.00	m
Distance bottom	0.00	m
No. of rows	3	
Row height	1.00	m
Distance left	0.00	m
Distance right	0.00	m

Element

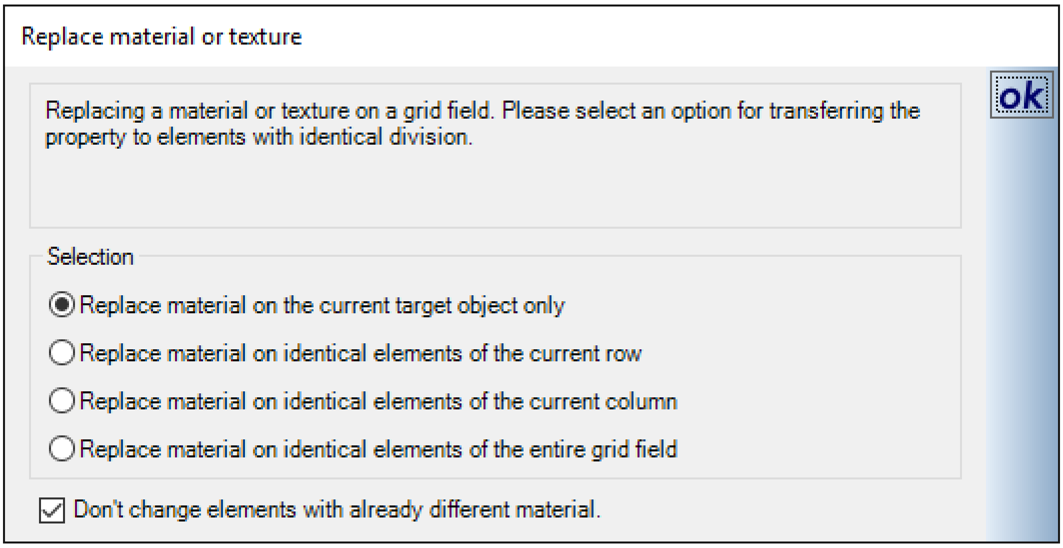
Border, right	0.00	m
Border, left	0.00	m
Border, top	0.00	m
Border, bottom	0.00	m
Material		
Texture dimensions		

Select the regions by clicking in the 2D preview.

19.5.5 Edit materials on 3D-Grid fields

To modify materials and textures on 3D grids, a separate mechanism was created, which allows you to implement the project more effectively than with the material selector of the dialog.

Instead, you use the catalogue with textures and materials in the usual way, by selecting a material and drag and drop onto the 3D grid. The software identifies accurate, at which point you drop the new material and the following dialog appears.



Replace material or texture

Replacing a material or texture on a grid field. Please select an option for transferring the property to elements with identical division.

Selection

● Replace material on the current target object only
○ Replace material on identical elements of the current row
○ Replace material on identical elements of the current column
○ Replace material on identical elements of the entire grid field

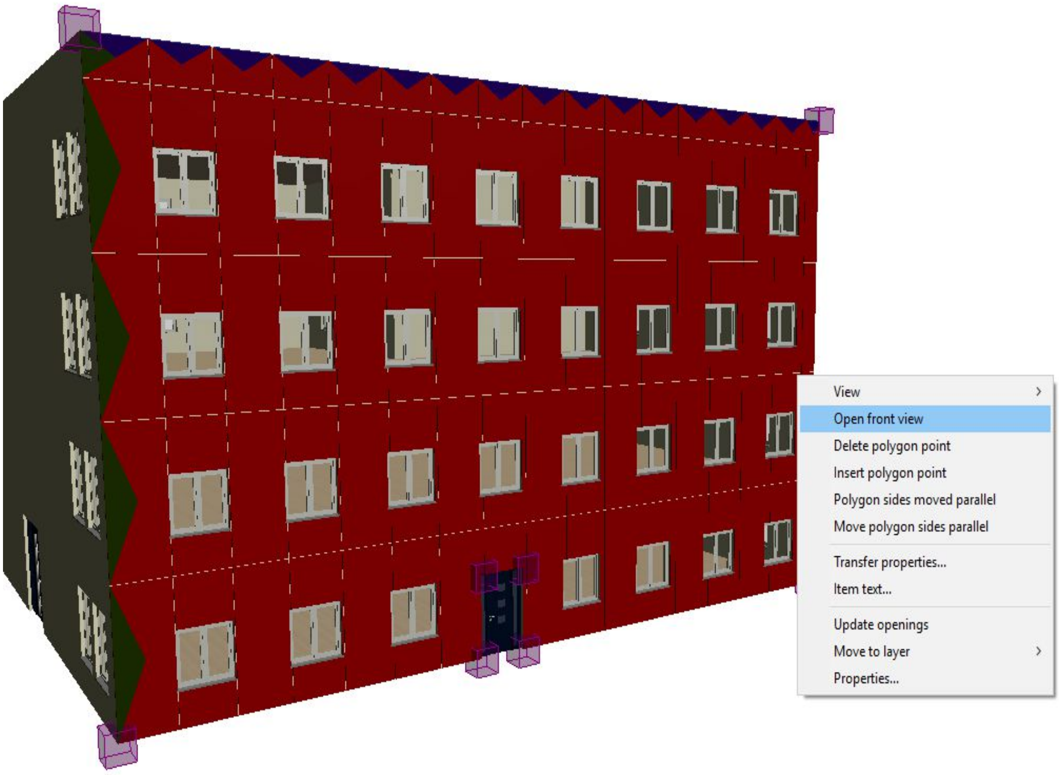
☑ Don't change elements with already different material.

Here you can specify whether the material should only be used for the current target element, or instead for the current row in which the item is located, the column or the whole field.
The same mechanism is also used if you transfer a material with functions of the 3D toolbar.

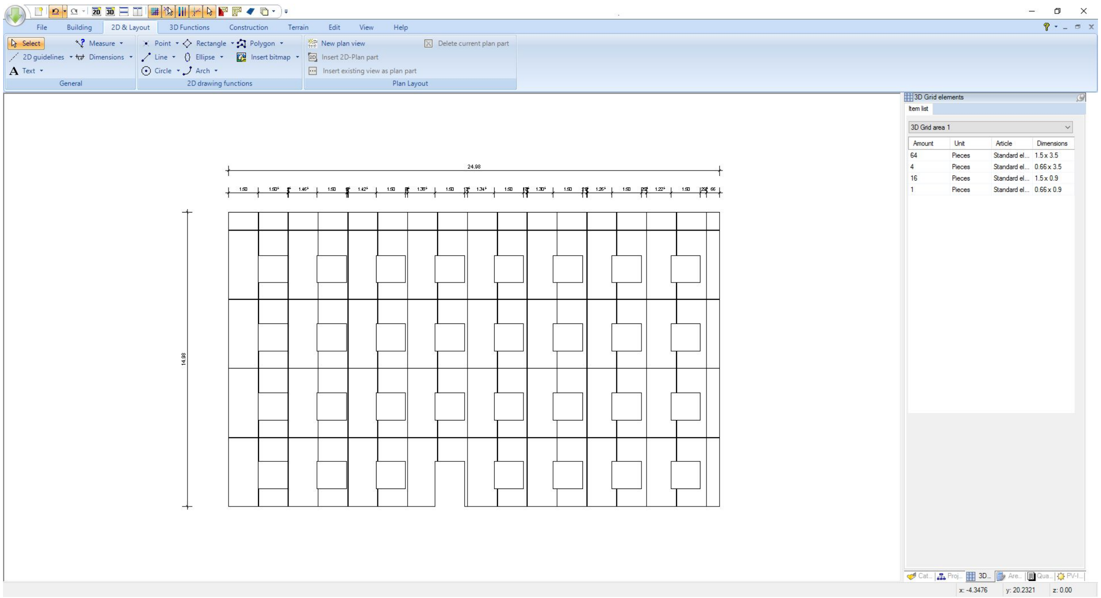
19.5.6 2D-Front views of 3D Grid fields

Note: this feature is not included in all products. If necessary, ask your dealer.

In addition to the 3D representation of the elements it may be necessary to create a 2D drawing with dimensions, comments, etc., which can also serve as a template for the assembly.
With only one click you can create a special 2D view that only includes the 3D elements of the grid. To do this, select the 3D grid field and choose "Open front view" from the context menu.



It automatically generates the mentioned 2D view and presents the elements. Further editing with dimensions, texts, etc. is performed with the standard functions, such as in sectional views also.



3D Grid elements

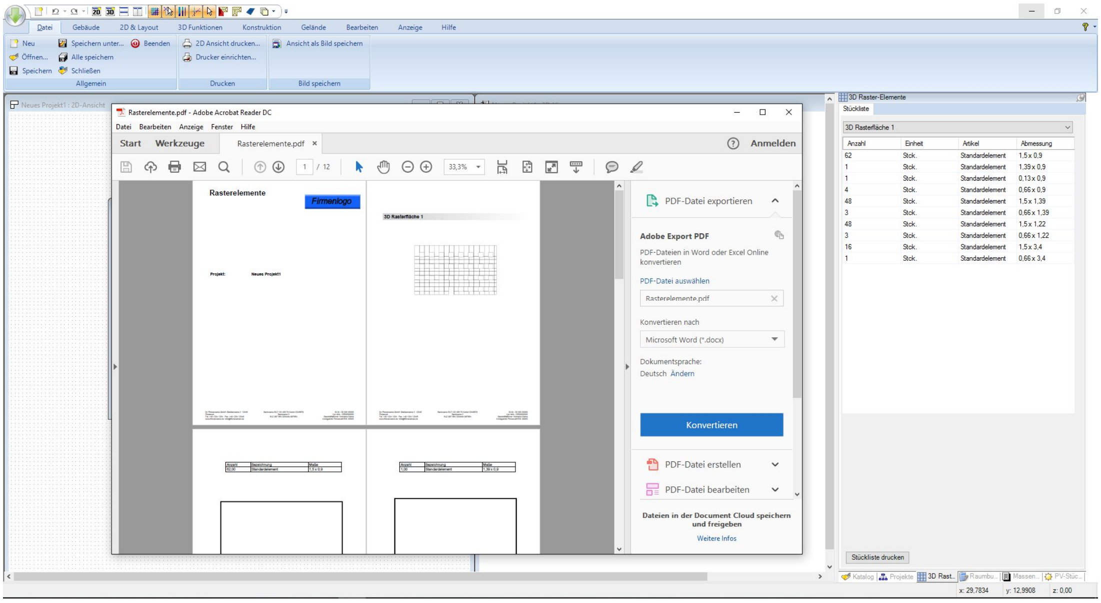
Item list

3D Grid area 1

Amount	Unit	Article	Dimensions
64	Pieces	Standard el...	1.5 x 3.5
4	Pieces	Standard el...	0.66 x 3.5
16	Pieces	Standard el...	1.5 x 0.9
1	Pieces	Standard el...	0.66 x 0.9

19.5.7 Item lists of 3D-Grid elements, Export PDF-files,…

On the right side of the software, see a list of the 3D grid elements in the project, and the possibility, along with sketches of the grid and each individual element to export the item list as PDF, RTF or Excel file. Elements of identical dimensions are summarized.



Adobe Export PDF

PDF-Dateien in Word oder Excel Online konvertieren

PDF-Datei auswählen: Rasterelemente.pdf

Konvertieren nach: Microsoft Word (*.docx)

Dokumentsprache: Deutsch Ändern

Dateien in der Document Cloud speichern und freigeben

3D Rasterfläche 1

Anzahl	Einheit	Artikel	Abmessung
62	Stck.	Standardelement	1,5 x 0,9
1	Stck.	Standardelement	1,39 x 0,9
1	Stck.	Standardelement	0,13 x 0,9
4	Stck.	Standardelement	0,66 x 0,9
48	Stck.	Standardelement	1,5 x 1,39
3	Stck.	Standardelement	0,66 x 1,39
48	Stck.	Standardelement	1,5 x 1,22
3	Stck.	Standardelement	0,66 x 1,22
16	Stck.	Standardelement	1,5 x 3,4
1	Stck.	Standardelement	0,66 x 3,4

20 3D CONSTRUCTIONS

One of the most important and versatile features available is free-form 3D modelling, which is included in the premium versions of the software. 3D modelling not only offers you the possibility to construct your own 3D objects for the catalog, but also increases the construction capabilities of the software over and above those provided by the predefined building components already described.

3D constructions can be created by combining 3D elements, known as solids, of which there are four different types.

- Primitives: Basic predefined solids e.g. cube, cylinder, pyramid.
- Extrusion solids: Created from a closed 2D contour for which a height is specified.
- Rotation solids: Created from a closed 2D contour which is rotated about a specified axis.
- Sweep solids: Created from a closed 2D contour which follows a defined path.

Once solids have been created in this way they can be edited with further functions such as merge and union, or using Boolean operations, to form new 3D constructions.

3D constructions can then be selected and saved as 3D objects in the catalog over the ‘Output>3D formats>3D object’ menu, can remain unchanged in the project and be saved with the project, or can be saved as individual entities in a special catalog. Which procedure is most suitable for a particular application, together with the basic functions and several obvious applications, is described with the aid of examples in the following sections.

In addition to this manual we provide training videos on our web site under ‘Support’ to further demonstrate certain topics and input techniques, and also there, we are glad to answer any user questions.

20.1 SOME EXAMPLES FOR THE USE OF 3D CONSTRUCTIONS

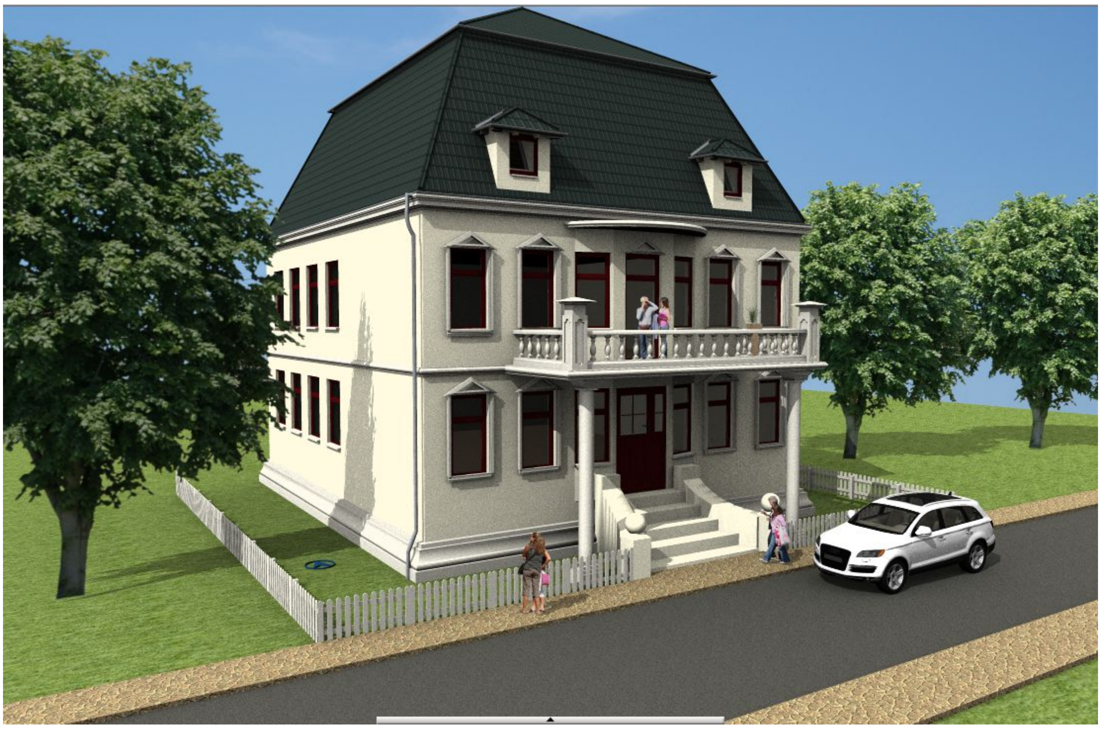
As already mentioned, applications for the use of 3D constructions are almost unlimited. Obvious examples, apart from creating 3D objects for the catalog, are construction and decorative elements on or around a building, such as:

- Carports
- Patio roofs
- Drainpipes
- Steel girders
- Balconies
- Moldings

- Baseboards
- Half-timbering
- Roads
- Fences
- ...

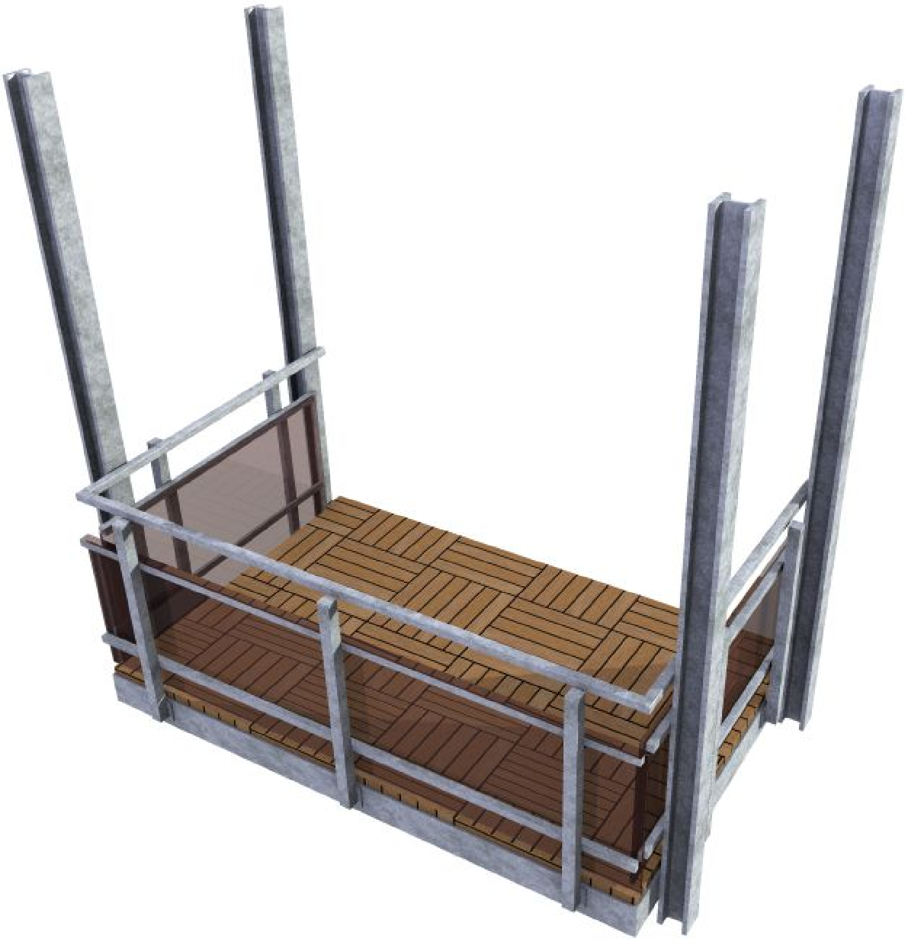
The following illustrations show a building with and without 3D constructions or 3D objects created from 3D constructions, with the exception of the car, people and trees, which come from the catalog.

The example with 3D constructions:

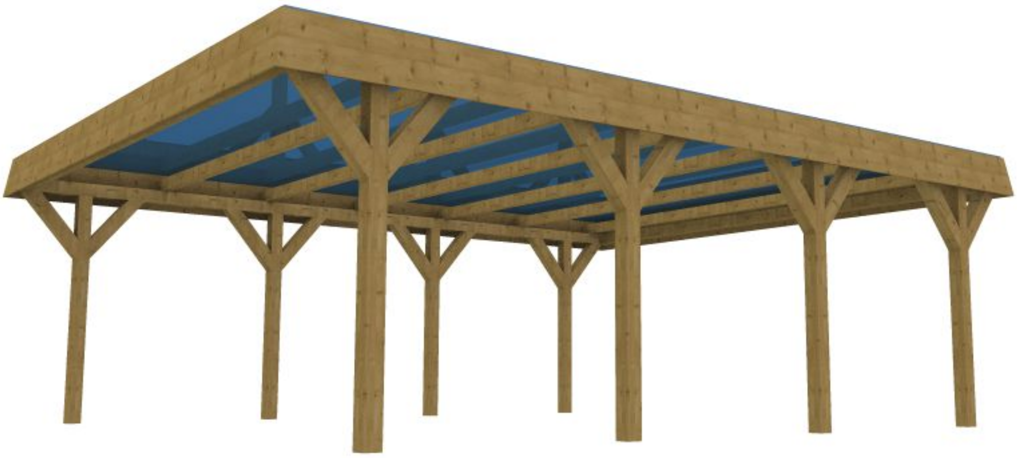


In this project the following types of solids were used:
Sweep solids: For the window, cornice and foundation moldings, the road and pavements, the drainpipes, the balustrade parapet and the balustrade footing.
Rotation solids: For the balusters.
Extrusion solids: For the stoop, the canopy, parts of the fence and on various balcony elements.
Primatives: Cubes for the balustrade pillars, spheres for the steps, cylinders for the columns ....
The same project without 3D constructions:

An exterior balcony with sweep solids for the steel supports, the handrail and the sides of the platform. The remainder is made up of cubes.



Example of a carport: From cubes and a sweep solid for the fascia board.

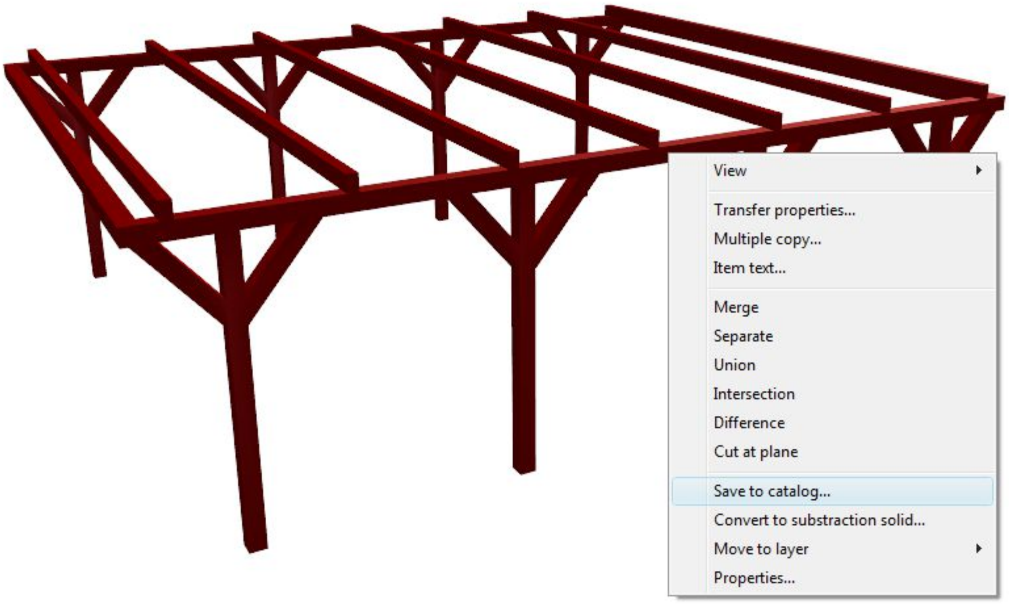


Rose arch: Cubes for the trellis and extrusion solids for the timber structure.

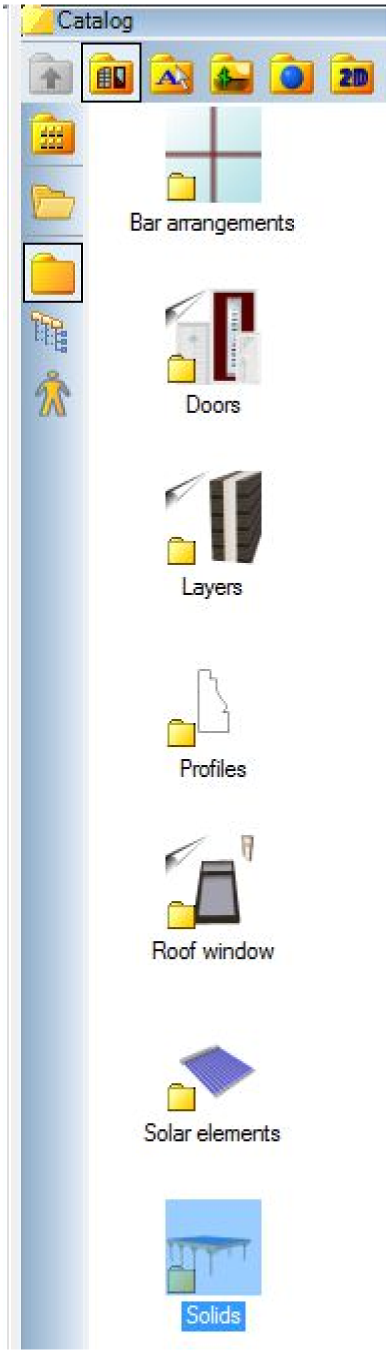
Various planters created from rotation solids:

20.2 Saving 3D Constructions / Catalog

When a 3D construction is selected it can be saved in the catalog over the context menu opened with a right mouse click.

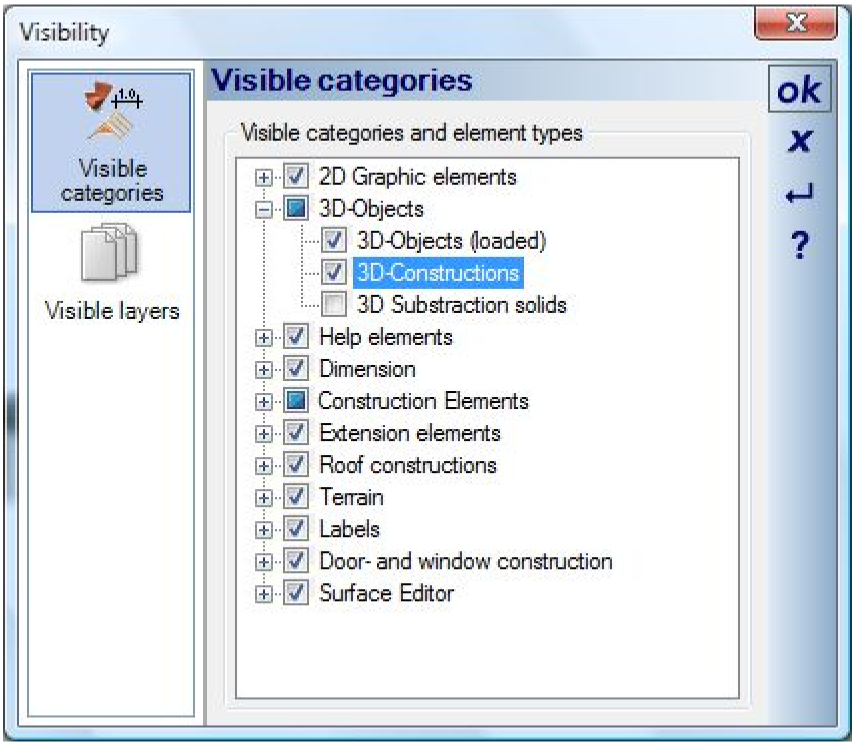


All 3D constructions, including those provided with the software and the examples shown previously, are saved in the construction elements catalog (directory \AEC\Solids). If required, you can create in the normal way your own sub-directories to save new 3D constructions. The files of 3D constructions have their own file format *.solids. The directory in the catalog is called ‘Solids’, as is the folder in the preview. As with 3D objects, 3D constructions can be easily inserted and positioned when planning using drag and drop



20.2.1 Visibility of 3D Constructions and Subtraction Solids

Both elements can be set as visible or invisible under ‘3D Objects’ in the visibilities dialog.

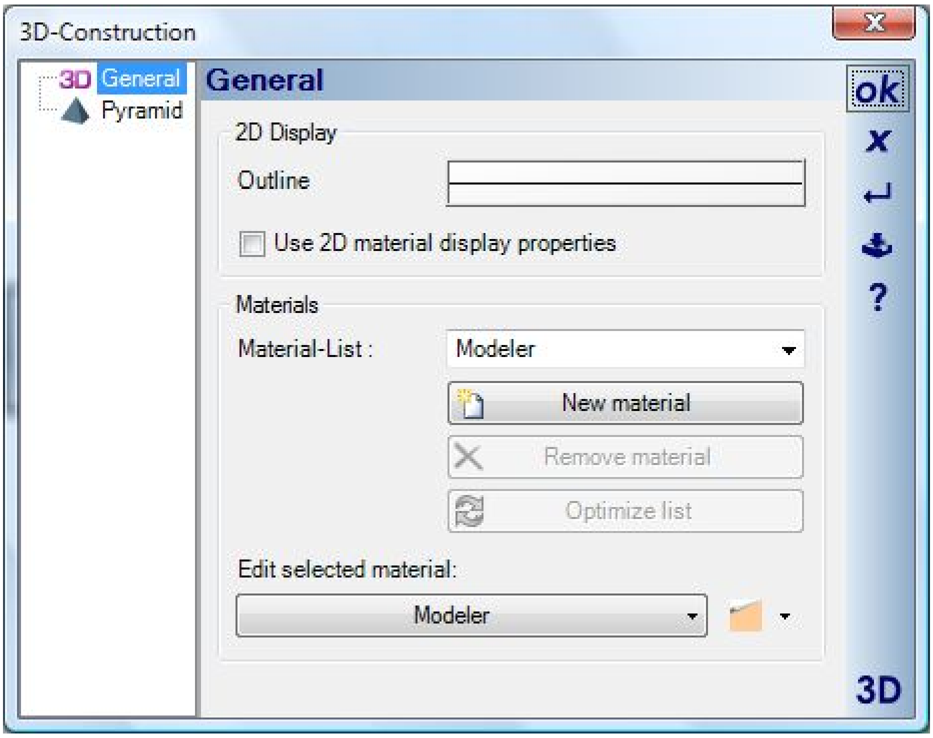


Visible categories and element types

- ☑ 2D Graphic elements
- ▣ 3D-Objects
  - ☑ 3D-Objects (loaded)
  - ☑ 3D-Constructions
  - ☐ 3D Substraction solids
- ☑ Help elements
- ☑ Dimension
- ▣ Construction Elements
- ☑ Extension elements
- ☑ Roof constructions
- ☑ Terrain
- ☑ Labels
- ☑ Door- and window construction
- ☑ Surface Editor

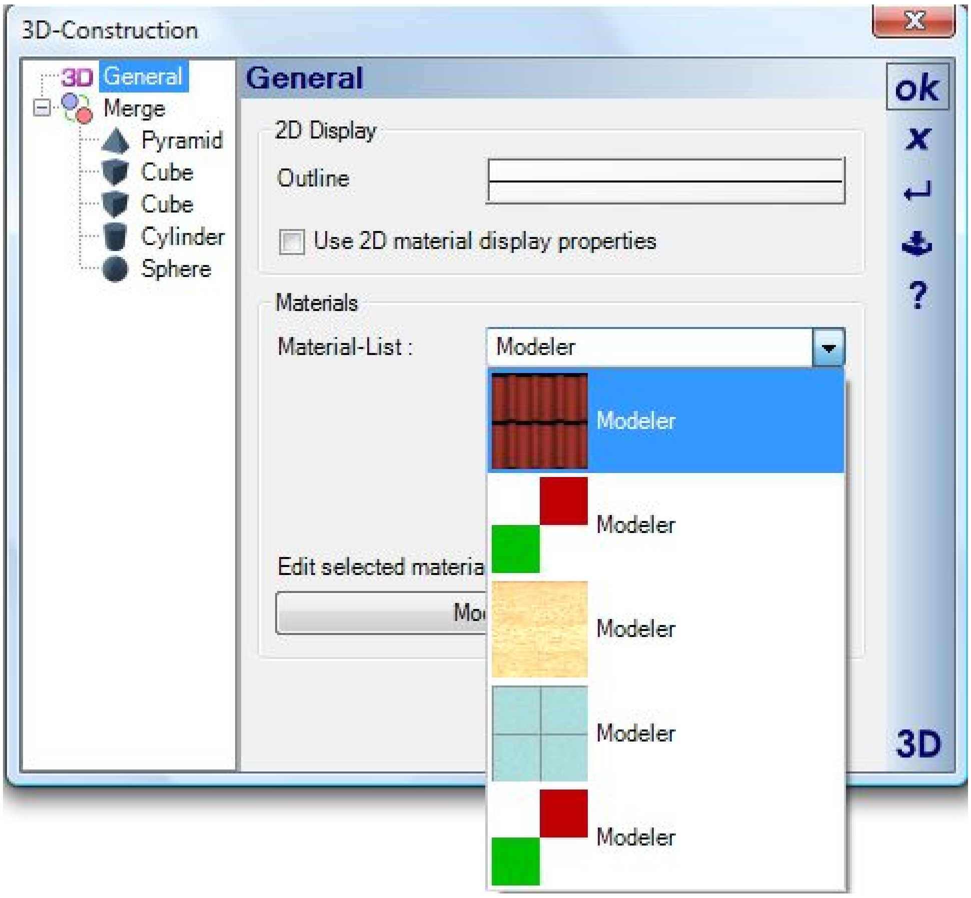
20.2.2 2D Representation of 3D Constructions

As with most other construction elements, 3D constructions use materials which determine both their 3D and 2D representation. Here however, the 2D representation is deactivated by default, since the normal filled or hatched representation would interfere with modeling. If required, the 2D representation can be activated in the dialog by ticking ‘Use 2D material display properties’.



20.2.3 Materials of 3D Constructions

Each component of a 3D construction uses basically its own material. Even if a visualization material from the catalog is applied to a 3D construction using drag and drop, internally a new material is created. If 3D constructions are merged or are the result of Boolean operations, the materials for the complete structure are listed. This list is shown in the dialog with a preview of the materials.



☐ Use 2D material display properties

Material-List : Modeler

As already mentioned, new materials result from the use of drag and drop, but can also be created directly by clicking on the ‘New material’ button in the dialog. The name of the material can be changed if required in the materials dialog, activated by clicking on the ‘Edit selected material’ button. A name can then be allocated to the material to enable it to be more easily identified in the dialog.

An option is also provided to optimize the material list. With this option all identical materials are combined as one. This means, however, that if the material is altered the changes apply to all elements which use this material, which may well be the intention.

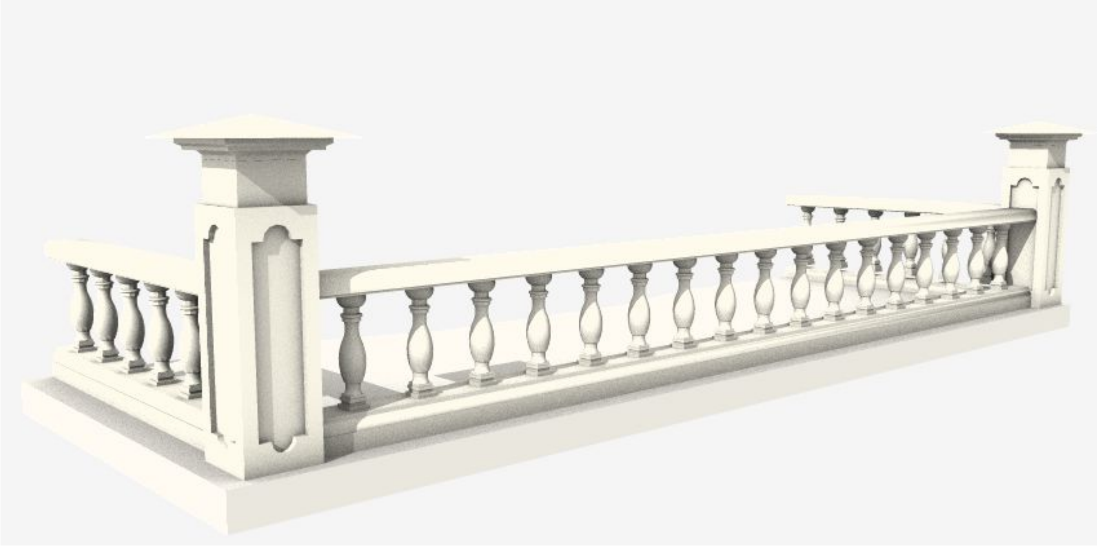
An example: A 3D construction includes four steel supports on to each of which a steel material from the catalog has been added individually via drag and drop. As a result four separate materials are created in the list. This means that for future changes a new material has to be dragged onto each of the four supports. If the list is optimized these materials are combined as one, which is then common to all four supports. If a new material is subsequently dragged onto one of the supports, then the same material is automatically applied to all the other supports.

20.2.4 What to use - 3D Objects or 3D Constructions?

In many cases it is advisable to save user-created 3D constructions as 3D objects and simply use them in the same way as other 3D objects. Reasons for this could be:

- Better performance
- Easier positioning and scaling

An example: We want to create a balcony with a balustrade. The balusters are modeled using the functions available for rotation solids.



All 3D constructions included in the project are always completely reconstructed and recalculated when the project is loaded or changes are made to them, whereas a finished 3D object is simply loaded and displayed. The processing of the rotation solids in this example would, depending on the system, take about 10 seconds each time. On the other hand, loading the balcony from the catalog as a complete 3D object only takes about 1 second.

It is therefore recommended that the balcony be constructed with the following steps:

1. Input the platform as a cube or extrusion solid.
2. Create a baluster as a rotation solid.
3. Save the baluster as a solid, in case it needs to be changed at a later point in time.
4. Save the baluster as a 3D object in the catalog.
5. Input the balustrade footing as a sweep solid.
6. Position a baluster as a 3D object. Use the multiple copy function to create further balusters.
7. Input the parapet as a sweep solid.
8. The balustrade pillars should also be created as solids, and saved and inserted as 3D objects.
9. Now select all the components in a 2D plan view with the mouse using a rectangle.

10. Save the complete balcony in the catalog over the ‘Output>3D formats>3D object’ menu.
11. Since we have a mixture of 3D objects and 3D constructions it is not possible to save the balcony in its entirety as a 3D construction in the catalog. Therefore, the project file should also be saved for later changes.

20.3 PERFORMANCE, RESOLUTION, NUMBER OF SURFACES

With various rounded solids such as spheres and cylinders, and also with rotation solids, it can easily happen that 3D objects with a large number of surfaces are created which are not totally necessary, and which only serve to put an unnecessary load on the system or make the task more difficult later. Therefore, it is advisable at the start to check the number of surfaces of a 3D construction from time to time and to adjust certain parameters, such as the number of segments for spheres and cylinders, or the number of curved segments in the contour of a rotation solid, to meet the actual requirements.

The model of a baluster is created from two cylinders with a diameter of 2 cm and a sphere with a diameter of 4cm. If a sphere with the standard settings of 16 x 16 segments and two cylinders each with 16 segments are used, then the baluster as a 3D object has in total the following surfaces:

2 x 60 surfaces for the two cylinders
480 surfaces for the sphere
Total: 600 surfaces per baluster.

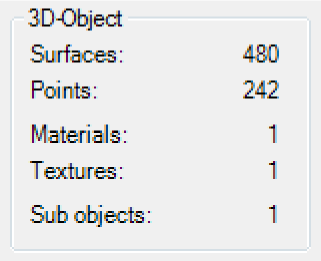
If 30 balusters are used for the banister, then alone this part of the banister has 18,000 surfaces. Surfaces that are not only represented in 3D, but which also have to be calculated for a alternative 2D representation in plan views and 2D representation in cross-sections.

If the setting for the cylinders is changed to 6 segments and for the sphere to 8 x 8, then the allocation of surfaces is as follows:

2 x 20 surfaces for the two cylinders
112 surfaces for the sphere
Total: 152 surfaces per baluster.

That means 4,560 surfaces for 30 balusters, i.e. 13,440 less surfaces. With the small diameters involved the difference would be hardly noticeable anyway, as long as a close-up view of the banister is not calculated.

For each 3D object the number of surfaces is shown in its properties dialog.



3D-Object
Surfaces: 480
Points: 242
Materials: 1
Textures: 1
Sub objects: 1

Therefore, depending on the model, always check the number of surfaces, and only create those surfaces that are necessary for the particular application.

20.4 2D CONTOURS AND PROFILES, THE BASIS FOR ROTATION, SWEEP AND EXTRUSION SOLIDS

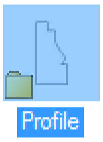
To allow for 3D constructions various enhancements were made to the functions of the 2D graphic plug-in. The most significant enhancements are:

- Adjustable segmentation for spheres, ellipses and arcs.
- Automatic generation of contours, i.e. the formation of closed polygons from lines, polylines and arcs.
- Splitting polygons into line segments.
- Accurate scaling of polygons, 2D symbols and images.

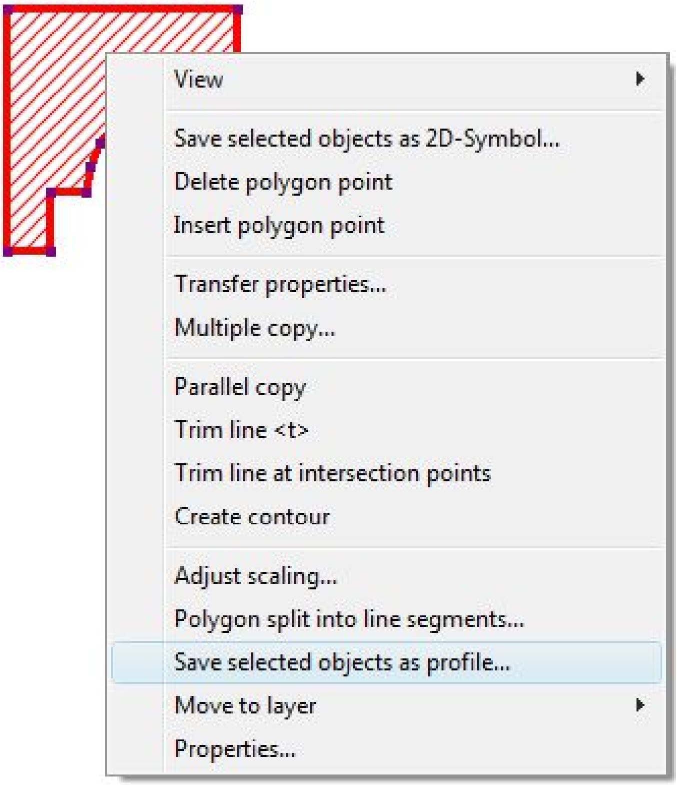
Any contour can be created with the aid of these functions, and from it a solid for use in modeling.

20.4.1 Saving Contours and Profiles

All closed polygons / contours, including the examples provided, are saved in the in the construction elements catalog (directory \AEC\Profiles). If required, you can create in the normal way your own sub-directories to save these files. The files have their own file format *.profile. The directory in the catalog is called ‘Profiles’, as is the folder in the preview. These files can be accessed in the dialog of sweep solids, or be simply inserted and positioned when planning using drag and drop. Profiles are then inserted as 2D polygons and are immediately available for creating extrusion or rotation solids.

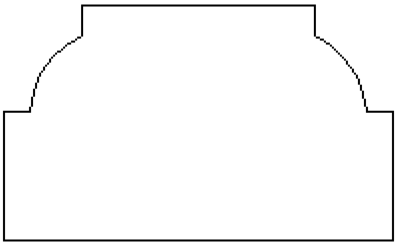


When a user-created contour or closed polygon is selected, it can be saved as a profile in the catalog over the context menu opened with a right mouse click.

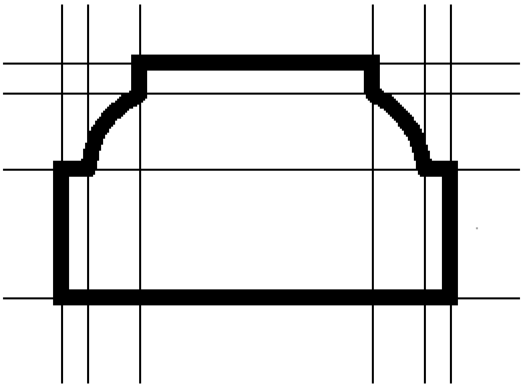


20.4.2 Inputting Contours, Creating Contours

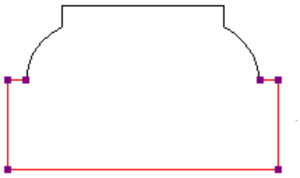
Contours are either created automatically as the result of inputting a closed polygon, or they can be generated from elements such as lines, polylines and arcs using the 'Create contour' function. A requirement for this is that the contour possesses successive endpoints and can be eventually closed.
An example:
We require the following profile for a balustrade footing.

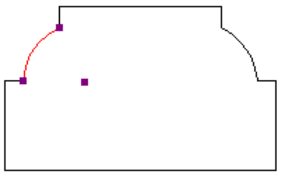


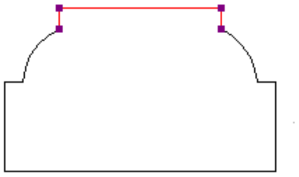
If necessary, we can create a construction aid with guidelines to enable accurate input and ensure correct proportions.



The subsequent profile consists of two polylines and two arcs (input using 3 points), whereby the ends of the polylines meet the end points of the respective arcs.

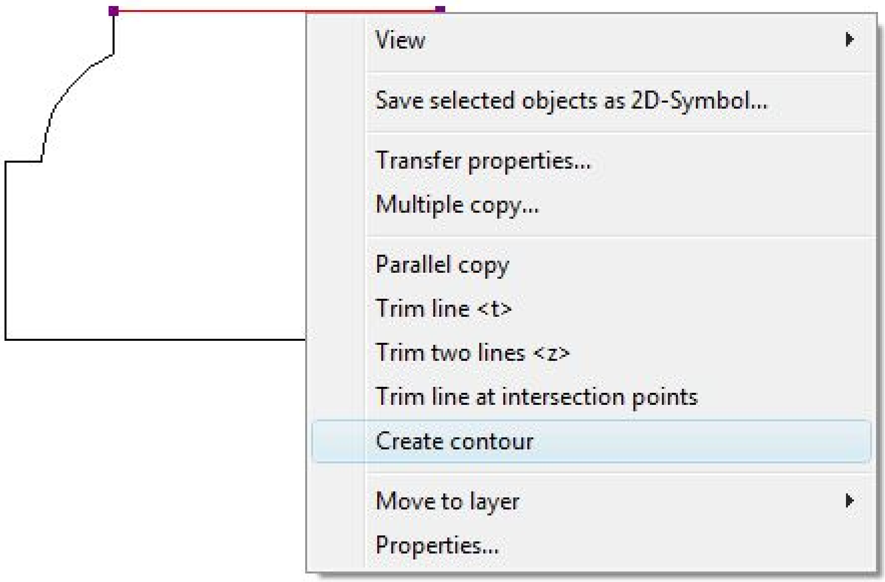




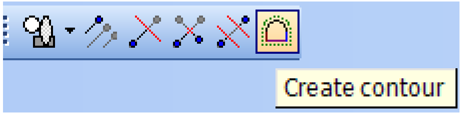


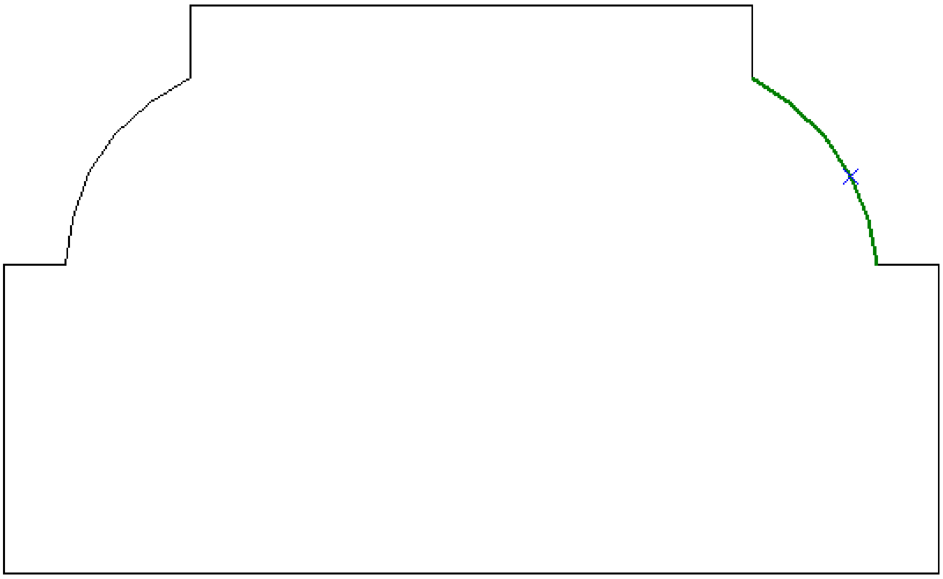
Once input has been completed the contour is created over the ‘Edit 2D Graphics’ toolbar or over the context menu, activated with a right mouse-click, when one of the 2D elements is selected.

Context menu:

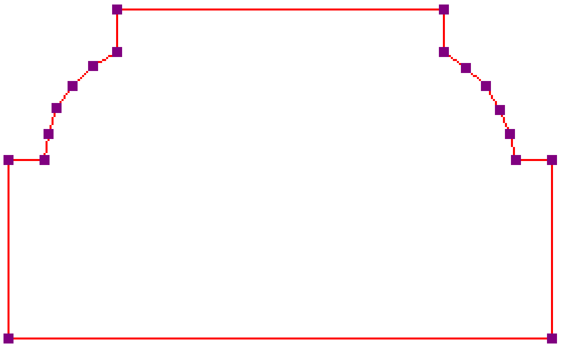


Toolbar: In this case an element does not have to be selected. Once the tool has been activated, the contour is created by positioning the mouse cursor over an element of the contour, which is then highlighted. A left mouse-click now starts creation of the contour.





If a valid contour is present it is automatically converted to a closed polygon and can be saved as a profile or used directly to create rotation or extrusion solids.

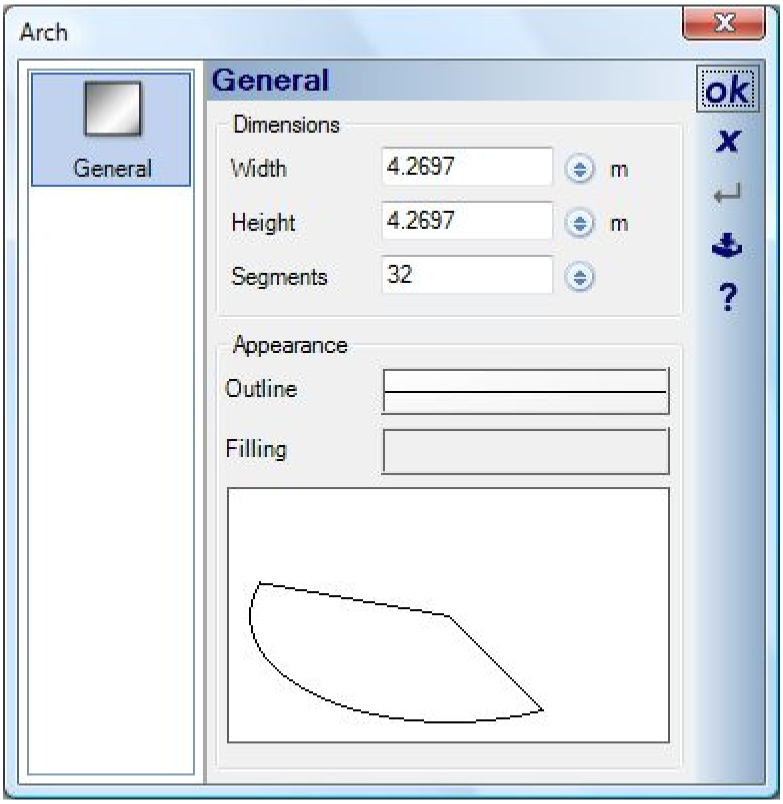


Tip: A contour is generated even if the contour is not closed. In this way paths for sweep solids can be created. However, non-closed contours cannot be saved as profiles.

20.4.3 Performance, Number of Segments in Contours and Profiles

When arcs, circles or ellipses are being used, their segmentation should be adjusted to suit requirements before they are input, see also the chapter ‘Performance, Resolution, Number of Surfaces’. For instance, the number of segments of an arc has

the same effect on performance as the number of surfaces. In the previous example the number of segments was set to 5, which is perfectly adequate for the application described. Were an extrusion solid to be created from this contour, it would have 68 surfaces. If the arc had 32 segments the number of surfaces would be 248.
The number of segments can be changed at any time in 2D elements properties dialogs.

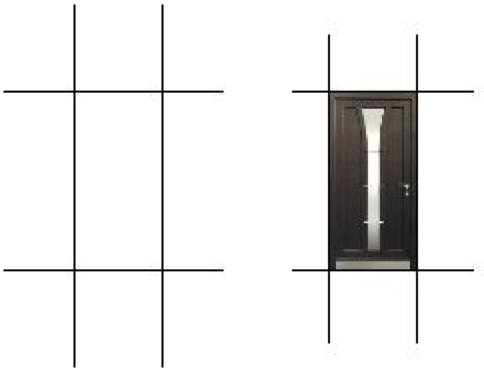


Width 4.2697 m
Height 4.2697 m
Segments 32

20.4.4 *Using Images as a Basis for Modeling*

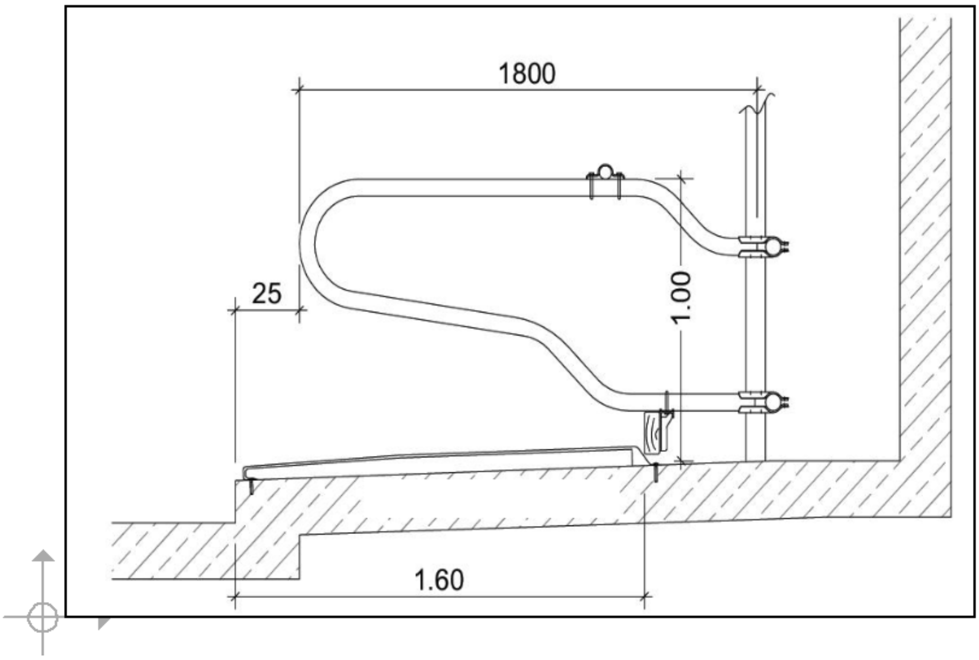
It can often be helpful to use photos or sketches of the model to be created, as a basis for modeling. Here an example based on a door:

- Create with guidelines in a sectional view a rectangle with the required dimensions e.g. 2.0 m x 1.0 m.
- Create a new layer and insert in this layer, in the rectangle created, an image of the door using the ‘Insert image’ function of the 2D Graphics plug-in.

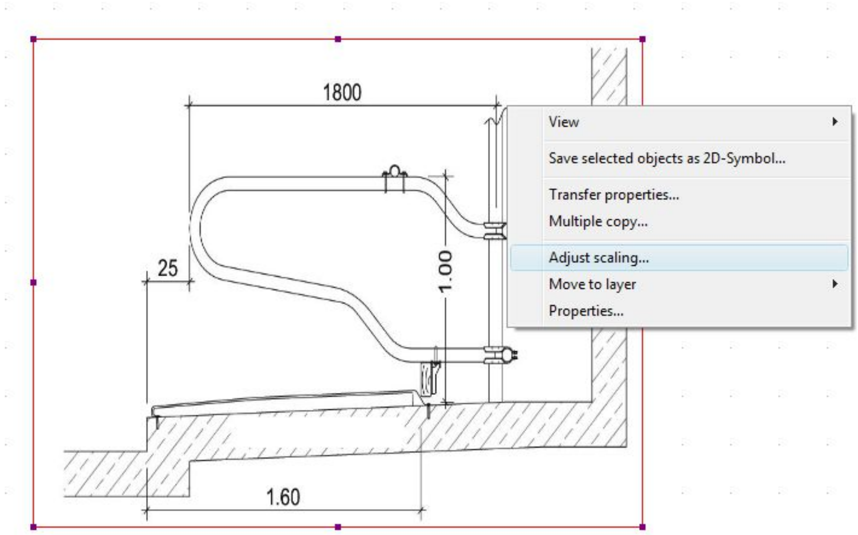


- Return to the layer in which the 3D construction is to be created. Allocating a separate layer for the ‘Background’ has the advantage that the image can be quickly switched on and off over the layer, and that the image cannot be selected by mistake when planning.
- Depending on the door filling, the 3D solid can now be input directly over the image, or appropriate contours can be inserted beforehand using further guidelines or 2D elements.

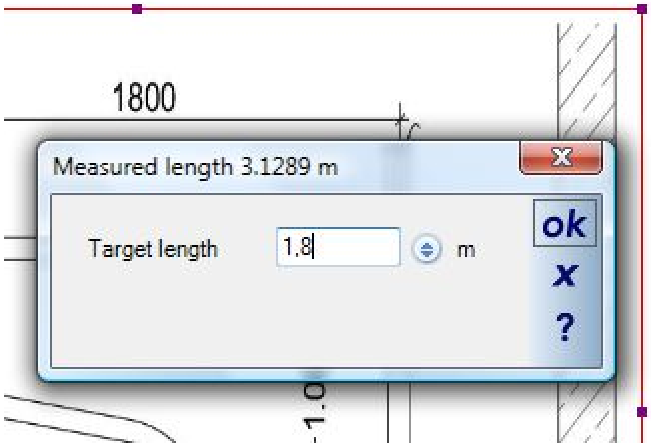
Alternatively, an image can be inserted without guidelines and then scaled.
The following image is well suited as a basis for creating a 3D gate using sweep solids.



To achieve this, the image must first be scaled to the correct dimensions, as undefined dimensions and incorrect proportions result on insertion. First select the image and then choose the ‘Adjust scaling’ function from the context menu.



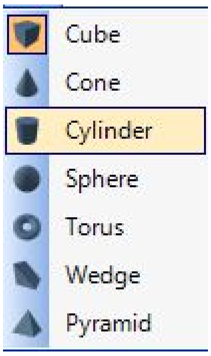
The next step is to enter a dimension from the image as a reference dimension for subsequent scaling. In this case we choose the horizontal value shown as 1800 and define the length with two mouse-clicks on the dimension in the image. Hereby, keep the ‘Ctrl’ key pressed to activate the angle grid and so guarantee an exact horizontal measurement of the length. On the second mouse-click a dialog box appears in which the current measurement is shown and allows input of the value from the drawing, in this case 1.80 m.
A click on ‘OK’ ends the dialog and the image is scaled to the new dimensions. We can now start inserting the sweep solids.


Measured length 3.1289 m

Target length 1,8 m

20.5 PRIMITIVES

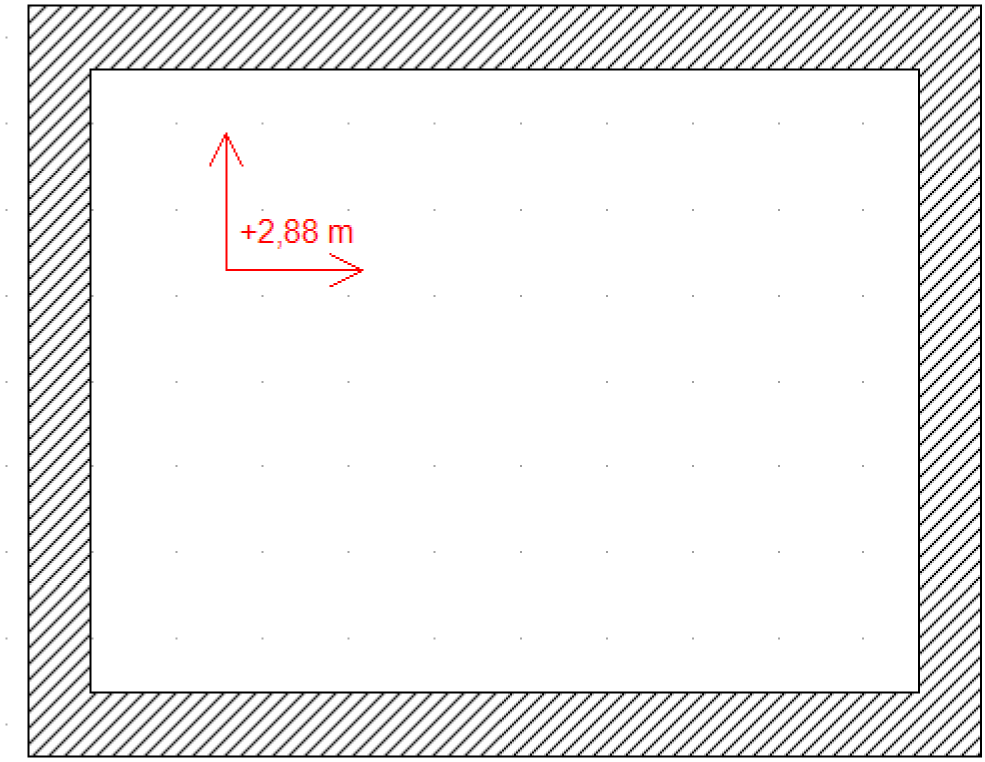
Provided here are various predefined 3D solids, which can be modified over their specific properties. A specific property of a cone, for instance, is its variable radius. Basically, all primitives could also be created as extrusion or rotation solids; providing a predefined selection, however, makes input easier and is common in 3D modelling programs.



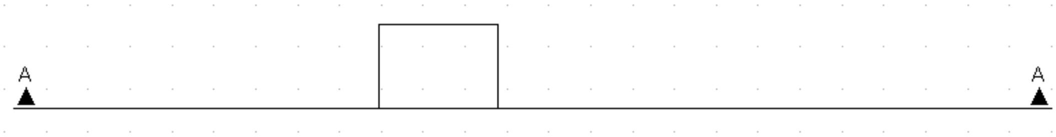
20.5.1 Inputting Primitives

Primitives can be input and freely positioned with the function or by inputting a rectangle which defines the width and depth of the solid. To freely position a solid it is attached to the cursor and can be dropped with a left mouse-click.
The properties of a primitive can be modified before it is inserted, in the dialog activated by a right mouse-click on its button, or over the properties context menu. While a solid is being inserted the reference point to which the cursor is attached can be changed by pressing ‘Ctrl+w’.

Insertion using a rectangle requires that a plane is defined with the first mouse click. This plane can be selected in all views, however the results differ.
In a 2D plan view the cursor shows the currently calculated height before a plane is selected, in this case the floor of an upper storey, the height being 2.8 m (the height of the storey below) plus 8 cm for the floor of the room over which the cursor is positioned, i.e. 2.88 m



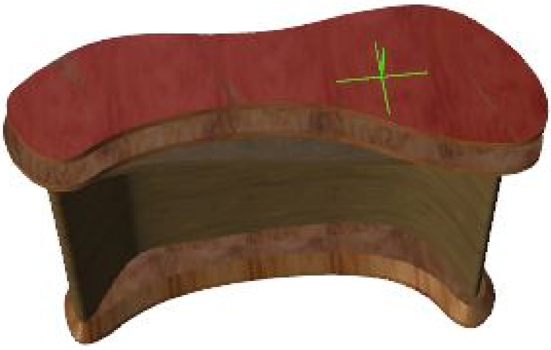
In a cross-section view the plane is located along the line of cut with which the view was created. If a plane is selected in a cross-section view and a solid is inserted, the result is as shown below. As a rule the solid must then be moved to its correct position in a 2D plan view.

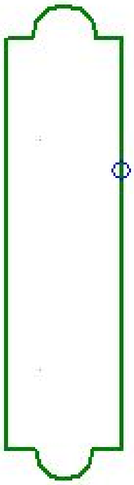


In 3D views the plane is specified by positioning the cursor over a chosen surface. The resultant plane is then highlighted in red in the preview. This method saves further editing, for example, when the plane is the inclined surface of a roof, since the solid does not have to be subsequently positioned or rotated. With all solids, once a plane has been selected, the view can be changed for input. Therefore, the height can be determined in 3D and the solid can be input more accurately in 2D
An example: On the left the selected plane which is highlighted, and on the right a cube inserted in this plane.

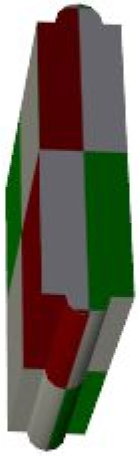
20.6 EXTRUSION SOLIDS

To create an extrusion solid a contour must either be input manually as a closed polygon ,or an existing contour can be used.
Input as a polygon can be performed in any view once a plane has been selected, see also ‘Inputting Primitives’.
To select a contour simply move the cursor over a surface in 3D or over a closed 2D contour, produced, for example, from a profile in the profile catalog.
When a surface or contour is detected, it is highlighted in red in the 3D preview and outlined in green in 2D.



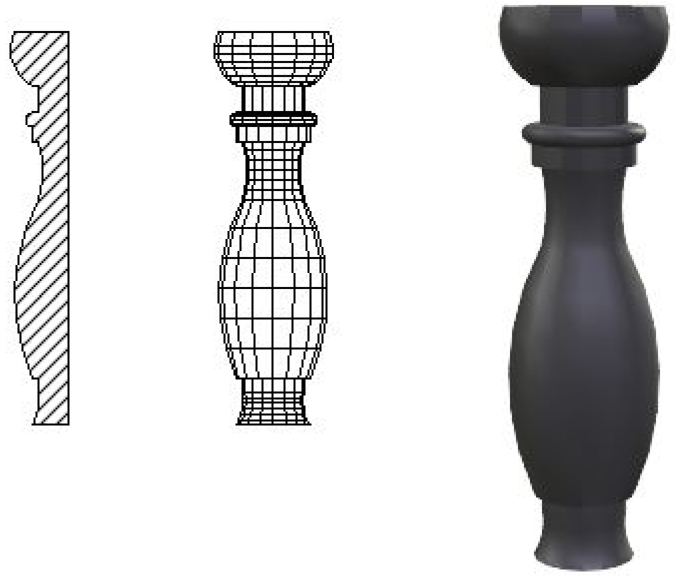


The solid is now created directly with a left mouse-click. The following extrusion solids result for the examples shown.

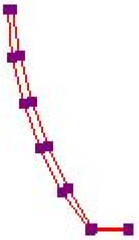


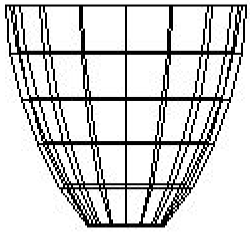
20.7 ROTATION SOLIDS

Rotation solids are created by revolving a 2D contour about a specified axis. Surfaces are generated along the contour to form the solid. This can best be illustrated by a few examples, which all show, from left to right, the 2D contour, the result after rotation in a cross-section view, and the resultant solid.
A baluster:

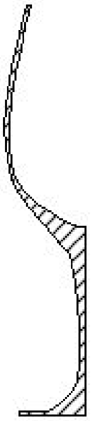


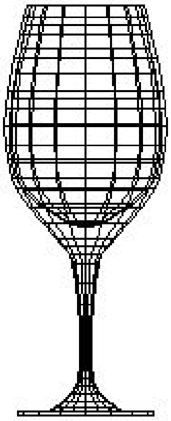
A planter:



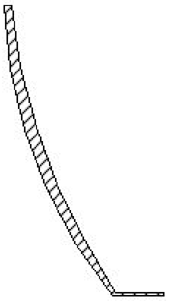


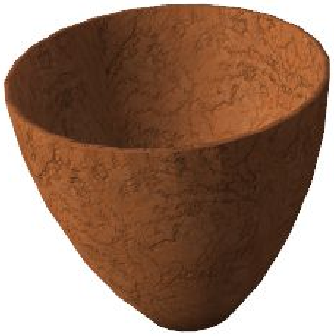
A wine glass:

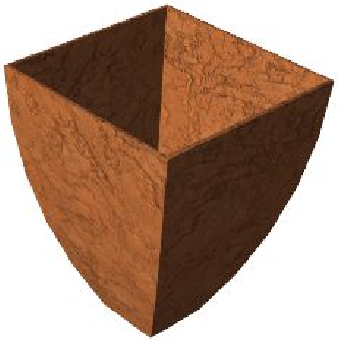




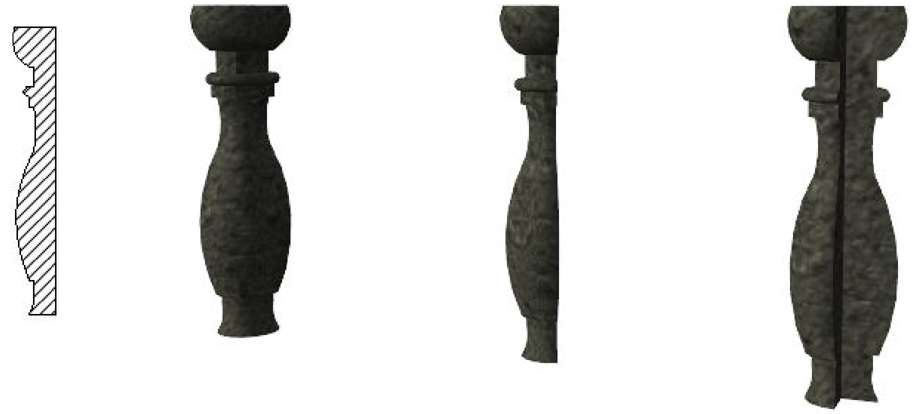
Several different 3D objects can be generated from a single 2D contour by varying the segmentation and the angle of rotation.
Planter: On the left the contour and on the right after rotation with 24 segments and 4 segments respectively.







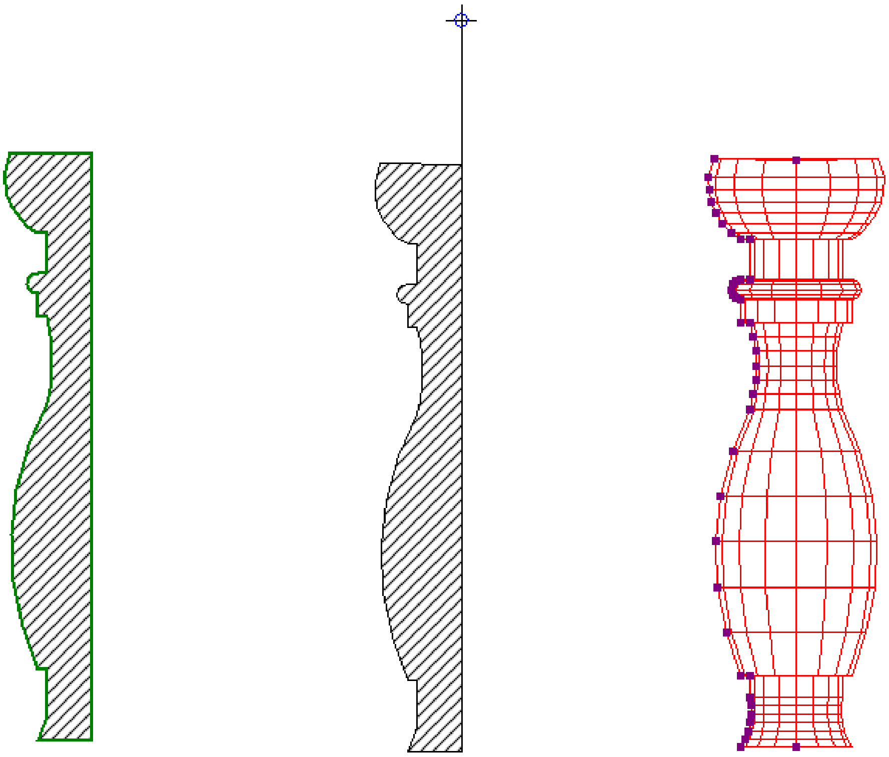
Baluster: On the left the contour and on the right after rotation by 360°, 180° and 270°, respectively.



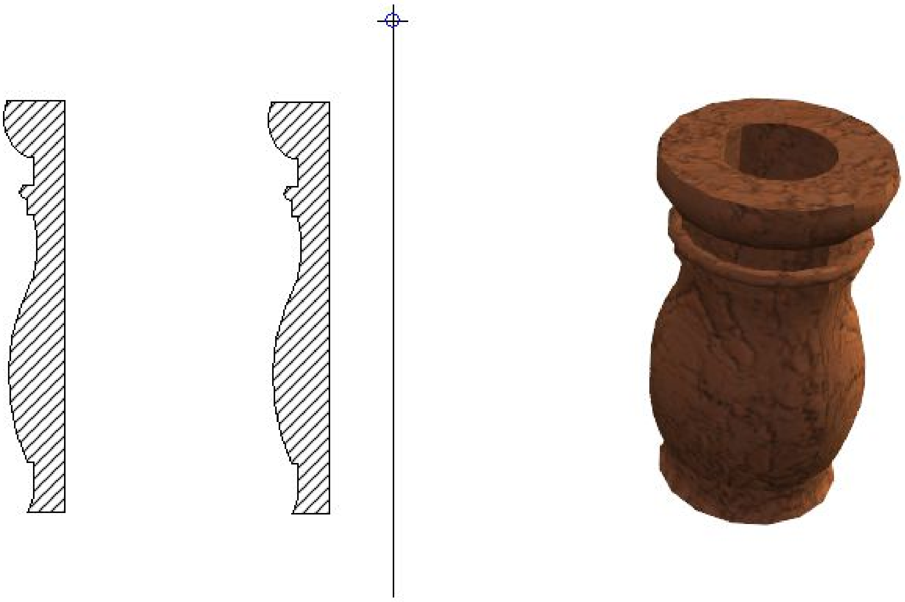
20.7.1 Inputting Rotation Solids

Two steps are required to input a rotation solid. First position the mouse cursor over a closed contour. When a contour is detected it is outlined in green. The contour is selected with left mouse-click. Now the rotation axis has to be input. In the example shown the contour was entered in a cross-section view. The first point of the rotation axis is defined with a click on the bottom right corner of the contour Then the cursor is moved vertically upwards keeping the ‘Ctrl’ key pressed to activate the angle grid, to ensure that the axis is drawn accurately. The length of the axis, however, is not important. The axis is completed with a second mouse-click and the rotation solid is immediately calculated and created.
Here the process showing the individual steps from left to right:

- Select the contour.
- Input the rotation axis, the first, lower point has already been input.



If the rotation axis is not entered directly along the contour but instead at a distance from it, the result is a solid with, in this case, a cylindrical opening in the middle.



20.8 SWEEP SOLIDS

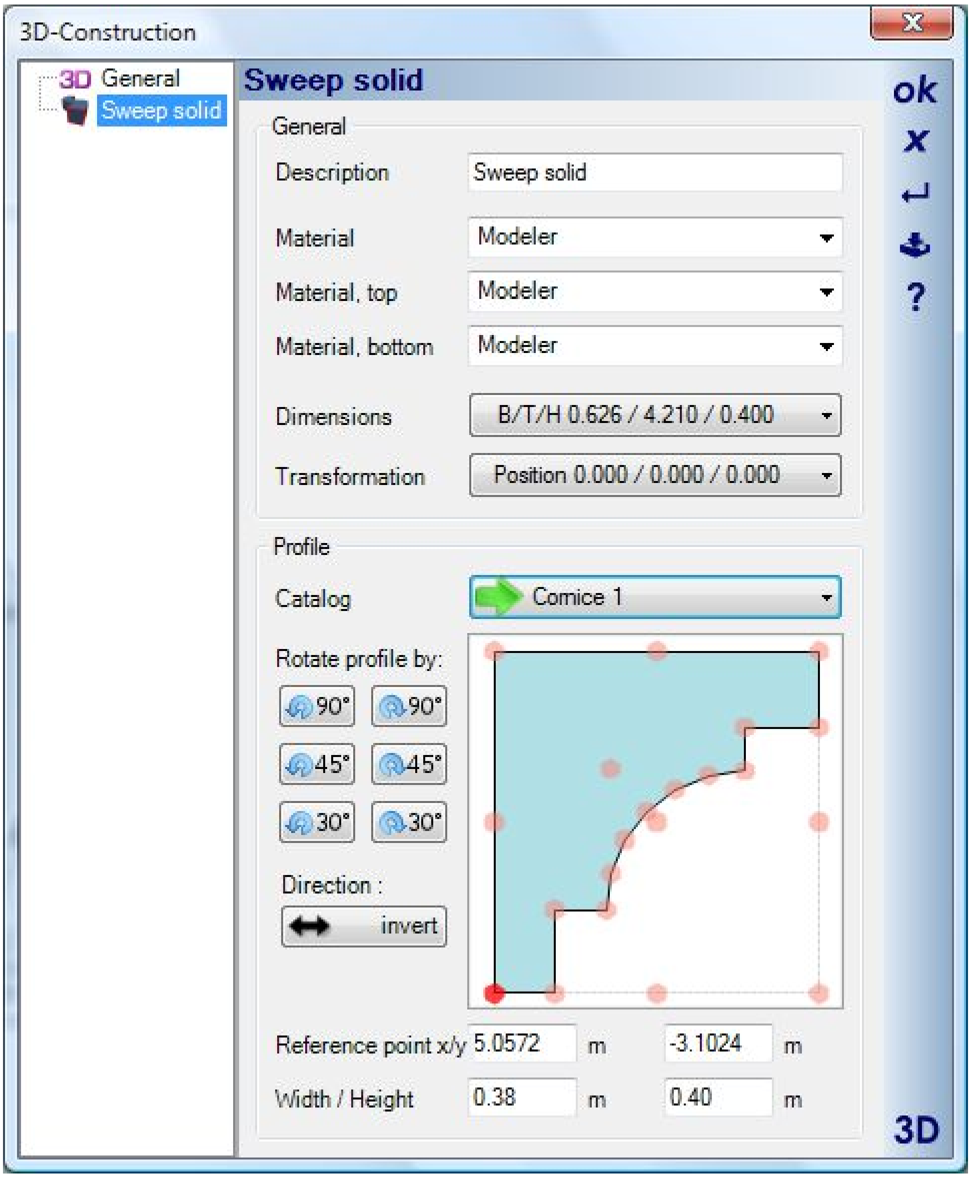
Sweep solids result from ‘sweeping’ a contour along a predefined path. The path can be defined in one of three ways.

- Polyline: Produces a sweep solid which is ‘open’ at the start and end, and which can be used to create, for example, baseboards in a room which cannot form a closed solid since they start and end either side of a door frame.
- Polygon: Produces a closed solid in which the end points meet and which can be used to create, for example, ceiling moldings at the junction of wall and ceiling.
- Contour / Path: Produces a solid which follows a contour or path made up of 2D elements. Several individual 2D elements must first be combined to form a contour. This option is useful for producing, for example, a path consisting of lines and arcs, as would be required to create a drainpipe.

20.8.1 Inputting Sweep Solids

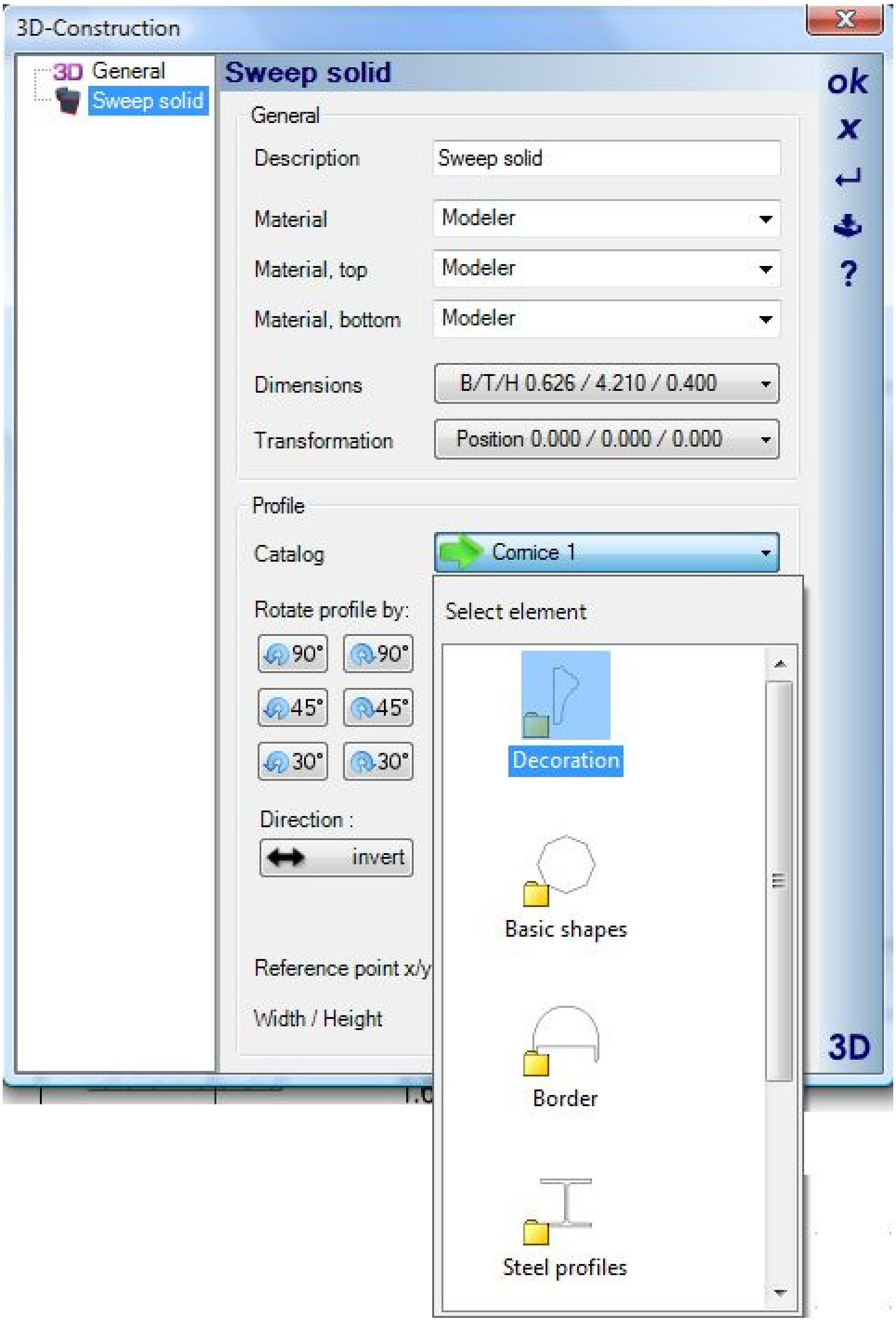
The first step for inputting a sweep solid using polylines or a polygon is to select a plane in a 2D or 3D view. This is a very easy way to position a solid. For example, a molding can be positioned underneath a ceiling by simply clicking on the ceiling support.

The choice of profile can be performed directly on input, or can be specified or changed any time later in the properties dialog for sweep solids.



Description: Sweep solid
Material: Modeler
Material, top: Modeler
Material, bottom: Modeler
Dimensions: B/T/H 0.626 / 4.210 / 0.400
Transformation: Position 0.000 / 0.000 / 0.000
Catalog: Cornice 1
Reference point x/y: 5.0572 m -3.1024 m
Width / Height: 0.38 m 0.40 m

A profile can be selected from the catalog components shown above the sketch in the dialog.



Sweep solid

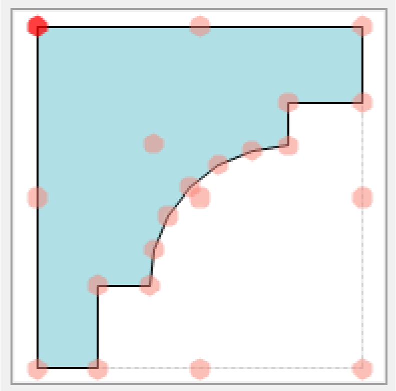
General

- Description: Sweep solid
- Material: Modeler
- Material, top: Modeler
- Material, bottom: Modeler
- Dimensions: B/T/H 0.626 / 4.210 / 0.400
- Transformation: Position 0.000 / 0.000 / 0.000

Profile

- Catalog: Cornice 1

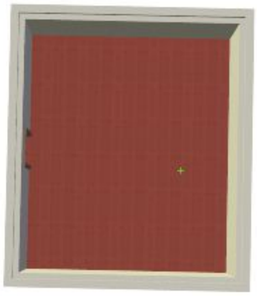
The sketch shows the contour of the profile with its reference points. A reference point can be selected in the sketch with the mouse. To enter a molding under a ceiling, the reference point at the top left corner would be selected.

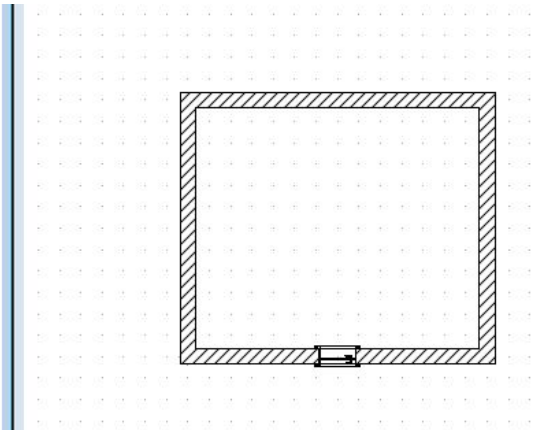


On or after input the profile can be rotated, scaled or its direction of input changed.

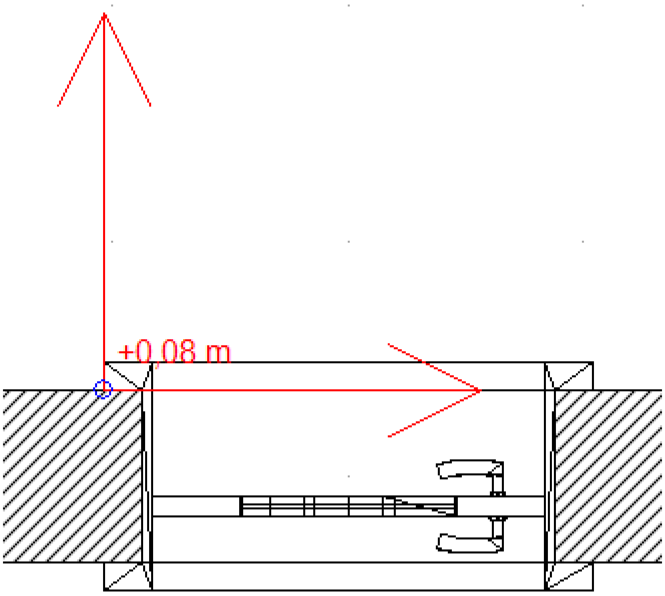
20.8.2 *Polylines, Example for Baseboards*

To input baseboards we first select in the 3D view the floor of the room as the plane and confirm this with a left mouse-click.

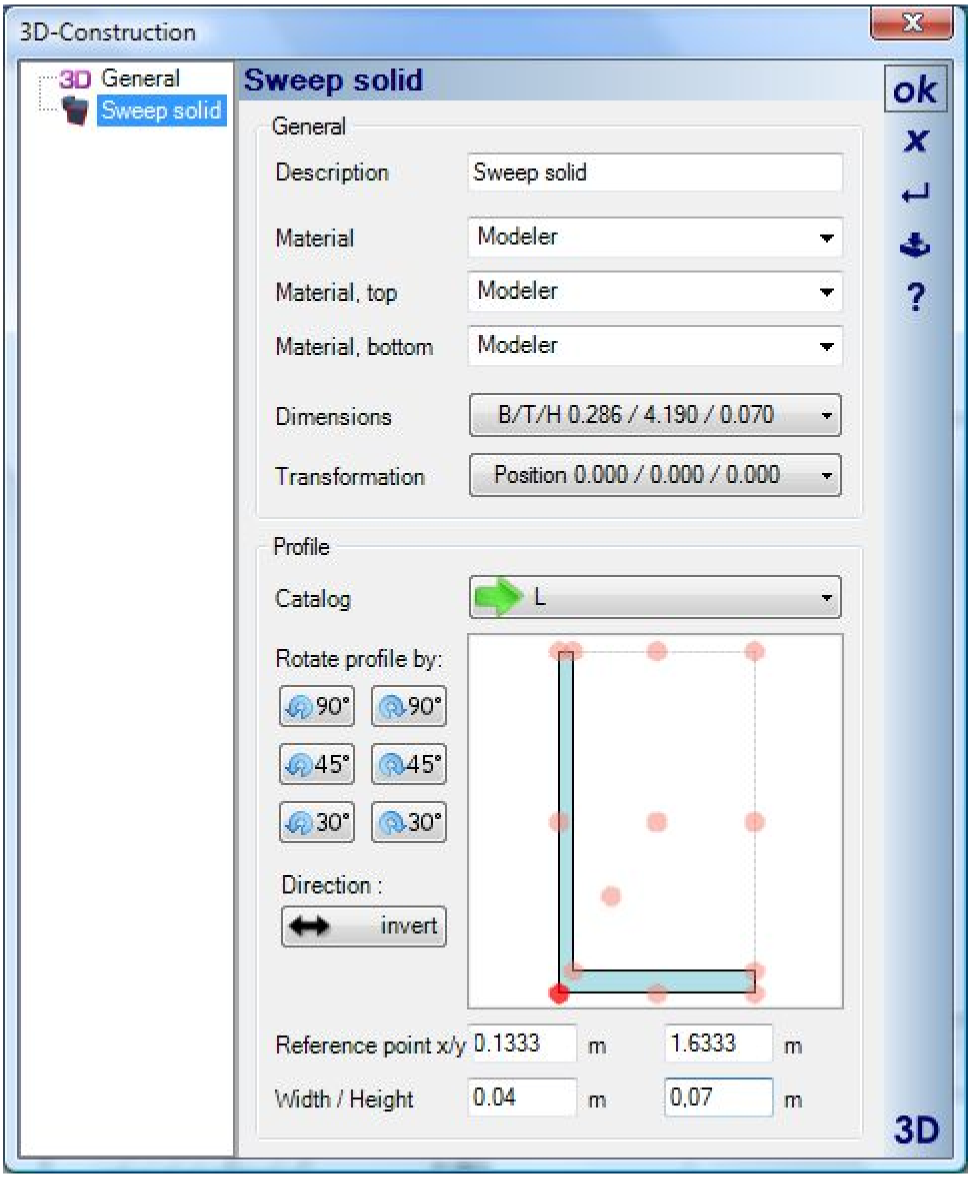




Next, we select in the 2D plan view the left corner of the door frame as the first point. For this purpose we have changed the 2D representation of the door from standard to wire-frame in the door dialog under ‘Top view’.



Now we choose the profile of the baseboard in the solid's properties dialog activated over the context menu, opened with a right mouse-click. We select an 'L' profile and modify the settings for width and height shown below the sketch. In the sketch we select the bottom left corner of the profile as the reference point and close the dialog with 'OK'.



3D-Construction

Sweep solid

General

Description: Sweep solid

Material: Modeler

Material, top: Modeler

Material, bottom: Modeler

Dimensions: B/T/H 0.286 / 4.190 / 0.070

Transformation: Position 0.000 / 0.000 / 0.000

Profile

Catalog: L

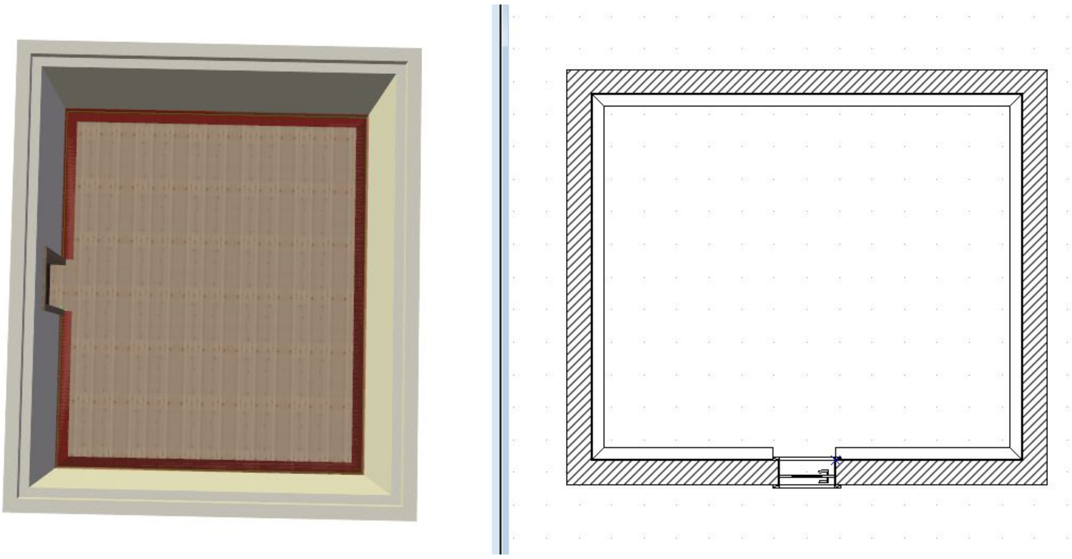
Rotate profile by:

Direction :

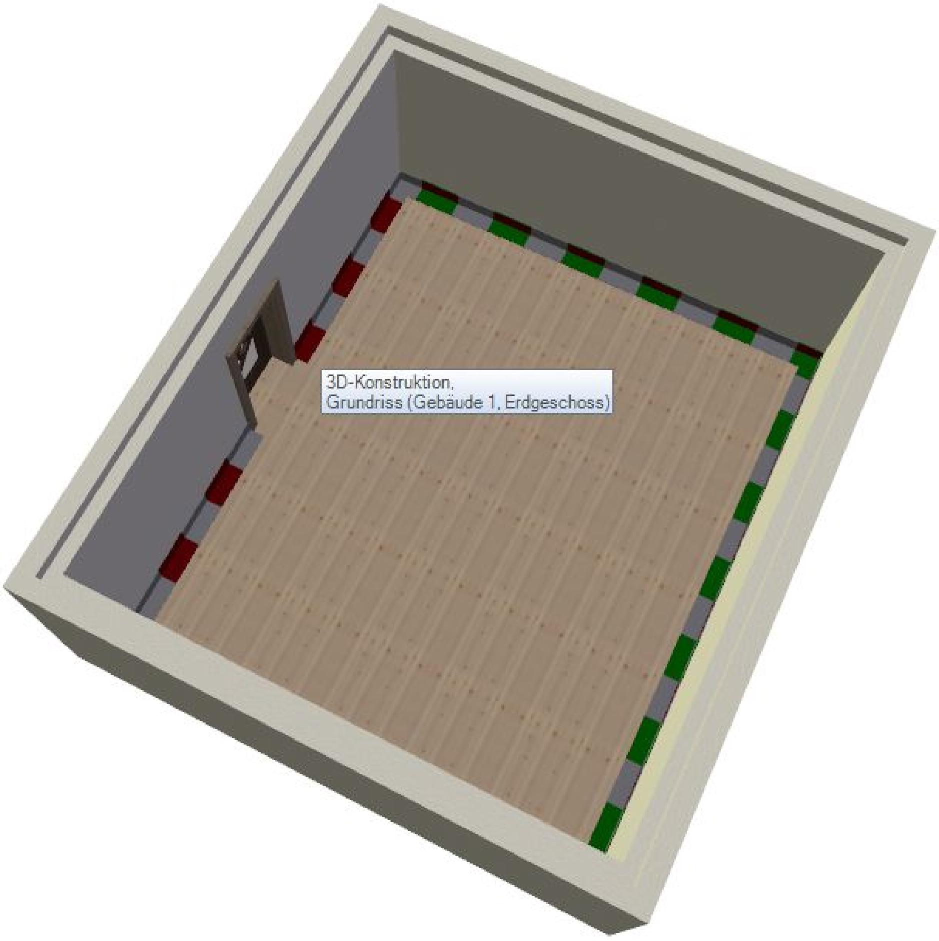
Reference point x/y: 0.1333 m 1.6333 m

Width / Height: 0.04 m 0,07 m

Finally, we ‘sweep’ the polyline over the corners of the room to the other side of the door frame. The resultant sweep solid appears as a preview in 3D and 2D while it is being created. A final mouse-click on the door frame, followed by ‘Enter’, completes the input and creates the sweep solid.
Note: In the example shown, the dimensions of the baseboard were modified so that it was more visible in the preview during input.

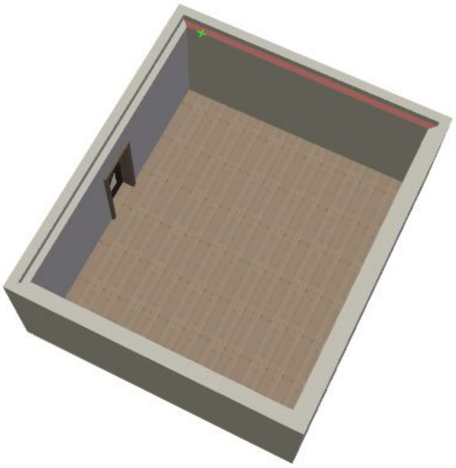


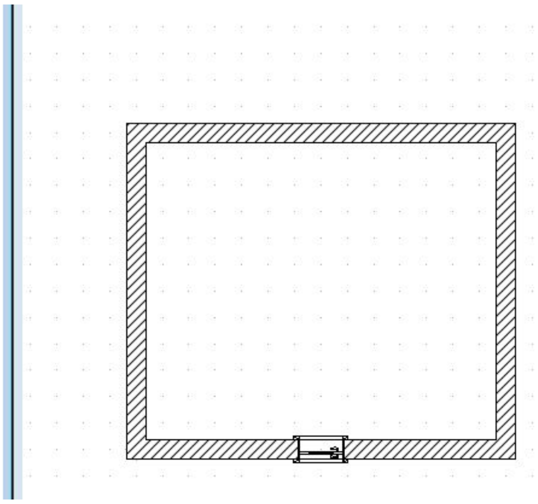
The finished baseboard:



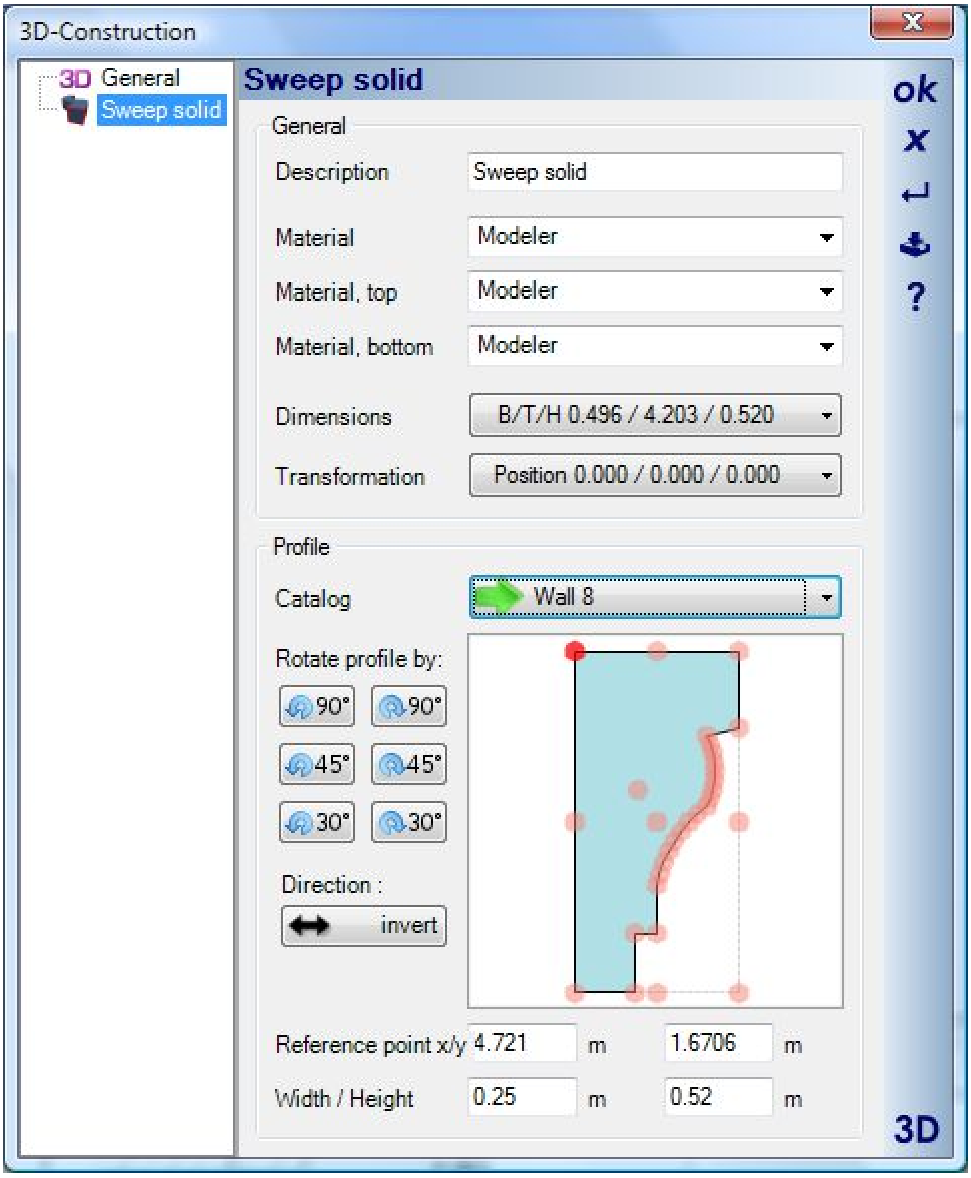
20.8.3 Poylgon, Example for Ceiling Moldings

To input ceiling moldings we first select in the 3D view the ceiling support at the top of a wall as the plane, and confirm this with a left mouse-click.





We begin input of a closed polygon by setting the first point at any corner of the room. Now we choose the profile of the molding in the solid's properties dialog activated over the context menu, opened with a right mouse-click. We select a 'Decoration' profile and, if necessary, modify the settings for width and height shown below the sketch. In the sketch we select the top left corner of the profile as the reference point and close the dialog with 'OK'.



3D-Construction

Sweep solid

General

Description: Sweep solid

Material: Modeler

Material, top: Modeler

Material, bottom: Modeler

Dimensions: B/T/H 0.496 / 4.203 / 0.520

Transformation: Position 0.000 / 0.000 / 0.000

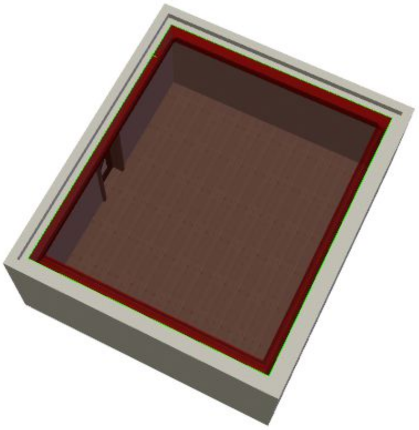
Profile

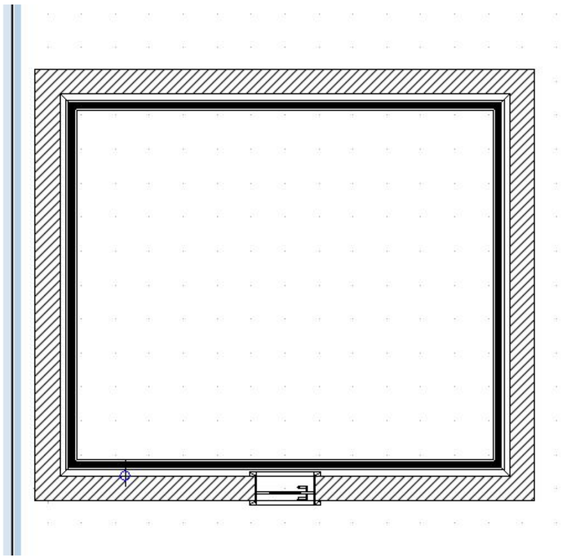
Catalog: Wall 8

Reference point x/y: 4.721 m, 1.6706 m

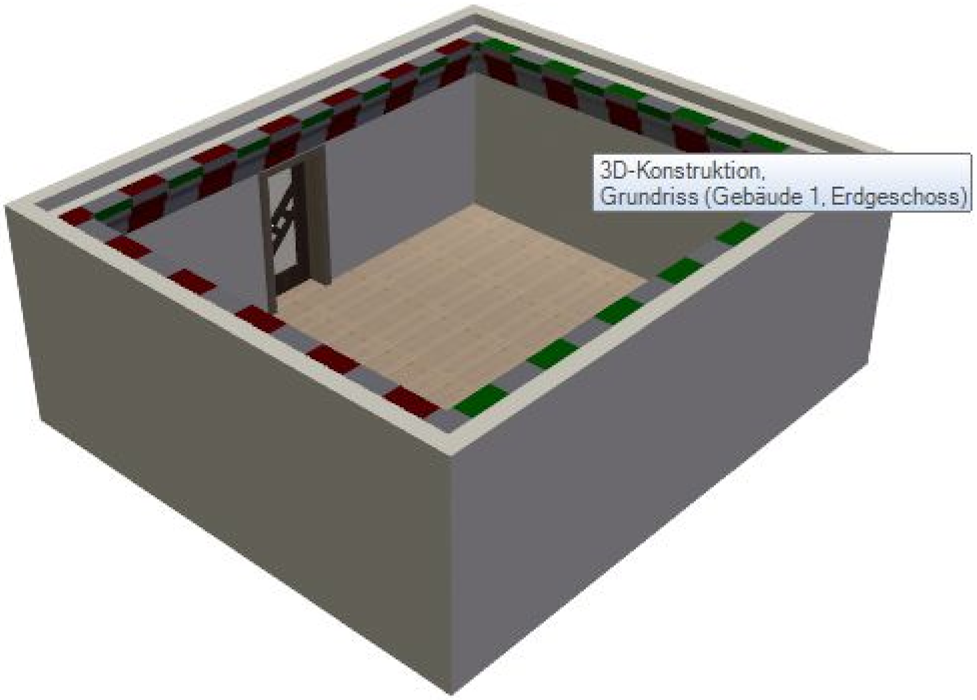
Width / Height: 0.25 m, 0.52 m

Finally, we enter the polygon over the corners of the room. The resultant sweep solid appears as a preview in 3D and 2D while it is being created. ‘Enter’, completes the input and creates the sweep solid.
The preview during input:



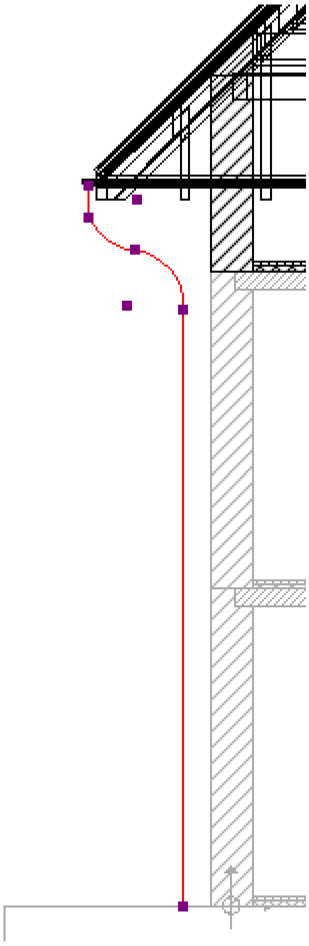


The finished molding:

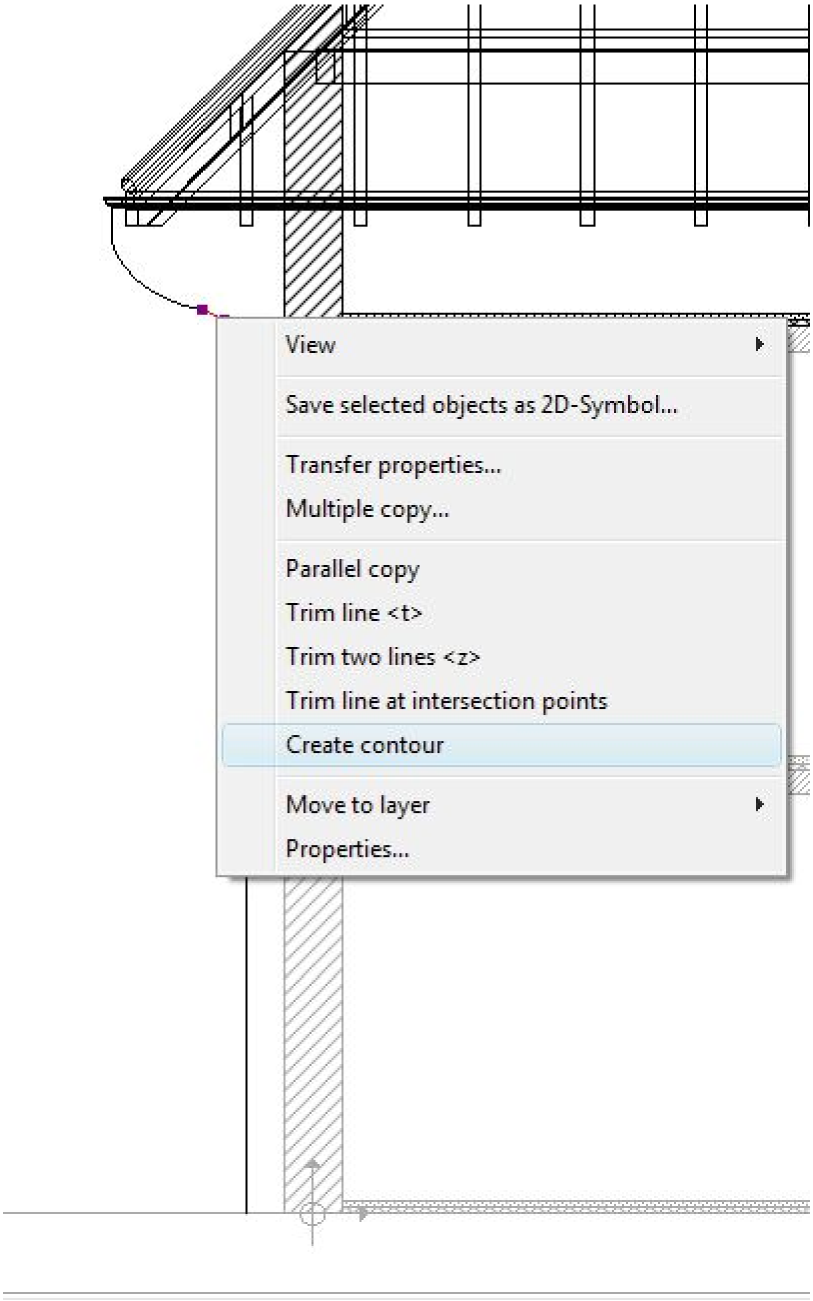


20.8.4 Contour / Path , Example for a Drainpipe

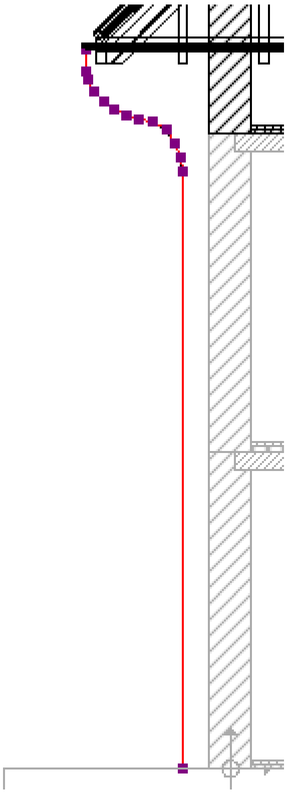
First, we define the contour of the drainpipe in a cross-section view using 2D elements from the 2D Graphics plug-in, i.e. lines and arcs. It is important that the end points of the 2D elements meet, as otherwise a contour or path cannot be created. The following example shows the contour made up of two lines and two arcs (input with 3 points). On input, the number of segments for the arcs was set to 6, see the chapter 'Performance, Number of Segments'.



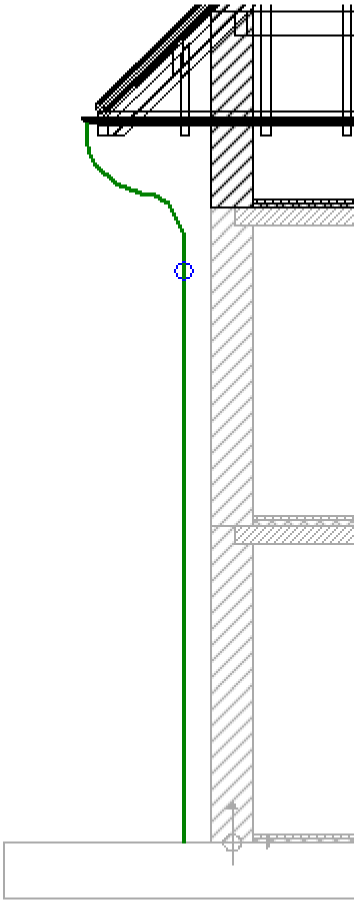
Now select one of the 2D elements and click on 'Create contour' in the context menu.



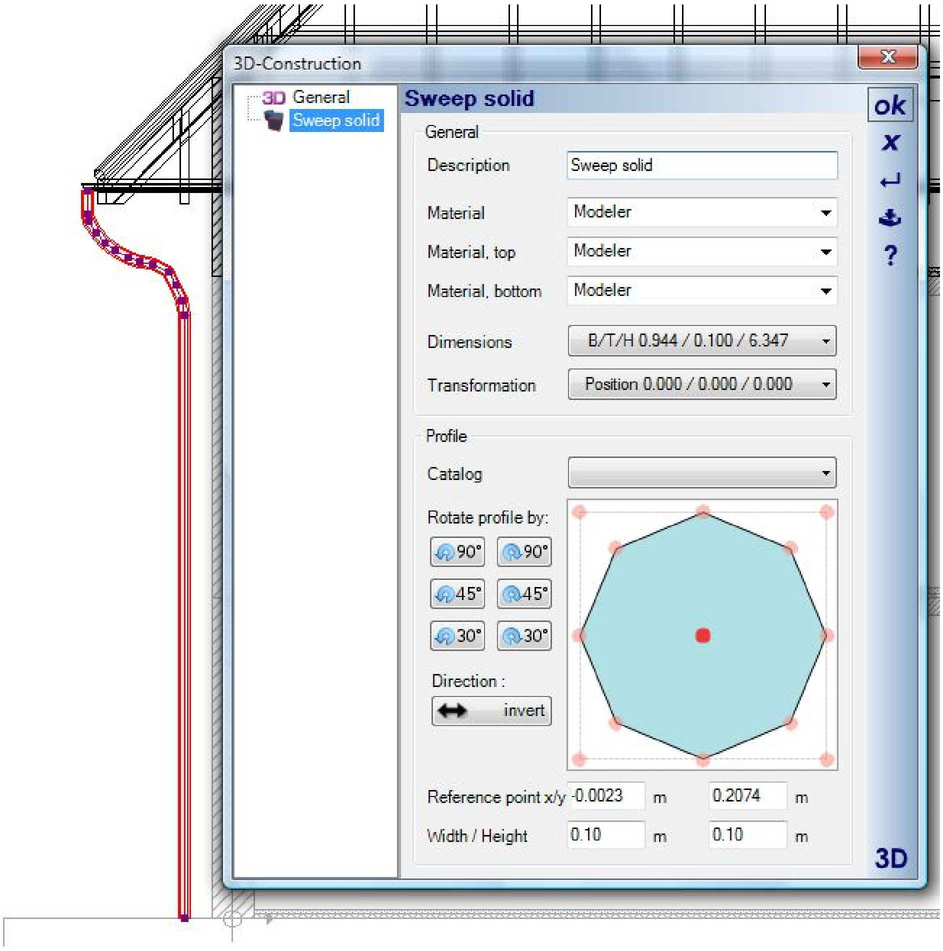
The resultant contour:



Next we choose ‘Contour / Path’ as input option for the sweep solid and position the cursor over the contour, which is highlighted in green as soon as it is detected.



A left mouse-click completes the input and creates the sweep solid. Finally, a suitable profile for the drainpipe can be selected and modified in the properties dialog.



Sweep solid

General

Description: Sweep solid

Material: Modeler

Material, top: Modeler

Material, bottom: Modeler

Dimensions: B/T/H 0.944 / 0.100 / 6.347

Transformation: Position 0.000 / 0.000 / 0.000

Profile

Catalog:

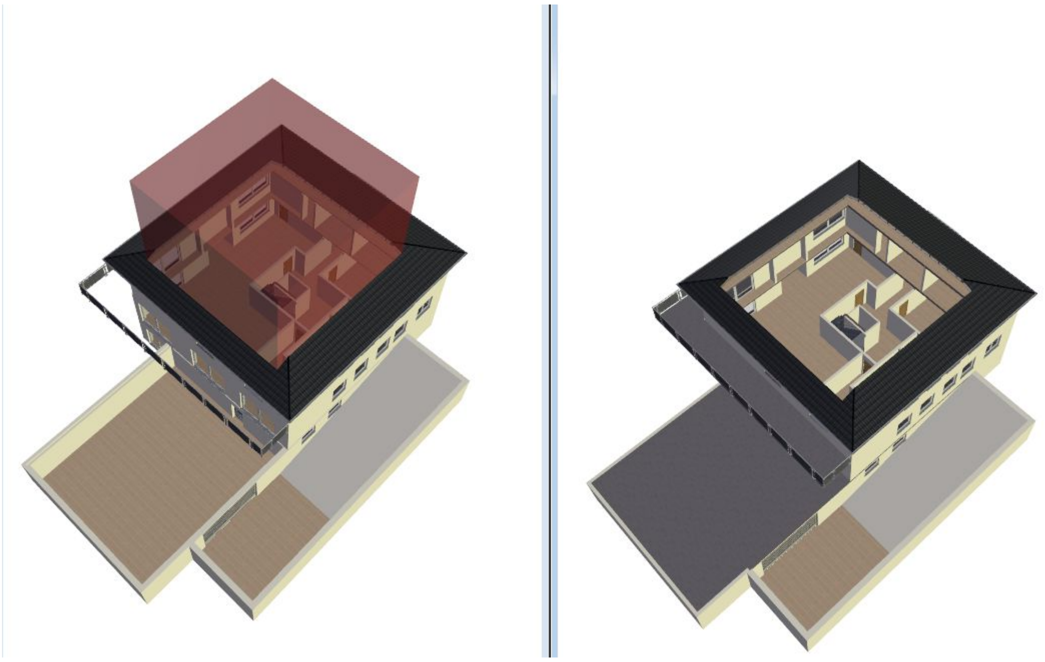
Reference point x/y: -0.0023 m 0.2074 m

Width / Height: 0.10 m 0.10 m

20.9 SUBTRACTION SOLIDS

As the name implies, subtraction solids are intended for subtraction from other solids using Boolean operations. ‘Cube’ and ‘Plane’ are provided as standard subtraction solids in the toolbar of the 3D Construction plug-in, and further, it is possible to convert existing 3D constructions to subtraction solids. This function is available over the context menu when a 3D construction is selected.

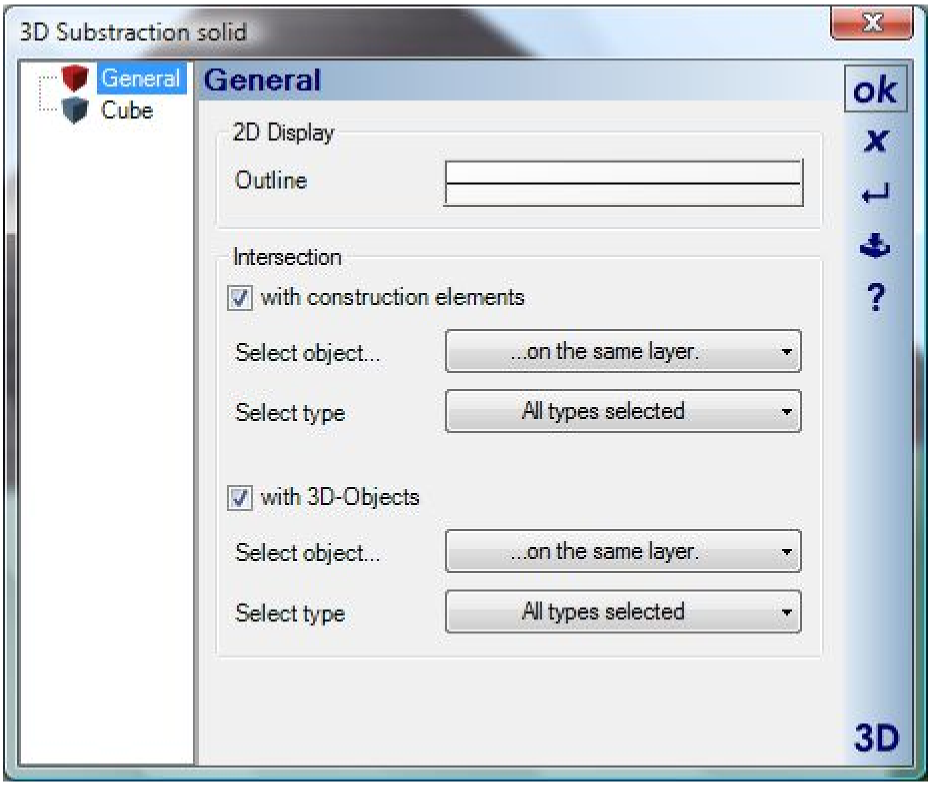
The above-mentioned subtraction solids are generally valid globally for the entire project and all its components. These subtraction solids are not intended for use in modeling. For modeling, other mechanisms such a Boolean operations are provided. An example, the ‘Cube’ subtraction solid in a building:



In the example shown the cube was subtracted from all layers of the building. In the view on the left the cube is still visible, while on the right it is set as invisible in the visibilities dialog. The cut-out representation, however, has no effect on the 2D representation in the plan view.

Tip: Processing for such operations is very complex, and depending on the project can take several minutes. Before creating such views the project should first be saved, as depending on the system the available main memory is also an important factor.

The scope of the subtraction can be set in the properties dialog for a subtraction solid. Here can be specified which types of construction element and which layers are to be affected by the subtraction solid.



3D Substraction solid

General

2D Display

Outline

Intersection

☑ with construction elements

Select object... ...on the same layer.

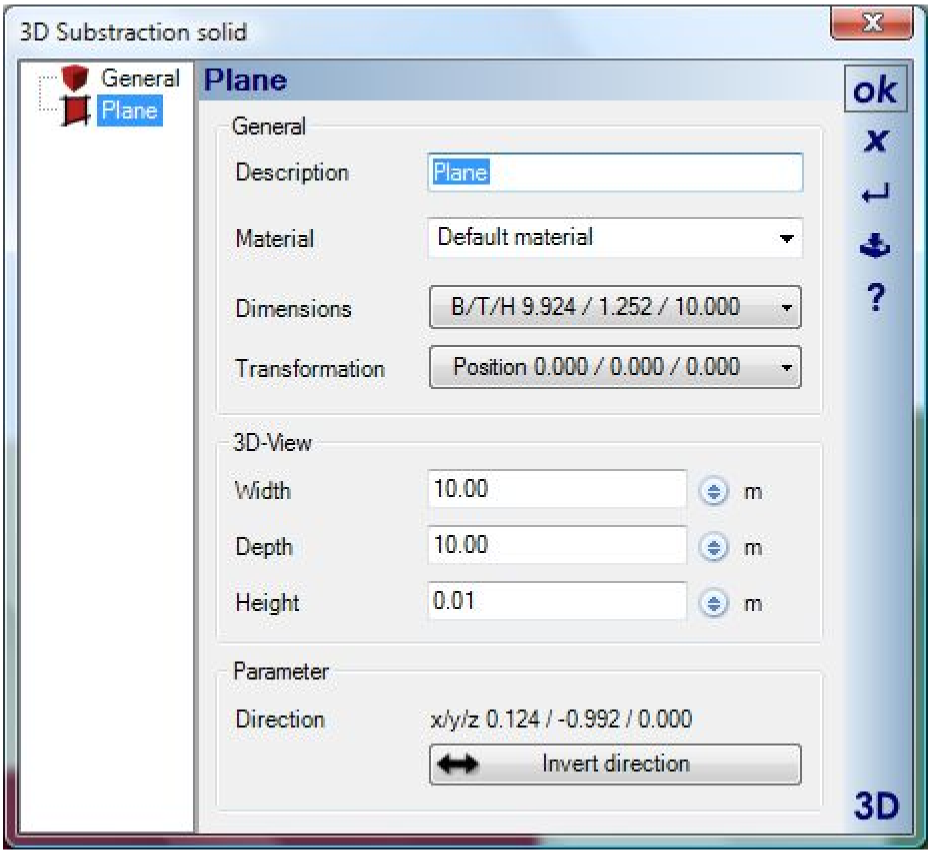
Select type All types selected

☑ with 3D-Objects

Select object... ...on the same layer.

Select type All types selected

Planes remove elements dependant on the direction in which they are input, i.e. to the right of their direction of input. Therefore, the direction of input of a plane can be subsequently changed using the ‘Invert direction’ button in the dialog, or over the context menu.



3D Substraction solid

General
Plane

Plane

General

Description: Plane

Material: Default material

Dimensions: B/T/H 9.924 / 1.252 / 10.000

Transformation: Position 0.000 / 0.000 / 0.000

3D-View

Width: 10.00 m

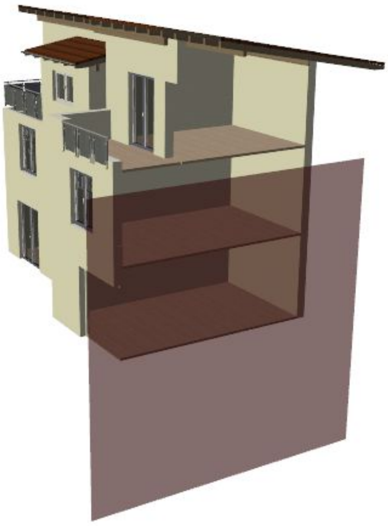
Depth: 10.00 m

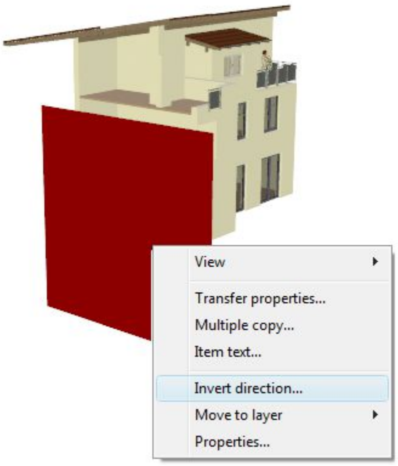
Height: 0.01 m

Parameter

Direction: x/y/z 0.124 / -0.992 / 0.000

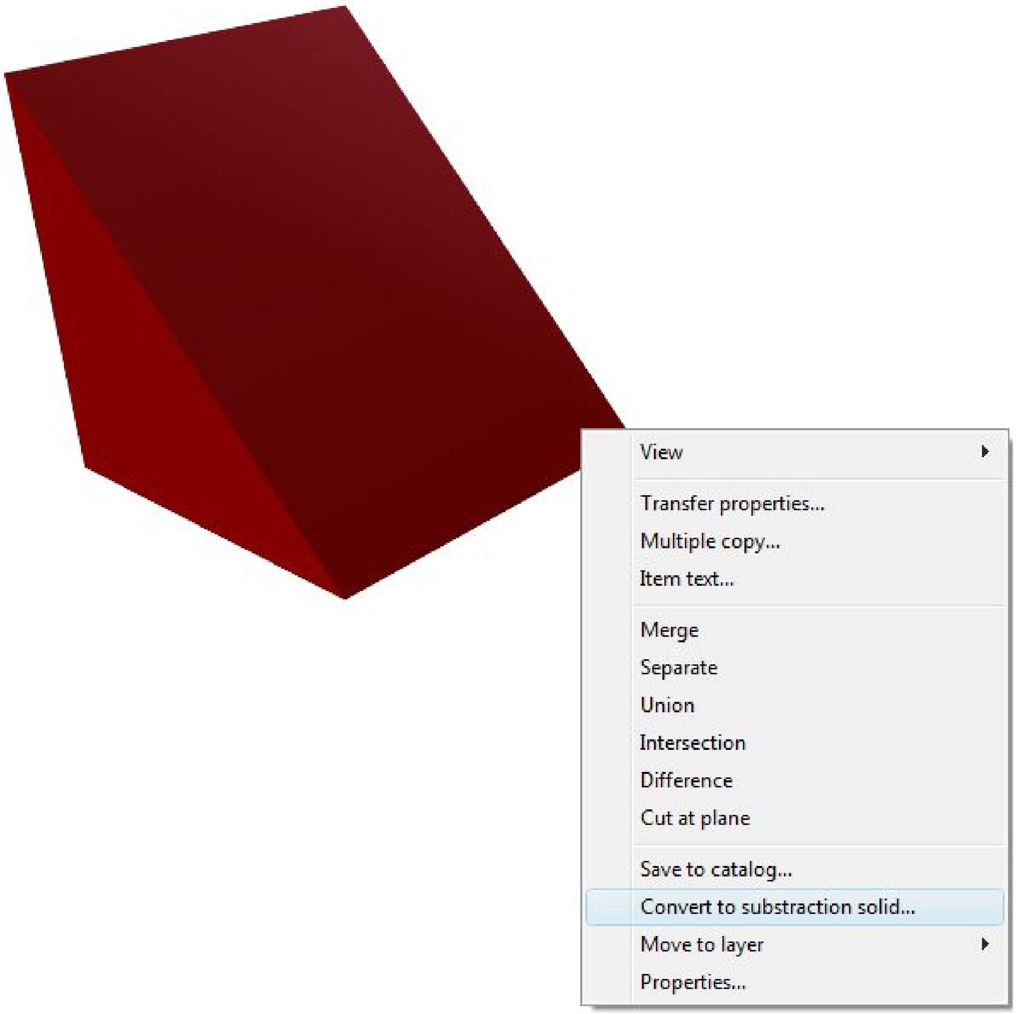
An example with the direction of input reversed:





20.9.1 Converting 3D Constructions to Subtraction Solids

Any 3D construction in the project can subsequently, when it is selected, be converted to a subtraction solid over the context menu activated with a right mouse-click.



After the conversion has been performed the solid is shown in red, becomes transparent, and automatically intersects the specified elements in the layer in which it was input. It retains the properties of the original solid, and the options for specifying the types of construction element and layers to be intersected are added to the properties dialog.

20.9.2 Examples of the Use of Subtraction Solids

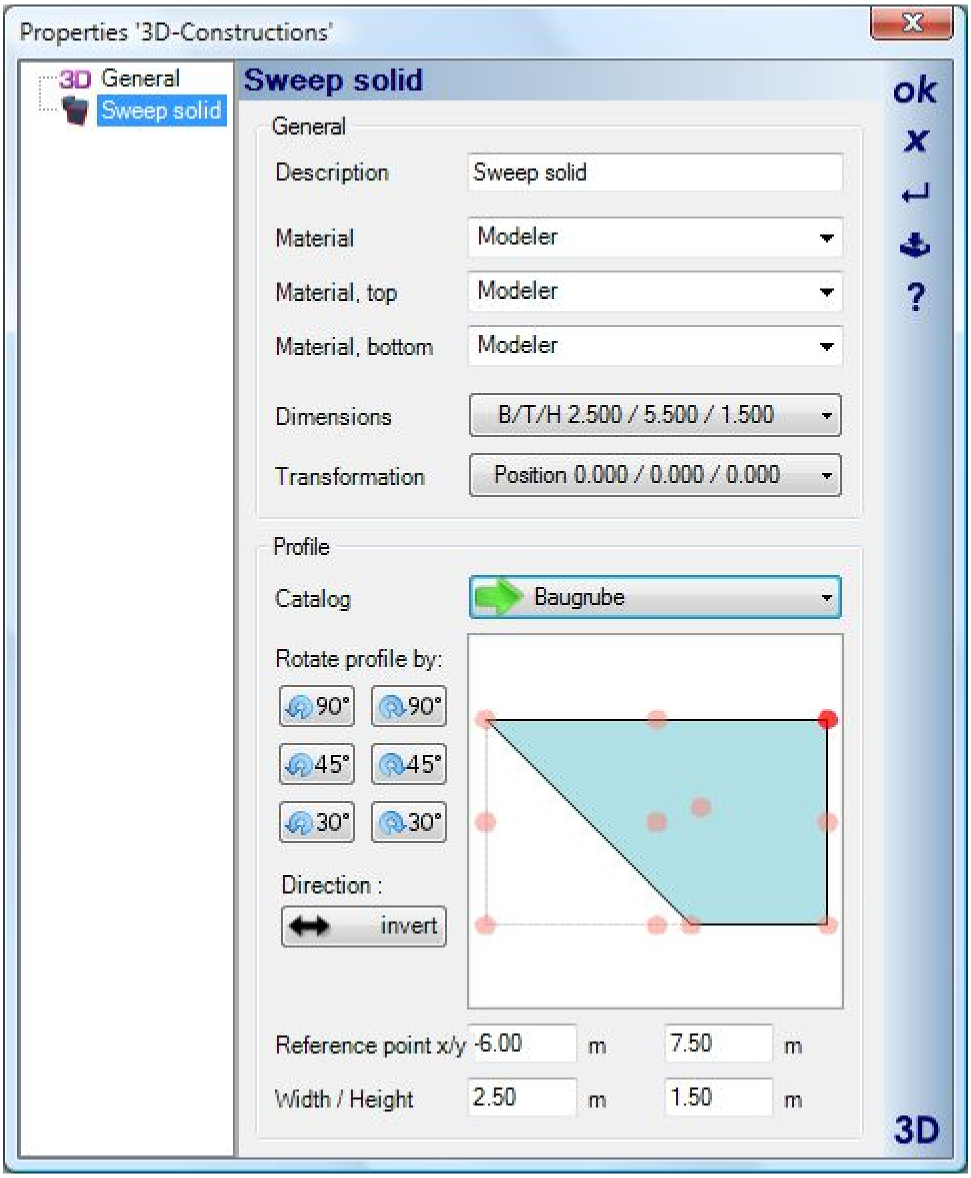
We would like to show here a few examples of the use of subtraction solids. Generally, before a subtraction solid is input it is important to consider in which layer it is to be inserted. This particularly affects the processing time required for the 3D model.
An example: We want to use a subtraction solid, for example a wedge for a ramp, to remove a part of the 3D terrain. In this case the solid should be input directly in the‘Environment’ layer. The default settings for the subtraction solid to only include elements in the current layer, mean that it intersects automatically with the terrain, and only the terrain. If the solid were to be input in the ground floor of the building instead, and only later the ‘Environment’ layer activated in the properties dialog of the subtraction solid, it would mean nevertheless that it initially intersects all elements of the ground floor. An action that is not necessary in this case and which only costs processing time.

20.9.3 Example of a Subtraction Solid in the Terrain

In this example input consists of the following steps:

- Draw a 2D contour for the cross-section of the construction pit and save it as a profile.
- Switch to the ‘Environment’ layer.
- Input a sweep solid as a closed polygon with the profile of the construction pit.
- Convert the sweep solid to a subtraction solid.
- Set the subtraction solid as invisible in the visibilities dialog.

The dialog for the sweep solid showing the profile of the construction pit:



Properties '3D-Constructions'

Sweep solid

General

Description: Sweep solid

Material: Modeler

Material, top: Modeler

Material, bottom: Modeler

Dimensions: B/T/H 2.500 / 5.500 / 1.500

Transformation: Position 0.000 / 0.000 / 0.000

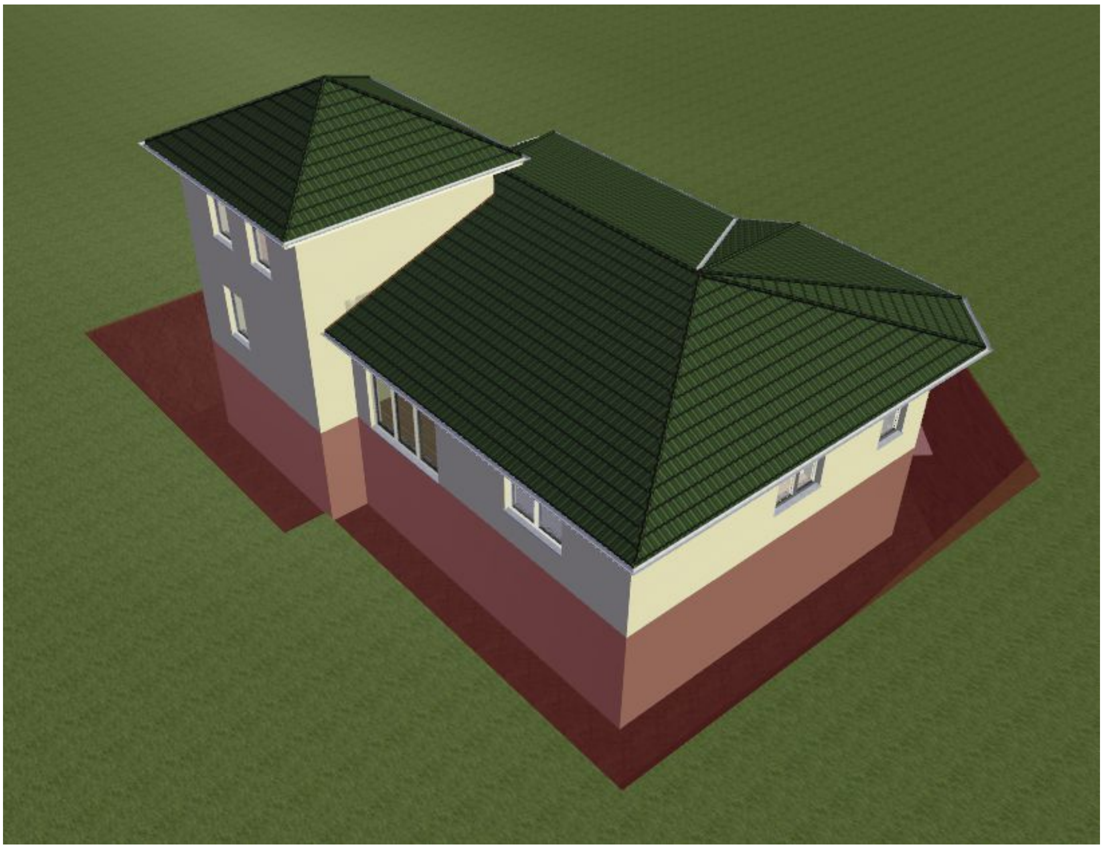
Profile

Catalog: Baugrube

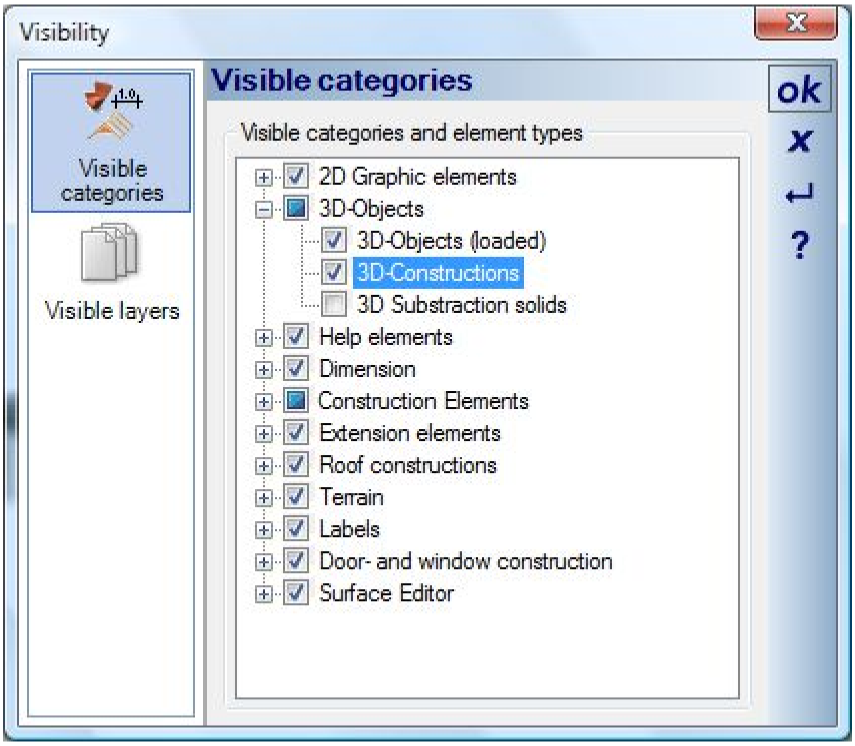
Reference point x/y: -6.00 m, 7.50 m

Width / Height: 2.50 m, 1.50 m

The view after the sweep solid was converted to a subtraction solid:



Setting the subtraction solid to invisible:

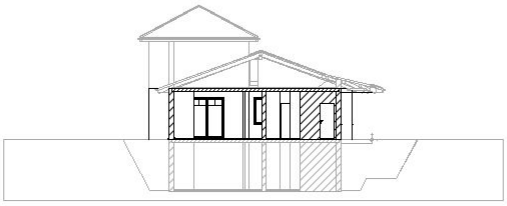


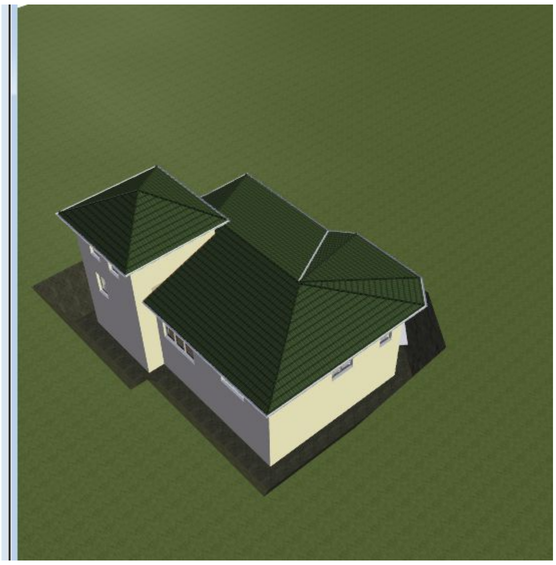
Visible categories

Visible categories and element types

- ☑ 2D Graphic elements
- ▣ 3D-Objects
  - ☑ 3D-Objects (loaded)
  - ☑ 3D-Constructions
  - ☐ 3D Substraction solids
- ☑ Help elements
- ☑ Dimension
- ▣ Construction Elements
- ☑ Extension elements
- ☑ Roof constructions
- ☑ Terrain
- ☑ Labels
- ☑ Door- and window construction
- ☑ Surface Editor

The result:

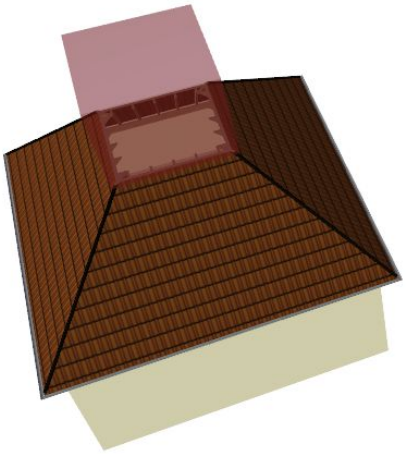


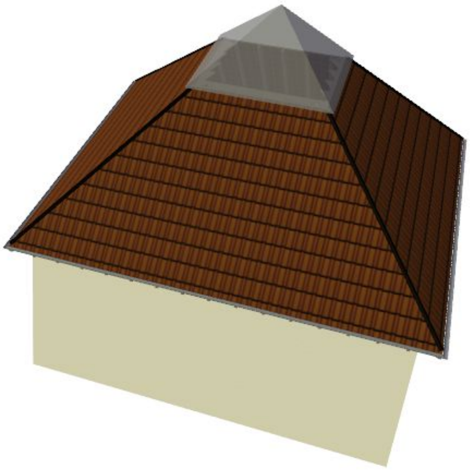


20.9.4 Example of a Subtraction Solid in Roofs

In this example input consists of the following steps:

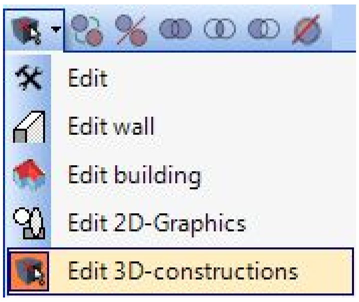
- Input a cube in the upper storey.
- Convert the cube to a subtraction solid (left illustration).
- Create, for example, a pyramid as a skylight.
- Set the subtraction solid to invisible in the visibilities dialog.



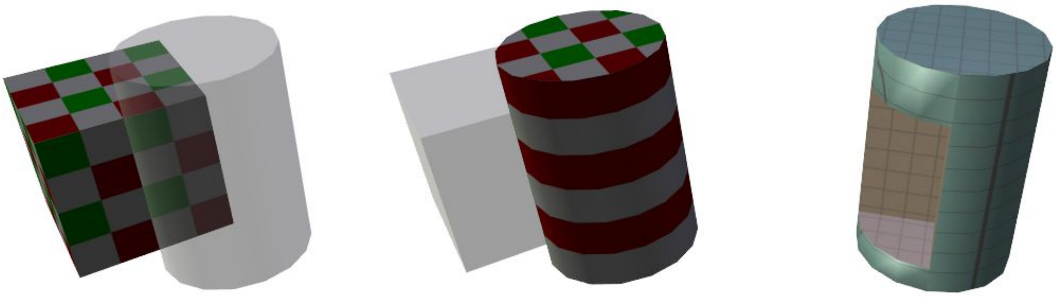


20.10 EDITING / BOOLEAN OPERATIONS

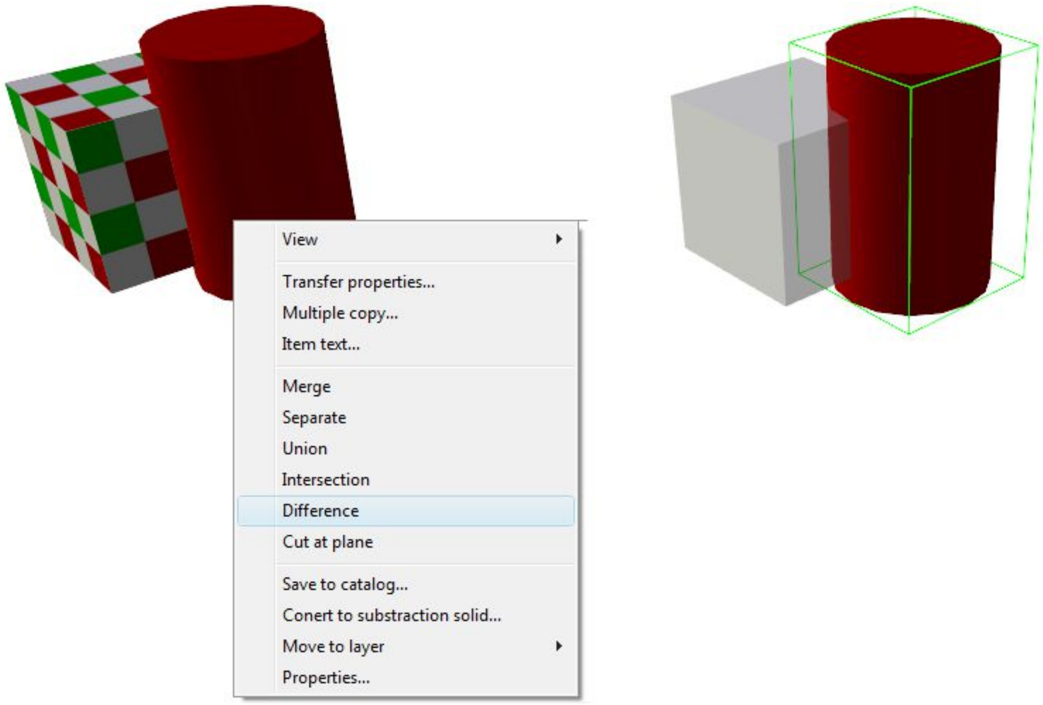
The functions for editing 3D constructions are found in the toolbar of the same name, and in the context menus when a 3D construction is selected.



Both options differ somewhat in their usage. For instance, if the ‘Difference’ function is selected over the toolbar, two operands must be specified using the mouse. When the cursor is positioned over the 3D construction it becomes transparent. Here the process from left to right; the first operand is the cylinder, the second operand the cube, and the result is that the cube is subtracted from the cylinder (the material was changed subsequently).

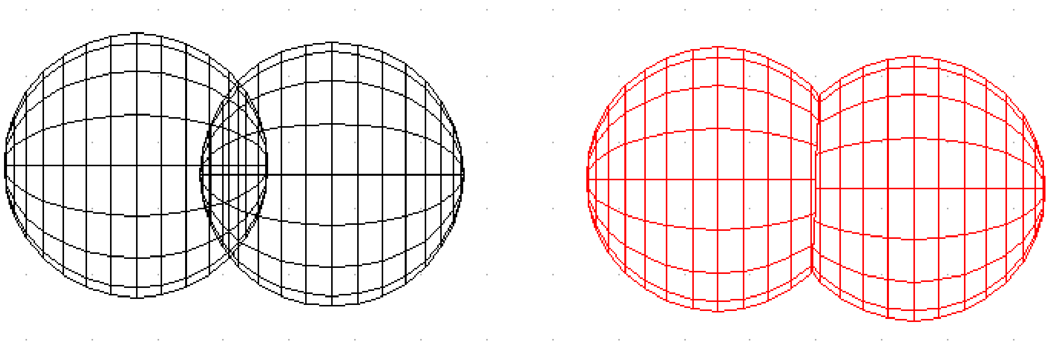


Alternatively, the ‘Difference’ function can be activated over the context menu; first select the cylinder to set it as the first operand, and then select the cube.



20.10.1 Merge / Union

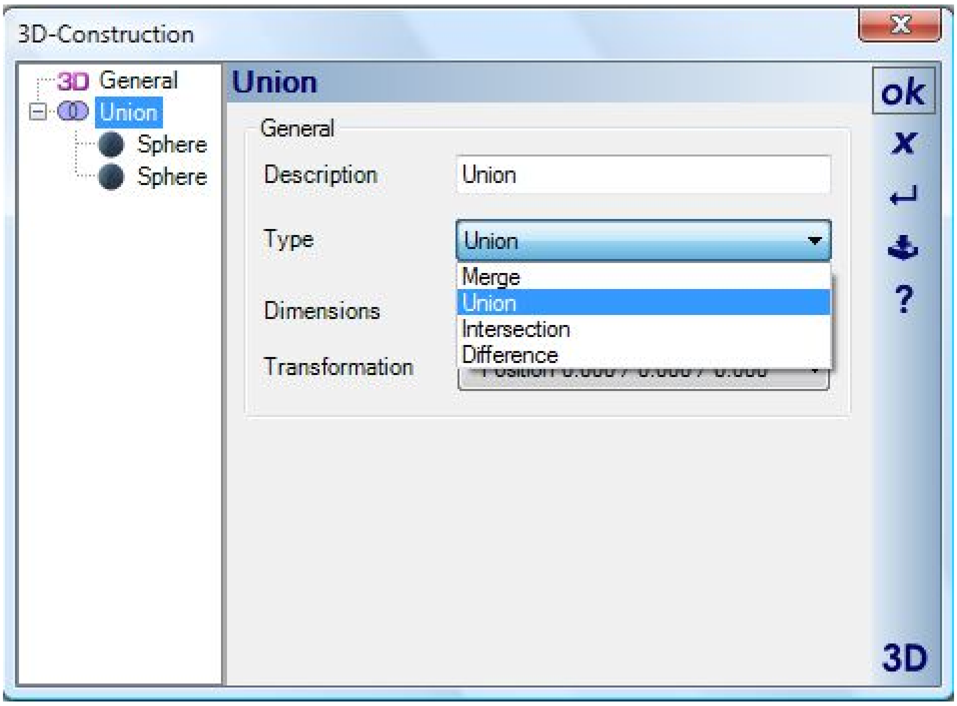
To be able to process a 3D construction as an entity, we as a rule need not only to be able to trim solids but also to merge or unify them. The difference between these two operations is shown in the following illustration. On the left the result of the 'Merge' function, on the right the result of the 'Union' function:



To put it simply, both solids remain unchanged when they are merged and only form an entity for further processing, whereas when solids are unified the parts and surfaces which are common to both solids are removed.
The following is a general rule for our 3D modelling functions:

- Solids, which do not penetrate each other, must be merged.
- Solids, which penetrate each other, must be unified.

As we can see, the illustration above is not quite correct and only serves to demonstrate the operations.
When one the two functions is activated, the software attempts to establish which of the two operations is best suited for the particular case and then performs internally the function which it has determined. It can therefore happen that the 'Merge' function was selected but internally the solids are processed with the 'Union' function. This may not always be correct, as for performance reasons the function is determined based on the bounding box of the objects. If this results in incorrect processing then the type of operation should be changed in the '3D construction' dialog.



3D-Construction

Union

General

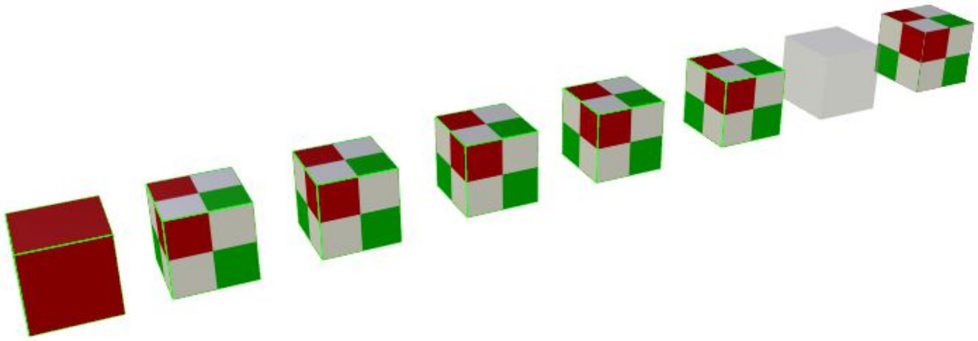
Description: Union

Type: Union

Dimensions

Transformation

Multiple 3D constructions can be merged in one operation by keeping the 'Shift' key pressed during selection. The solids which have been selected for the operation are outlined in green. The operation is completed by pressing 'Enter'

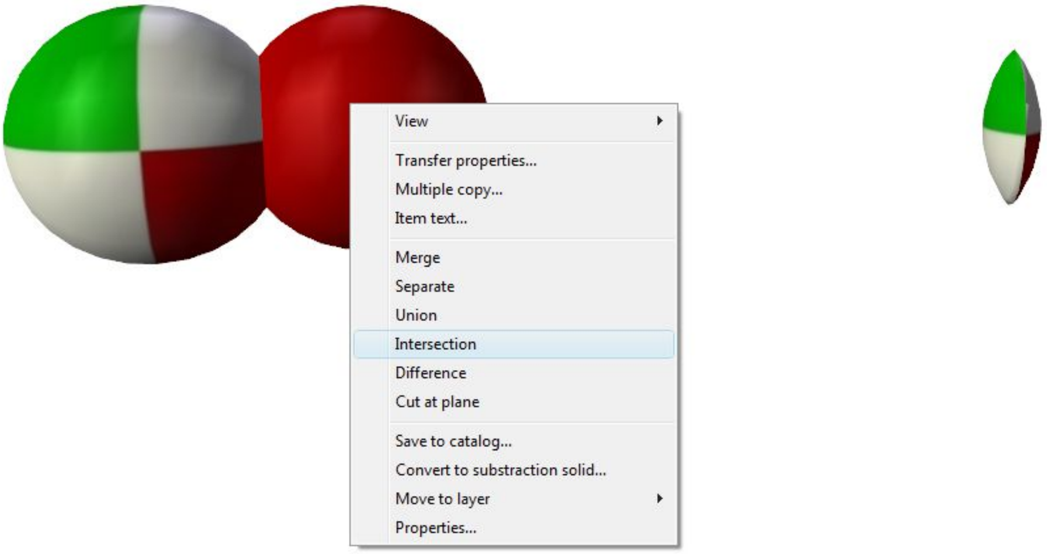


20.10.2 Separate

3D constructions, which have been merged or are the result of Boolean operations, can be dismantled again using the ‘Separate’ function. The 3D construction is dismantled starting at the top of its hierarchical structure. Depending on the depth of the structure it may be necessary to use the ‘Separate’ function several times in order to dismantle the entire structure.

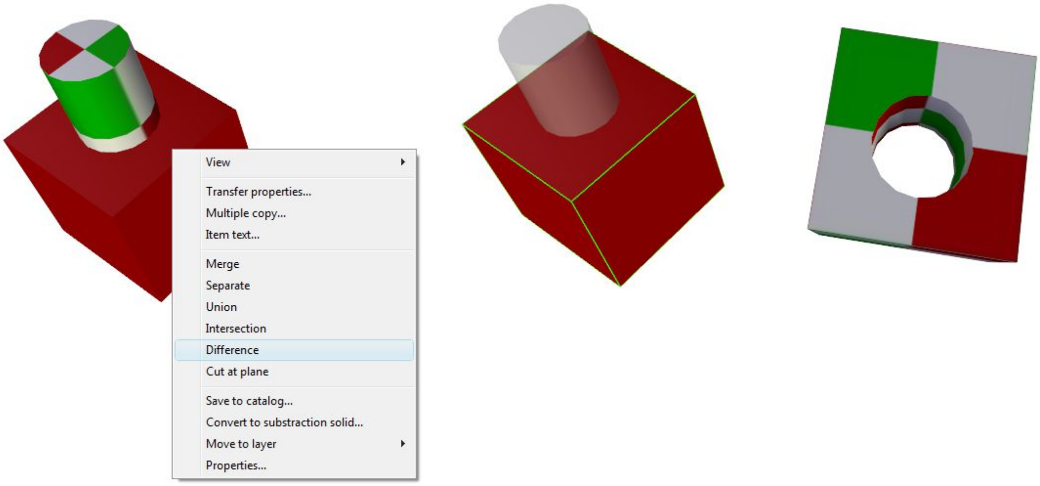
20.10.3 Intersection

The result of this operation is a solid which represents the common part of the two operands. In the case of two spheres which intersect, the result is a lens.



20.10.4 Difference

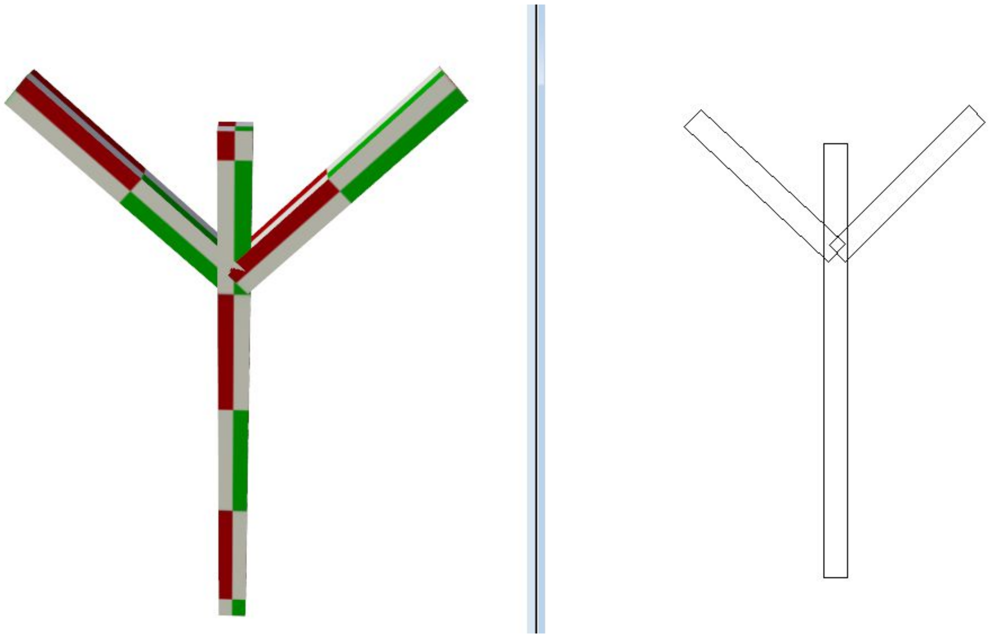
Probably one of the most often used operations is ‘Difference’. This enables one 3D construction to be subtracted from another.
Here an example with a cube and a cylinder, whereby, from left to right, the cube is selected as the first operand, the cylinder as the second operand and the result.



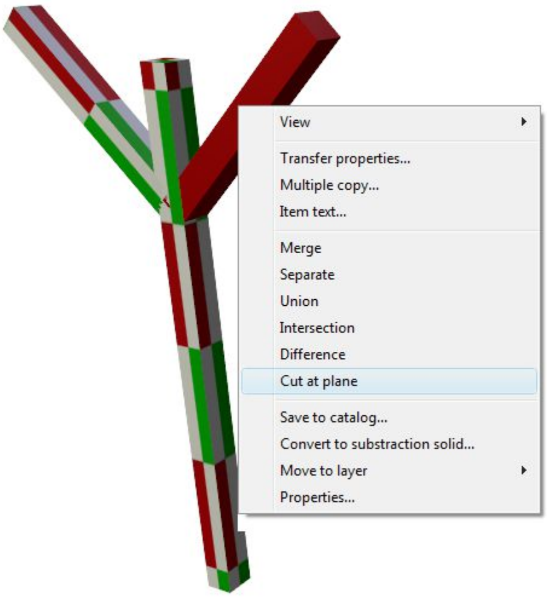
20.10.5 Trimming at a Plane

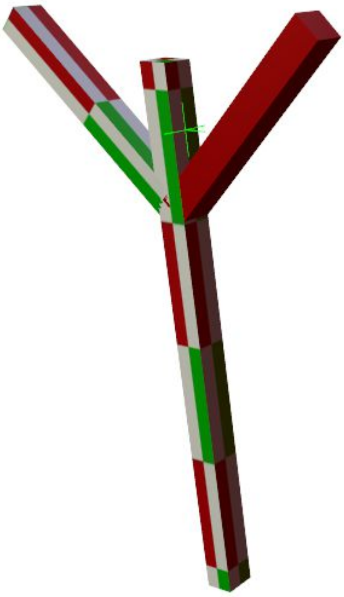
Another operation, which can be very useful for 3D construction, is the trimming of a solid at a plane. The plane is selected from the surrounding 3D scene with a mouse-click.

We can best demonstrate the procedure with an example.
We want to construct a carport and have first created a post with an upper brace using cubes. We now have the following 3D construction:

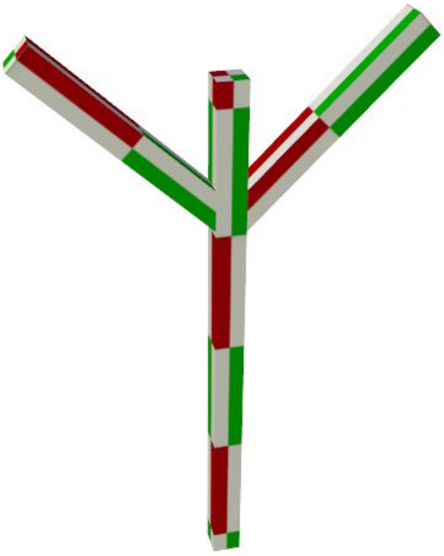


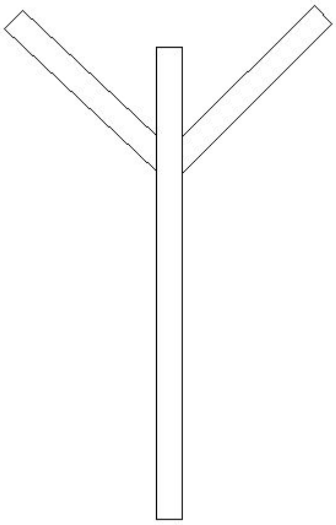
The braces must now be trimmed where they meet the post and also to match the height of the post. First we select the operand and then the surface / plane, at which it is to be trimmed.
On the left the selected operand and on the right the selected plane, in this case, the side of the post.



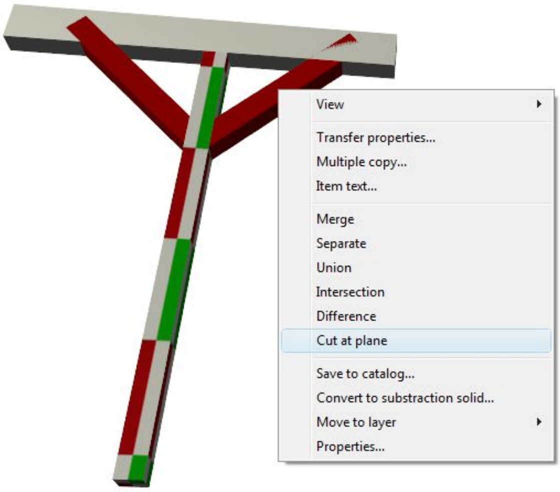


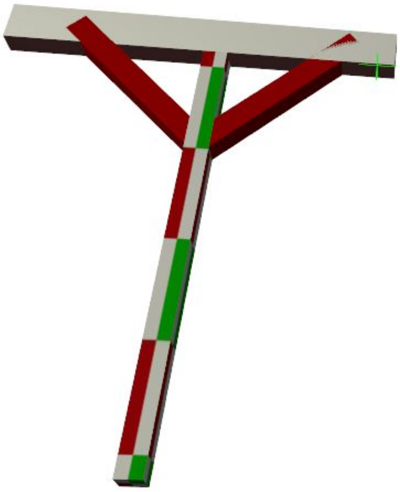
We then repeat the procedure for the brace on the other side. The result now looks like this:



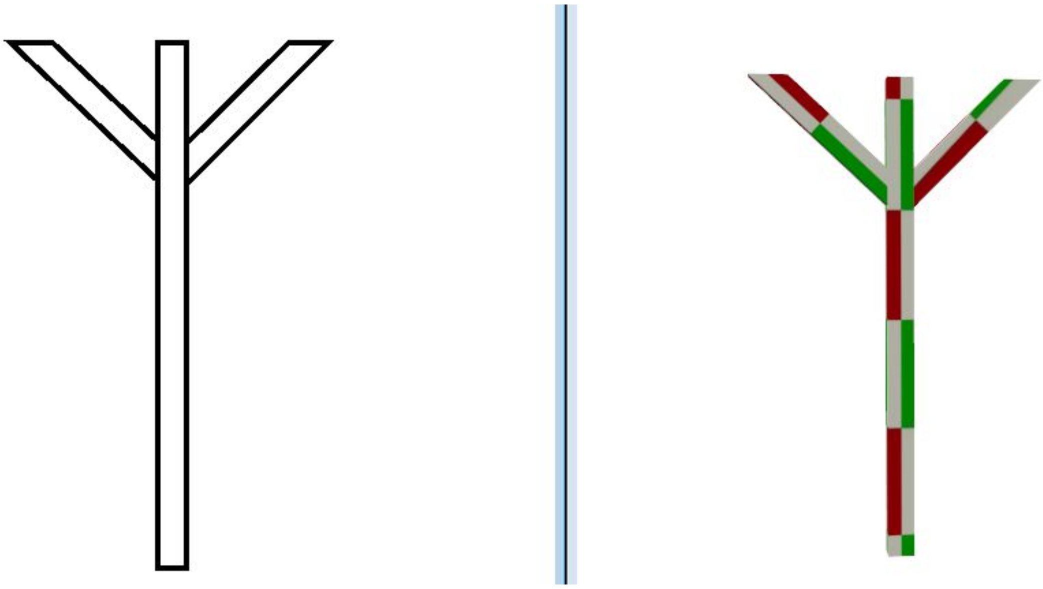


The braces must now be trimmed to match the height of the post. To select the plane we could use the beam above the post, which has been added here as an example. First, however, we select both braces so that the trimming operation only has to be performed once.
As the plane we select the underside of the beam.


View
Transfer properties...
Multiple copy...
Item text...
Merge
Separate
Union
Intersection
Difference
Cut at plane
Save to catalog...
Convert to substraction solid...
Move to layer
Properties...



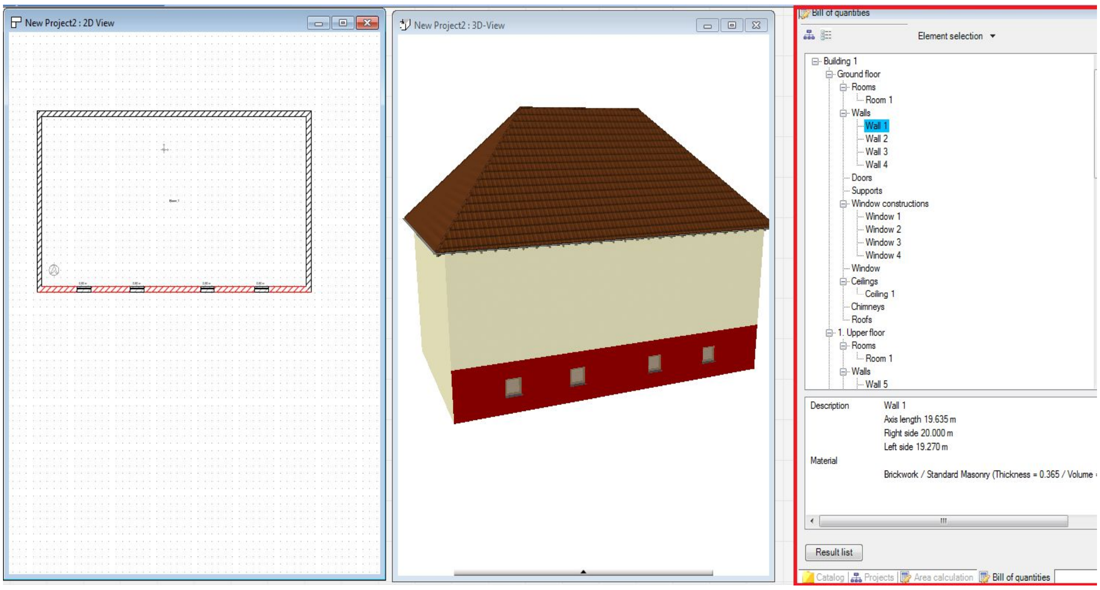
The result;



21 QUANTITIES

21.1 GENERAL

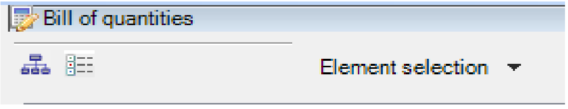
The plugin for the determining the quantities of surfaces and materials is integrated within the catalog and the project panel.



Description Wall 1
Axis length 19.635 m
Right side 20.000 m
Left side 19.270 m

Material Brickwork / Standard Masonry (Thickness = 0.365 / Volume

The dialog lists the elements used in the project in two ways: sorted by building e.g. buildings, floors, etc., or sorted by type, e.g. walls, windows etc. The sort method is determined by the buttons at the top of the panel.

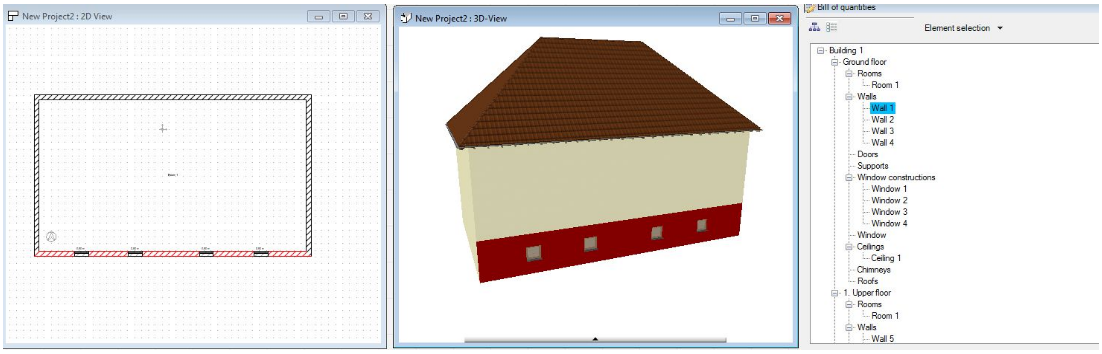


On the right you have a list of elements that determines which elements are to be displayed. This applies both to the elements in the dialogue as well as the elements listed in the output.

21.2 IDENTIFYING THE ELEMENTS

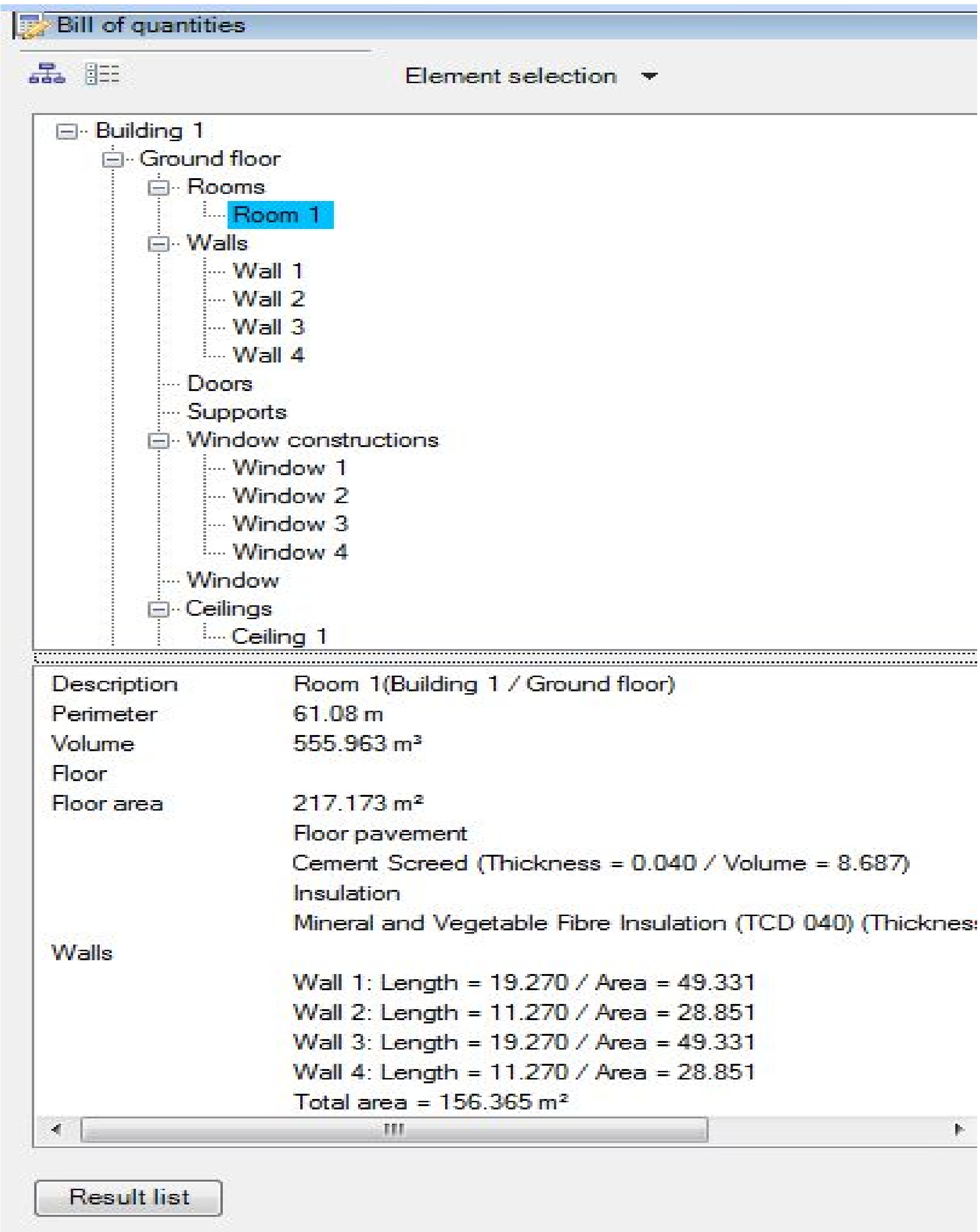
When you select an item from the tree on the right side, it also becomes selected in the views. This enables you to identify visually the component in your project.

The reverse also applies. Select an item in the plan and the corresponding component is selected in the tree and its properties are displayed.



21.3 ELEMENT PROPERTIES

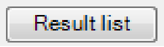
For each element in the project the properties are evaluated and calculated. The elements properties and values are displayed at the bottom of the dialog.



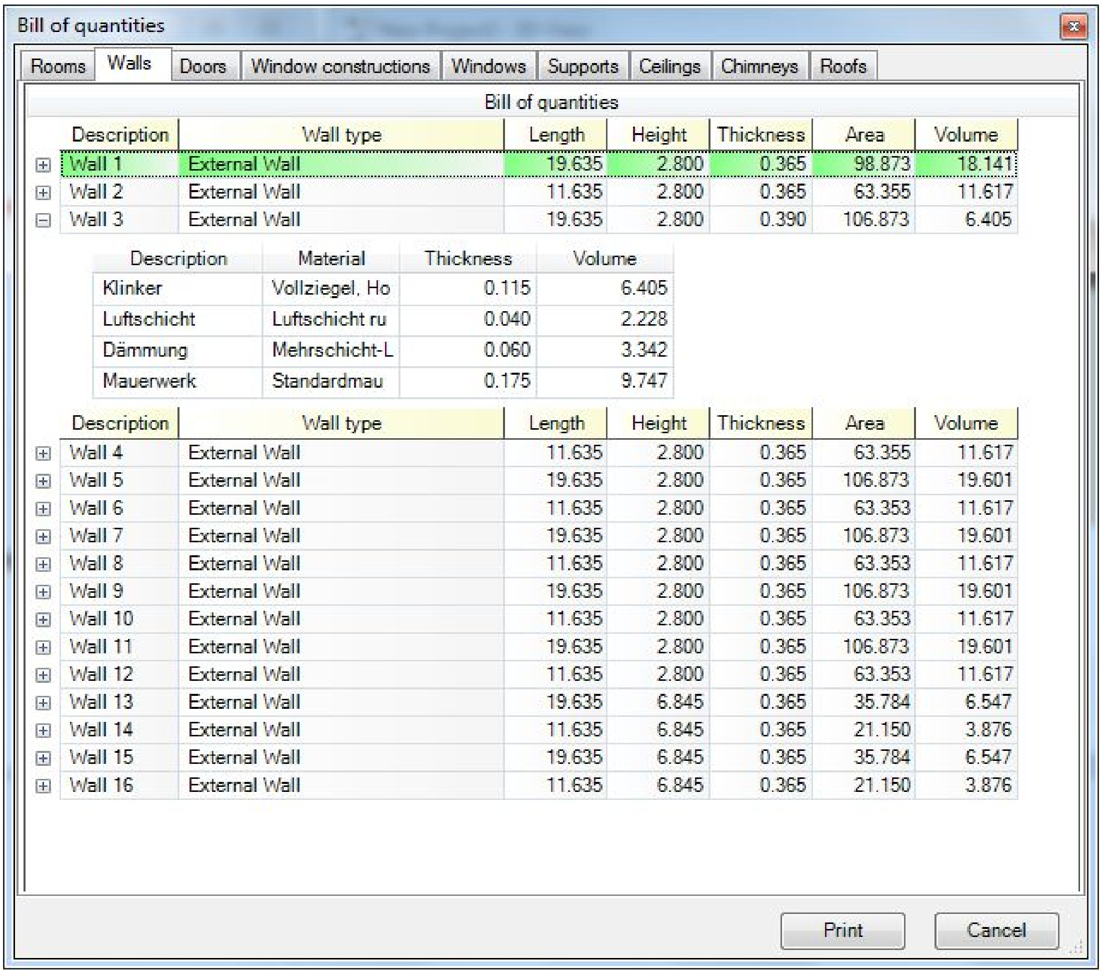
Description Room 1(Building 1 / Ground floor)
Perimeter 61.08 m
Volume 555.963 m³
Floor
Floor area 217.173 m²
Floor pavement
Cement Screed (Thickness = 0.040 / Volume = 8.687)
Insulation
Mineral and Vegetable Fibre Insulation (TCD 040) (Thicknes
Walls
Wall 1: Length = 19.270 / Area = 49.331
Wall 2: Length = 11.270 / Area = 28.851
Wall 3: Length = 19.270 / Area = 49.331
Wall 4: Length = 11.270 / Area = 28.851
Total area = 156.365 m²

21.4 OUTPUT OF RESULTS LIST

At the bottom of the toolbox you will find the Result List button to display the results in PDF, RTF, or Excel format.



A dialog containing the results will open, with the elements listed separately on a tab. Some elements, for example Walls, will contain additional information that can be expanded using the + sign.



Bill of quantities

Description	Wall type	Length	Height	Thickness	Area	Volume
⊞ Wall 1	External Wall	19.635	2.800	0.365	98.873	18.141
⊞ Wall 2	External Wall	11.635	2.800	0.365	63.355	11.617
⊟ Wall 3	External Wall	19.635	2.800	0.390	106.873	6.405

Description	Material	Thickness	Volume
Klinker	Vollziegel, Ho	0.115	6.405
Luftschicht	Luftschicht ru	0.040	2.228
Dämmung	Mehrschicht-L	0.060	3.342
Mauerwerk	Standardmau	0.175	9.747

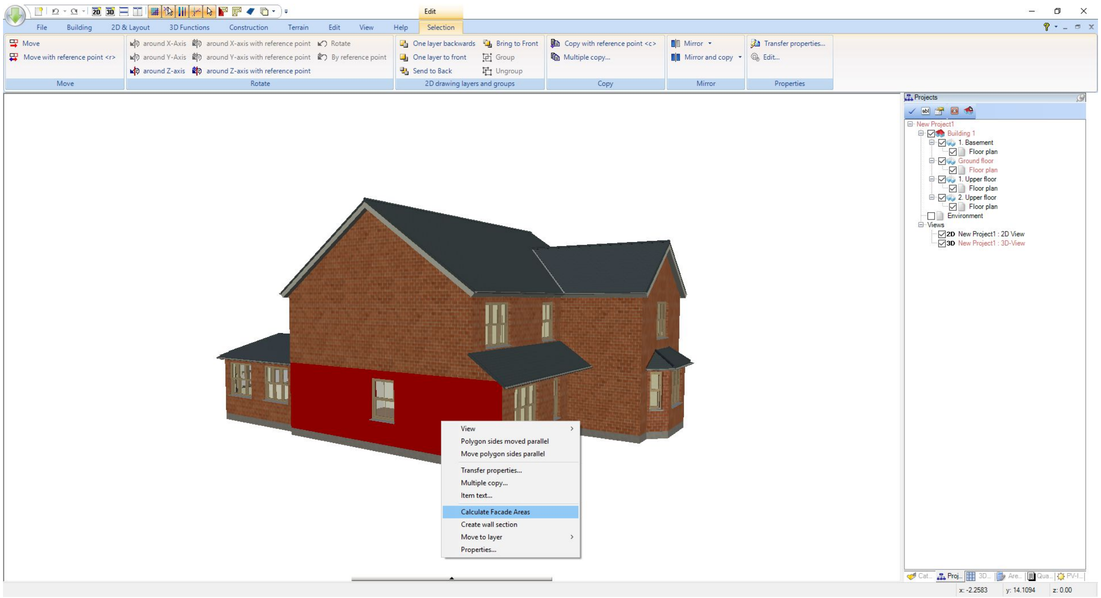
Description	Wall type	Length	Height	Thickness	Area	Volume
⊞ Wall 4	External Wall	11.635	2.800	0.365	63.355	11.617
⊞ Wall 5	External Wall	19.635	2.800	0.365	106.873	19.601
⊞ Wall 6	External Wall	11.635	2.800	0.365	63.353	11.617
⊞ Wall 7	External Wall	19.635	2.800	0.365	106.873	19.601
⊞ Wall 8	External Wall	11.635	2.800	0.365	63.353	11.617
⊞ Wall 9	External Wall	19.635	2.800	0.365	106.873	19.601
⊞ Wall 10	External Wall	11.635	2.800	0.365	63.353	11.617
⊞ Wall 11	External Wall	19.635	2.800	0.365	106.873	19.601
⊞ Wall 12	External Wall	11.635	2.800	0.365	63.353	11.617
⊞ Wall 13	External Wall	19.635	6.845	0.365	35.784	6.547
⊞ Wall 14	External Wall	11.635	6.845	0.365	21.150	3.876
⊞ Wall 15	External Wall	19.635	6.845	0.365	35.784	6.547
⊞ Wall 16	External Wall	11.635	6.845	0.365	21.150	3.876

The "Print" button will start the print function in the familiar steps:

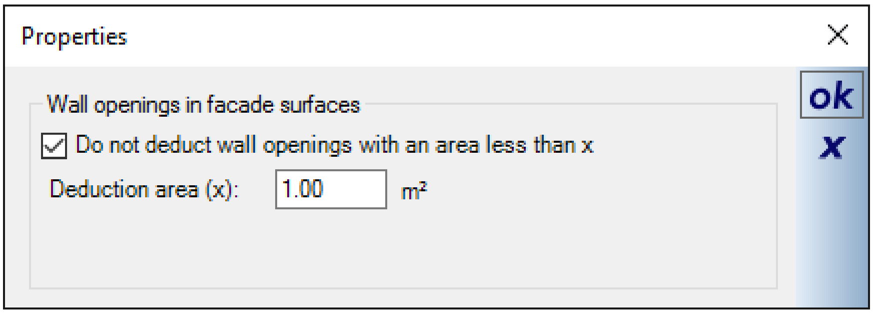
- If necessary, select a template to define the layout of the content.
- You can save the report by specifying the file name and selecting the output format (PDF, RTF, Excel).

21.5 ADDITIONAL AREA CALCULATION FOR FACADES, ROOFS, ETC.

The software allows a number of surface investigation, which is usually created via the export menu- reports-...
A simple method for determining the area of a single facade you get when you select a wall and use the context menu, right-click "Calculate facades" choose.



You will get a dialog that allows you to determine the areas of deductible opening areas.



Properties

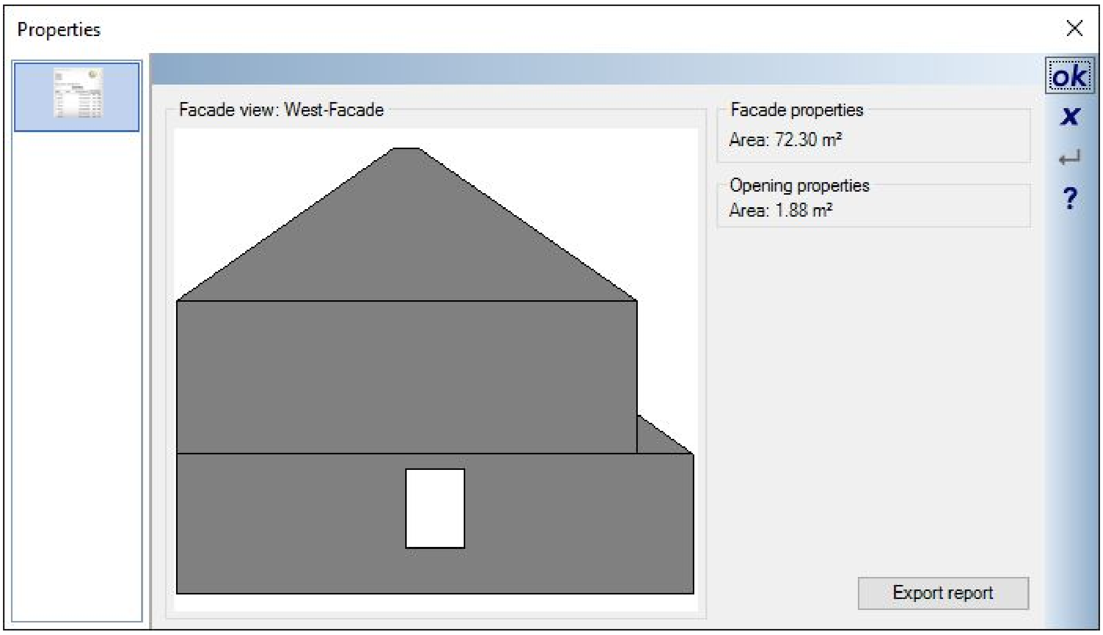
Wall openings in facade surfaces

☑ Do not deduct wall openings with an area less than x

Deduction area (x): 1.00 m²

Anschließend zeigt der folgende Dialog die automatisch zusammengefassten Flächen.
Hinweis: es werden nur solche Wandflächen zusammengefasst, die exakt übereinander bzw. in einer Ebene liegen. Sollten Sie an dieser Stelle kein oder nur ein lückenhaftes Ergebnis sehen, wäre zunächst die Lage der Wände in den Geschossen zu prüfen.
Das dargestellte Ergebnis sowie die Flächen der einzelnen Wände können Sie wie gewohnt über den Button Ergebnisausgabe als PDF, RTF oder Excel Datei exportieren.
In manchen Versionen gibt es auch eine automatische Ermittlung aller Gebäudeseiten und deren Ausgabe in einem gemeinsamen Dokument.
Then the following dialog shows the automatically combined surfaces.
Note: it summarizes only those wall areas that are exactly one above the other and in a plane. If you see at this point no or an incomplete result, you should check the position of the walls on the floors.
The shown result as well as the surfaces of the individual walls can be exported as PDF, RTF or Excel.

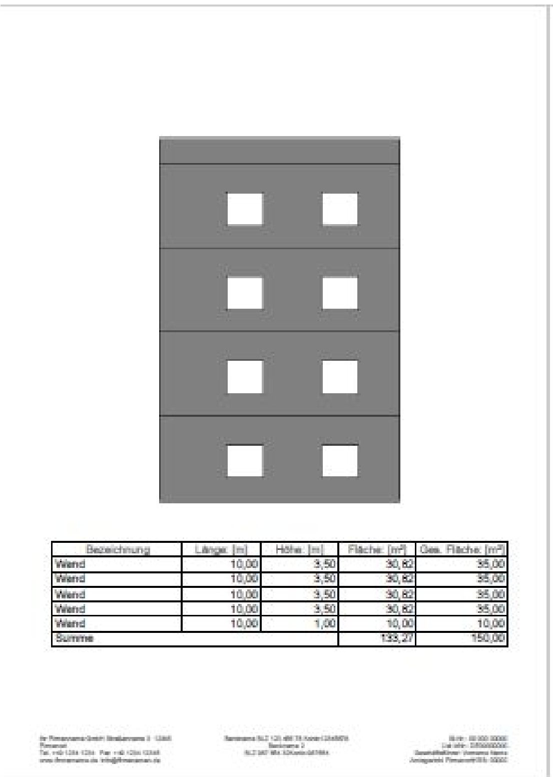
In some versions there is also an automatic determination of all sides of the building and its output in a common document.



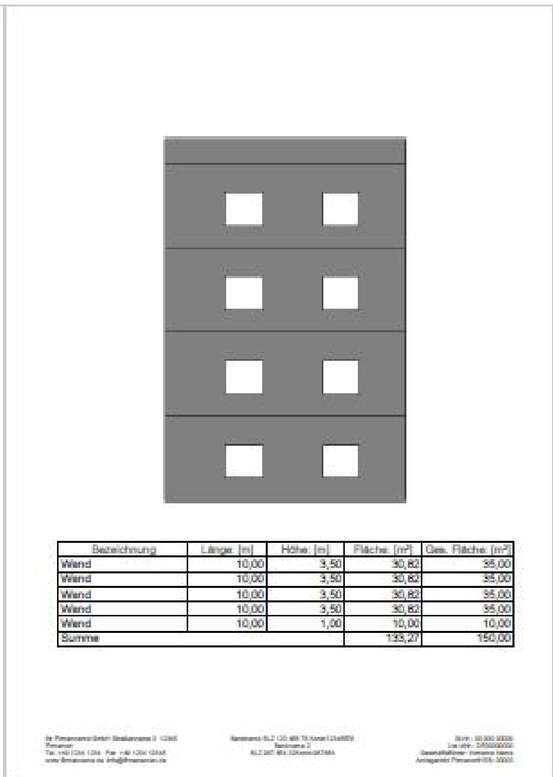
Facade properties
Area: 72.30 m²

Opening properties
Area: 1.88 m²

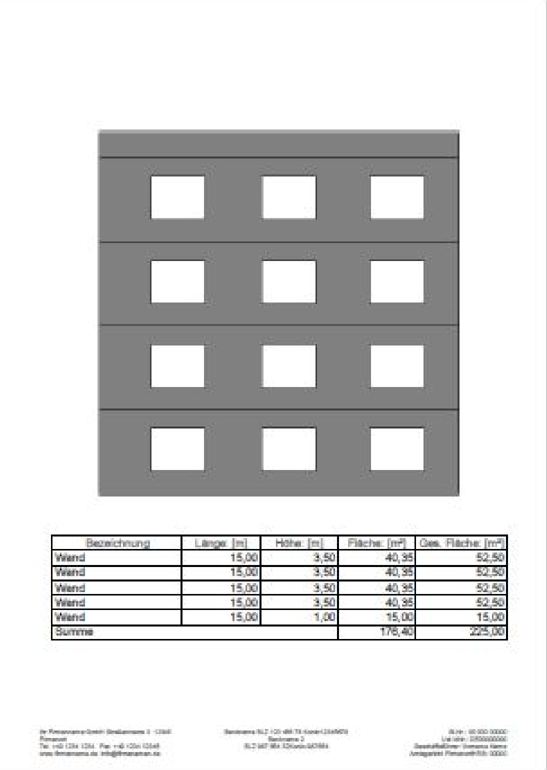
Report examples for facades and roof surfaces:



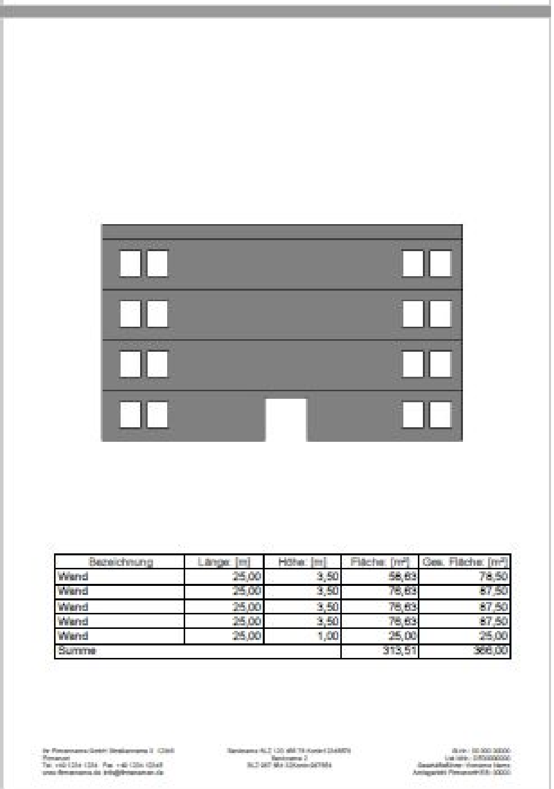
Bezeichnung	Länge: [m]	Höhe: [m]	Fläche: [m²]	Ges. Fläche: [m²]
Wand	10,00	3,50	30,82	35,00
Wand	10,00	3,50	30,82	35,00
Wand	10,00	3,50	30,82	35,00
Wand	10,00	3,50	30,82	35,00
Wand	10,00	1,00	10,00	10,00
Summe			133,27	150,00



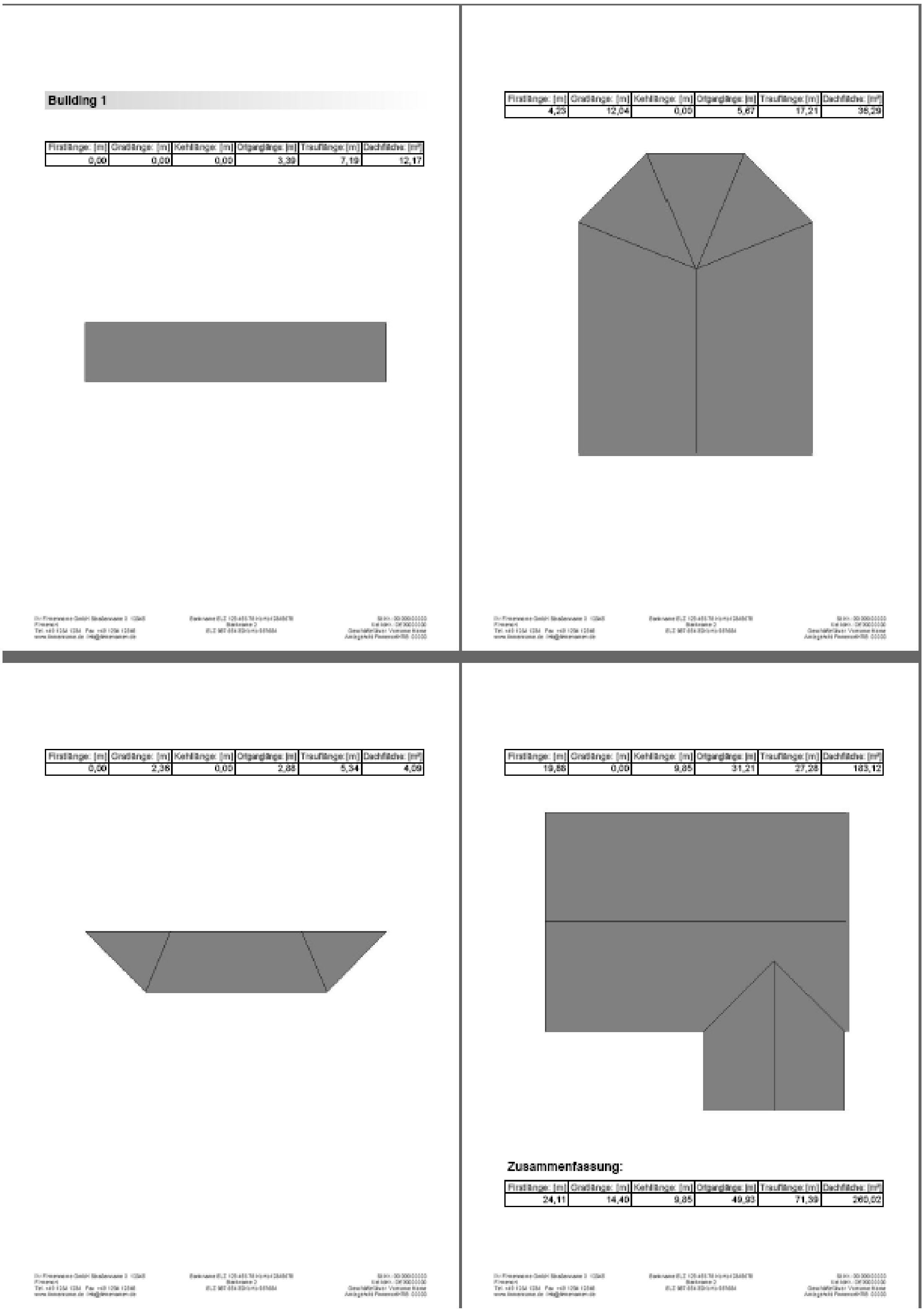
Bezeichnung	Länge: [m]	Höhe: [m]	Fläche: [m²]	Ges. Fläche: [m²]
Wand	10,00	3,50	30,82	35,00
Wand	10,00	3,50	30,82	35,00
Wand	10,00	3,50	30,82	35,00
Wand	10,00	3,50	30,82	35,00
Wand	10,00	1,00	10,00	10,00
Summe			133,27	150,00



Bezeichnung	Länge: [m]	Höhe: [m]	Fläche: [m²]	Ges. Fläche: [m²]
Wand	15,00	3,50	40,35	52,50
Wand	15,00	3,50	40,35	52,50
Wand	15,00	3,50	40,35	52,50
Wand	15,00	3,50	40,35	52,50
Wand	15,00	1,00	15,00	15,00
Summe			176,40	225,00



Bezeichnung	Länge: [m]	Höhe: [m]	Fläche: [m²]	Ges. Fläche: [m²]
Wand	25,00	3,50	58,63	78,50
Wand	25,00	3,50	76,63	87,50
Wand	25,00	3,50	76,63	87,50
Wand	25,00	3,50	76,63	87,50
Wand	25,00	1,00	25,00	25,00
Summe			313,51	366,00



Building 1

Firstlänge: [m]	Gratlänge: [m]	Kehllänge: [m]	Ortganglänge: [m]	Trauflänge: [m]	Dachfläche: [m²]
0,00	0,00	0,00	3,39	7,19	12,17

Firstlänge: [m]	Gratlänge: [m]	Kehllänge: [m]	Ortganglänge: [m]	Trauflänge: [m]	Dachfläche: [m²]
4,23	12,04	0,00	5,67	17,21	36,29

Firstlänge: [m]	Gratlänge: [m]	Kehllänge: [m]	Ortganglänge: [m]	Trauflänge: [m]	Dachfläche: [m²]
0,00	2,36	0,00	2,88	5,34	4,09

Firstlänge: [m]	Gratlänge: [m]	Kehllänge: [m]	Ortganglänge: [m]	Trauflänge: [m]	Dachfläche: [m²]
19,88	0,00	9,85	31,21	27,28	183,12

Zusammenfassung:

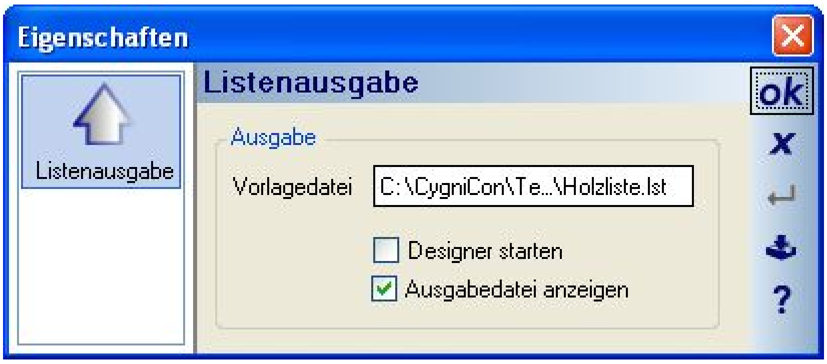
Firstlänge: [m]	Gratlänge: [m]	Kehllänge: [m]	Ortganglänge: [m]	Trauflänge: [m]	Dachfläche: [m²]
24,11	14,40	9,85	49,93	71,39	265,02

22 EXPORT MENU

The ‘Export menu shows all reports, data formats for export, and any further options for outputting data, that are provided not only by the basic version, but which may have been added by plug-in extensions.

22.1 OUTPUTTING REPORTS

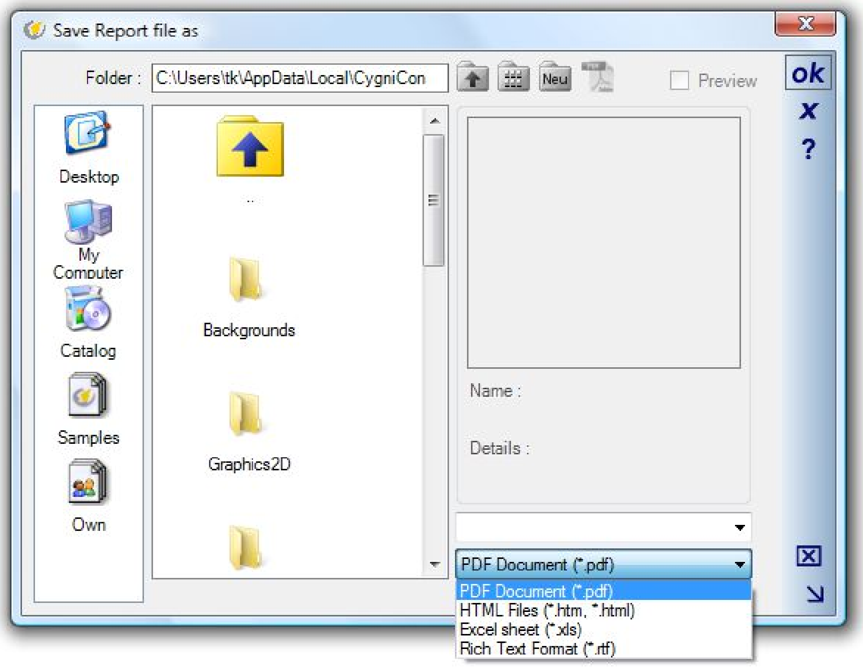
Basically, the basic version provides various formats in which lists can be output. The procedure is always the same and can be demonstrated as follows using a timber list.
First of all a dialog is opened in which the template file is selected. Template files are found in the directory ‘\Templates’. In this example click on the field ‘Template file’ and open the template ‘Timberlist.lst.*’ over the ‘Open file’ dialog. If you wish to always use the same template for output, you can save the directory and name of the file with the ‘Save as default’ button. In future, the dialog is then opened automatically with the default template.
If the ‘Display output file’ option is checked, after the file has been saved, the program which is associated with the file format is started directly and the list displayed. For instance, if the template file is saved in PDF format, as a rule the associated ADOBE program would be started.



Vorlagedatei C:\CygniCon\Te...\Holzliste.lst

☐ Designer starten
☑ Ausgabedatei anzeigen

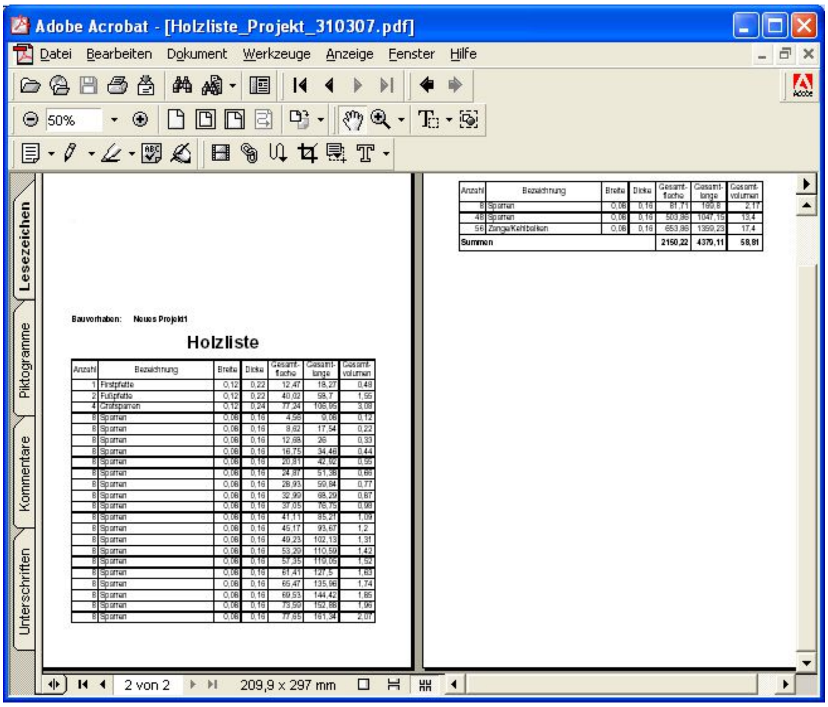
The ‘Output list’ dialog is terminated with ‘OK’ and the ‘Save report file’ dialog is then opened. Here you can enter the desired file name and select the file format from a drop-down list. Normally PDF, RTF, Excel and HTML formats are available.



Folder : C:\Users\tk\AppData\Local\CygniCon

PDF Document (*.pdf)

After the file name and format have been specified, the list is generated.



22.2 EDITING LISTS, CREATING USER TEMPLATES

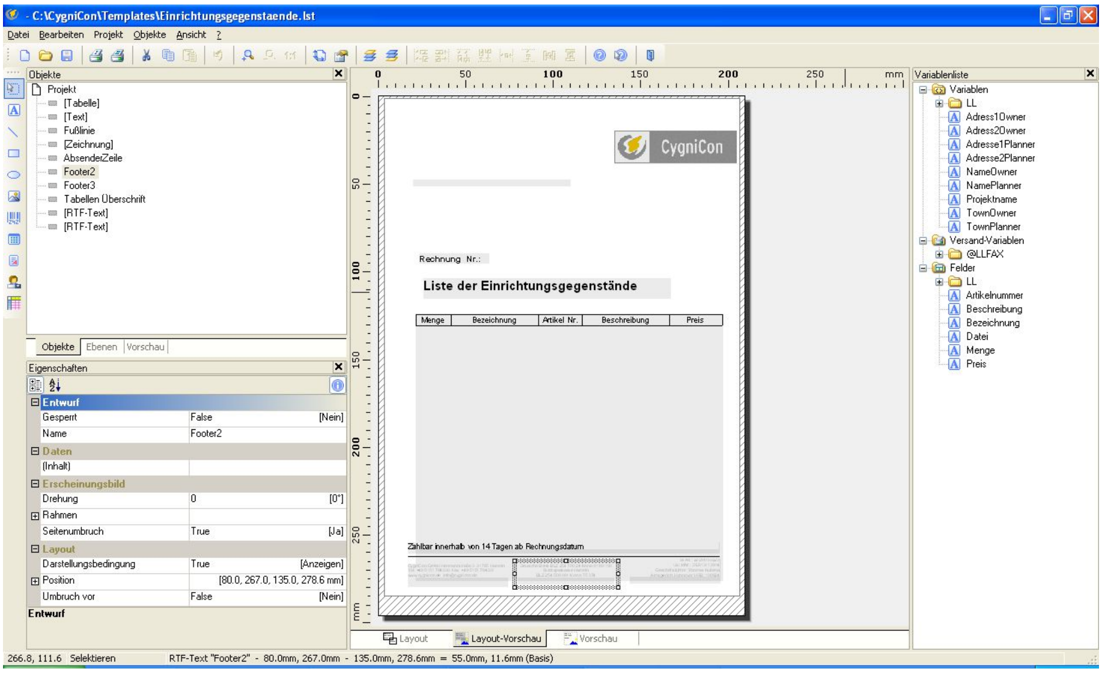
The ‘Start Designer’ option is also provided when generating lists. If a template has been selected, then on terminating the dialog instead of the list being generated, the Designer is started to define the layout of the list. As well as the template (*.lst file), certain variables and fields are also passed to the Designer for use in the list.

The program for processing lists provides all the essential elements required to design output lists. You can convert existing layouts yourself to suit your own business stationary, and also create several different templates for a particular category of output, e.g. estimates or invoices.

On the right-hand side the Designer presents a list of variables. These variables are filled by the software with the current values for the project when a list is generated. The upper part consists of fixed variables, which refer to the properties of the project, e.g. name and address of the planer. All variables can simply be moved with drag and drop from the list of variables to the document, and positioned and formatted as required.

Additionally, fields defined for the contents of a table are shown. You are not forced to accept all the predefined fields and can delete existing fields. However, inserting additional fields into the table is not possible as such, since data for these fields would not be available in the software. If this is required please contact us.

Detailed information on the use of the Designer are contained in the manual and the help file for the program, which are included.

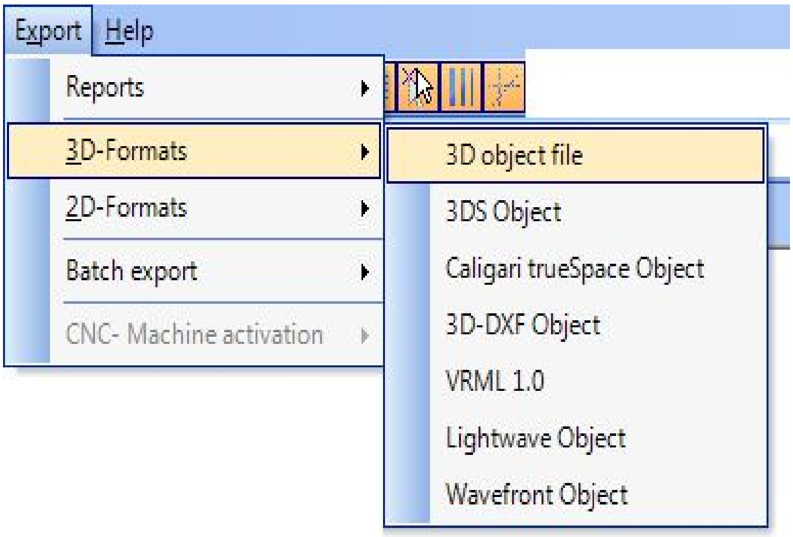


Entwurf		
Gesperrt	False	[Nein]
Name	Footer2	
Daten		
(Inhalt)		
Erscheinungsbild		
Drehung	0	[0°]
Rahmen		
Seitenumbruch	True	[Ja]
Layout		
Darstellungsbedingung	True	[Anzeigen]
Position		[80.0, 267.0, 135.0, 278.6 mm]
Umbruch vor	False	[Nein]

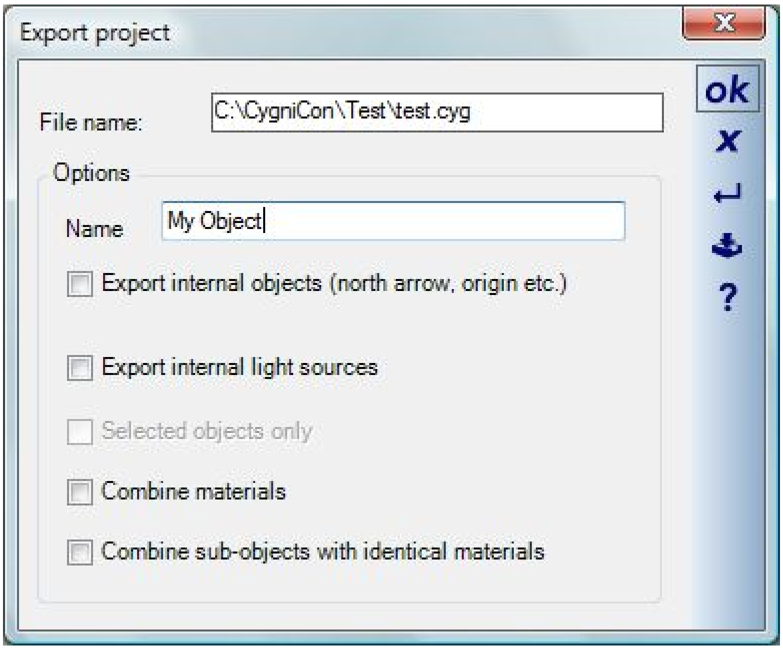
Entwurf

266.8, 111.6 Selektieren RTF-Text "Footer2" - 80.0mm, 267.0mm - 135.0mm, 278.6mm = 55.0mm, 11.6mm (Basis)

22.3 OUTPUTTING 3D FORMATS



Output of 3D formats is always dependant on the contents of the current 3D view. If a 3D view is not active then no data will be exported.
By means of the visibilities and/or the visible categories of the 3D view which is to be exported, it is possible to control whether the complete view or only certain parts of it should be exported as a 3D object. Thus, it not only to possible to save individual results, e,g a roof or a staircase, for further use in other programs, but also to extend your own catalogs by exporting objects.
Apart from settings for visibility, you are also offered, once the file name of the object to be saved has been specified, a range of options which affect, amongst other things, the way an object later behaves.
Using the feature for multiple selection, by clicking on several objects one after the other while holding down the shift key, one or more objects, including furnishings, can be chosen for export. Once the objects have been selected, they can be exported using the 'selected objects only'Option.
'Combine materials' makes the editing of exported objects in other programs easier.
Even more important is the option, 'Combine sub-objects with identical materials'. If for example, you have a room with four walls which you save as an object, then each side of a wall will be exported as a single sub-object, i.e. in total at least 16 objects. In this case, it would then in fact be possible to subsequently assign different materials or textures to each side of each wall of the resultant object, but this would have to be done at least four times, in order just to assign a new material to the exterior surfaces of the walls. If you know in advance that this feature is not required, you can merge the sub-objects for the sides of the walls on export. All wall surfaces then have common properties which can be changed collectively in the object.



File name: C:\CygniCon\Test\test.cyg

Options

Name: My Object

☐ Export internal objects (north arrow, origin etc.)

☐ Export internal light sources

☐ Selected objects only

☐ Combine materials

☐ Combine sub-objects with identical materials

The object is saved with a click on ‘OK’. According to the selected format, all necessary textures are also exported to the target directory. If for example you save a house as a ‘3DS’ object, you will find in the target directory the file ‘Haus.3ds’ and all textures and images that are referred to in the it.

If you save objects in the directory ‘\Objects’, they can be used directly when planning.

Note: available export formats are depending on the version you have purchased

23 SUPPORT

23.1 HOTLINE

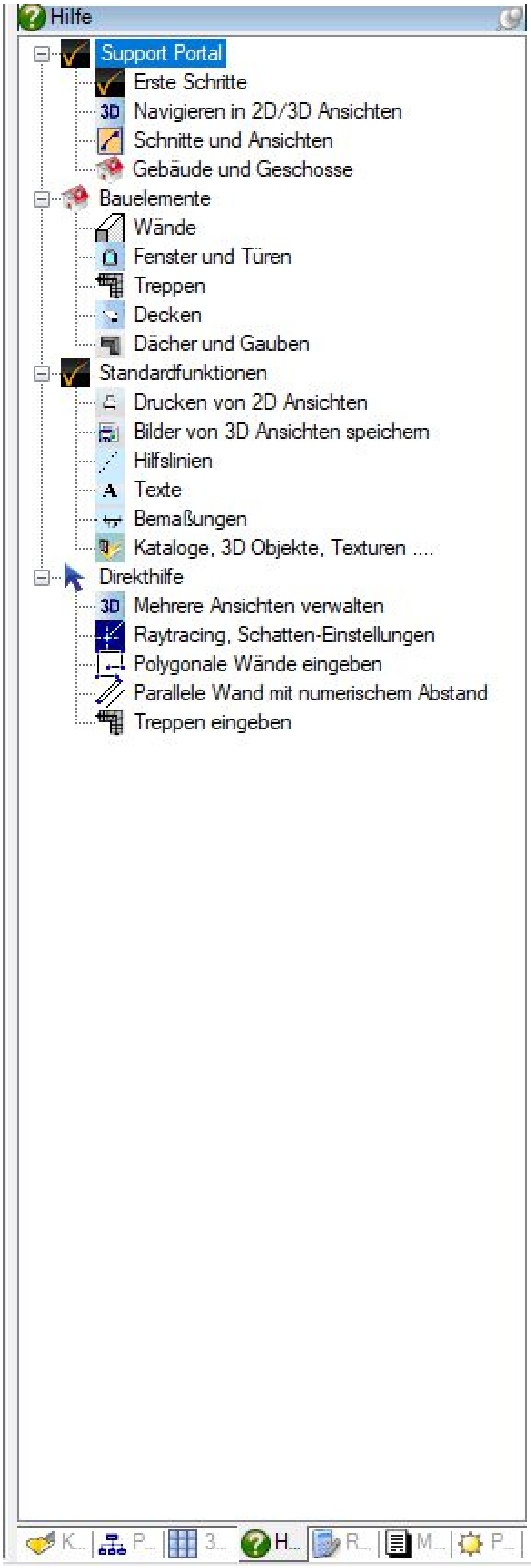
For questions concerning this software please contact our customer support via email.

23.2 CATALOG EXTENSIONS

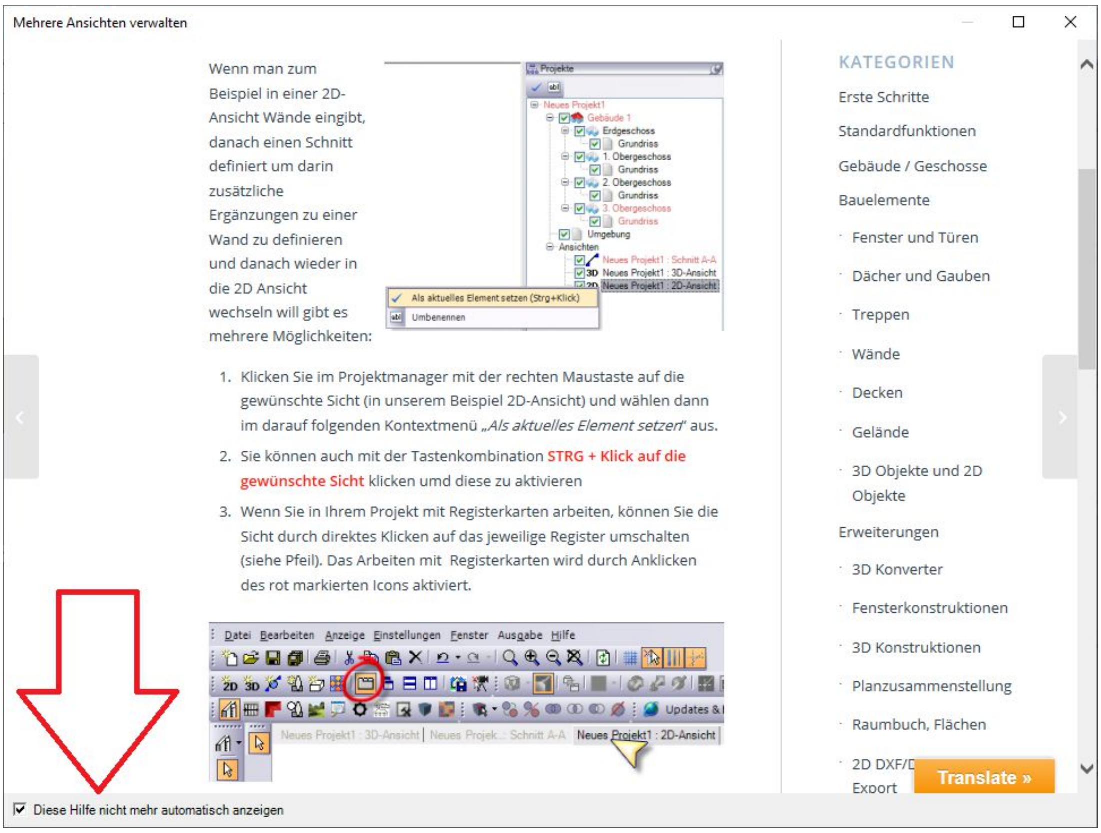
A wide range of 3D models, textures and materials are already provided to aid you in planning and designing your projects. Nevertheless, it can happen that just the object you are looking for happens to be missing. In such cases please contact us and we will do our best to help you solve the problem.

23.3 NEW HELP PLUGIN IN OUR TOOLBOX

These functions have been implemented especially for new users.
The new HTML help plug-in is located in the general toolbox, where the catalogs and the project viewer can also be found.
The help topics are structured in a tree view within the toolbox and can be called up by double-clicking or via the context menu of the right mouse button.


Hilfe
Support Portal
Erste Schritte
Navigieren in 2D/3D Ansichten
Schnitte und Ansichten
Gebäude und Geschosse
Bauelemente
Wände
Fenster und Türen
Treppen
Decken
Dächer und Gauben
Standardfunktionen
Drucken von 2D Ansichten
Bilder von 3D Ansichten speichern
Hilfslinien
Texte
Bemaßungen
Kataloge, 3D Objekte, Texturen ....
Direkthilfe
Mehrere Ansichten verwalten
Raytracing, Schatten-Einstellungen
Polygonale Wände eingeben
Parallele Wand mit numerischem Abstand
Treppen eingeben
K... P... 3... H... R... M... P...

All topics are loaded as an HTML page from a website and displayed in a dialog window.



Mehrere Ansichten verwalten

Wenn man zum Beispiel in einer 2D-Ansicht Wände eingibt, danach einen Schnitt definiert um darin zusätzliche Ergänzungen zu einer Wand zu definieren und danach wieder in die 2D Ansicht wechseln will gibt es mehrere Möglichkeiten:

1. Klicken Sie im Projektmanager mit der rechten Maustaste auf die gewünschte Sicht (in unserem Beispiel 2D-Ansicht) und wählen dann im darauf folgenden Kontextmenü *„Als aktuelles Element setzen"* aus.
2. Sie können auch mit der Tastenkombination **STRG + Klick auf die gewünschte Sicht** klicken umd diese zu aktivieren
3. Wenn Sie in Ihrem Projekt mit Registerkarten arbeiten, können Sie die Sicht durch direktes Klicken auf das jeweilige Register umschalten (siehe Pfeil). Das Arbeiten mit Registerkarten wird durch Anklicken des rot markierten Icons aktiviert.

☑ Diese Hilfe nicht mehr automatisch anzeigen

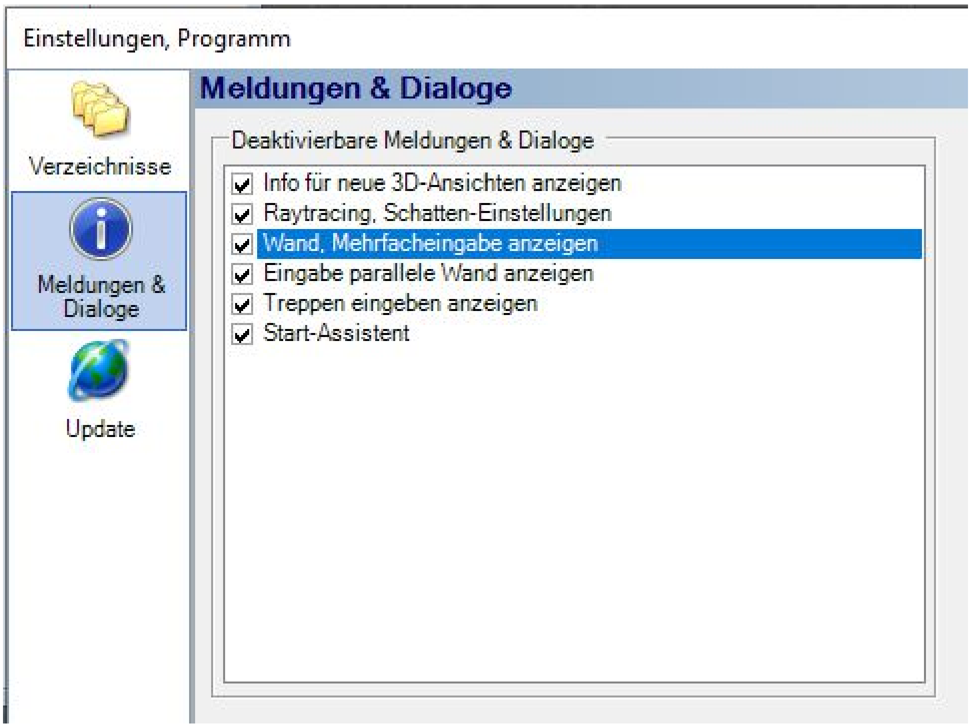
There are two types of help. The normal one from the tree view, which the user has to call up specifically, and the so-called direct help, which is automatically activated from the software and is intended to help with the first application.

For this direct help, we have selected a number of topics that are intended to draw new users' attention to the special features of the software. So e.g. a help topic opens when you open a second 3D view. As a hint to prevent the mass generation of views of the same content. Many still believe that it is necessary to switch between 2D and 3D views, but in our software all views are operated in parallel and in most cases one 3D view is therefore sufficient.

Also for certain input mechanisms, e.g. changing reference points with CTRL + W activates the help topics when starting a wall entry or with stairs.

Likewise for the subject of raytracing, which is essential for generating high-quality 3D visualizations and the settings can only be obtained by right-clicking on the raytrace button.

The direct help can be switched off via a checkbox in the dialog or via the Settings-PROGRAM dialog on the Messages & Dialogs page.



Meldungen & Dialoge

Deaktivierbare Meldungen & Dialoge

- ☑ Info für neue 3D-Ansichten anzeigen
- ☑ Raytracing, Schatten-Einstellungen
- ☑ Wand, Mehrfacheingabe anzeigen
- ☑ Eingabe parallele Wand anzeigen
- ☑ Treppen eingeben anzeigen
- ☑ Start-Assistent